

STATE OF NEW MEXICO  
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:

CASE NO. 12940 (Reopened)  
ORDER NO. R-11856-A

APPLICATION OF MEWBOURNE OIL COMPANY TO REOPEN CASE NO.  
12940 TO AMEND AND MAKE PERMANENT THE SPECIAL RULES AND  
REGULATIONS FOR THE SHUGART-STRAWN POOL, AND FOR A  
DISCOVERY ALLOWABLE, EDDY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION;

This case came on for hearing at 8:15 a.m. on November 20, 2003, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 12<sup>th</sup> day of March, 2004, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner,

FINDS THAT:

- (1) Due public notice has been given, and the Division has jurisdiction of this case and its subject matter.
- (2) By Order No. R-11856 entered in Case No. 12940 on October 28, 2002, the Division, upon the application of Mewbourne Oil Company, created the Shugart-Strawn Pool, the vertical limits of which comprise the Strawn interval of the Pennsylvanian formation, and the horizontal limits of which initially comprised the NE/4 of Section 8, Township 18 South, Range 31 East, NMPM, Eddy County, New Mexico.
- (3) Order No. R-11856 also established the *"Temporary Special Pool Rules for the Shugart-Strawn Pool,"* which provide for:
  - (a) 160-acre spacing and proration units;

- (b) designated well location requirements such that a well shall be located no closer than 660 feet to the outer boundary of the spacing unit, nor closer than 330 feet to any quarter-quarter section line or subdivision inner boundary;
  - (c) a special depth bracket allowable of 1,120 barrels of oil per day;
  - (d) a limiting gas-oil ratio (GOR) of 4,000 cubic feet of gas per barrel of oil; and
  - (e) a casinghead gas limit of 4.48 MMCF of gas per day.
- (4) The applicant, Mewbourne Oil Company ("Mewbourne") seeks:
- (a) to amend the special pool rules for the **Shugart-Strawn** Pool by increasing the pool oil allowable from 1,120 to 1,350 barrels of oil per day;
  - (b) to amend the special pool rules for the **Shugart-Strawn** Pool by increasing the gas-oil ratio limitation from 4,000 to 10,000 cubic feet of gas per barrel of oil; and
  - (c) to make permanent the *"Temporary Special Pool Rules for the Shugart-Strawn Pool."*

(5) Pursuant to Division Rule No. 509.A, Mewbourne also seeks the assignment of a discovery allowable to its 8" Federal Com Well No. 3 (API No. 30-015-32313) located 2276 feet from the North line and 1471 feet from the East line (Unit G) of Section 8, Township 18 South, Range 31 East, NMPM, in the amount of 52,310 barrels of oil. The proposed discovery allowable was determined by multiplying five barrels of oil times the depth to the top perforation in the well (10,462 feet.) In accordance with Rule No. 509.A, Mewbourne proposes to produce this discovery allowable over a two-year (730-day) period at a rate of approximately 71.6 barrels per day.

(6) Gruy Petroleum Management Company ("Gruy"), Harvey E. Yates Company ("Heyco") and Pecos Production Company ("Pecos"), all operators and/or interest owners in the Shugart-Strawn Pool, appeared at the hearing in opposition to the application.

(7) Marbob Energy Corporation ("Marbob"), a working interest owner in the Shugart-Strawn Pool, supports the application of Mewbourne in this case. The position of Marbob is evidenced by a letter from Marbob to Mewbourne dated September 9, 2003, and presented as evidence as Mewbourne's Exhibit No. 5.

(8) The Shugart-Strawn Pool currently comprises the N/2 of Section 8 and the S/2 of Section 5, Township 18 South, Range 31 East, NMPM.

