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\* KEY ISSUES: Confiscation - Location - \*  
\* Structural High \*  
\* Provision allowing Protestant \*  
\* to observe inclination survey \*  
\* FINAL ORDER: R37 EXCEPTION GRANTED \*  
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**RULE 37 CASE NO. 0201881**

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**APPLICATION OF SIERRA OIL COMPANY FOR AN EXCEPTION TO STATEWIDE  
RULE 37 FOR ITS A. D. CRAWFORD NO. 4 WELL IN THE EASTLAND COUNTY  
REGULAR, CRAWFORD (MARBLE FALLS), SIERRA (RANGER LIME), SOVEREIGN  
GENESIS (MISS) AND WILDCAT FIELDS, EASTLAND COUNTY, TEXAS**

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**APPEARANCES:**

**APPLICANT:**

Lloyd Muennink, Attorney  
Marshall Tillman, Petroleum Landman  
Ted Coughran, Geophysicist  
Keith Maddox  
Charles E. Graham, III, Petroleum Engineer

**REPRESENTING:**

Sierra Oil Company

**PROTESTANTS:**

George C. Neale, Attorney  
Charles Salmon, Petroleum Engineer  
Bob Jones, Drilling Contractor

Pruitt Engineering and Petroleum Co./  
Sovereign Petroleum Corp.

**PROPOSAL FOR DECISION**

**PROCEDURAL HISTORY**

**APPLICATION FILED:** April 28, 1993  
**NOTICE OF HEARING:** May 3, 1993  
**HEARING(S):** July 7 and 8, 1993  
**HEARD BY:** Jim McDougal, Hearings Examiner  
Thomas H. Richter, Technical Hearings Examiner  
**TRANSCRIPT RECEIVED:** July 16, 1993  
**PFD CIRCULATED:** September 30, 1993

### **STATEMENT OF THE CASE**

This is the application of Sierra Oil Company (Sierra) for an exception to Statewide Rule 37 for its No. 4 Well on the A. D. Crawford Lease, (156.34 acres) Sierra (Ranger Lime), Sovereign Genesis (Miss), and Wildcat Fields. Spacing rules for the subject fields require lease line spacing of 330 feet and between well spacing of 933 feet with 20 acre density patterns. Sierra proposes to drill the No. 4 Well 50 feet from the south lease line. Sierra bases its application on confiscation. At the hearing, Sierra withdrew its applications for the Eastland County Regular Field and the Crawford (Marble Falls) Fields.

The application is protested by Pruitt Engineering and Petroleum Co. (Pruitt) and Sovereign Petroleum Corp. (Sovereign) (collectively referred to hereafter as Protestants). Sovereign is the leasehold interest owner offsetting Sierra's lease immediately to the south and west. Pruitt is the operator of the Sovereign lease.

The examiners believe that sufficient evidence was presented by Sierra to warrant a recommendation that its exception to Statewide Rule 37 application based on confiscation be granted with regard to the Sovereign Genesis (Miss) Field and Wildcat Field (hereinafter referred to as subject fields). However, insufficient evidence was presented to warrant a recommendation that Sierra receive an exception to Statewide Rule 37 for the Sierra (Ranger Lime) Field.

Sierra previously applied for an exception to Rule 37 on this same lease and that application was denied. The location for that proposed well was 100 feet from the south lease line. The applicant drilled a well at a regular location, Well No. 2A, i.e. 330 feet from the south lease line. This well has produced approximately 1,500 barrels of oil and is nearing its economic limit after only a few months of production. It is Sierra's intention to plug this well if this Rule 37 is granted. If the first well is plugged, and the Rule 37 is granted, there will only be one Sierra well on the subject lease. Sierra was able to obtain significant geological information from the drilling of this well. It was the examiners' opinion that this new information constituted changed conditions such that Sierra should be allowed to try again on its Rule 37 application.

### **DISCUSSION OF THE EVIDENCE**

#### **Applicant's Evidence**

Sierra presented four witnesses and thirty-three exhibits. Sierra's first witness was Mr. Marshall Tillman, a petroleum landman. Mr. Tillman testified about acreage assignments on the Form W-1 and established that no acreage was double assigned.

Sierra drilled its Crawford Well 2-A at a regular location 330' from the lease line. A previous Rule 37 exception had been denied. The 2A was completed March 6, 1993. The initial potential was 23 BOPD and 19 BWPD. The well currently produces 12 - 13 BOPD and 100 BWPD. The well has reached its economic limit. At the time of the previous Rule 37 hearing, Pruitt had completed but not started producing its Sovereign wells. Now production history is available. The Pruitt-Sovereign A Well No. 1 is a gas cap completed well. The other 2 Sovereign wells are classified as oil wells. Also, Sierra has run 3 seismic survey lines across its lease to tie into the seismic lines which had previously been run across Pruitt's leases.

