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\* KEY ISSUES: CONFISCATION \*  
\* Water drive \*  
\* Regular location \*  
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\* FINAL ORDER: R37 EXCEPTION DENIED \*  
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**RULE 37 CASE NO. 0204239**

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**THE APPLICATION OF MAGNUM PRODUCING AND OPERATING COMPANY FOR A SPACING EXCEPTION PERMIT IN THE WILDCAT AND STEDMAN ISLAND (8120' FRIO), (B-4), (7600') AND STEDMAN ISLAND FIELDS, NUECES COUNTY, TEXAS.**

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**APPEARANCES:**

**REPRESENTING:**

**APPLICANT**

Mr. Timothy George (Attorney)  
Mr. Patrick Nye (Geologist)

Magnum Producing and  
Operating Company

**PROTESTANTS**

Ms. Carla Doyne (Attorney)  
Mr. Stephan Schubarth (Engineer)

Bannon Energy, Inc.

**PROCEDURAL HISTORY:**

REQUEST FOR HEARING:	December 27, 1993
NOTICE OF HEARING:	January 12 & 21, 1994
DATE OF HEARING:	May 18, 1994
TRANSCRIPT RECEIVED:	June 7, 1994
PFD CIRCULATED:	August 19, 1994
CURRENT STATUS:	Protested
HEARD BY:	Jeffrey T. Pender, Hearings Examiner Charles Dickson, Technical Examiner

**EXAMINERS' REPORT AND PROPOSAL FOR DECISION**

**STATEMENT OF THE CASE**

Magnum Producing and Operating Company is requesting an exception to Statewide Rule 37 to drill State Tract 321 Well No. 2 in the Stedman Island (8120 Frio), Stedman Island (B-4), Stedman Island (7600), Stedman Island, and Wildcat Fields of Nueces County, Texas. The proposed well would be the first well on a pooled unit comprising 596.59 acres in State Tracts 320 and 321 and would be directionally drilled from a surface location north of the pooled unit (see attached plat). The proposed well's bottom hole location is to be 200 FNWL and 700 FNEL of State Tract 321. The appropriate field rules are as follows:

Field	Spacing	Density
Stedman Island (7600)	467/1200	40 acres
Stedman Island	467/1200	40 acres
Stedman Island (B-4)	467/1200	40 acres
Stedman Island (8120' Frio)	933/1867	160 acres
Wildcat	467/1200	40 acres

The proposed location requires an exception to Statewide Rule 37 because it would be 200 feet from a common lease line with State Tract 322 in all of the fields and is a substandard distance, 700 feet, from the northeastern lease line for the Stedman Island (8120' Frio) Field. The applicant asserts that the proposed location is necessary to prevent confiscation.

This application is protested by Bannon Energy Incorporated, which operates the eastern offset State Tract 322, because the proposed well would be 200 feet from the common lease line. Bannon believes the proposed location is not necessary and that a well can be drilled at a regular location that would afford Magnum an opportunity to recover their share of hydrocarbons.

The examiners recommend that the application of Magnum Producing and Operating for an exception to Statewide Rule 37 be denied.

**DISCUSSION OF THE EVIDENCE**

The primary target of the application is the Stedman Island (8120' Frio) Field with the other fields as secondary targets because they are of limited areal extent and if productive at the proposed location would not justify development by a separate well.

The Stedman Island (8120' Frio) field today contains four producing wells, two oil wells operated by Bannon and two associated gas wells operated by Abraxas. The State Tract 309 No. 3, a gas well operated by Abraxas, is located approximately 1100 feet northeast of the common lease line between Tracts 309 and 321. The other gas well, the Mobil State of Texas No. 57428, is located in State Tract 308 and will be referred to as the State Tract 308 No. 1 well. This well is approximately 2600 feet northwest of the proposed location. The two oil wells in the field are located on State Tract 322, the No. 1 being approximately 2000 feet northwest of the proposed location and the No. 3 which is approximately 1500 feet west of the proposed location.

