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LINDIL C. FOWLER, JR., *GENERAL COUNSEL*
COLIN K. LINEBERRY, *DIRECTOR*
HEARINGS SECTION

RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

OIL AND GAS DOCKET NO. 8A-0275950

THE APPLICATION OF APACHE CORPORATION FOR AUTHORIZATION PURSUANT TO STATEWIDE RULE 36 TO INJECT FLUIDS CONTAINING HYDROGEN SULFIDE FOR THE ROBERTS UNIT IN THE WASSON FIELD, YOAKUM COUNTY, TEXAS

HEARD BY: Andres J. Trevino, P.E., Technical Examiner
Gene Montes, Hearings Examiner

DATE OF HEARING: June 7, 2012

APPEARANCES:

Robert S. Hale
Mark Ellis

REPRESENTING:

Apache Corporation

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Apache Corporation ("Apache") requests authority pursuant to Statewide Rule 36 to inject fluids containing hydrogen sulfide ("H₂S") into 64 injection wells on its Roberts Unit in the Wasson Field. Apache is making separate application with the Commission's Technical Permitting section for authority pursuant to Rule 46.

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."

This application was unopposed and the examiners recommend approval.

DISCUSSION OF THE EVIDENCE

The Wasson Field was discovered in 1936. The Wasson Field has been subject to waterflooding and carbon dioxide (CO₂) injection for many years. Production from the Wasson Field is from the San Andres at an average depth of 5,000 feet.

Apache is implementing the CO₂ flood in the Roberts Unit. The Roberts Unit is located on the western edge of the Wasson Field. The Roberts Unit is the last remaining major project in the Wasson field to undergo CO₂ flood operations. The CO₂ flood project for the Roberts Unit will use a water-alternating-gas (WAG) procedure. Under proposed operations in the Roberts Unit, pure CO₂ will be purchased from an outside source and will be combined with recycled sour CO₂ from the XTO Energy Cornell-Mahoney Gas Plant and injected into the Unit. The recycled CO₂ proposed to be used in the CO₂ flood contains H₂S at an average concentration of 7,000 ppm. The produced gas stream will be returned to the XTO Energy Cornell-Mahoney Gas Plant for processing. Apache seeks initial authority to inject sour CO₂.

The Commission's District Office has approved Form H-9 (Certificate of Compliance Statewide Rule 36) and the Contingency Plan submitted by Apache. The Contingency Plan includes all operations associated with the proposed injection, including the wellheads, gathering lines and distribution lines. For the gas gathering system, the 500 part per million (ppm) radius of exposure (ROE) is 1,393 feet and the 100 ppm ROE is 3,049 feet. These calculations are based on a maximum release of 15,000 MCFD and 15,500 ppm H₂S. There are two business locations, the XTO Cornell-Mahoney Gas Plant and the Linde Denver City CO₂ Plant and four public roads, CR 255, CR 330, Cr 340 and FR 1622 within the 100 ppm ROE. Only the four public roads identified earlier are within the 500 ppm ROE.

For the sour CO₂ injection distribution system, the 500 part per million (ppm) ROE is 847 feet and the 100 ppm ROE is 1,854 feet. These calculations are based on a maximum release of 15,000 MCFD and 7,000 ppm H₂S. The 500 ppm ROE for the CO₂ injection distribution system includes the same four public roads, CR 255, CR 330, CR 340 and FR 1622 as identified earlier. The 100 ppm ROE for the CO₂ injection distribution system includes the four public roads, the two businesses, (CO₂ plants) and two residences.

All equipment associated with the injection program satisfies the requirements in the latest editions of NACE Standard MR-0175. The 6" supply line will be monitored for pressure loss via automated pressure monitoring transmitters. The anticipated operating pressure of the CO₂ supply line is between 1,800 to 2,500 psig. Alarms will notify field personnel there is a variance above or below these pressures. The automatic shut in valve will activate if there is a variance above or below the operating pressures.

All Apache employees associated with the Roberts Unit receive hydrogen sulfide safety training regarding the proper response to an H₂S release. Each employee is trained on proper notification procedures in case of a release and are required to be familiar with the contingency plan. Employees also receive periodic training in hazardous material operations, respiratory equipment use, well control procedures and first aid.

