

Entered August 7, 1981
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STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 7116
Order No. R-6747

APPLICATION OF SOUTHLAND ROYALTY
COMPANY FOR DESIGNATION OF A TIGHT
FORMATION, SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on December 30, 1980, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 7th day of August, 1981, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That, pursuant to Section 107 of the Natural Gas Policy Act of 1978, and CFR Section 271.703, applicant Southland Royalty Company requested the designation as a "tight formation" of the Dakota formation underlying the following described lands:

SAN JUAN COUNTY, NEW MEXICO

TOWNSHIP 31 NORTH, RANGE 10 WEST, NMPM
Sections 1 through 36: All

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM
Section 1: All
Sections 12 and 13: All
Sections 22 through 27: All
Sections 34 through 36: All

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Sections 7 through 36: All

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TOWNSHIP 32 NORTH, RANGE 11 WEST, NMPM
Sections 7 through 27: All
Sections 34 through 36: All

TOWNSHIP 32 NORTH, RANGE 12 WEST, NMPM
Sections 7 through 33: All

TOWNSHIP 32 NORTH, RANGE 13 WEST, NMPM
Sections 7 through 36: All

containing a total of 93,860.00 acres, more or less.

(3) That at the hearing, applicant requested dismissal of that portion of the application pertaining to Sections 30 and 31, Township 32 North, Range 13 West, NMPM, containing some 989.32 acres, more or less, leaving for consideration some 92,871 acres, more or less.

(4) That said request for dismissal should be approved, and no further consideration given herein to said lands.

(5) That at the hearing, Consolidated Oil and Gas, Incorporated, appeared and requested expansion of the area applied for by applicant Southland Royalty to also include the following described lands for consideration as a "tight formation":

SAN JUAN COUNTY, NEW MEXICO

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM
Sections 5 through 8: All
Sections 17 through 20: All
Sections 29 through 32: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 1 through 36: All

containing a total of 29,645 acres, more or less.

(6) That although the aforesaid 29,645 acres, combined with the 92,871 acres remaining in the Southland application, exceeds the 93,860 acres stated in the legal notice for this case as being up for consideration, the 29,645 acres do lie within the area described in said legal notice, it having been advertised that consideration would be given to "the designation of the Dakota formation underlying portions of Townships 31 and 32 North, Ranges 10, 11, 12, and 13 West."

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(7) That consideration for designation as a tight formation should be given to the Dakota formation underlying the lands described in Finding No. (5) above, as requested by Consolidated.

(8) That subsequent to the hearing on December 30, 1980, certain parties requested further additions to the lands being considered in this case for designation as a tight formation.

(9) That no evidence appears in the record to support such additional lands and they should not be considered further.

(10) That the lands with which this order will hereinafter be concerned are described as follows:

SAN JUAN COUNTY, NEW MEXICO

TOWNSHIP 31 NORTH, RANGE 10 WEST, NMPM
Sections 1 through 36: All

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM
Section 1: All
Sections 12 and 13: All
Sections 22 through 27: All
Sections 34 through 36: All

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM
Sections 5 through 8: All
Sections 17 through 20: All
Sections 29 through 32: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 1 through 36: All

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Sections 7 through 36: All

TOWNSHIP 32 NORTH, RANGE 11 WEST, NMPM
Sections 7 through 27: All
Sections 34 through 36: All

TOWNSHIP 32 NORTH, RANGE 12 WEST, NMPM
Sections 7 through 33: All

TOWNSHIP 32 NORTH, RANGE 13 WEST, NMPM
Sections 7 through 29: All
Sections 32 through 36: All

containing 122,516 acres, more or less, and hereinafter referred to as the "area."

(11) That while the application was for designation of the Dakota formation as a tight formation, the Dakota formation constitutes but a portion of the "Dakota Producing Interval," which, as defined by the Division, comprises the vertical limits of the Basin-Dakota Gas Pool, being from the base of the Greenhorn Limestone to a point 400 feet below the base of said formation and consisting of the Graneros formation, the Dakota formation, and the productive upper limit of the Morrison formation.

(12) That inasmuch as practically all so-called "Dakota" wells drilled in the subject area are, or potentially are, tested in and/or completed in the entire Dakota Producing Interval, and the well data presented at the hearing of this case involves the entire Dakota Producing Interval, the application should be broadened to cover all of said producing interval throughout the area.

(13) That the Dakota Producing Interval, hereinafter referred to as the "Dakota," consists of a near blanket sandstone (probably an almost continuous series of northwest trending barrier beach sandstones composed of fine-grained quartose sandstones and carbonaceous shales with occasional conglomerates and coals in the basal part).

(14) That from the logs available at the hearing, the top of the Dakota in the area ranges from a depth of 5234 feet to 7220 feet and averages some 6603 feet beneath the surface.

