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\* KEY ISSUES: Horizontal well passing thru \*  
\* a narrow isthmus; fracture \*  
\* orientation \*  
\* \*  
\* FINAL ORDER: R37 EXCEPTION GRANTED \*  
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**RULE 37 CASE NO. 0205021**

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**APPLICATION OF UNION PACIFIC RESOURCES COMPANY FOR A RULE 37  
EXCEPTION TO DRILL WELL NO. 1, EUREKA UNIT, GIDDINGS (AUSTIN CHALK-3)  
AND GIDDINGS (AUSTIN CHALK, GAS) FIELDS, FAYETTE COUNTY, TEXAS**

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**APPEARANCES:**

**FOR APPLICANT:**

Glenn E. Johnson (Attorney)  
David Kyte  
Michael Richardson  
Aline Perry

**APPLICANT:**

Union Pacific Resources Company

**FOR PROTESTANT:**

Sandra Bolz Buch (Attorney)  
R. Lynn McCoy  
Renee D. Burns

**PROTESTANTS:**

Swift Energy Company

George C. Neale (Attorney)  
Matt Telfer

Edco Energy, Inc. and Genie Corporation

**PROPOSAL FOR DECISION**

**PROCEDURAL HISTORY**

<b>APPLICATION FILED:</b>	March 24, 1994
<b>NOTICE OF HEARING:</b>	April 22, 1994
<b>HEARING DATE:</b>	May 10, 1994
<b>TRANSCRIPT RECEIVED:</b>	May 31, 1994
<b>HEARD BY:</b>	Meredith Kawaguchi, Legal Examiner Margaret Allen, Technical Examiner
<b>PFD CIRCULATION DATE:</b>	July 25, 1994
<b>CURRENT STATUS:</b>	Protested

### **STATEMENT OF THE CASE**

Union Pacific Resources Company (hereinafter "UPRC") has applied for a Rule 37 exception to drill a horizontal well, the first well on its Eureka Unit in the Giddings (Austin Chalk-3) Field. Field rules require wells to be located 467' from the nearest lease line with a density of 160 acres and an 80 acre option.

The unit consists of 275.89 acres, which is all the acreage that was available for leasing when the unit was formed. The configuration of the unit is such that a narrow isthmus connects the northern portion from the smaller southern portion of the unit. UPRC proposes to initiate a horizontal well in the southern portion, thread the isthmus, and terminate the well in the northern portion of the unit. At the most narrow part of the isthmus the well will be 158' from one lease line and 159' from the other lease line. Negotiations among the parties have been ongoing to allow UPRC to include more acreage around the narrow band through which the drainhole passes; the protestants and UPRC have been unable to agree on terms for the inclusion of protestants' acreage in the unit.

Regular locations are available on the Eureka Unit. The protestants, offset operators, propose that UPRC drill two wells at regular locations in order to drain the unit, one being a horizontal well in the larger northern portion and the other being a vertical well in the southern portion.

The dispute centers on whether the regular locations will protect UPRC from drainage, which in turn hinges on the orientation of fractures in the Austin Chalk. All parties agree that to encounter the most number of fractures, a horizontal well should be drilled perpendicular to the fractures. UPRC contends that in order to be perpendicular to the fracture orientation, the drainhole must be placed approximately north 20 degrees west and must cross the isthmus to recover hydrocarbons underlying the southern portion of the unit.

The parties concede that offset horizontal wells are currently draining UPRC's acreage. UPRC concedes that its horizontal well will drain offset acreage, as well as its own unit.

The protestants in this matter are Swift Energy Company, Edco Energy, Inc., and Genie Corporation. Each protestant has at least one producing horizontal well in the field.

### **DISCUSSION OF THE EVIDENCE**

To prove that its reserves will be confiscated absent a Rule 37 exception, UPRC made a determination of drainage patterns in this fractured reservoir. UPRC first assumed that a horizontal wellbore will drain the fractures that it crosses to a distance of 3,500', a conservative estimate since wells in the area have demonstrated communication 7,000' away in a fracture.

To carve out each well's drainage area when two wells penetrate the same fractures, UPRC

assumed a no-flow boundary equidistant between the two wells, regardless of which well was drilled first. In actuality, the existing wells will continue to extend the potential no-flow boundary and shrink the drainage area available to UPRC, until UPRC has a producing well in competition. In addition, UPRC's expert is of the opinion that there will be very little drainage from the matrix at the well's initial penetration point and terminus. Based on these assumptions and opinions, UPRC drew drainage areas in rectangles extending from the drainhole of each well to a distance of 3,500', or to the no-flow boundary between wells. UPRC then compared the size of units operated by protestants with the number of acres the wells on these units will drain. This comparison showed that if UPRC is granted a permit to drill its proposed well, and if the protestants develop their remaining acreage by drilling additional wells at regular locations, the UPRC well will drain the number of acres that is approximately equal to its unit size, 276 acres. If the Rule 37 exception is denied and the well is confined to a regular location, UPRC will drain an amount of acreage that is less than half its unit size. In other words, a spacing exception would allow the Eureka Unit well a reasonable opportunity to drain approximately the same number of acres that are contained in the unit, thereby preventing confiscation of hydrocarbons underlying the unit.

UPRC attempted to show that waste of 165,000 barrels of oil will occur if UPRC is denied the requested exception. However, there is a regular location on the offsetting Swift Energy tract that, if drilled, would recover the hydrocarbons UPRC claims would be lost ultimately.

