Oil & Gas production formula attached

EXXON COMPANY, U.S.A.

POST OFFICE BOX 3116 • MIDLAND, TEXAS 79702-3116

PRODUCTION DEPARTMENT
SOUTHWESTERN DIVISION

Penrose #4
Downhole Commingling

Jerry Sexton
Supervisor, District I
Hobbs District Office
Oil Conservation Division
Post Office Box 1980
Hobbs, New Mexico 88241-1980

Dear Mr. Sexton:

The downhole commingling workover for the Penrose #4 has been completed.

In accordance with Order No. R-8707 (attached), I am recommending adjustments to the allocation percentages submitted as evidence in Case No. 9398. The proposed Penrose #4 allocation is presented on the following page. The recommended adjustments are based on results from daily tests recorded on the morning reports and on the allocation percentages submitted in Case No. 9398.

For your convenience I have attached a production summary from our morning reports with conclusions obtained from the average test rates. These conclusions were then applied to determine the proposed Penrose #4 allocation. Additional enclosed information includes a morning report summary, Exhibit 14 for Case No. 9298 showing the previous proposed allocation, and Order No. R-8707.

If you have any questions or desire any additional information, please feel free to call me at (915) 688-6740 or Bill Duncan at (915) 688-7538.

Sincerely,

Gary E. Gould

GEG11/pph

Attachments

xc: C. H. Harper

PROPOSED PENROSE #4 ALLOCATION

OIL	bopd	%
Wantz Granite Wash	36.0	61
Drinkard	9.0	15
Tubb Oil & Gas	0.8	2
Blinebry Oil & Gas	13.0	22
	58.8	100

WATER	BWPD	%
Wantz Granite Wash	0.0	0
Drinkard	6.0	28
Tubb Oil & Gas	11.7	54
Blinebry Oil & Gas	4.0	18
	21.7	100

GAS	mcfgpd	%
Wantz Granite Wash	92.6	45
Drinkard	74.4	37
Tubb Oil & Gas	35.5	17
Blinebry Oil & Gas	1.0	1
	203.5	100

allocation formula used for allowable per Gd

PRODUCTION SUMMARY FROM MORNING REPORTS

DATES	POOLS TESTED	AVERAGE OIL RATE (bopd)	AVERAGE* WATER RATE (bopd)	AVERAGE GAS RATE (kcfgpd)	CONCLUSIONS
3/09/89-3/13/89	Wantz Granite Wash Drinkard	45	6		Wantz Granite Wash Oil = (14/17.5) (45 bopd) = 36.0 bopd (Apply Case No. 9398 allocation to average test rate.)
3/09/89-3/12/89	Wantz Granite Wash Drinkard			167	Drinkard Oil = (3/17.5) (45 bopd) = 9.0 bopd (Apply Case No. 9398 allocation to average test rate.) Wantz Granite Wash Water = (0/19) (6 bopd) = 0.0 bopd (Apply Case No. 9398 allocation to average test rate.) Drinkard Water = (19/19) (6 bopd) = 6.0 bopd (Apply Case No. 9398 allocation to average test rate.) Wantz Granite Gas (85/153.3) (167 mcfgpd) = 92.6 mcgfpd (Apply Case No. 9398 allocation to average test rate.) Drinkard Gas (68.3/153.3) (167 mcfgpd) = 74.4 mdfgpd (Apply Case No. 9398 allocation to average test rate.)
4/16/89-4/23/89 and 4/25/89-4/27/89	Wantz Granite Wash Drinkard Tubb Oil & Gas	33	16	155	Oil Production declined in this one month time frame from March to April. Therefore water and gas production from the Wantz Granite Wash and Drinkard pools also declined. The Tubb Oil and Gas pool produced little oil. Tubb Oil = 0.8 bopd (See Case No. 9398 allocation - 1986 Average Production in Study Area). Tubb Water = 16 bwpd - ((33-0.8 bopd)/45 bopd)*(6 bwpd)) = 11.7 bwpd (Apply decline seen in Wantz Granite Wash and Drinkard oil rate to water rate and subtract from average test rate.) Tubb Gas = 155 mcfgpd-((33-0.8 bopd)/45 bopd)*(167 mcfgpd)) = 35.5 mcfgpd (Apply decline seen in Wantz Granite Wash and Drinkard oil rate to gas rate and subtract from average test rate.)
5/15/89-5/18/89	Wantz Granite Wash Drinkard Tubb Oil & Gas Blinebry Oil & Gas	46			No production decline observed. Blinebry Oil = 46 bopd - 33 bopd = 13 bopd (From average test rates) Blinebry Water = 20 bwpd - 16 bwpd = 4 bwpd (From average test rates) Blinebry Gas = 156 mcfgpd - 155 mcfgpd = 1 mcfgpd (From average test rates)
5/18/89	Wantz Granite Wash Drinkard Tubb Oil & Gas Blinebry Oil & Gas		20		
5/17/89-5/18/89	Wantz Granite Wash Drinkard Tubb Oil & Gas Blinebry Oil & Gas			156	