The subject reservoir is a Mississippian reef formation. Utilizing seismic data and cross section log data, a depiction of the reservoir can be made. The applicant's tract lies on the north side of the reef. The reef is steeply dipping on the north and west sides. Small incremental movements in a horizontal direction parallel to the dip direction of the formation provide for significantly greater or lesser formation thickness. Sierra proposes moving updip from its present well location at 330' to 50' from the lease line. The existing well penetrated the top of the Mississippian reef at 1,818' subsea depth. It is calculated that the proposed location will penetrate the reef at 1,729' subsea depth. Even at this location, the proposed well will still be at a level lower than any of Pruitt's wells.

The primary reservoir drive mechanism is water in-flux. Secondary assistance is provided by gas cap expansion and solution gas. The log data, production history data, drill stem test data and the plug back of the Pruitt-Sovereign Well No. 2 clearly indicate that the water level has risen from the original position at approximately 1,880' subsea depth. The proposed Rule 37 location is necessary for Sierra to recover the hydrocarbons under this lease. As the water in-flux continues due to withdrawal from wells higher on structure, the oil and gas underlying the applicant's tract will move up structure.

Volumetric analysis shows the recoverable reserves under the Sierra tract to be approximately 63,000 BO. This is based on the geologic interpretation of 9.5 acres of the reef underlying the tract, an average net pay of 75' and a recovery factor of 35% based on the efficiency of the primary water drive in-flux.

The proposed well is to be located 50' from the protestant's lease line and the tendency of a drill bit is to drift in a direction perpendicular to sloping bedding. Sierra proposes a drilling program which would mitigate the proposed bottom hole location from encroaching on the protestant's lease line. Additionally, Sierra has no objection to Pruitt's witnessing any and all inclination surveys, directional surveys, or steering tool surveys during the drilling of the proposed well.

Protestant's Evidence

Pruitt's concern lies in 3 areas: (1) Maintaining the bottom hole location of 50' from the lease line; (2) the well may penetrate the gas cap which, if it does, will drain reservoir gas cap expansion energy; and (3) the proposed well will drain reserves off the Sovereign Lease on to the applicant's tract.

Wells associated with the subject reef suffer considerable horizontal displacement. The Sovereign Well No. 2 is a reef flank well just like the proposed Rule 37 well. The inclination survey indicated maximum horizontal displacement of 121.2 feet. Sierra's Crawford Well A-2 inclination survey showed maximum horizontal displacement of 165.72 feet. Though it is not known where the exact bottom hole location of these wells are, it is reasonable to assume the displacement is in the direction of being perpendicular to the bedding plane of the reef. The Pruitt-Sovereign A Well No. 1 which is structurally on top of the reef had a maximum horizontal displacement of 79.12 feet. The proposed well is only 50' from the lease line and it is imperative that the bottom hole location be monitored.

Pruitt's data indicates that the proposed well will encounter the gas cap. If this occurs, the subject well will produce from the gas cap and thus reduce the reservoir energy which would be available to more efficiently produce the reservoir. The gas well, Pruitt's Sovereign A Well No. 1 was only produced for 3 months (cumulative 9,968 MCF of gas) and has been shut-in since that time to conserve the reservoir gas cap energy. Sierra does not believe they will encounter the gas cap. It believes the well will be in the oil leg only.

Pruitt believes the proposed well will drain reserves from its lease. The drive mechanism of the reservoir is a combination gas and solution gas cap expansion/water in-flux. The reservoir depiction is not one of water in-flux sweeping up structure. The proposed well will drain from all directions and not stop just at the lease line 50' away. It will continue to drain from an equal level in all directions.

**EXAMINERS' OPINION**

The examiners are of the opinion that Sierra proved that if it were not allowed to drill a well at its proposed location in the Sovereign Genesis (Miss) Field, it would suffer net uncompensated drainage of its hydrocarbons therefrom. The undisputed testimony showed that a Mississippian Reef dipping steeply to the north underlies the subject lease. Further, it is undisputed that the primary energy mechanism for the field is a waterdrive. Accordingly, Sierra must get to the highest structural point on its lease in order to recover the hydrocarbons underneath its lease. Finally, Sierra's testimony that the highest reasonable structural point on its lease is the proposed location was not refuted. Therefore, the examiners are of the opinion that the proposed location of Sierra, with regard

to the Sovereign Genesis (Miss) Field, is necessary in order for Sierra to prevent confiscation of the hydrocarbons underneath its lease. The geological evidence presented by Sierra showed that a regular location was being watered out and thus neither the Sovereign Genesis (Miss) Field well nor a wildcat well would be drilled at a regular location.