(9) There are currently seven (7) wells completed in and producing from the Shugart-Strawn Pool, described as follows:

Operator	Well Name & Number	API Number	Well Location
Mewbourne	Fren "8" Fed Com No. 2	30-015-31794	Unit A, Section 8
Mewbourne	Fren "8" Fed Com No. 3	30-015-32313	Unit G, Section 8
Mewbourne	Fren "8" Fed Com No. 5	30-015-32349	Unit C, Section 8
Mewbourne	Fren "8" Fed Com No. 6	30-015-32980	Unit B, Section 8
Heyco	Parker Deep "5" Fed Com No. 3	30-015-32555	Unit N, Section 5
Gruy	Magnum "5" Fed Com No. 2	30-015-31570	Unit O, Section 5
Gruy	Magnum "5" Fed Com No. 3	30-015-32651	Unit P, Section 5

(10) The seven producing wells are dedicated to four standard 160-acre proration units in the Shugart-Strawn Pool, described as follows: (i) the Mewbourne Fren "8" Federal Com Wells No. 2, 3 and 6 are dedicated to the NE/4 of Section 8; (ii) the Mewbourne Fren "8" Federal Com Well No. 5 is dedicated to the NW/4 of Section 8; (iii) the Gruy Magnum "5" Federal Com Wells No. 2 and 3 are dedicated to the SE/4 of Section 5; and (iv) the Heyco Parker Deep "5" Federal Com Well No. 3 is dedicated to the SW/4 of Section 5.

(11) Production data from the Shugart-Strawn Pool shows that:

- (a) Mewbourne's wells within the NE/4 of Section 8 are currently capable of producing at a combined rate in excess of 2,200 barrels of oil and 11.0 MMCF of gas per day;

- (b) Mewbourne's well within the NW/4 of Section 8 is currently capable of producing at a rate of approximately 233 barrels of oil and 1.16 MMCF of gas per day;
- (c) Gruy's wells within the SE/4 of Section 5 are currently capable of producing at a combined rate of approximately 475 barrels of oil and 3.7 MMCF of gas per day; and
- (d) Heyco's well within the SW/4 of Section 5 is currently capable of producing at a rate of approximately 23 barrels of oil and 83 MCF of gas per day.

(12) Mewbourne seeks an increase in the oil allowable and GOR for the Shugart-Strawn Pool due to the fact that its wells within the NE/4 of Section 8 are currently capable of producing in excess of the present oil allowable, and also due to the fact that the oil production from these wells is further restricted by the current 4,000:1 GOR.

(13) Mewbourne presented geologic evidence that demonstrates that:

- (a) the discovery well for the Shugart-Strawn Pool is the Mewbourne Fren "8" Federal Com Well No. 3. This well was completed in August 2002 in the **Strawn** interval from 10,462 feet to 10,942 feet. The well initially produced at a rate of 267 barrels of oil and 937 MCF of gas per day;
- (b) based upon subsurface well data, this Strawn structure appears to be fairly limited in size encompassing a portion of the N/2 of Section 8 and a portion of the S/2 of Section 5;
- (c) the maximum porosity development appears to occur within the center of this structure which is located within the NE/4 of Section 8; and
- (d) the largest portion of this Strawn reservoir is located on Mewbourne's acreage in Section 8.

- (14) Mewbourne presented engineering evidence that demonstrates that:
- (a) PVT reservoir analysis shows the Shugart-Strawn Pool to be a solution gas-drive volatile oil reservoir. The initial reservoir pressure was approximately 5,849 psi, with a bubble point pressure of 4,583 psi;
  - (b) volatile oil reservoirs are characterized by high initial gas-oil ratios (compared to black oil reservoirs) and generally higher oil gravities. As production from the reservoir progresses and the reservoir pressure is depleted to below the bubble point pressure, extensive free gas is evolved, and the reservoir's free gas saturation increases;
  - (c) there is no evidence to suggest the presence of a gas cap within the reservoir;
  - (d) the gravity of the oil produced from the Shugart-Strawn Pool is approximately 50 degrees API;
  - (e) all wells in the reservoir are in pressure communication, and there is competition for reserves among the wells;
  - (f) the initial GOR for the seven wells producing from the Shugart-Strawn pool ranged from 2,700-5,100 SCF/Bbl. The current GOR for these seven wells ranges from 3,500-9,000 SCF/Bbl;
  - (g) there are several Strawn reservoirs in this area located in close proximity to the Shugart-Strawn Pool. An analysis of these reservoirs shows that they are also volatile oil reservoirs. The producing characteristics of these reservoirs are similar, and generally show that:
    - (i) the initial GOR of these pools range from 2,000-7,000 SCF/Bbl. The current GOR of these pools range from 6,000-11,000 SCF/Bbl; and