*After recovering load water

PENROSE #4 COMPLETION
MORNING REPORT SUMMARY

2-21-89	Moved in and rigged up.
2-22-89	Tested BOP and wellhead. Hot oiled tubing to clean out paraffin. Pulled out of hole with tubing. Tripped in with perf guns to perforate Wantz Granite Wash and Drinkard.
2-23-89	Finished perforating Wantz Granite Wash and Drinkard.
2-24-89	Spotted acid across perfs with 1 bbl 15% NEFE HCl per perf. Flushed tubing and annulus with 2% KCl.
2-25-89	Finished acidizing perfs.
2-26-89	Shut down on Sunday.
2-27-89	Swabbed 60 BO, 39 BW. (Wantz Granite Wash and Drinkard)
2-28-89	Started putting well on pump.
3-01-89	Finished putting well on pump.
3-02-89	24 hour pump test. 80 BO 8 BW. (Wantz Granite Wash and Drinkard)
3-03-89	24 hour pump test. 62 BO 12 BW. (Wantz Granite Wash and Drinkard)
3-04-89	24 hour pump test. 66 BO 5 BW. (Wantz Granite Wash and Drinkard)
3-05-89	24 hour pump test. 31 BO 6 BW. (Wantz Granite Wash and Drinkard)
3-06-89	24 hour pump test. 28 BO 0 BW. (Wantz Granite Wash and Drinkard)
3-07-89	No Test - Test tanks full.
3-08-89	No Test - Test tanks full.
3-09-89	24 hour pump test. 47 BO 8 BW 169 MCF. (Wantz Granite Wash and Drinkard)
3-10-89	24 hour pump test. 44 BO 8 BW 166 MCF. (Wantz Granite Wash and Drinkard)
3-11-89	24 hour pump test. 45 BO 6 BW 167 MCF. (Wantz Granite Wash and Drinkard)
3-12-89	24 hour pump test. 45 BO 3 BW 166 MCF. (Wantz Granite Wash and Drinkard)
3-13-89	24 hour pump test. 45 BO 7 BW. (Wantz Granite Wash and Drinkard)
3-14-89	Moved in and rigged up. Tested BOP and wellhead. Tripped out of hole with tubing.

3-15-89	Set retrievable bridge plug with wireline above Drinkard and Wantz Granite Wash. Plug unseated and fell down hole. Rigged down wireline and ran tubing to retrieve retrievable bridge plug. Ran kill string.
3-16-89	Pulled kill string. Set cast-iron bridge plug above Drinkard and Wantz Granite Wash. Perforated Tubb Oil and Gas.
3-17-89	Set PPI packer. Did not hold pressure. Unseated PPI packer and took out of hole. Packer slips had failed. Picked up new PPI packer and tested OK in hole.
3-18-89	Pumped PPI acid job for Tubb Oil and Gas perforations. Flushed tubing and annulus with 2% KCl. Swabbed 5 BO, 45 BW. (Tubb Oil and Gas). 230 BLW
3-19-89	Shut down on Sunday.
3-20-89	Swabbed 4 BO, 42 BW. (Tubb Oil and Gas) 188 BLW
3-21-89	Shut down due to weather.
3-22-89	Tripped out with Tubing. Tripped in with bottom hole assembly and tubing.
3-23-89	Ran in hole with rods.
3-24-89	24 hour pump test. 35 BO 28 BW. (Tubb Oil and Gas) 160 BLW
3-25-89	24 hour pump test. 39 BO 25 BW 110 MCF. (Tubb Oil and Gas) 135 BLW
3-26-89	24 hour pump test. 40 BO 19 BW 125 MCF. (Tubb Oil and Gas) 116 BLW
3-27-89	24 hour pump test. 40 BO 13 BW. (Tubb Oil and Gas) 103 BLW
3-28-89	24 hour pump test. 39 BO 13 BW 72 MCF. (Tubb Oil and Gas) 90 BLW
3-29-89	24 hour pump test. 36 BO 2 BW 130 MCF. (Tubb Oil and Gas) 88 BLW
3-30-89	24 hour pump test. 39 BO 3 BW 132 MCF. (Tubb Oil and Gas) 85 BLW
3-31-89- 4-10-89	Well taken off morning report. Daily production was not recorded. Daily average was 31 BO 11 BW 110 MCF. 0 BLW
4-11-89	24 hour pump test. 35 BO 3 BW 132 MCF. (Tubb Oil and Gas)
4-12-89	24 hour pump test. 36 BO 3 BW 140 MCF. (Tubb Oil and Gas)
4-13-89	24 hour pump test. 30 BO 5 BW 140 MCF. (Tubb Oil and Gas)
4-14-89	20 hour pump test. 24 BO 2 BW 120 MCF. (Tubb Oil and Gas) Moved in and rigged up. Unseated pump and pulled rods. Installed and tested BOP. Pulled out of hole with tubing. Tripped in hole with drill bailer. Knocked cast-iron bridge plug to bottom.

