OIL AND GAS DOCKET NO. 05-0232205

THE APPLICATION OF ANADARKO PETROLEUM CORPORATION TO CONSOLIDATE VARIOUS NAN-SU-GAIL AND RED LAKE FIELDS INTO A NEW FIELD TO BE KNOWN AS THE NAN-SU-GAIL (CV CONSOLIDATED) FIELD AND TO ADOPT OPERATING RULES AND REGULATIONS FOR THE NAN-SU-GAIL (CV CONSOLIDATED) FIELD, FREESTONE COUNTY, TEXAS

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: August 12, 2002
Hearing held: September 13, 2002

Appearances

	Representing
Ana Maria Marsland-Giffith	Anadarko Petroleum Corporation
C.M. Stephens, Jr.	
Kirk Chatawanich	
Phil Russell	Marathon Oil Company

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Anadarko Petroleum Corp. is seeking to have the Nan-Su-Gail (Bossier), Nan-Su-Gail (Cotton Valley) and Red Lake (Bossier Sand) Fields consolidated into a new field to be known as the Nan-Su-Gail (CV Consolidated) Field. The applicant is seeking the following rules for the new field:

1. Designated interval between 10,875 feet and 14,240 feet as shown on the log of the Anadarko Hill "B" Lease Well No. 1;

2 Well spacing of 467-1200 feet;

3. 640 acre gas proration units with 40-acre optional units; and

4. allocation based 95% on deliverability and 5% per well.

A representative of Marathon Oil Company appeared at the hearing but presented no evidence or testimony. The examiner recommends approval.

DISCUSSION OF THE EVIDENCE

Anadarko has several Bossier wells in this area and has found several potentially-productive sandstones within the overlying Cotton Valley section of these wells. It believes these Cotton Valley sandstones can be developed in the same wells as the sandstones in the Bossier Formation. Cotton

Valley and Bossier sandstones are similar and developing them at the same time will lower their economic limit.

The Cotton Valley/Bossier sequence is a thick series of sandstones and shales. There are several regional correlation markers within the sequence, but the individual sandstones do not correlate easily from well to well. The basal rocks in the series were deposited in the distal area of a prograding deltaic sequence. Later, deltas built out in an erratic, sawtooth pattern over the more distal shales. The shallowest sandstones were deposited in a mostly fluvial environment.

The Nan-Su-Gail (Cotton Valley) Field was discovered in 1981, and has about 90 wells. Field rules were first adopted October 31, 1983, under Oil & Gas Docket No. 5-80,424, and specify 640 acre proration units with 80-acre optional units. Anadarko operates 13 wells in this field that also has four other operators.

The Nan-Su-Gail (Bossier) Field was also discovered in 1981 and has nine wells, three of them operated by Anadarko. The Red Lake (Bossier Sand) Field was discovered in 1982, and Anadarko operates four of the five wells in the field. Both of these fields are on Statewide Rules.

These fields have grown together, in part, because Anadarko did not realize that the designated interval of the Nan-Su-Gail (Cotton Valley) Field included the Bossier. The designated interval for the Nan-Su-Gail (Cotton Valley) Field was adopted in 2000, and extends from 10,450' to 12,660' in the Valence Operating Eppes "B" Well No. 1. The top of the Bossier interval is at 11,850' in the Eppes "B" No. 1. The Red Lake (Bossier Sand) Field was inactive between 1995 and late 1998, when Anadarko began placing its Bossier wells in this field.

The Nan-Su-Gail (Cotton Valley) Field has cumulative production of 52 BCF, and the Nan-Su-Gail (Bossier) Field's cumulative production is 3 BCF. Cumulative production of the Red Lake (Bossier Sand) Field is 1.3 BCF. The initial potential of a Bossier well is as much as 4.4 MMCF per day but production declines rapidly. The initial potential of a Cotton Valley well is 1 MMCF/D. The minimum producing rate to maintain critical velocity is 300 MCF/D and producing both series together will lower the economic limit per completion.

The average ultimate recovery that Anadarko expects from a Bossier only well is 1.6 BCF over 15 years. If the well is recompleted to the Cotton Valley when it reaches a rate of 150 MCF/D, the total production is expected to be 2.3 BCF. However, Bossier completions usually experience loading after five years and the well may have to be recompleted to the Cotton Valley before the Bossier is completely depleted. Anadarko calculated that downhole commingling the Cotton Valley and Bossier from the beginning will increase the average recovery to 3 BCF per well.

Anadarko made studies of scaling that might result from commingling the water from the various fields to be consolidated. These studies show that water and hydrocarbon liquids produced from the Cotton Valley sandstones and Bossier sandstones are compatible.

