

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:

(Reopened) CASE No. 10793

APPLICATION OF YATES PETROLEUM CORPORATION FOR A PILOT GAS ENHANCED RECOVERY PROJECT, CHAVES COUNTY, NEW MEXICO.

(Reopened) CASE No. 10981

APPLICATION OF YATES PETROLEUM CORPORATION TO AMEND DIVISION ORDER NO. R-9976 TO EXPAND ITS PILOT GAS ENHANCED RECOVERY PROJECT WITHIN PORTIONS OF THE PECOS SLOPE-ABO GAS POOL, CHAVES COUNTY, NEW MEXICO.

(Reopened) CASE No. 11004

APPLICATION OF YATES PETROLEUM CORPORATION FOR THIRTEEN UNORTHODOX INFILL GAS WELL LOCATIONS, CHAVES COUNTY, NEW MEXICO.

CASE No. 11421

APPLICATION OF YATES PETROLEUM CORPORATION FOR THE PROMULGATION OF SPECIAL RULES AND REGULATIONS FOR THE SOUTH PECOS SLOPE-ABO GAS POOL, CHAVES COUNTY, NEW MEXICO.

CASE No. 11422

APPLICATION OF YATES PETROLEUM CORPORATION FOR THE PROMULGATION OF SPECIAL RULES AND REGULATIONS FOR THE WEST PECOS SLOPE-ABO GAS POOL, CHAVES COUNTY, NEW MEXICO.

**NOMENCLATURE
Order No. R-9976-C**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause first came on for hearing at 8:15 a.m. on November 2, 1995, at Roswell, New Mexico and again on January 11, 1996, in Santa Fe, New Mexico, both before Examiner Michael E. Stogner.

NOW, on this 19th day of March, 1996 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) By Order No. R-9976, issued in Case No. 10793 and dated September 24, 1993, the Division granted Yates Petroleum Corporation ("Yates") authorization to implement a pilot "infill" drilling program within portions of the unprorated Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, for the purpose of allowing the applicant the opportunity to gather data to determine if infill drilling is necessary to effectively and efficiently drain the Abo formation.

(3) Yates was initially authorized by said Order No. R-9976 to drill an infill gas well within each of the following described five standard 160-acre gas spacing units, and within a non-standard 201.29-acre gas spacing unit comprising all of irregular Section 1, Township 6 South, Range 25 East, NMPM, Chaves County, New Mexico:

TOWNSHIP 6 SOUTH, RANGE 25 EAST, NMPM

Section 8: NE/4
Section 11: SE/4
Section 24: SW/4
Section 26: NE/4
Section 35: NE/4.

(4) Division Order No. R-9976-A, issued to both Case Nos. 10981 and 11004 and dated July 26, 1994, granted Yates the authority to expand its pilot infill drilling project to include the following 19 standard 160-acre gas spacing units in the Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, and on a non-standard 166.0-acre gas spacing unit comprising all of irregular Section 5, Township 6 South, Range 26 East, NMPM, Chaves County, New Mexico:

TOWNSHIP 5 SOUTH, RANGE 25 EAST, NMPM

Section 16: NE/4
Section 32: SW/4

TOWNSHIP 6 SOUTH, RANGE 26 EAST, NMPM

Section 7: NE/4
Section 18: SE/4
Section 19: SE/4
Section 31: NE/4

TOWNSHIP 7 SOUTH, RANGE 25 EAST, NMPM

Section 3: SE/4
Section 10: NW/4
Section 11: SE/4

TOWNSHIP 7 SOUTH, RANGE 25 EAST, NMPM

(Cont.)

Section 13: NW/4
Section 15: NW/4
Section 22: NW/4
Section 25: NW/4
Section 27: SE/4
Section 33: SE/4

TOWNSHIP 7 SOUTH, RANGE 26 EAST, NMPM

Section 6: NE/4
Section 18: SE/4
Section 19: SW/4
Section 21: SE/4.

(5) Further, Division Order No. R-9976-A, as amended by Order No. R-9976-B, provided for 13 of the proposed infill gas well locations within said expanded area to be drilled at unorthodox gas well locations.

(6) Two provisions common to both Order Nos. R-9976 and R-9976-A:

(a) authorized Yates to produce both wells within each of the two spacing units within the pilot project area at unrestricted rates until August, 1995; at which time,

(b) Yates would be required to appear at an examiner hearing to present the geologic and engineering data it had acquired and to make recommendations to the Division concerning amendments, if applicable, to the rules governing the Pecos Slope-Abo Gas Pool.

