

OIL AND GAS DOCKET NO. 03-0232520

THE APPLICATION OF EXXON MOBIL CORPORATION TO CONSOLIDATE VARIOUS CONROE FIELDS INTO NEW FIELDS TO BE KNOWN AS THE CONROE (CONS. U) FIELD AND CONROE (CONS. L) FIELD AND TO ADOPT OPERATING RULES AND REGULATIONS FOR THE RESULTANT FIELDS, MONTGOMERY COUNTY, TEXAS

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: October 24, 2002

Hearing held: November 8, 2002

Appearances

	Representing
Timothy George	Exxon Mobil Corporation
William T. Duncan, Jr.	
John M. Clayton	
Keith Masters	H L Brown Operating, L.L.C.

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Exxon Mobil is seeking to consolidate six Conroe fields into a new field to be known as the Conroe (Cons. L.) Field. These fields are listed in Finding of Fact 2. Exxon Mobil wants to consolidate another 14 Conroe fields into a new field to be known as the Conroe (Cons. U) Field. These six fields are listed in Finding of Fact 3. The proposed operating rules for these resultant fields are summarized as follows:

1. a. Designated interval for the Conroe (Cons. U.) Field between 460' and 2818' as shown on the log of the Humble Oil & Refining Co. A.A. & D.A. Madeley Well No. 44;
b. Designated interval for the Conroe (Cons. U.) Field between 2818' and 3887' as shown on the log of the same well;
2. minimum spacing of 330' from the nearest lease line and 330' between wells;
3. 40 acre proration units with 20-acre optional units; and
4. gas allocation based 5% per well and 95% on deliverability.

Exxon Mobil originally requested that the new fields be approved as Conroe, South fields, but consecutive numbers are not available for the field names requested and the applicant agreed to new field names under 'Conroe'. The applicant requested that oil wells be classified as salvage and given capacity exempt allowables. Each operator should be required to file completion reports listing in detail the depths of perforations or changed perforations in each wellbore. Exxon Mobil has also requested

a casing rule be adopted for the Conroe (Cons. U.) Field (for wells with a total depth above top of the Frio Formation) as follows:

5. In lieu of setting the casing as required under Statewide Rule 13, an operator may without prior approval of the Commission elect to use an alternative casing program with two strings of casing:
 - a. surface casing set at approximately 500' and cemented to the surface; and
 - b. production casing extending to the total depth of the well and cemented to the surface.

DISCUSSION OF THE EVIDENCE

Exxon Mobil operates a large unit on the Conroe Dome in the Cockfield Formation. The dome is a highly-faulted anticline over a deep-seated salt structure, and the top of the anticline contains a nested graben. There are numerous shallow sandstones above the Cockfield that form small fields among the complex of splinter faults. There is some thinning of this shallow interval over the dome, showing salt movement was active while these sandstones were deposited.

The applicant wants to develop these small fields by consolidating them into two intervals. The sandstones range in thickness from very thin to over 20', and most will not support separate completions. Many existing wells have already been completed in more than one sandstone and other sands will be perforated in these wells if this application is approved. Exxon Mobil also plans to drill additional wells in these intervals.

The upper consolidated field will include the sandstones from the top of the Pliocene at 460' to its base at 2000' (named P-1 through P-28), and the Miocene sandstones between 2000 and 2500'. There are 300' of shale below the Miocene, separating the producing sandstones in the proposed upper and lower consolidated fields. The designated interval from the proposed Conroe (Cons. U.) Field will extend from 460' to the base of this shale at 2818', as shown on the log of the Humble Mandeley Well No. 44.

The lower consolidated field will extend from 2818' through 3887' as shown on the log of the same well. The interval between 2818' and about 3400' contains five Frio sandstones, named F-1 through F-5. The interval between about 3400' and 3887 is the Vicksburg Formation.

Only one of the fields to be consolidated already has special field rules, the Conroe (Frio 3000) Field. These rules were adopted May 21, 1979, under Docket No. 3-72,486, and specify 466-933' well spacing and 160 acre density. All of the fields to be consolidated are gas fields and only the Conroe (Vicksburg) Field and Conroe (3500) Fields are associated with oil reservoirs.

Only a few of the fields proposed for consolidation have active wells. In the fields to be consolidated into the proposed upper consolidated field, Exxon Mobil has one well in the Conroe (P-21) Field. Heisey Ventures has one well in each of the Conroe (Miocene 1800), Conroe (P-20) and Conroe (P-21) Fields. All four of these wells have deliverabilities less than 250 MCF/D.

