



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 10-0299565

THE APPLICATION OF APACHE CORPORATION TO CONSIDER UNITIZATION, SECONDARY RECOVERY, AND ENTITY-FOR-DENSITY AUTHORITY FOR THE PROPOSED PAINT RIDGE UNIT, PAINT RIDGE (CANYON GRANITE WSH) FIELD, OLDHAM COUNTY, TEXAS

HEARD BY: Karl Caldwell – Technical Examiner
Jennifer Cook – Administrative Law Judge

HEARING DATE: March 28, 2016
CONFERENCE DATE: May 3, 2016

APPEARANCES:

REPRESENTING:

APPLICANT:

Apache Corporation

Flip Whitworth
Mary Byars
Nick Daniele
Roger Macarevich
Rob Maier
Dallas Martin
Jeff Reck
Frank Sheppard
Yvonne Trejo

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Apache Corporation ("Apache") requests Commission authority for unitization of the Paint Ridge Unit ("Unit"), approval of secondary recovery operations for the Unit, and designation of the Unit as an entity-for-density purposes. The application is unopposed and the Technical Examiner and Administrative Law Judge (collectively referred to as "Examiners") recommend approval of the authority for unitization, approval of secondary recovery operations, and designation of the Unit as an entity-for-density purposes.

DISCUSSION OF EVIDENCE

The Paint Ridge (Canyon Granite Wsh) Field, Oldham County, Texas ("Field"), was discovered March 17, 2010 at a depth of 9,175 feet. Pursuant to Oil and Gas Docket No. 10-0286972, the current field rules for the Field include a correlative interval from 9,186 feet to 9,600 feet, as shown on the High Definition Induction Gamma Ray Log and the Compensated Z-Densilog Compensated Neutron Log and Digital Spectra Log of the Apache Corporation Bivins LIT AC Lease, Well No. 1155, API No. 42-359-30352. Other field rules include minimum lease line spacing of 467 feet to any property line, lease line, or subdivision line, minimum between well spacing of 1,200 feet, with no minimum between well spacing limitation between horizontal and vertical wells. There are no horizontal wells completed in the field at this time. The standard oil proration unit for the field is 160 acres, with a 40 acre tolerance for the last well on the same lease or unit, and an allocation formula based upon 100% acreage and an MER allowable of 1,700 BOPD.

The proposed Unit is located in Oldham County, approximately forty miles northwest of Amarillo, Texas. Apache is the only operator of wells on the Unit acreage and will be the Unit Operator. The proposed unitized interval is from 9,186 feet to 9,600 feet, as shown on the same well as the well defining the correlative interval for the Field. The proposed Unit contains a total of 1299.34 acres and consists of two tracts ("Tract 1" and "Tract 2"). Evidence shows that 100% of the working interest ownership in both Tract 1 and Tract 2 has signed the Unit Agreement, while 98.96% of the royalty interest ownership in Tract 1 and 96.45% of the royalty interest ownership in Tract 2, or 97.9% of the total Unit royalty has signed the Unit Agreement.

The owners of interest in oil and gas under each tract of land in the area reasonably defined by development were given an opportunity to enter into the Unit on the same yardstick basis as the owners of interest in the oil and gas under the other tracts in the Unit. The unsigned interests will be protected by the proposed Unit operations. Apache will conduct monthly well production tests and allocate production accordingly. Further, Apache will report production on a lease basis to the Railroad Commission for wells on tracts with owners who have not signed the Unit Agreement.

The Unit's participation formula is as follows: 25% cumulative barrels of oil equivalent, 25% current rate – barrels of oil equivalent, 25% remaining primary estimated unrecovered reserves – barrels of oil equivalent, and 25% acreage in each tract. There are no mineral interests owned by the State of Texas within the Unit.

There are currently 17 producing wells within the Unit. There are also two injector wells that have been drilled but not yet used for injection within the Unit. The average daily production for January 2016 from the Field was 650 BOPD with 605 BOPD of the total Field production from wells completed within the Unit. As of January 31, 2016,

cumulative production for the Field was 3.82 MMBO. Of this cumulative production, 3.64 MMBO or greater than 95% has been produced from wells completed within the Unit.