4-15-89	Ran tubing. Flanged up wellhead. Ran pump and rods.
4-16-89	16 hour pump test. 28 BO 2 BW 119 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-17-89	24 hour pump test. 44 BO 48 BW 122 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-18-89	24 hour pump test. 41 BO 20 BW 147 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-19-89	24 hour pump test. 33 BO 17 BW 147 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-20-89	24 hour pump test. 25 BO 17 BW 155 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-21-89	24 hour pump test. 35 BO 6 BW 165 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-22-89	24 hour pump test. 30 BO 14 BW 175 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-23-89	24 hour pump test. 28 BO 10 BW 177 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-24-89	No Test - Test tanks full.
4-25-89	24 hour pump test. 35 BO 17 BW 175 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-26-89	24 hour pump test. 30 BO 10 BW 165 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-27-89	24 hour pump test. 32 BO 10 BW 158 MCF. (Wantz Granite Wash, Drinkard, and Tubb Oil and Gas)
4-28-89 5-07-89	No tests - testing other wells
5-08-89	Moved in and rigged up. Tripped out with rods. Tested BOP. Tripped out with tubing. Ran killstring.
5-09-89	Shut down due to wind.
5-10-89	Perforated the Blinebry.
5-11-89	Spotted acid across the perfs. Performed PPI acid job with 10,000 gallons of 15% HCl. Flushed tubing and casing with water. Set packer above all perfs. Prepared to swab back 278 bbls of load water.
5-12-89	Shut-in tubing pressure of 560 psi. Blew well down. Swabbed 29 BO 0 BW. Pulled out of hole with packer and tripped in hole with pumping bottom hole assembly. 278 BLW

5-13-89 Finished running bottom hole assembly and tubing. Flanged up wellhead. Ran pump and rods.

5-14-89 24 hour pump test. 14 BO 140 BW. (Wantz Granite Wash, Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas) 138 BLW

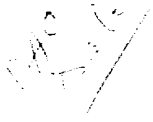
5-15-89 24 hour pump test. 51 BO 58 BW. (Wantz Granite Wash, Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas) 80 BLW

5-16-89 24 hour pump test. 45 BO 51 BW. (Wantz Granite Wash, Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas) 29 BLW

5-17-89 24 hour pump test. 40 BO 40 BW 150 MCF. (Wantz Granite Wash, Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas) 0 BLW

5-18-89 24 hour pump test. 47 BO 20 BW 162 MCF. (Wantz Granite Wash, Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas)