The applicant presented structure maps depicting the net sands in the other fields included in the application. Only one well is presently in each of the 7600' and the B-4 sands, and two wells in the Stedman Island sand. The applicant testified that they could not map the net pay in those fields because of insufficient information.

### **APPLICANT'S EVIDENCE**

Magnum believes that a regular location is too risky to drill and that an exception to Rule 37 is necessary to reduce the substantial geologic risks of encountering too little net pay and/or wet sand. Magnum pointed out that Bannon had testified at the field rules hearing that the field is a partial water drive field. Magnum's structure map of the 8120' sand indicates that the reservoir would be encountered at a depth of 8125 feet subsea at the proposed location. According to Magnum, a location any further down dip would greatly increase the risk of encountering wet sand.

Magnum offered pressure data which it says indicates no significant reduction or change in pressure over several years time despite substantial production from the field as evidence that the reservoir is in fact a partial water drive. The most recent pressure, obtained from the form G-1 of the Abraxas State Tract 309 No. 3, shows a bottom hole pressure of 2913 PSI in February 1994. It contends that the Bannon State Tract 322 Well No. 2 indicated a bottom hole pressure (BHP) of 2728 PSI in July 1992 and 1777 PSI in July of 1993. Additionally, Magnum's Redfish Bay No.2, which is located approximately one mile north of the proposed location, recorded a Repeat Formation Test (RFT) of 2702 PSI in 1992. Magnum believes that a comparison of these pressures over a two year time period indicates that the reservoir pressure has essentially stabilized as a result of the partial water support and that the pressure decline in the reservoir has been arrested. Therefore, they believe there is a substantial and unacceptable risk of water encroachment at the down dip regular location.

Magnum submitted a net pay isopach map with a 23 percent (%) porosity cutoff at which they believe a sand would be too thin to support a successful well. Magnum's net pay isopach map shows that the 0' and 5' net pay contour lines cross Magnum's State Tract 321. The net pay contours crossing Magnum's acreage are strongly controlled by the thin net pay found in the Abraxas State Tract 309 No. 3 well immediately to the northeast of Magnum's proposed location. That well encountered only 3' of net pay in the 8120' sand and produces at rates which are not commercial. Additionally, the contouring of net pay across Magnum's acreage is controlled by the zero net pay

found in the H.L. Hunt State Tract 321 No. 1 which not only condemns a portion of Magnum's acreage but also affords some control for placement of the zero line.

Magnum believes it would encounter a little less than 5' of net pay at the proposed location. They also believe that wells with less net pay do not produce enough to be successful. They believe that the Abraxas State Tract 309 No. 3 with only 3' of net pay and limited producing rates illustrates this fact. Magnum stated that they would not drill a well at a regular location because of the virtual certainty a well at a regular location would not have enough net pay to be economic.

Magnum testified that they believe that their State Tract 321 contains 88 productive surface acres above an oil water contact which should be able to produce 124,000 barrels of oil and 350,000 MCF of gas. This estimate was based on an average of 27% porosity, 48% water saturation, and a recovery factor of 300 barrels of oil per acre-foot and 4.5 feet of pay.

### **PROTESTANT'S EVIDENCE**

Bannon believes the field does not have an active water drive but is driven by gas cap and solution gas. They cite the decline in the reservoir pressure has from 3570 PSIG as recorded in the Bannon State Tract 322 No. 1 well in March 1984 to 2700 PSIG as recorded in the Bannon State Tract 322 No.2 in July 1992 to a January 1993 pressure in the Bannon State Tract No. 2 of 1777 PSIG. They explain the high pressure recorded in the Abraxas State Tract 309 No.3 in February 1994 of 2913 PSIG as the result of sensing virgin pressure in an isolated sand or lobe of the reservoir. The only other pressure recorded in the field was one taken in the Magnum Red Fish Bay No.2 of 2702 PSIG in April, 1992.

