

November 22, 1999

OIL AND GAS DOCKET NO. 08-0222908 & 08-0222909

THE APPLICATIONS OF CARLOW CORPORATION TO CONSIDER UNITIZATION, AND SECONDARY RECOVERY AND ENTITY FOR DENSITY AUTHORITY FOR THE KERMIT, SOUTH DEVONIAN UNIT, AND TO CONSIDER FIELD RULES FOR THE KERMIT, SOUTH (DEVONIAN-OIL) FIELD, WINKLER COUNTY, TEXAS

Heard by: Margaret Allen, Technical Examiner
Mark Tittel, Hearings Examiner

Procedural History

Application filed: October 11, 1999
Hearing held: November 12, 1999

Appearances

Ana Maria Marsland	Representing
Frank M. Agar, Jr.	Carlow Corp.
Joe C. Neal	

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Carlow Corp. ("Carlow") is seeking Commission approval of its unitization agreement and of its plan for secondary recovery in the Kermit, South Devonian Unit, Kermit, South (Devonian-Oil) Field, Winkler County, Texas. Carlow is also seeking to have its Kermit, South Devonian Unit designated an entity for density purposes, and to have allowable assigned to the unit on a lease basis.

Carlow requests the following field rules be adopted for the Kermit, South (Devonian-Oil) Field:

1. Designated interval from 8584 to 8738 feet as shown on the log of the Carlow Corp. (originally Cities Services) Campbell "B" Lease Well No. 1;
2. 467-933 foot well spacing;
3. 80 acre proration units with 40-acre optional units;

4. allowable based on acreage.

DISCUSSION OF THE EVIDENCE

The Kermit, South (Devonian) Field area was discovered in 1957 and is nearly depleted. The original pressure was 3700 psi and the current pressure is about 250 psi. The type log, the Carlow Corp. (originally Cities Service) Campbell "B" Well No. 1 shows the interval from 8584 to 8738 as the unitized Devonian section. Eighty-three net feet of pay are present within the 150-foot interval.

The Kermit, South (Devonian-Oil) Field is found within a large northwest-trending fault block, bounded on the northeast and southwest by major faults. To the northwest is a large gas cap that has produced 214 MCF and is now largely depleted. The top of the Devonian has been eroded in the field area and porosity around the hydrocarbon-bearing rock was occluded after the oil migrated into the trap. The oil reservoir will be flooded by peripheral injection and there will be a row of injection wells between the oil-bearing rock and the gas cap to prevent the loss of oil into the gas cap.

There are five active oil wells and three gas wells on the proration schedule for the Kermit, South (Devonian-Oil) Field which is classified as an associated field. Carlow's unit covers 3200 acres, 2580 of which are productive, and the operators of the shut-in oil wells, northwest of the unit, declined to join the unit. There will be 14 producing wells--three that are currently producing and 11 now shut-in. Twenty-one non-producing wells will be re-entered and used for injection.

Total primary production from the unit area is estimated to be about 8,799,000 BO or 17% of the original oil in place. Secondary operations will increase the recoverable reserves to 33% of the oil in place. The applicant believes that waterflooding will produce an incremental 8,000,000 barrels for a secondary to primary ratio of 0.9. Three analogous Devonian waterfloods have secondary to primary ratios of 1.1, 1.9 and 2.9. The estimated net revenue of \$116,000,000 from the secondary oil will exceed the \$27,000,000 cost of the project.

Tract participation is based 50% on barrels of oil equivalent and 50% on net acre-feet. As of the hearing date, 97% of the royalty interest had signed the unit agreement, as had 100% of the working interest. The applicant expects more interest owners to join the unit but some of the smaller interest owners could not be located. If there remains any unsigned interest in a tract, Carlow will meter the production from that tract separately.

The interests of all owners in the field, whether or not they sign the unit agreement, will be protected. The State of Texas owns no royalty interest in any of the tracts. It is necessary to unitize the acreage in order to conduct an effective waterflood. The persons entering into the unit own interests in the unit and the unit agreement is voluntarily entered into to establish pooled units for a secondary recovery operation. The unit agreement does not bind any interest owner who does not execute it. No one was compelled to enter into the unit agreement.