FRW



PENROSE ALLOCATION FORMULAS

Well & Zone	Oil %	Oil BOPD	Gas %	Gas MCFPD	Wtr %	Wtr BWPD
Penrose #1						
* Blinebry Oil & Gas	52	4.6	41	84.9	70	4.5
* Drinkard	39	3.5	33	68.3	19	1.2
* Tubb Oil & Gas ✡	9	0.8	26	54.8	11	0.7
	100	8.9	100	208.0	100	6.4
Penrose #2						
* Blinebry Oil & Gas	52	4.6	41	84.9	70	4.5
* Drinkard	39	3.5	33	68.3	19	1.2
* Tubb Oil & Gas ✡	9	0.8	26	54.8	11	0.7
	100	8.9	100	208.0	100	6.4
Penrose #3						
* Blinebry Oil & Gas	30	4.6	79	84.9	85	4.5
** Drinkard	49	7.6	13	13.9	15	0.8
** Wantz Granite Wash	21	3.2	8	8.3	0	0.0
	100	15.4	100	107.1	100	5.3
Penrose #4						
* Blinebry Oil & Gas	20	4.6	29	84.9	70	4.5
* Drinkard	15	3.5	23	68.3	19	1.2
* Tubb Oil & Gas ✡	3	0.8	19	54.8	11	0.7
✱ Wantz Granite Wash	62	14.0	29	85.0	0	0.0
	100	22.9	100	293.0	100	5.3
Grand Total:		56.1		816.1		24.5

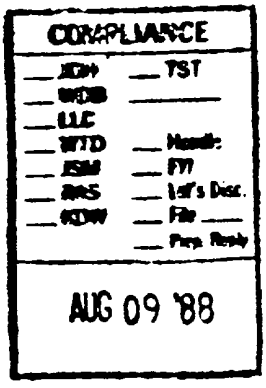
* - From 1986 Average Production, Per Completion, In Study Area.
** - 1987 Average Production.
✱ - Reported Production Rate Prior To Well Dieing.

✡ - Designates Gas Completion In A Prorated Gas Pool.

see revised allocation on 1st page of these attachments

EXXON CORP.
Exhibit No. 14
Case No. 9398 & 9399
June 8, 1988 Docket

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. 9398
Order No. R-8707

APPLICATION OF EXXON CORPORATION FOR DOWNHOLE COMMINGLING, SIMULTANEOUS DEDICATION AND AN UNORTHODOX GAS WELL LOCATION, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on June 8, 1988, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 4th day of August, 1988, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) Division Case Nos. 9398 and 9399 were consolidated at the time of the hearing for the purpose of testimony.

(3) The applicant, Exxon Corporation, seeks approval to commingle production from the Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas Pools within the wellbore of its N. G. Penrose Wells Nos. 1 and 2 located, respectively, 660 feet from the North line and 1980 feet from the East line (Unit B) and 1980 feet from the North line and 660 feet from the East line (Unit H), of Section 13, Township 22 South, Range 37 East, NMPM, and to commingle production from the

Drinkard, Wantz-Granite Wash, Blinebry Oil and Gas, and Tubb Oil and Gas Pools within the wellbore of its N. G. Penrose Well No. 4 located 350 feet from the North line and 660 feet from the East line (Unit A) of said Section 13.

(4) The applicant further seeks approval of an unorthodox gas well location for its N.G. Penrose Well No. 4 (as described above) within the Tubb Oil and Gas Pool, and the simultaneous dedication of the NE/4 of said Section 13 to the N.G. Penrose Wells Nos. 1, 2, and 4 within the Tubb Oil and Gas Pool.

(5) The evidence presented in this case indicates that the N.G. Penrose Wells Nos. 1 and 2 are currently multiple completions in the Blinebry and Tubb Oil and Gas Pools, and that the N.G. Penrose Well No. 4 is currently a single completion in the Wantz-Granite Wash Pool.

(6) The latest production tests from the N.G. Penrose Well No. 1 indicate that the Blinebry zone, which has not produced since 1976, is capable of producing approximately 8 MCFGD and no fluid and that the Tubb zone is capable of producing approximately 17 MCFGD and no fluid.

(7) The latest production tests from the N.G. Penrose Well No. 2 indicate that the Blinebry zone, which was tested in September, 1976, but has never produced, is capable of producing approximately 59 MCFGD and no fluid and that the Tubb zone is capable of producing approximately 50 MCFGD and no fluid.

(8) The latest production test from the N.G. Penrose Well No. 4 indicates that the Wantz-Granite Wash zone is capable of producing approximately 15 BOPD and 82 MCFGD.

(9) The production data presented indicates that the N.G. Penrose Wells Nos. 1, 2, and 4 are capable of low marginal production only from the Blinebry and Tubb Oil and Gas Pools and the Wantz-Granite Wash Pool.