(15) That the only test data for flow holes prior to stimulation for wells within the area indicates that Aztec Pierce Well No. 2 in Section 30, Township 31 North, Range 10 West, NMPM, had a stabilized production rate calculated at atmospheric pressure of 208.1 MCF of gas per day; that other wells in the immediate vicinity of the area but just outside had stabilized production rates calculated at atmospheric pressure prior to stimulation ranging from 21.7 MCF per/day to 224.1 MCF per day.

(16) That none of the stabilized production rates cited above exceeds the maximum stabilized production rate set forth in 18 C.F.R. Section 271.703(c)(2)(i)(B) of 251 MCF per day for wells at the average depth to the top of the formation for this area (6603 feet), and it is not expected that the average well in the area will exceed such rate.

(17) That in situ permeability calculations are available for only four wells in the area, being the Southland Pierce Well No. 2 and Moore No. 8, and the Consolidated Kline No. 1M and Senter No. 1M; that the in situ permeabilities calculated for said wells are .0609 md, .0151 md, .0049 md, and .0146 md, respectively, and average .0239 md.

(18) That the average in situ permeability for all wells in the area is not expected to exceed 0.1 md, the limit set forth in 18 C.F.R. Section 271.703(c)(2)(i)(A).

(19) That prior to stimulation, the average well in the area is expected to produce far less than the maximum five barrels of crude oil per day as set forth in 18 C.F.R. Section 271.703(c)(2)(i)(C).

(20) That 18 C.F.R. Section 271.703(c)(2)(i)(D) provides that "if the formation or any portion thereof was authorized to be developed by infill drilling prior to the date of recommendation and the jurisdictional agency has information which in its judgment indicates that such formation or portion subject to infill drilling can be developed absent the incentive price established in paragraph (a) of this section then the jurisdictional agency shall not include such formation or portion thereof in its recommendation."

(21) That the Division, by its Order No. R-1670-V, dated May 22, 1979, and effective July 1, 1979, approved infill drilling for the Basin-Dakota Gas Pool in San Juan and Rio Arriba Counties, New Mexico, and said pool includes the Dakota Producing Interval in the area under consideration here.

(22) That Southland in this hearing indicated that under current Section 103 prices of the NGPA of 1978, reserves of 350,000 MCF of gas are necessary to provide it with the economics necessary to justify drilling a Dakota well at its current drilling costs, while 150,000 MCF of reserves will justify a well at Section 107(c)(5) prices (tight formations).

(23) That Consolidated in this hearing indicated that under current Section 103 prices of the NGPA of 1978, reserves of 650,000 MCF of gas are necessary to provide it with the economics necessary to justify drilling a Dakota well at its current drilling costs, while 335,000 MCF of reserves will justify a well at Section 107(c)(5) prices (tight formations).

(24) That the wide discrepancy of reserves required to justify drilling according to these two companies' economic analyses probably results primarily from the following three factors:

- (A) Southland is content with a 15 percent rate of return (ROR) on its investment while Consolidated requires a 20 percent ROR.
- (B) Southland estimates that it can drill and complete a Dakota well in the area for approximately \$378,560.00, while Consolidated estimates that it would cost \$475,400.00.
- (C) Southland, in its economic analysis, calculates an 86.5 percent working interest share of well proceeds with 13.5 percent going to royalty, while Consolidated calculates a 75.5 percent working interest share of well proceeds with 24.5 percent going to royalty and overriding royalty.

(25) That while the Consolidated desire for a 20 percent ROR is understandable, the Division believes that the 15 percent ROR sought by Southland is more reasonable.

(26) That it would appear that some items in the Consolidated estimate of well costs are excessive, and that the \$378,560.00 estimate for a completed Dakota well is more realistic than the \$475,400.00 estimate.

(27) That the standard royalty for most leases in the area is 12.5 percent, leaving an 87.5 percent share of well proceeds to the working interest.

(28) That there are an infinite number of overriding royalty arrangements, farm-in arrangements, and other deals by which drilling rights are obtained, and it would be impracticable, if not impossible, for the Division to accommodate each of these carved-out interests when calculating pricing and reserves requirements and determining necessary economic incentives.

(29) That the Southland working interest of 86.5 percent is essentially the same as a standard 87.5 working interest and should be used in this case rather than the Consolidated 75.5 percent working interest.

(30) That the economics as presented by Southland in this case are reasonable, and lands which indicate recoverable reserves of 350,000 MCF or more of gas should be dismissed from further consideration, while lands indicating recoverable reserves of less than 350,000 MCF of gas should be considered for recommendation as a tight formation.

(31) That the Division, in approving infill drilling for the Basin-Dakota Gas Pool, based its approval on the premise that the reservoir was of low permeability and that 320-acre wells were not draining more than the 160-acre tract upon which they were located.

(32) That the remaining reserves under the 160-acre tract upon which the unit well is not located should be similar to, if not equal to, the original reserves under the 160-acre tract upon which the unit well is located.