The unit agreement is subject to all valid rules, orders and regulations of the Railroad Commission. The agreement does not provide for the location of wells nor does the agreement relieve Carlow from its obligation to develop reasonably the leases in the unit. The agreement does not anticipate the use of dry gas in the reservoir. Nor does the unit agreement limit the amount of production from the unit properties. The unit agreement does not provide for cooperative refining or marketing of crude petroleum or its by-products. The agreement does not restrict any of the rights which persons now have to pool or unitize.

The unit agreement does not attempt to set different field rules, and the operator has make a separate application to adopt rules for the field as a whole. Cumulative production from the 86 wells ever completed in the field is 9,800,000 BO. Porosity in the field is 12% and permeability averages 15 md though it ranges as high as 70 md. The field is currently developed with one well per eighty acres. As part of the secondary recovery plan, some infill wells will be drilled on a density of less than eighty acres. Carlow is therefor seeking to have field rules adopted that provide for 80-acre density with 40-acre optional units. Carlow is also seeking to have its Kermit South Devonian Unit recognized as an Entity for Density purposes to allow it to drill wells in the most advantageous locations, without regard to between-well spacing.

Well spacing of 467-933 feet is standard for 40-acre optional units, and no unit wells will be drilled closer than 467 feet to the nearest lease line unless granted a Rule 37 exception. Allocation based on acreage will generally protect correlative rights. The applicant is seeking to have allowable assigned to the unit on the basis of the total number of acres in the unit until a capacity allowable is necessary.

FINDINGS OF FACT

1. Notice of these hearings was issued to persons entitled to notice on October 13 or December 6, 1999.
 - a. Notice of the unitization hearing was issued to all interest owners in the proposed Kermit South Devonian Unit, both signed and unsigned, and to all offset operators on October 13, 1999.
 - b. On October 13, 1999, notice of the field rule hearing was issued to all operators in the field, with the exception of Prize Operating Company.
 - c. Notice of the field rule application was mailed to Prize Operating Company on December 6, 1999, and Prize Operating did not object to the application.
2. Notice of the unitization hearing was published in the Winkler County News, a newspaper of general circulation in Winkler County, on October 14, 21, and 28, and November 4, 1999.
3. The proposed unit includes fifteen tracts, covering 3200 acres wherein 2580 acres are

productive.

4. The unit is bounded to the southeast by an oil/water contact, and to the northwest by a gas cap.
5. Only acreage that can reasonably be considered productive and that has been reasonably defined by development is included within the unit.
6. There will be 14 producing wells and 21 injection wells.
7. The unit is sufficiently large to operate an efficient secondary recovery project.
8. The unit area contains only that acreage reasonably necessary for a waterflood project.
9. The oil reservoir in the Kermit, South (Devonian-Oil) Field has a combined gas cap and solution gas drive, which makes the Devonian oil reservoir in the proposed unit a good candidate.
10. Cumulative production from the field has been 9,800,000 BO and 214 BCF of gas, and primary production from the unit will be 8,800,000 BO.
11. The anticipated secondary recovery is 8,000,000 BO, for a secondary to primary ratio of 0.9.
12. The State of Texas owns no royalty interest in any of the tracts.
13. The waterflood project will not be successful unless the area is unitized; waterflood operations will sweep hydrocarbons across lease lines.
14. The proposed injection project is expected to produce a reasonable profit: the value of the anticipated additional recovery from the reservoir by means of the secondary recovery program will more than offset the cost of the proposed secondary recovery operation.
15. The rights of the owners of all interests in the field whether or not they join the unit will be protected under the operation of this unit.
16. The owners of interest in the oil and gas under each tract of land within the area reasonably defined by development and capable of inclusion in a contiguous unit have been given an opportunity to enter the unit on the same yardstick basis as the owners of interest in the oil and gas under the other tracts in the unit.
17. To date 100% of the working interest ownership and 97% of the royalty interest ownership have signed or ratified the unit agreement.
18. Such agreement does not bind any interest owner who does not execute the agreement.
19. No one was compelled to enter into the unit agreement; the owners of interests not desiring

to enter the unit on the yardstick basis may continue to participate in production from the field on an independent basis governed by Commission rules and by the provision of the individual lease contract.