- (ii) the producing GOR increases over time and has no detrimental effects on the oil production or ultimate recovery of oil;
- (h) the spacing, oil allowable and GOR limitation vary within these analogous Strawn pools. Generally within these analogous Strawn pools, the GOR limitation is 4,000 SCF/Bbl or less, the oil allowable ranges from 560 BOPD to 1120 BOPD in pools spaced on 160 acres, and 320 BOPD to 365 BOPD in pools spaced on 40 acres (1,280 BOPD to 1,460 BOPD 160-acre equivalent); and
- (i) production data from the Fren "8" Federal Com Wells No. 2 and 6 show that producing the wells at higher oil rates does not result in a higher producing GOR.

(15) During 2003, Mewbourne's proration unit comprising the NE/4 of Section 8 became overproduced in the Shugart-Strawn Pool. According to Mewbourne's testimony, the production from the Fren "8" Federal Com Wells No. 2 and 3 was restricted subsequent to the discovery of this overproduction, and as of December, 2003, this proration unit will be back in balance.

(16) Mewbourne contends that its geologic and engineering evidence demonstrates that approval of a 10,000:1 gas-oil ratio limitation and a special depth bracket allowable of 1,350 barrels of oil per day for the Shugart-Strawn Pool will not result in the waste of reservoir energy, will not reduce the ultimate recovery of oil from the reservoir, and will not violate correlative rights.

(17) Gruy, Heyco and Pecos (collectively "Opposition") presented geologic and engineering evidence to support their position that approval of the application will result in the waste of reservoir energy and the violation of correlative rights.

(18) Opposition presented geologic evidence that demonstrates that:

- (a) utilizing well **control** and 2-D seismic data, structure and **isopach** maps of this Strawn structure have been constructed;

- (b) the isopach map of this Strawn structure is generally in agreement with the isopach map presented by Mewbourne; however, due to the incorporation of 2-D seismic data into this analysis, the Strawn structure, as mapped by Opposition, has been extended further north into the NE/4 of Section 5;
  - (c) in order to facilitate the calculation of original oil in place ("OOIP") underlying each of the proration units in the pool, a porosity feet map was constructed utilizing well log data; and
  - (d) based upon its geologic interpretation of this Strawn reservoir, an additional two wells will be drilled by Pecos and Gruy, located respectively in the NW/4 of Section 9 and the SE/4 of Section 5. In addition to these two new wells, an additional well will be drilled by Mewbourne within the NW/4 of Section 8.
- (19) Opposition presented engineering evidence that demonstrates that:
- (a) utilizing volumetric and material balance methodologies, it has calculated the OOIP for the Shugart-Strawn Pool. The results, which are in close agreement, show that the OOIP within the Shugart-Strawn Pool is approximately 7.15 million barrels of oil;
  - (b) utilizing volumetric calculations derived from its porosity feet map, it has calculated the OOIP for each of the existing proration units within the pool. This data show that the NE/4 of Section 8 originally contained 4.132 million barrels of oil or 57.8% of the OOIP in the pool, the NW/4 of Section 8 originally contained 460,728 barrels of oil or 6.5% of the OOIP for the pool, the SE/4 of Section 5 originally contained 1.66 million barrels of oil or 23.3% of the OOIP for the pool, and the SW/4 of Section 5 originally contained 94,930 barrels of oil or 1.3% of the OOIP for the pool;