Only the Conroe (Vicksburg) Field, among the fields to be consolidated into the lower consolidated field, has any active wells. In this field, Exxon has one gas well (with a deliverability of 618 MCF/D) and one oil well (with a potential of 32 BOPD), while Merrett Operating has one marginal gas well. The Conroe (3500) Field has an inactive oil well operated by Wapiti Energy.

Almost all of the fields have had only one or two wells completed in them, though six fields have produced over 1 BCF. The Conroe (Vicksburg) and (Frio 3000) Fields have been the most prolific, producing over 3 BCF each. Though the initial pressures in various wells were on trend for depth, wells within particular fields have not exhibited similar pressure declines.

The initial pressures of wells in the proposed upper consolidated field ranged from 411 to 1022 psi. The initial pressure of wells in the proposed lower consolidated field ranged from 1112 to 1827 psi. The average porosities in all of the sandstones ranged from 7 to 30% and the water saturation was about 30%. Exxon Mobil calculated the expected drainage areas of two of its wells to determine that 40-acre density with 20-acre optional density was appropriate. The W.T. Pfafflin Lease Well No. 7 in the Conroe (P-17) Field will drain an estimated 53 acres and the J.W. Lewis Well No. B-13 in the Conroe (P-22) will drain an estimated 15 acres.

Exxon Mobil requested between-well spacing of 330' to facilitate infill drilling between existing wells. Because of the multiple reservoirs included within the proposed designated intervals, two-factor gas allocation formulas are necessary. Basing them 5% per well and 95% on deliverability will satisfy statutory requirements and this formula is close to Statewide rules.

Operators in the proposed consolidated fields expressed concern that, after consolidation, offset operators may not know which sandstones wells are reperforated in. Therefore, the applicant requested a provision in the field rules requiring operators to give details on any perforations in the proposed new fields. Exxon Mobil has also requested that the oil production in any of the sandstones in the consolidated fields be considered salvage and subject to capacity allowables.

Exxon Mobil analyzed the salinity of the formation water in the shallow sandstones of two wells. Above 1000', the formation water was very fresh with a salinity less than 700-800 ppm. Between 1300' and 2000', the salinity was 800-2000 ppm, indicative of usable-quality water. The massive Oakville aquifer occurs between about 1050' and 1350'. Between 2000' and the base of the proposed lower consolidated interval, the water was brackish, with a salt content between 2000 and 8000 ppm. Below 4000', the salinity increased to 35,000 ppm, the same as ocean water. The lower Frio and Vicksburg have been and are still being used for disposal of salt water.

A recent casing letter from the TNRCC (now the TCEQ) indicates that the base of usable-quality water is at 1550'. The interval from the surface to 250' and the fresh water in what it calls the Evangeline Aquifer between 650' and 1550' must be isolated from water in overlying and underlying beds. Exxon Mobil has requested a field rule to standardizing the casing program for wells not drilled below the proposed upper consolidated field.

The casing programs used in wells on the Conroe Dome have evolved over the years. The more recent Cockfield wells, drilled in the 1980's, have surface casing set through the Oakville aquifer, to about 1600'. In 2002, Wapiti Energy, LLC, received a permit to drill to 3800' in this area. It was

allowed to set surface casing to 500' and cement the production casing back to the surface. Exxon Mobil is requesting that a field rule allowing a similar casing program to be used for all wells completed in the proposed upper consolidated field.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators of wells in the fields to be consolidated on October 30, 2002.
2. The interval for the Conroe (Cons. L.) Field between 2818' and 3788' as shown on the log of the Humble Oil & Refining Co. A.A. & D.A. Madeley Well No. 44, includes the following fields which can be produced economically, and without causing waste, if consolidated into a single field to be known as the Conroe (Cons. L.) Field:

<u>FIELD NAME</u>	<u>FIELD NO.</u>
Conroe (Frio 2800)	20211 120
Conroe (Frio 3000)	20211 160
Conroe (Vicksburg)	20211 600
Conroe (3500)	20211 960
Conroe (F-4)	20211 100
Conroe (3470)	None
All Wildcat intervals between the above listed fields.	