FINDINGS OF FACT

1. Notice of this hearing was given to all persons entitled to notice at least ten (10) days prior to the subject hearing.
2. The Wasson Field was discovered in 1936. The Wasson Field has been subject to waterflooding and carbon dioxide (CO₂) injection for many years. The Roberts Unit is the last remaining major project in the Wasson Field to undergo CO₂ flood operations.
3. Crude oil production from the Wasson Field is from the San Andres. The recycled CO₂ proposed to be used in the CO₂ flood contains H₂S at an average concentration of 7,000 ppm.
4. Apache is implementing their CO₂ flood in the Roberts Unit in stages. The CO₂ flood project for the Roberts Unit will use a water-alternating-gas (WAG) procedure. The current permit seeks to authorize sour CO₂ injection into Well Nos. 2760W, 2721W, 2731RW, 2759W, 2758W, 2741W, 2761W, 2722W, 2762W, 2732W, 2763W, 2747W, 2768W, 2723W, 2765W, 2733W, 2764W, 2743AW, 2769W, 2724AW, 2770W, 2734W, 2771W, 2744W, 3763W, 3721AW, 3762W, 3731AW, 3748W, 3741W, 3674W, 3642W, 3675W, 3712RW, 3764W, 3722RW, 3765W, 3732RW, 3749W, 3742AW, 3681W, 3633RW, 3677W, 3643W, 3676W, 3713AW, 3767W, 3723W, 3766W, 3733W, 3750W, 3743AW, 3680W, 3634W, 3678W, 3644W, 3771W, 3753W, 3768W, 3724AW, 3769W, 3734W, 3770W, 3744W.
5. Under proposed operations in the Roberts Unit, pure CO₂ is purchased from an outside source will be combined with recycled sour CO₂ from the XTO Energy Cornell-Mahoney Gas Plant and injected into the Unit.
6. The Commission's District Office has approved Form H-9 (Certificate of Compliance Statewide Rule 36) and the Contingency Plan submitted by Apache. The Contingency Plan includes all operations associated with the proposed injection, including the XTO Energy Cornell-Mahoney Gas Plant's supply line, wells, injection well headers, gathering lines and distribution lines.
7. The 500 and 100 part per million (ppm) radius of exposure (ROE) was calculated from compression to wellhead at various maximum rates.
 - a. For the gas gathering system, the 500 part per million (ppm) ROE is 1,393 feet and the 100 ppm ROE is 3,049 feet. These calculations are based on a maximum release of 15,000 MCFD and 15,500 ppm H₂S. There are two business locations, the XTO Cornell-Mahoney Gas Plant and the Linde Denver City CO₂ Plant and four public roads, CR 255, CR 330, Cr 340 and FR 1622 within the 100 ppm ROE. Only the four public roads identified earlier are within the 500 ppm ROE.

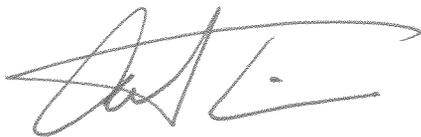
- b. For the sour CO₂ injection distribution system, the 500 part per million (ppm) ROE is 847 feet and the 100 ppm ROE is 1,854 feet. These calculations are based on a maximum release of 15,000 MCFD and 7,000 ppm H₂S. The 500 ppm ROE for the CO₂ injection distribution system includes the same four public roads, CR 255, CR 330, Cr 340 and FR 1622 as identified earlier. The 100 ppm ROE for the CO₂ injection distribution system includes the four public roads, the two businesses, (CO₂ plants) and two residences.
- 8. The 6" CO₂ supply line will be monitored for pressure loss via automated pressure monitoring transmitters. The anticipated operating pressure of the CO₂ supply line is between 1,800 to 2,500 psig. Alarms will notify field personnel there is a variance above or below these pressures. The automatic shut in valve will activate if there is a variance above or below the operating pressures.
- 9. The proposed injection meets the safety requirements of Rule 36 regarding warning and marker provisions, security provisions and materials and equipment.

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. Apache Corporation has complied with the safety provisions of Statewide Rule 36 for injection of fluid containing hydrogen sulfide.

EXAMINER'S RECOMMENDATION

The examiners recommend approval of the application of Apache Corporation to inject fluid containing hydrogen sulfide into 64 injection wells on its Roberts Unit lease in the Wasson Field.



Andres J. Trevino, P.E.
Technical Examiner

Respectfully submitted,



Gene Montes
Hearings Examiner