The estimated ultimate primary recovery of the Unit is 4.2 MMBO, based on a decline curve analysis. In its waterflood studies, Apache used a successful waterflood project in the Hryhor (Granite Wash) Field, located 11 miles south-southwest from the Unit that contains a similar reservoir to the subject Field. The secondary/primary recovery factor for that project is 1.6. Apache expects a similar secondary/primary recovery factor from its proposed waterflood.

Based on volumetric modeling and the study of the analog field in the Hryhor (Granite Wash) Field, Apache estimates an additional 6.74 MMBO of incremental oil will be recovered from its proposed secondary recovery water injection program in the Unit. Without the proposed secondary recovery operations, this 6.74 MMBO of recoverable oil would not be produced. The total estimated potential recovery primary and secondary recovery from the Unit is 10.9 MMBO.

The Apache waterflood program will consist of two currently un-utilized injector wells, four new drill injector wells, four conversion wells, and five new production wells. The sources of injection fluid will be produced water from wells in the Paint Ridge (Canyon Granite Wash) Field, in addition to produced water from wells in the Bivins, Lit (Canyon Lime) Field, and water from a nearby non-productive Brown Dolomite zone. None of the injection fluid sources is potable.

The proposed secondary recovery project is economically feasible. The estimated capital cost of the waterflood facilities, flow lines, conversions, and new drills is \$25,000,000. The estimated operating expense is \$55,447,000. The estimated revenue is \$216,090,000, based on the production of 6.74 MBO of incremental oil due to the waterflood project and associated gas. The estimated non-discounted profit is \$135,643,000 and does not include taxes or royalties.

Notice of the hearing was mailed to the owner of each and every mineral interest, both working interests and royalty interests within the Unit. In addition, notice of the hearing was mailed to every operator and unleased owner of lands touching the boundary of the Unit. There are several operators of lands outside the Unit who are working interest owner participants in the Unit. In addition, the notice of hearing in this matter was published once each week for four consecutive weeks (February 18, February 25, March 3, and March 10, 2016) in *The Vega Enterprise*, a newspaper of general circulation in Oldham County, where the proposed Unit is located. The first such publication occurred more than 28 days prior to the hearing date.

Apache requests that the Paint Ridge Unit be designated as an entity-for-density purposes. The proposed waterflood development plan may have infill wells closer to either existing or future producing wells than the Field's between well spacing rule. Designation of the proposed Unit as an entity-for-density purposes will allow Apache to

drill new wells at locations on the Unit without having to obtain between well spacing exceptions to maximize the recovery of hydrocarbons. Designation of the unit as an entity-for-density will prevent waste by providing the necessary flexibility to locate wells to maximize the recovery of reserves in response to the waterflood operations.

FINDINGS OF FACT

1. Notice of hearing was sent to all owners of interest in the oil and gas, including working interest owners, operators and royalty interest owners under each tract of land within the proposed Unit, as well as operators and unleased mineral owners of tracts contiguous to the boundaries of the Unit.
2. The Notice of hearing was published in *The Vega Enterprise*, a newspaper of general circulation in Oldham County, Texas, once each week for four consecutive weeks on February 18, February 25, March 3, and March 10, 2016.
3. The proposed Unit contains 1299.34 acres consisting of two separate tracts.
4. The Unit Agreement has been signed or ratified by 100% of the working interest ownership and 97.9% of the royalty interest ownership in the Unit.
5. The proposed unitized interval is from 9,186 feet to 9,600 feet within the proposed Unit Area as shown on the log of the Apache Bivins LIT 1155 Well, API No. 42-359-30352 and is identical to the field interval for the Paint Ridge (Canyon Granite Wsh) Field.
6. Cumulative recovery from the leases proposed for unitization is 3.64 MMBO and 7.74 BCF through January 2016. Remaining primary recovery from the Unit is estimated to be 4.2 MMBO.
7. Secondary recovery operations will result in the recovery of an estimated 6.74 MMBO, which would otherwise be unrecovered. This volume of secondary recovery is based upon volumetrics, reservoir modeling and the study of a successful analog waterflood in a nearby and similar reservoir.
8. The cost to implement the project does not exceed the value of additional reserves to be recovered.
9. The participation formula is based on tract participation and is calculated as follows: 25% cumulative barrels of oil equivalent, 25% current rate – barrels of oil equivalent, 25% remaining primary estimated unrecovered reserves – barrels of oil equivalent, and 25% acreage in each tract.
10. The secondary recovery project will not be successful unless the area is unitized.