Bannon also says that no evidence exists that any well ever experienced increasing water production caused by a rising water table. Only two completions in the field have been abandoned. One well, the Conquest State Tract 307 No. 1 was plugged back from the 8120' Frio after producing only 863 MCF and did not water out. The second well, the Bannon State Tract 322 No.2, was abandoned after a workover caused mechanical problems and water channeling blamed on a failed stimulation attempt and not a rising water table. The Bannon oil wells in State Tract 322 produced approximately 10 barrels of water per day in early 1994 along with 20,000 barrels of oil and 40 MMCF of gas per month.

Bannon believes that with a cumulative production from the field of 900,000 barrels of oil and 4 BCF of gas that evidence of a rising water table would be more apparent by now. They agree the reservoir has an underlying water leg but that the decreasing reservoir pressure, absence of significant water production and production performance consistent with pressure depletion demonstrate that the reservoir drive mechanism is gas cap and solution gas expansion not water drive. They believe that Magnum's contention that a structurally high location is necessary to avoid an active and rising water table is simply wrong.

Bannon believes that the structure map submitted by the applicant (Exhibit 5) defeats the

spacing exception requested. It shows that a location 933' from the common lease line with Bannon would be structurally equivalent to the Bannon State Tract 322 No. 3 which is a successful completion. That map demonstrates that a well at a regular location would be sufficiently high in the reservoir to provide a reasonable opportunity for a completion.

Bannon took exception to the applicant's criteria of a 23% porosity cutoff and a minimum of 3' of net pay for commercial well. Bannon contends that the existing wells produce from portions of the reservoir that contain less than 23% porosity. Bannon also believes that Magnum's cutoff excludes upper portions of the reservoir and results in a cutoff that is too high.

Bannon stated that the parameters used by the applicant to define the size of the reserves predicts a reservoir that is too small to contain the oil and gas produced thus far plus what will be produced in the future. Bannon believes that Magnum's porosity cut-off results in a smaller reservoir than actually exists and argues that the reservoir is both vertically and aerially larger than Magnum hypothesized. Bannon believes that the reservoir will ultimately recover 1.6/1.7 MMBO and 6.5/7.0 BCF of gas by using a recovery factor of 15/18%, which they believe represents a more practical recovery factor for this type of reservoir.

### **EXAMINERS' OPINION**

The applicant did not meet its burden of proof that an exception to Statewide Rule 37 is necessary to prevent the confiscation because they failed to negate a regular location. This recommendation is based the following:

The reservoir is not a water drive because of the change in pressures from 1984 of 3570 PSIG to the January 1993 pressure of 1777 PSIG. We believe that the pressure of 2913 PSIG recorded in the Abraxas State Tract 309 No. 3 was, in fact, from an isolated sand. We believe that the cumulative production of some 900,000 barrels of oil and 4.0 BCF of gas along with the lack of water production in the two oil wells demonstrates the absence of a primary water drive mechanism. This negates the applicant's contention that an upstructure well is necessary. The applicant's structure map indicates that a well at a regular location would be structurally equivalent to the Bannon State Tract 322 No. 2 which is a successful completion.

The examiners believe that the net pay isopach map submitted by the applicant as exhibit 9 and indicating 88 productive acres is incorrect. The 0' net pay contour should probably be drawn closer to the H.L. Hunt State Tract 321 No.1. By doing so, the map will reflect a reservoir that is larger than the applicant contends (88 acres).

The proposed well, at a location 200 feet from the common lease line with State Tract 322, is not necessary to provide the applicant with a reasonable opportunity to recover the hydrocarbons underlying State Tract 321. The applicant can drill, with equal probability of success, a well at a location 933' from the common lease line with blocks 322 and 309.