(10) The applicant proposes to perforate and complete the Drinkard zone and selectively perforate and complete additional Blinebry oil pay within the wellbores of its N.G. Penrose Wells Nos. 1 and 2 and also proposes to perforate and complete the Blinebry, Tubb, and Drinkard zones within the wellbore of its N.G. Penrose Well No. 4.

(11) The applicant further proposes to perforate and complete the zones described in Finding No. (10) above without separately testing the productive capabilities of these zones.

(12) The applicant presented evidence and testimony which indicate that a requirement by the Division to separately test each newly completed zone in the subject wells prior to commingling would result in a substantially greater expense which would consequently make the proposed downhole commingling uneconomic.

(13) As an alternate method of allocating production to each zone within the subject wellbores, the applicant proposes to utilize ratios calculated from 1986 average production data obtained from wells producing from these zones and located in the area of the N.G. Penrose Lease.

(14) The evidence presented indicates that the Tubb zone, which will be produced from the N.G. Penrose Wells Nos. 1, 2, and 4, will be classified as gas zones and therefore subject to the General Rules for the Prorated Gas Pools of New Mexico as promulgated by Order No. R-8170, as amended.

(15) While the allocation method proposed by the applicant represents a reasonable method of allocating production to the non-prorated pools within the subject wells, a more accurate method of determining Tubb Oil and Gas Pool production is necessary in order to ensure the protection of correlative rights of the various operators in said pool.

(16) In order to accurately determine the productive capability of the Tubb Oil and Gas Pool within the N.G. Penrose Well No. 4, the applicant should be required to separately test said zone until such time as the production has stabilized prior to commingling.

(17) Inherent in the approval of the subject application is the possibility of the N.G. Penrose Wells Nos. 1, 2, and 4 being shut in due to overproduction of gas from the Tubb Oil and Gas Pool.

(18) The applicant presented evidence and testimony at the hearing which indicate that should the subject wells be shut in as described above, cross flow may likely occur within the wellbores; however, the applicant further testified that the amount of reserves lost due to crossflow would be insignificant compared to the amount of additional reserves recovered under the proposed plan.

(19) Approval of the proposed commingling, unorthodox well location, and simultaneous dedication will result in the recovery of additional reserves from the Blinebry, Tubb, and Drinkard Pools, thereby preventing waste, and will protect correlative rights.

(20) Upon completion of the workover operations in the subject wells, the applicant should be required to consult with the supervisor of the Hobbs district office of the Division to make adjustments and/or corrections to the allocation percentages submitted as evidence in this case.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Exxon Corporation, is hereby authorized to commingle production from the Drinkard, Tubb Oil and Gas, and Blinebry Oil and Gas Pools within the wellbores of its N. G. Penrose Wells Nos. 1 and 2 located, respectively, 660 feet from the North line and 1980 feet from the East line (Unit B) and 1980 feet from the North line and 660 feet from the East line (Unit H), of Section 13, Township 22 South, Range 37 East, NMPM, and is further authorized to commingle production from the Drinkard, Wantz-Granite Wash, Blinebry Oil and Gas, and Tubb Oil and Gas

Pools within the wellbore of its N. G. Penrose Well No. 4 located 350 feet from the North line and 660 feet from the East line (Unit A) of said Section 13, all in Lea County, New Mexico.

PROVIDED HOWEVER THAT, prior to commingling the production within the N.G. Penrose Well No. 4, the applicant shall separately test the Tubb zone until such time as the production rate has stabilized.

PROVIDED FURTHER THAT, the Director of the Division shall require the subject wells to be shut in should the subject gas proration unit become overproduced in the Tubb Oil and Gas Pool in accordance with the terms and conditions of Rule 11 (b)(2) of the General Rules for the Prorated Gas Pools in New Mexico as promulgated by Order No. R-8170, as amended.

(2) An unorthodox gas well location in the Tubb Oil and Gas Pool is hereby approved for the applicant's N.G. Penrose Well No. 4 located as described above.

(3) A standard 160-acre gas spacing and proration unit consisting of the NE/4 of said Section 13 shall be simultaneously dedicated to the N.G. Penrose Wells Nos. 1, 2, and 4, as described above, within the Tubb Oil and Gas Pool.

(4) Upon completion of the workover operations in the subject wells, the applicant shall consult with the supervisor of the Hobbs district office of the Division to make adjustments and/or corrections to the allocation percentages submitted as evidence in this case.

(5) Jurisdiction of this cause is 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.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L