- (c) at its current restricted rate of production (due to overproduction), Mewbourne currently produces approximately 51.7% and 47.4% of the total oil and gas production, respectively, from the pool. If its application is approved, Mewbourne will be allowed to produce at a rate equal to 64% and 73% of the total oil and gas production, respectively, from the pool;
- (d) there appears to be a correlation between the depth a given well is perforated and its producing GOR. The data show that wells perforated higher within this Strawn structure generally produce at a higher GOR. These data suggest that there may be a gas cap forming in the reservoir;
- (e) the GOR of the wells perforated higher within this Strawn structure appear to increase at a faster rate than the GOR of wells perforated lower within this Strawn structure. This may also be indicative of a gas cap forming in the reservoir;
- (f) during the period from May, 2003 through November, 2003 the GOR for the entire Shugart-Strawn Pool has remained relatively flat at approximately 6,000 SCF/Bbl;
- (g) if a gas cap is forming in the reservoir, it will be located at a structurally high position. Geologic data show that the structural high in the reservoir occurs within the NE/4 of Section 8; and
- (h) production data from the NE/4 of Section 8 show that when the oil production from the Fren "8" Federal Com Wells No. 2 and 3 was curtailed due to overproduction, the GOR decreased from approximately 6,000 to 5,000 SCF/Bbl. This reduction in GOR may indicate that the reservoir is rate sensitive.

(20) Opposition testified that it would not be opposed to increasing the GOR limitation for the Shugart-Strawn Pool to 6,000:1; however, it remains opposed to increasing the pool oil allowable, assigning a discovery allowable to the Fren "8" Federal Com Well No. 3, and increasing the GOR to 10,000:1.

(21) Both Mewbourne and the Opposition are in agreement that the Shugart-Strawn Pool should be developed on 160-acre spacing. The technical evidence presented by both parties demonstrates that 160-acre spacing is appropriate for the Shugart-Strawn Pool, and that this well spacing should be adopted on a permanent basis.

(22) Division records show that the Mewbourne Fren "8" Federal Com Well No. 3 was completed in the Strawn formation in August, 2002, and first produced from this interval on August 21, 2002. The Mewbourne Fren "8" Federal Com Well No. 2 was completed in the Strawn formation in September, 2002, and first produced from this interval on September 14, 2002.

(23) The Mewbourne Fren "8" Federal Com Well No. 3 should be designated the discovery well for the Shugart-Strawn Pool.

(24) Although the Mewbourne Fren "8" Federal Com Well No. 3 was completed in the Shugart-Strawn Pool approximately fifteen months prior to Mewbourne's filing for a discovery allowable, Division Rule No. 509 places no time limit on seeking, or approving, a discovery allowable.

(25) Mewbourne's Fren "8" Federal Com Well No. 3 should be assigned a discovery allowable in the amount of 52,310 barrels of oil. In accordance with Rule No. 509.A, Mewbourne should be authorized to produce this discovery allowable over a two year (730-day) period at a rate of approximately 71.6 barrels per day.

(26) With regards to Mewbourne's request to increase the oil allowable from 1,120 to 1,350 barrels of oil per day, the evidence presented by both parties demonstrates that:

- (a) increasing the oil allowable to 1,350 barrels per day will likely not result in excessive dissipation of reservoir energy or reduced recovery of oil from the Shugart-Strawn Pool;

- (b) the only proration unit in the pool that would benefit from an increased oil allowable is Mewbourne's acreage in the NE/4 of Section 8. Given Mewbourne's capacity to produce substantial volumes of oil from its wells located in the NE/4 of Section 8, it is likely that this spacing unit will remain capable of top allowable oil production for some time;
- (c) Gruy and Heyco's wells located within Section 5 are on a steep oil production decline;
- (d) As Gruy's production declines within the SE/4 of Section 5, it will be less capable of competing with Mewbourne for oil reserves in the pool. Increasing the oil allowable will only serve to aggravate this situation; and
- (e) Mewbourne did not present sufficient evidence to demonstrate that its correlative rights will be impaired if the pool oil allowable is not increased from 1,120 to 1,350 barrels of oil per day.

(27) Mewbourne's request to increase the pool oil allowable from 1,120 to 1,350 barrels of oil per day will not protect the correlative rights of operators in the Shugart-Strawn Pool, and should therefore be denied.