(33) That cumulative production figures and estimates of ultimate recoverable reserves were presented at the hearing for some of the developed tracts within the area, while cumulative production figures only are available for the remainder of the developed tracts.

(34) That to determine that under certain lands insufficient reserves are available to justify drilling absent the Section 107 incentive price, it is reasonable to make the following assumptions:

- A. No primary drilling, i.e., no drilling on 320-acre spacing is prima facie evidence that the lands are edge lands to the reservoir and drilling has not occurred because of the probable marginal nature of the reserves.
- B. Primary drilling has occurred but the calculated total ultimate reserves or the cumulative production for long-connected wells indicates low ultimate recovery (less than 350,000 MCF of gas).

(35) That to determine that under certain lands sufficient reserves may reasonably be expected to be recovered to justify drilling without the Section 107 incentive price, it is reasonable to make the following assumptions:

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- A. Calculated ultimate recoverable reserves are 350,000 MCF or more.
- B. Calculated ultimate recoverable reserves are not available, but cumulative recoveries indicate that 350,000 MCF of gas already has been recovered.

(36) That the assumptions in Findings Nos. (34) B. and (35) A. and B. above may reasonably be based on offsetting wells in a given area.

(37) That primary drilling and some infill drilling has occurred on the following lands, and cumulative recoveries and/or estimates of remaining reserves indicate that more than 350,000 MCF of gas can be recovered by an average well therein, and therefore said lands can be developed absent the incentive price established in 18 C.F.R. Section 271.703(a) and should not be considered for recommendation for designation as a tight formation:

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM

Sections 5 through 8: All
Sections 17 through 20: All
Sections 29 through 32: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM

Sections 12 through 14: All
Sections 22 through 28: All
Sections 33 through 36: All

TOWNSHIP 32 NORTH, RANGE 12 WEST, NMPM

Sections 25 through 27: All
Sections 32 and 33: All

containing 19,602 acres, more or less.

(38) That there are fresh water aquifers underlying the lands being considered, and these aquifers extend to a depth of approximately 1200 feet.

(39) That there is a vertical distance of some 5400 feet between the base of the lowermost of said aquifers and the top of the Dakota, and this distance, combined with the required casing and cementing program for wells in the area, will assure that development of the Dakota will not adversely affect the fresh water aquifers (during both hydraulic fracturing and waste disposal operations) that are or are expected to be used

as a domestic or agricultural water supply.

(40) That the Dakota Producing Interval underlying the following lands meets all of the guidelines set forth in 18 C.F.R. Section 271.703(c)(2)(i), subsections (A), (B), (C), and (D), and should be recommended for designation as a tight formation:

TOWNSHIP 31 NORTH, RANGE 10 WEST, NMPM
Sections 1 through 36: All

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM
Section 1: All
Sections 12 and 13: All
Sections 22 through 27: All
Sections 34 through 36: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 1 through 11: All
Sections 15 through 21: All
Sections 29 through 32: All

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Sections 7 through 36: All

TOWNSHIP 32 NORTH, RANGE 11 WEST, NMPM
Sections 7 through 27: All
Sections 34 through 36: All

TOWNSHIP 32 NORTH, RANGE 12 WEST, NMPM
Sections 7 through 24: All
Sections 28 through 31: All

TOWNSHIP 32 NORTH, RANGE 13 WEST, NMPM
Sections 7 through 29: All
Sections 32 through 36: All

containing some 102,914 acres, more or less, all in San Juan County, New Mexico.

IT IS THEREFORE ORDERED:

(1) That it be and hereby is recommended to the Federal Energy Regulatory Commission pursuant to Section 107 of the Natural Gas Policy Act of 1978, and 18 C.F.R. Section 271.703, that the Dakota Producing Interval, being from the base of the Greenhorn Limestone to a point 400 feet below the base of said formation and consisting of the Graneros formation, the Dakota

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formation and the productive upper portion of the Morrison formation, underlying the following described lands in San Juan County, New Mexico, be designated as a tight formation:

TOWNSHIP 31 NORTH, RANGE 10 WEST, NMPM
Sections 1 through 36: All

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM
Section 1: All
Sections 12 and 13: All
Sections 22 through 27: All
Sections 34 through 36: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 1 through 11: All
Sections 15 through 21: All
Sections 29 through 32: All

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Sections 7 through 36: All

TOWNSHIP 32 NORTH, RANGE 11 WEST, NMPM
Sections 7 through 27: All
Sections 34 through 36: All

TOWNSHIP 32 NORTH, RANGE 12 WEST, NMPM
Sections 7 through 24: All
Sections 28 through 31: All

TOWNSHIP 32 NORTH, RANGE 13 WEST, NMPM
Sections 7 through 29: All
Sections 32 through 36: All

containing approximately 102,914 acres, more or less.

(2) That no recommendation is made as to those lands described in Finding No. (10) of this order which are not included in Order No. (1) above.

(3) That 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


JOE D. RAMEY
Director

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