20. The persons entering into the unit own or control production, leases, royalty or other interest in the Kermit, South (Devonian-Oil) Field.
21. The unit agreement is subject to all valid rules, orders and regulations of the Railroad Commission.
22. The unit agreement does not attempt to contain the field rules for the area or field.
23. The unit agreement does not limit the amount of production.
24. The unit agreement does not provide for cooperative refining or marketing of crude petroleum or its by-products.
25. The agreement was voluntarily entered into to establish pooled units to conduct secondary recovery operations.
26. The unit agreement does not restrict the rights which persons now have to make and enter into unitization and pooling agreements.
27. Such agreement does not provide for the location of wells.
28. The unit agreement does not relieve Carlow Corp. from its obligation to develop reasonably its leases committed to the unit.
29. There are no other existing alternate methods or facilities available that are adequate for the purpose of secondary recovery; the unitization agreement is necessary to accomplish the purposes set forth in Section 101.011 of the Texas Natural Resources Code, specifically the establishment of pooled units necessary to effect secondary recovery operations for oil or gas.
30. The unit agreement is in the interest of public welfare as reasonably necessary to prevent waste and promote conservation.
31. The injection fluid will be saltwater from the nearby dissolution of salt to form storage caverns and from the Keystone (Ellenburger) Field.
32. Production from any tract with unsigned interests will be metered separately.
33. Field development to date has been on 80-acre density but infill wells on 40 acres may be necessary to fully develop the unit.
34. Treating the Kermit, South Devonian Unit as an entity for density purposes will allow the infill wells to be located in the most advantageous places.

35. Well spacing of 467-933 feet is standard for 40-acre optional units, and no well in the Kermit, South Devonian Unit will be drilled closer to a lease line than 467 feet without a Rule 37 exception.
35. Allocation based on acreage will protect correlative rights.
36. If the Kermit, South Devonian unit is treated as an entity for density purposes, allocation for the unit will be on a lease basis.

CONCLUSIONS OF LAW

1. Proper notice of this application and hearing was provided in accordance with all applicable regulatory statutes and rules.
2. All things have occurred or have been accomplished to afford the Commission the opportunity to consider and decide this matter.
3. Consideration of a secondary recovery program that will prevent the waste of otherwise recoverable hydrocarbon resources is a matter properly within the statutory jurisdiction of the Commission.
4. Approval of the proposed secondary waterflood injection program will foster conservation and prevent waste by providing for the recovery of hydrocarbons that would not otherwise be recovered.
5. The application complies with Chapter 101 of the Texas Natural Resources Code.
6. Because waterflood operations will sweep hydrocarbons across lease lines, a unit agreement is necessary to protect the correlative rights of working interest owners and royalty interest owners.
7. The requested field rules will prevent waste, protect correlative rights and promote conservation of oil.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiners recommend the approval of the requested unitization and secondary recovery project. The examiners also recommend the Kermit, South Devonian unit be considered an entity for density purposes, and that the requested field rules be adopted for the Kermit, South (Devonian-Oil) field.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner

Mark Tittel
Legal Examiner

Date of Commission action _____

Exhibits

1. Location map
2. Map of Devonian fields in Permian Basin
3. Structure map
4. Unit agreement
5. Unit operating agreement
6. Publication notice
7. Proration schedules
8. Map of producing wells
9. Type log
10. Structure map on base of porosity
11. Porosity cross section
12. Microlog cross section
13. Isopach of net microlog porosity
14. Reservoir data
15. Structural cross section showing contacts
16. Location of cross section
17. Graph of oil and gas production
18. Graph of production from unit
19. Volumetric calculations
20. Production map
21. Forms H-1 and H-1A
22. Projected recovery
23. Analogous waterfloods
24. Economic calculations
25. Twenty questions on unitization agreement
26. Tract participation