(28) With regards to Mewbourne's request to increase the GOR limitation for the Shugart-Strawn Pool to 10,000:1, the evidence presented by both parties demonstrates that:

- (a) the Shugart-Strawn Pool is a solution gas drive volatile oil reservoir. The GOR within these types of reservoirs naturally increases over time;
- (b) the average producing GOR for the seven wells in the Shugart-Strawn Pool is currently 6,800 SCF/Bbl. While the GOR for each of the seven producing wells appears to be increasing, the rate of increase varies from well to well;

- (c) there is preliminary engineering data to show that a gas cap may be forming in the reservoir;
- (d) the Shugart-Strawn Pool is a unique reservoir capable of high rates of oil production. There are no other Strawn pools in this area that have exhibited similar producing characteristics; therefore, comparisons between the Shugart-Strawn Pool and other Strawn reservoirs in this area may not be valid; and
- (e) the current engineering evidence shows that an increase in the GOR for the Shugart-Strawn Pool is necessary in order to efficiently produce the reservoir; however, Mewbourne's request to increase the GOR to 10,000 SCF/Bbl appears to be excessive and without sufficient justification.

(29) A gas-oil ratio limitation of 7,000 SCF/Bbl appears to be more in line with current production data from the Shugart-Strawn Pool.

(30) Increasing the GOR for the Shugart-Strawn Pool to 7,000 SCF/Bbl will provide Mewbourne additional producing capability within the NE/4 of Section 8, will serve as a reasonable GOR limitation during the period of time in which additional development will occur in this reservoir, and will otherwise prevent waste and protect correlative rights.

**IT IS THEREFORE ORDERED THAT :**

(1) The portion of Mewbourne Oil Company's application to amend the "*Special Pool Rules for the Shugart-Strawn Pool*," as established by Division Order No. R-11856, to increase the pool oil allowable from 1,120 to 1,350 barrels of oil per day is hereby denied.

(2) The portion of Mewbourne Oil Company's application seeking to amend the "*Special Pool Rules for the Shugart-Strawn Pool*," as established by Division Order No. R-11856, to increase the gas-oil ratio limitation from 4,000 to 10,000 cubic feet of gas per barrel of oil is hereby approved in part. The limiting gas-oil ratio is hereby increased to 7,000 standard cubic feet of gas per barrel of oil.

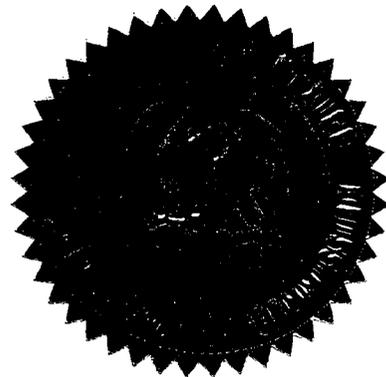
(3) The portion of Mewbourne's application for the assignment of a discovery allowable to its Fren "8" Federal Com Well No. 3 (API No. 30-015-32313) located 2276 feet from the North line and 1471 feet from the East line (Unit G) of Section 8, Township 18 South, Range 31 East, NMPM, in the amount of 52,310 barrels of oil in the Shugart-Strawn Pool is hereby approved. In accordance with Rule No. 509.A, Mewbourne shall be authorized to produce this discovery allowable over a two-year (730-day) period at a rate of approximately 71.6 barrels per day. The resulting oil allowable for the NE/4 of Section 8 shall be set at 1,191.6 barrels per day for a two-year period commencing April 1, 2004. The oil allowable assigned to the NE/4 of Section 8 may be produced by any well on the unit in any proportion.

(4) The "Temporary Special Pool Rules for the Shugart-Strawn Pool", as established by Division Order No. R-11856, are hereby made permanent; provided however, Rule No. (7) is hereby amended to read in its entirety as follows:

"Rule 7. The limiting gas-oil ratio shall be 7,000 cubic feet of gas per barrel of oil."

(5) Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



SEAL

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

LORI WROTENBERY  
Director