2. The interval for the Conroe (Cons. U.) Field between 460' and 2818' as shown on the log of the Humble Oil & Refining Co. A.A. & D.A. Madeley Well No. 44, includes the following fields which can be produced economically, and without causing waste, if consolidated into a single field to be known as the Conroe (Cons. U.) Field:

<u>FIELD NAME</u>	<u>FIELD NO.</u>
Conroe (Charged Zone)	20211 030
Conroe (Miocene 1800)	20211 200
Conroe (Miocene 1890)	20211 240
Conroe (Miocene 2250)	20211 280
Conroe (P-11)	20211 320
Conroe (P-13)	20211 360
Conroe (P-14)	20211 400
Conroe (P-17)	20211 420
Conroe (P-20)	20211 440
Conroe (P-21)	20211 520
Conroe (P-22)	20211 560
Conroe (1650)	20211 895

Conroe (2000) 20211 910

Conroe (P-20 FB-1) 20211 480

All Wildcat intervals between the above listed fields.

3. There are numerous shallow sandstones above the Cockfield waterflood unit on the Conroe Dome that form small fields among the complex of splinter faults over the dome.
4. These shallow productive sandstones in the Pliocene, Miocene, Frio and Vicksburg formations range in thickness from very thin to over 20', and most will not support separate completions.
 - a. Almost all of the fields have had only one or two wells completed in them, though six fields have produced over 1 BCF.
 - b. The Conroe (Vicksburg) and (Frio 3000) Fields have been the most prolific, producing over 3 BCF each.
5. Only a few of the fields proposed for consolidation have active wells.
 - a. In the proposed upper consolidated field, Exxon Mobil has one gas well in the Conroe (P-21) Field, while Heisey Ventures has one gas well in each of the Conroe (Miocene 1800), Conroe (P-20) and Conroe (P-21) Fields.
 - b. The only active wells in the proposed lower consolidated field are in the Conroe (Vicksburg) Field, where Exxon has one gas and one oil well while Merrett Operating has one marginal gas well.
6. Forty acre density with 20-acre optional density is appropriate for both consolidated fields.
 - a. The W.T. Pfafflin Lease Well No. 7 in the Conroe (P-17) Field will drain an estimated 53 acres.
 - b. The J.W. Lewis Well No. B-13 in the Conroe (P-22) will drain an estimated 15 acres.
7. The Conroe (Frio 3000) Field has special rules adopted May 21, 1979, under Docket No. 3-72,486, which will no longer be applicable if this field is consolidated into the proposed Conroe (Cons. L) Field.
8. Well spacing of 330'-330' will facilitate infill drilling between existing wells.
9. A provision in the field rules requiring operators to give details on any perforations in the proposed new fields will allow offset operators to know which sandstones are completed in any particular wellbore.

10. Any oil production in any of the sandstones in the consolidated fields can be considered salvage and subject to capacity allowables.
11. Downhole commingling production from various sandstones in a single wellbore will lower the economic limit of each completion and allow the recovery of more reserves.
12. As the designated intervals includes multiple, stratigraphic reservoirs, two factor allocation formulas are required for statutory reasons.
13. Gas allocation based 5% per well and 95% on deliverability will protect correlative rights and will satisfy statutory requirements.
14. A rule allowing surface casing to be set at 500' and the production casing to be cemented back to the surface will protect usable-quality water in wells completed above the Frio Formation around the Conroe Dome.
 - a. The more recent Cockfield wells, drilled in the 1980's, have surface casing set through the Oakville aquifer, to about 1600'.
 - b. In 2002, Wapiti Energy, LLC, received a permit to drill to 3800' in this area using the proposed casing program.
 - c. A recent casing letter from the TNRCC (now the TCEQ) indicates that the base of usable-quality water is at 1550', while the interval from the surface to 250' and the fresh water in what it calls the Evangeline Aquifer between 650' to 1550' must be isolated from water in overlying and underlying beds.
 - d. Above 1000', the formation water was very fresh with a salinity less than 700-800 ppm.
 - e. Between 1300' and 2000', the measured salinity is 800-2000 ppm, indicative of usable-quality water in the massive Oakville aquifer occurring between about 1050' and 1350'.
 - f. Between 2000' and the base of the proposed lower consolidated interval, the formation water is brackish, with a salt content between 2000 and 8000 ppm.

CONCLUSIONS OF LAW

1. Proper notice was given as required by statute.
2. All things have been done or occurred to give the Railroad Commission jurisdiction to resolve this matter.
3. Consolidation of the fields as requested will prevent waste and protect correlative rights, while encouraging conservation.

4. The requested field rules, for the resultant fields, will prevent waste, protect correlative rights within the fields and satisfy statutory requirements.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the requested fields be consolidated into new fields to be known as the Conroe (Cons. U.) and Conroe (Cons. L.) Fields. The field rules proposed for the resultant fields should be adopted, as per the attached order.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner

Date of Commission Action: December 3, 2002