

**RAILROAD COMMISSION OF TEXAS  
OFFICE OF GENERAL COUNSEL**

**OIL AND GAS DOCKET  
NO. 08-0249225**

**IN THE WAHA (DELAWARE) FIELD,  
REEVES COUNTY, TEXAS**

**FINAL ORDER  
MODIFYING THE INJECTION WELL PERMITS FOR WELLS OPERATED BY  
ENSTOR WAHA STORAGE & TRANS. LP  
WAHA (DELAWARE) FIELD  
REEVES COUNTY, TEXAS**

The Commission finds that after statutory notice in the above-numbered docket heard on April 15-17, 2008, the presiding examiners have made and filed a report and proposal for decision containing findings of fact and conclusions of law, which was served on all parties of record; that the proposed application is in compliance with all statutory requirements; and that this proceeding was duly submitted to the Railroad Commission of Texas at conference held in its offices in Austin, Texas.

The Commission, after review and due consideration of the examiners' report and proposal for decision, the findings of fact and conclusions of law contained therein, and any exceptions and replies thereto, hereby adopts as its own the findings of fact and conclusions of law contained therein, except finding of fact No. 13, and incorporates said findings of fact and conclusions of law as if fully set out and separately stated herein. The Commission adopts substitute finding of fact No. 13 as set out below:

Substitute Finding of Fact No. 13:

13. In order to prevent fracturing of the injection interval, the maximum surface pressure for Enstor's injection operations under Permit F 16749 may not exceed 300 psig.
  - a. The top of the injection interval in the reconfigured wells is approximately 5900 feet.
  - b. Based on the results of the step rate test, the calculated fracture gradient for the injection interval is between 0.566 psi/ft and 0.578 psi/ft.
  - c. The injected fluids have an estimated weight of 9.5 ppg to 10 ppg.
  - d. The hydrostatic head of 9.5 ppg fluid is calculated at 2915 psi for a depth of 5900 feet. The hydrostatic head of 10 ppg fluid is calculated at 3068 psi at a depth of 5900 feet. The average is 2,991 psi.
  - e. A fracture gradient of 0.578 psi/ft, is equivalent to 3410 psi for a depth of 5900 feet. A fracture gradient of 0.566 psi/ft is equivalent to 3339 psi at a depth of 5900 feet.
  - f. The difference between the average hydrostatic head of 2991 psi and the calculated pressure to fracture the injection interval assuming a 0.578 psi/ft fracture gradient is 419 psi.
  - g. The difference between the average hydrostatic head of 2991 psi and the calculated pressure to fracture the injection interval assuming a 0.566 psi/ft fracture gradient is 348 psi.
  - h. Maximum surface injection pressure must be less than the calculated pressure necessary to fracture the injection interval.

- i. In order to provide an appropriate safety factor, the maximum surface pressure for injection operations should be limited to 300 psig.

Therefore it is **ORDERED** by the Railroad Commission of Texas that the injection well permits issued to Enstor Waha Storage & Trans. LP on January 3, 2005, Project No. 16749, Waha/Frost Lease, Well Nos. 1D, 2D, 3D, 4D, 5D, 6D, 7D, 8D, 9D and 10D, Waha (Delaware) Field, Reeves County, Texas, are modified and subject to the following terms and conditions:

SPECIAL CONDITIONS:

1. Injection fluid is limited to mined salt water.
2. The permitted injection interval for each well is between the approximate depths of 5,900 feet and 6,700 feet.
3. The maximum surface injection pressure for each well is limited to 300 psig.
4. An annual annulus pressure test must be performed on Well No. 2D and the results submitted in accordance with the instructions on Form H-5.
5. Enstor must maintain monitoring wells at its facility and provide the data collected from the monitoring wells to the Commission's District Office in Midland, and the Oil & Gas Division, Technical Permitting Section in Austin.

STANDARD CONDITIONS FOR EACH WELL:

1. Fluid injection must be through tubing set on a packer.
2. The District Office must be notified 48 hours prior to:
  - a) running tubing and setting packer
  - b) beginning any workover or remedial operation, and
  - c) conducting any required pressure tests or surveys.
3. The wellhead must be equipped with a pressure observation valve on the tubing and for each annulus.
4. Prior to beginning injection, and subsequently after any workover, an annulus pressure test must be performed. The test pressure must equal the maximum authorized injection pressure or 500 psig, whichever is less, but must be at least 200 psig. The test must be performed and the results submitted in accordance with the instructions of Form H-5.
5. Within 30 days after completion, conversion to fluid injection or any workover which results in a change in well completion, a new Form W-2 must be filed in duplicate with the District Office to show the current completion status of the well. The date of the injection permit and project number must be included on the new Form W-2.

- 6. The injection pressure and injection volume must be monitored at least monthly and reported annually on Form H-10 to the Commission's Austin Office.
- 7. Written notice of the intent to transfer the permit must be submitted to the Commission by filing Form P-4 at least 15 days prior to the date the transfer will occur. Permit transfer will not occur until the Form P-4 has been approved by the Commission.
- 8. A well herein authorized cannot be converted to a producing well and have an allowable assigned without filing an amended Form W-1 and receiving Commission approval.

Provided further that, should it be determined that such injection fluid is not confined to the approved strata, then the permission given herein is suspended and the fluid injection must be stopped until the fluid migration from such strata is eliminated.

Each exception to the examiners' proposal for decision not expressly granted herein is overruled. All requested findings of fact and conclusions of law which are not expressly adopted herein are denied. All pending motions and requests for relief not previously granted or granted herein are denied.

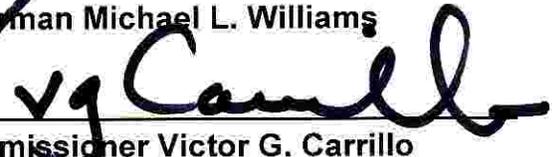
This order will not be final and effective until 20 days after a party is notified of the Commission's order. A party is presumed to have been notified of the Commission's order three days after the date on which the notice is actually mailed. If a timely motion for rehearing is filed by any party at interest, this order shall not become final and effective until such motion is overruled, or if such motion is granted, this order shall be subject to further action by the Commission. Pursuant to TEX. GOV'T CODE §2001.146(e), the time allotted for Commission action on a motion for rehearing in this case prior to its being overruled by operation of law, is hereby extended until 90 days from the date the order is served on the parties.

Done this 12<sup>th</sup> day of November, 2008.

RAILROAD COMMISSION OF TEXAS



Chairman Michael L. Williams



Commissioner Victor G. Carrillo



Commissioner Elizabeth A. Jones



ATTEST: 

Secretary