The examiners believe that Sierra should take all the appropriate steps to insure that the location of the bottom hole location is 50' from the lease line at completion. The examiners propose a Rule 37 exception permit which is similar to a directional permit i.e. lease line calls for both the surface and bottom hole location. Further, it is the examiners' opinion that the drilling permit authorize that Pruitt's representative be allowed to be present on location for the running of, and be allowed to review the interpretation of, any inclination survey, directional survey or steering tool survey.

Finally, the examiners do not believe Sierra proved a need for an exception location to drill to the Sierra (Ranger Lime) Field. Sierra attempted to prove its need for the exception by the testimony of Mr. Charles Graham. However, he stated that his only study of the Sierra (Ranger Lime) Field was a review of some micrologs. By his own testimony, he had not calculated any recoverable reserves from the Sierra (Ranger Lime) Field, nor had he drawn any structure or isopach maps to do any geological interpretations. He said that the Sierra (Ranger Lime) did not appear to be productive at a regular location and said merely that there "appears to be a better chance" of recovery at the proposed location. He further testified that he was not familiar with the production characteristics of the Sierra (Ranger Lime) Field because he had not studied it.

#### **FINDINGS OF FACT**

1. At least ten (10) days' notice was given to all affected operators, lessees with no designated operator and/or unleased mineral owners of each adjacent unleased tract.
2. The subject application is for the Sierra Oil Company A. D. Crawford Lease, Well No. 4, Sierra (Ranger Lime), Sovereign Genesis (Miss), and Wildcat Fields.
3. Spacing rules for the Sovereign Genesis (Miss) Field are: lease line spacing of 330 feet, between well spacing of 933 feet, and density patterns of 20 acres. Spacing rules for the Wildcat Field are: lease line spacing of 467 feet, between well spacing of 1,200 feet, and density patterns of 40 acres.
4. The proposed well will be located 50 feet from the south lease line which is structurally higher than any less irregular location.
5. The subject lease is underlain by a steeply northward dipping reef.

6. The dominant pressure mechanism in the subject field is a waterdrive. There is a contribution from solution gas and gas cap expansion mechanisms. The subject field has a gas cap that is not being produced by any well currently in the field.
7. If the proposed well is not drilled and produced at the proposed location, the oil that is located in the Sovereign Genesis (Miss) Field will move updip into wellbores that are being produced by offset operators and thus the Sierra Crawford Lease will suffer net uncompensated drainage by offset leases. Sierra did not put on sufficient evidence to warrant granting a Rule 37 exception for the Sierra (Ranger Lime) Field.
8. There are approximately 63,000 barrels of recoverable reserves in the Sovereign Genesis (Miss) Field underneath the Sierra Crawford Lease which will be drained by offset operators if Sierra is not allowed to drill and produce a well at the proposed location. Sierra did not put on sufficient evidence to warrant granting a Rule 37 exception for the Sierra (Ranger Lime) Field.
9. The geological evidence presented by Sierra showed that a regular location was being watered out and thus neither the Sovereign Genesis (Miss) Field well nor a wildcat well would be drilled at a regular location.

#### CONCLUSIONS OF LAW

1. Proper notice of hearing was timely given to all persons legally entitled to notice.
2. All things have occurred and have been done to give the Commission jurisdiction to decide this matter.
3. Statewide Rule 37 allows an exception to its spacing requirements, inter alia, upon a showing that an exception is necessary to prevent confiscation of the hydrocarbons underneath the applicant's lease.
4. Applicant has established that it needs the proposed location to prevent confiscation in the Sovereign Genesis (Miss) Field and Wildcat Field.
5. Applicant has not met its burden of proof to warrant granting a Rule 37 exception in the Sovereign (Ranger Lime) Field.

**EXAMINERS' RECOMMENDATION**

The examiners recommend that the Commission grant Sierra Oil Company an exception to Statewide Rule 37 lease line spacing requirements and approve its proposed location for the drilling of the A. D. Crawford No. 4 Well in the Sovereign Genesis (Miss) Field and Wildcat Field, Eastland County, Texas. The proposed drilling permit contains both a surface location and bottomhole location. It is further recommended that Pruitt be authorized to be present during any inclination survey; directional survey or steering tool survey.

Respectfully submitted,

Jim McDougal  
Hearings Examiner

Thomas H. Richter  
Technical Hearings Examiner