**FINDINGS OF FACT**

1. Notice of hearing was given by first class mail at least 10 days before the hearing to all designated operators, lessees of record for tracts that have no designated operator, and owners of record of unleased mineral interests for each adjacent tract and each tract within 933 feet of the proposed location.
2. Magnum Producing and Operating Company has submitted a Form W-1, dated 12/20/93 to drill its Well No. 2, State Tract 321 located in Redfish Bay, Nueces County, Texas.
3. Magnum is requesting an exception to Statewide Rule 37 to drill a well which would be located 200 FNWL and 700 FNEL of State Tract 321.
4. The proposed well would be the first well on a pooled unit comprising 596.59 acres in State Tracts 320 and 321. The well would be a directionally drilled well from a surface location north of the pooled unit.
5. The field rules in the target fields are as follows:

Field	Spacing	Density
Stedman Island (7600)	467/1200'	40 acres
Stedman Island	467/1200'	40 acres
Stedman Island (B-4)	467/1200'	40 acres
Stedman Island (8120'Frio)	933/1867'	160 acres
Wildcat	467/1200'	40 acres

6. The primary target of the application is the Stedman Island (8120' Frio) Field with the other fields included as secondary targets because they are limited in areal extent and would not justify development by separate wells.
7. There currently four wells in the 8120' sand, two oil wells operated by Bannon Energy Inc. and two associated gas wells operated by Abraxas.
8. The Stedman Island (B-4) Field has one producing well, the Stedman Island Field has two wells, and the Stedman island (7600) Field has one producing well.
9. The proposed well would be called the State Tract 321 No. 2 and be directionally drilled from a surface location north of the bottom hole location under Redfish Bay in Nueces County, Texas.
10. This application is protested by Bannon Energy Inc. who operates two oil wells completed in the Stedman Island (8120' Frio) on State Tract 322 which offsets the subject tract to the west.

11. The Stedman Island (8120' Frio) produces by way of gas cap expansion and gas depletion drive.
  - a. Reservoir pressures have decreased from 3570 PSIG in March 1984 to 1777 PSIG in January, 1993. The pressure recorded in the Abraxas State Tract 309 No. 3 recorded in February 1994 of 2913 PSIG is from an isolated sand and is not in hydraulic communication with other wells in the (8120' Frio) Field.
  - b. The cumulative production from the field has been 900 MBO, 4.0 BCF of gas with an expected ultimate recovery of 1600/1700 MBO, 6.5/7.0 BCF of gas.
  - c. No producing well has shown a significant amount of water production.
12. A well in the Stedman Island (8120' Frio) Field does not need to be structurally higher than the State Tract 322 No. 3 to avoid watering out.
13. The proposed well would be expected to encounter the top of the 8120' sand at a subsea depth of approximately 8125 feet subsea. A well at a regular location would be expected to encounter the top of the 8120' sand at a depth of approximately 8140 feet subsea as shown on Applicant Exhibit 5.
14. The Bannon State Tract 322 No. 3 encountered the top of the 8120' sand at 8140 feet subsea and is a commercial well.
15. Magnum's calculation of a 23% porosity cutoff limit on the net pay of the reservoir results in an underestimate of the subject tract's reserves.
16. Within State Tract 321, productive reservoir can be encountered at locations 933 feet from the lease line with tract 322.

### **CONCLUSIONS OF LAW**

1. Proper notice of this hearing was timely given to all persons legally entitled to notice.
2. All things have occurred or been accomplished to give the Commission jurisdiction in this matter.
3. The applicant has failed to refute that a well at a regular location will not afford it an opportunity to recover its share of hydrocarbons under the subject lease.
4. The proposed spacing exception location is not necessary in any of the applied for fields to prevent confiscation or waste.

**EXAMINER'S RECOMMENDATION**

Based on the findings of fact and conclusions of law, the examiners recommend that the application of Magnum Producing and Operating Company for an exception to Statewide Rule 37 in the Wildcat, Stedman Island (8120' Frio), (B-4), (7600') and Stedman Island Fields be DENIED.

Respectively,

Jeffrey T. Pender  
Hearings Examiner, Legal Division

Charles L. Dickson, P.E.  
Technical Hearings Examiner