11. The secondary recovery program will use produced water from the Paint Ridge (Canyon Granite Wsh) Field, produced water from the Bivins, Lit (Canyon Lime) Field, and water from a nonproductive Brown Dolomite zone. None of this injection water is potable.
12. The Unit Agreement was voluntarily executed by all parties affixing their signatures thereto and no person has been compelled or required to enter into the agreement. The Unit Agreement binds only those persons who have executed it, their heirs, successors, assigns, and legal representatives.
13. The rights of all owners of interests in the Field will be protected under the operation of the Unit, regardless of whether an owner signed the Unit Agreement.
 - a. The Unit Operator will conduct monthly well production tests and allocate production accordingly.
 - b. Production will be reported on a lease basis to the Commission for wells on tracts with unsigned interests.
14. The owners of interests in the oil and gas under each tract of land within the area reasonably defined by development have been given an opportunity to enter into the Unit on the same yardstick basis as owners of interest in the oil and gas under the other tracts in the Unit.
15. The proposed injection program will move hydrocarbons across lease lines, and unitization is necessary in order to protect the correlative rights of the various interest owners.
16. The unitization agreement is necessary to accomplish the purposes of establishing a unit to effect secondary recovery operations and to operate cooperative facilities necessary thereto. Other available or existing methods or facilities for secondary recovery operations are inadequate for the purpose of secondary recovery.
17. The Unit Agreement does not provide, either directly or indirectly, for the cooperative refining or marketing of crude petroleum, distillate, condensate, or gas, or any byproducts thereof.
18. The Unit Agreement is subject to all valid orders, rules, and regulations of the Railroad Commission.
19. The Unit Agreement contains no provision regarding field rules, nor does it limit the amount of production of oil or gas from the unitized area.

20. The Unit Agreement is a voluntary agreement entered into for the purpose of conducting secondary recovery operations.
21. The Unit agreement provides for the location and spacing of input wells and for the extension of leases covering any part of land committed to the Unit as long as operations for drilling or reworking are conducted on the Unit or as long as production of oil or gas in paying quantities is had from any part of the land or leases committed to the Unit. The Unit Agreement does not release the operator from the obligation to reasonably develop the land or leases as a whole committed to the Unit.
22. There are no state lands within the Unit.
23. The Unit Agreement is in the interest of public welfare as being reasonably necessary to prevent waste and to promote conservation.
24. The reservoir described in the Unit Agreement is identified as a single reservoir for Commission purposes and is a suitable reservoir for the proposed secondary recovery operation.
25. Designation of the unit as an entity-for-density purposes will allow for the drilling of new wells without obtaining between-well spacing exceptions, provided the density is not exceeded.
26. The Unit Agreement contains only the acreage reasonably necessary to accomplish the proposed secondary recovery project.
27. The unsigned interests will be protected by the proposed Unit operations.
 - a. Apache will conduct monthly well production tests and allocate production accordingly.
 - b. Apache will report production on a lease basis to the Railroad Commission for wells on tracts with owners who have not signed the Unit Agreement.

CONCLUSIONS OF LAW

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051.
2. All notice requirements have been satisfied. 16 Tex. Admin. Code § 1.45.
3. Applicant's proposed secondary recovery project satisfies all of the requirements set out in Tex. Nat. Res. Code Ann. §§ 101.001-052.

4. Approval of the proposed unit agreement for secondary recovery operations is in the public interest and is necessary to prevent waste and to promote the conservation of oil or gas or both.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the Examiners recommend approval of the proposed Paint Ridge Unit, secondary recovery operations, and designation of the Paint Ridge Unit as an entity-for-density purposes as set out in the attached final order.

Respectfully submitted,



Karl Caldwell
Technical Examiner



Jennifer Cook
Administrative Law Judge