The type well for the Nan-Su-Gail (Cotton Valley) Field, the Valence Operating Eppes "B" Lease Well No. 1, was not drilled deep enough to encounter the base of the Bossier. Anadarko is proposing a different type well that will show the whole section. The applicant believes the log of its Hill "B" Lease Well No. 1 will better illustrate the producing interval in the consolidated field. The top of the proposed designated interval (10,875 feet) in this well is the top of the Cotton Valley sandstone and the base (14,240 feet) is the base of the Bossier/top of the underlying Cotton Valley limestone.

The current designated interval in the Red Lake (Bossier Sand) Field extends from 13,361' MD to 13,388' MD in the Valence Operating Terry 'C' Lease Well No. 1, though this well was perforated from the top of this section down to 13,845 MD. The designated interval in the Nan-Su-Gail (Bossier) Field extends from 11,461' MD to 11,630' MD. Both of these intervals are within the proposed designated interval of the new field.

Anadarko has requested well spacing of 467-1200 feet, which is the same as current well spacing in all three fields. Because of the multiple reservoirs included within the proposed designated interval, a two factor allocation formula is necessary.

The allocation formula for the Nan-Su-Gail (Cotton Valley) Field is based 95% on acreage and 5% on deliverability, while the formulas of the other two fields are based on deliverability. Anadarko is requesting that 95% of the allocation be based on deliverability and 5% be assigned on a per well basis for the new consolidated field. At present, the allocation formulas are suspended for all of the fields in the proposed consolidation and Anadarko requests that the one adopted for the Nan-Su-Gail (CV Consolidated) Field also be suspended.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators of wells in the fields to be consolidated on August 21, 2002.

2. The Nan-Su-Gail (Bossier), Nan-Su-Gail (Cotton Valley) and Red Lake (Bossier Sand) Fields can be produced economically, and without causing waste, if consolidated into a single field.

3. The field rules for the Nan-Su-Gail (Cotton Valley) Field, adopted under Oil & Gas Docket No. 5-80,424, effective October 31, 1983, as amended, provide for 640-acre density with 80-acre optional units.

4. The Nan-Su-Gail(Bossier) and Red Lake (Bossier Sand) Fields are under Statewide Rules and all three fields have 467-1200' well spacing.

5. These Cotton Valley and Bossier fields were first developed in 1981 and 1982, and Anadarko has recently drilled several Bossier wells in the area.

6. Cumulative production of the Red Lake (Bossier Sand) Field is 1.3 BCF and there are five wells in this field.

7. The Nan-Su-Gail (Bossier) Field has nine wells, and its cumulative production is 3 BCF.

8. The Nan-Su-Gail (Cotton Valley) Field has about 90 wells, nine of them operated by Anadarko, and its cumulative production is 52 BCF.

9. The current designated interval of the Nan-Su-Gail (Cotton Valley) Field, between 10,450 feet and 12,660 feet as shown on the log of the Valence Operating (formerly TXO Production) Eppes "B" Lease, Well No. 1, was adopted in 2000 and includes all of the Cotton Valley sandstones and the part of the Bossier sandstones found between 11,850' and 12,660'.

10. The producing intervals in theNan-Su-Gail(Bossier) and Red Lake (Bossier Sand) Fields are within the producing interval of the Nan-Su-Gail (Cotton Valley) Field.

11. The proposed designated interval, between 10,875 feet and 14,240 feet as shown on the log of the Anadarko Hill "B" Lease, Well No. 1, covers the entire productive Cotton Valley sandstones and all of the Bossier, down to the top of the Cotton Valley limestone.

12. As the proposed designated interval includes multiple, stratigraphic reservoirs both within and between the Cotton Valley and Bossier sandstones, a two factor allocation is required for statutory reasons.

13. Allocation based 95% on deliverability and 5% per well will satisfy statutory requirements.

    a. Allocation in the two Bossier fields is currently based 100% on deliverability.

    b. Allocation in the Nan-Su-Gail (Cotton Valley) Field is based 95% on acreage and 5% on deliverability.

14. None of the wells in the three fields proposed for consolidation are now prorated and the allocation formula in the new field should continue as suspended.

15. Studies of possible scaling due to downhole commingling of production from the Cotton Valley and Bossier sandstones indicate that fluids from these two intervals can be combined safely.

16. Well spacing of 467-1200 feet is the same as now exists in all three current fields.

17. The average production from a downhole commingled well is expected to be 3 BCF while the most optimistic estimate for a well completed sequentially is 2.3 BCF.

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 requested fields will prevent waste and protect correlative rights, while encouraging conservation.

4. The requested field rules for the resultant field, the Nan-Su-Gail (CV Consolidated) Field, will prevent waste, protect correlative rights within the field, and satisfy statutory requirements.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the Red Lake (Bossier Sand), Nan-Su-Gail (Bossier); and Nan-Su-Gail(Cotton Valley) Fields be consolidated into a new field to be known as the Nan-Su-Gail (CV Consolidated) Field. The field rules proposed for the resultant Nan-Su-Gail (CV Consolidated) Field should be adopted.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner

Date of Commission Action: October 8, 2002