The protestants contend that UPRC could drill a horizontal well at a regular location by aligning the drainhole in a more east-west direction rather than a north-south direction. However, none of the parties presented evidence to establish conclusively the orientation of fractures in this area of the field. UPRC depends upon an FMS (formation microscanner) log of a well five miles away to establish its opinion of the fracture orientation. The protestants relied on testimony that the orientation of a fault in the area is swinging back towards the north, indicating a shift in the fracture orientation in the vicinity of the proposed well. The protestants also asserted that their seismic interpretation indicates that the orientation of fractures is quite different than UPRC's depiction. However, none of the seismic data was offered into evidence. The most telling information is that the majority of wells in the area and all wells drilled by protestants, except one, in the immediate vicinity of the proposed well, are drilled in a manner that reflects the fracture orientation espoused by UPRC.

### **EXAMINERS' OPINION AND RECOMMENDATION**

The evidence shows that operators can recover substantially all the hydrocarbons in this area of the field with existing wells and with future wells at regular locations. Consequently, there will be no waste if UPRC's request for an exception is denied. In regard to confiscation UPRC will suffer net uncompensated drainage if it is not allowed to drill the proposed well. The fact that the protestants drilled their wells using the same fracture orientation as UPRC relies on supports UPRC's opinion concerning the fracture orientation. In the examiners' opinion the proposed location is

reasonable and is necessary to provide the applicant UPRC an opportunity to recover the hydrocarbons under its lease, or equivalents in kind, that cannot otherwise be recovered by UPRC.

Requiring UPRC to drill two wells, a shortened drainhole in the northern portion of its lease and a vertical well in the southern portion of its lease, as proposed by protestants, is not a reasonable alternative. It requires the drilling of two wells where only one well would serve the purpose. Additionally, a vertical well would not necessarily drain radially in the Austin Chalk as protestants admitted. A vertical well may hit only one fracture. In this instance a vertical well, even if it drained radially, would leave a portion of UPRC's unit undrained according to Swift Exhibit No. 4.

The examiners recommend that UPRC's request for a Rule 37 exception be granted to prevent confiscation.

### **FINDINGS OF FACT**

1. At least ten days' notice of this hearing was given to the designated operator, all lessees of record for tracts that have no designated operator, and all owners of unleased mineral interests for each tract adjacent to the Ella A Lease and each tract nearer to the well than the prescribed minimum lease line spacing distance.
2. The application for a Rule 37 exception was filed properly by Union Pacific Resources Company (the applicant) on Form W-1 (Application to Drill, Deepen, Plug Back or Re-enter).
3. The applicant seeks an exception to Statewide Rule 37 to drill horizontal Well No. 1, the first well on the 275.89 acre Eureka Unit.
4. The applicant proposes to complete the well in the Giddings (Austin Chalk-3) and Giddings (Austin Chalk, Gas) Fields at a depth of 12,500'. Field rules require the well to be 467' from the nearest lease line.
5. The proposed well is 158' from the nearest lease line.
6. Offset operators, Swift Energy Company, Genie Corporation, and Edco Energy, Inc., protested the application.
7. A well in the Austin Chalk is most efficient (crosses statistically the maximum number of fractures) if it is drilled perpendicular to the fracture orientation.

8. The fracture orientation in the Austin Chalk Field is north 20 degrees west.
  - a. An FMS log run by UPRC indicates that the trend of fractures in the Austin Chalk is north 20 degrees west.
  - b. Three offset wells in the immediate vicinity of the proposed well were drilled by the protestants and placed perpendicular to a fracture orientation north 20 degrees west.
  - c. The majority of wells in this area of the field are placed perpendicular to this fracture orientation.
9. Net uncompensated drainage of reserves underlying UPRC's Eureka Unit will occur if the proposed well is not drilled.
  - a. The proposed well is the first well on the Eureka tract and is UPRC's only well in the field.
  - b. If the proposed well is drilled as a horizontal well at a regular location, it will drain only approximately 44 to 46 percent of the number of acres contained under the unit.
  - c. The alternate horizontal well location proposed by protestants is at a fracture orientation 45 degrees off the fracture orientation supported by UPRC's evidence and will not allow UPRC an opportunity to adequately drain its tract.
    - (i) The alternate horizontal drainhole will not penetrate the more southerly portion of UPRC's tract.
    - (ii) The alternate horizontal drainhole will encounter fewer fractures per foot of length than will a drainhole perpendicular to the fracture orientation.
10. Existing wells and future wells at regular locations will drain portions of the field that UPRC contends will remain undrained if the Rule 37 exception is denied.
  - a. Wells in the area will drain fractures to a distance of at least 3,500'.
  - b. A well at a regular location on Swift Energy Company's tract can drain the hydrocarbons claimed by UPRC to be unrecoverable without the proposed well.

**CONCLUSIONS OF LAW**

1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.
2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have been performed.
3. The applicant did not carry its burden to prove that the requested Rule 37 exception is necessary to prevent waste.
4. The requested Rule 37 exception is necessary to provide UPRC with a reasonable opportunity to recover its share of hydrocarbons from beneath its Eureka Unit.
5. The proposed location is reasonable.

Respectfully submitted,

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Legal Examiner

Margaret Allen  
Technical Examiner

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