(7) The Division caused Case Nos. 10793, 10981, and 11004 to be reopened and advertised for the August 24, 1995 examiner's hearing in such a manner to include Yates as applicant in seeking the adoption of special rules and regulations for the Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, authorizing the drilling of an optional second gas well ("infill well") within each standard 160-acre, more or less, gas spacing unit. This matter was continued on several occasions until November 2, 1995, at which time the preponderance of the testimony was presented.

(8) In Case 11421 Yates is seeking the adoption of special rules and regulations for the South Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, authorizing the drilling of an optional second gas well ("infill well") within each standard 160-acre, more or less, gas spacing unit.

(9) In Case 11422 Yates is seeking the adoption of special rules and regulations for the West Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, authorizing the drilling of an optional second gas well ("infill well") within each standard 160-acre, more or less, gas spacing unit.

(10) The Pecos Slope-Abo Gas Pool currently comprises approximately 199,000 acres in all or portions of Townships 4, 5, 6, 7, and 8 South, Ranges 24, 25, 26, and 27 East, NMPM, Chaves County, New Mexico. The South Pecos Slope-Abo Gas Pool currently comprises approximately 73,440 acres in portions of Townships 8, 9, 10, and 11 South, Ranges 24, 25, 26, and 27 East, NMPM, Chaves County, New Mexico. The West Pecos Slope-Abo Gas Pool currently comprises approximately 92,480 acres in portions of Townships 5, 6, 7, 8, and 9 South, Ranges 21, 22, and 23 East, NMPM, Chaves County, New Mexico. Within this 364,920-acre, more or less, area, henceforth to be referred to as the "Pecos Slope Area", there are currently in excess of 800 wells producing gas from the Abo formation.

(11) All three pools are considered to be "unprorated" (none are subject to the Division's "General Rules For The Prorated Gas Pools of New Mexico", as promulgated by Division Order No. R-8170, as amended), and at the time of the hearings all three were subject to the Division's Statewide Rule 104.C(2)(a) that was in effect prior to the issuance of Division Order No. R-10533, which order effected changes to the statewide spacing and well location rules, and to Division Memorandums dated July 27, 1988 and August 3, 1990. The applicable rules in place for these three pools provide for only one single well for each 160-acre spacing and proration unit and that each well can produce at an unrestricted rate and is to be located no closer than 660 feet from the outer boundary of such tract nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary nor closer than 1320 feet to the nearest well drilling to or capable of producing from the Abo formation.

(12) Inasmuch as the subject matter of reopened Case Nos. 10793, 10981, and 11004 and in Case Nos. 11421 and 11422 are related, the cases were consolidated for the purposes of hearing.

(13) Tide West Oil Company ("Tide West") and Great Western Drilling Company ("Great Western") appeared through their attorney at the November 2, 1995 hearing but did not present evidence. At the conclusion of Yates' presentation, Tide West and Great Western requested certain information from Yates and a 60-day continuance to determine what position to take on this application. The continuance was granted and the data requested by Tide West and Great Western was provided for their analysis. When the case was reopened on January 11, 1996, Tide West and Great Western elected not to present evidence but instead submitted closing statements.

(14) *The northern boundary of the South Pecos Slope-Abo Gas Pool is contiguous with the southern boundary of the Pecos Slope-Abo Gas Pool. The technical evidence presented by the applicant indicates that the Abo formation in the Pecos Slope-Abo Gas Pool and South Pecos Slope-Abo Gas Pool is a fluival clastic wedge deposit comprised of channel sands which are stacked vertically of varying lateral continuity.*

Finding: The South Pecos Slope-Abo Gas Pool is a geologic extension of the Pecos Slope-Abo Gas Pool and no geologic reasons exist to separate the two pools. Therefore the South Pecos Slope-Abo Gas Pool should be deleted and the horizontal limits of the Pecos Slope-Abo Gas Pool should concomitantly be extended to incorporate that acreage comprising the South Pecos Slope-Abo Gas Pool.

(15) The geologic evidence further indicates that the West Pecos Slope-Abo Gas Pool is located approximately 5 miles west of the Pecos Slope-Abo Gas Pool and that the

pay zones in the West Pecos Slope-Abo Gas Pool are equivalent to the pay zones in the Pecos Slope-Abo Gas Pool except that in the West Pecos Slope-Abo Gas Pool the wells are poorer and have smaller drainage areas than wells in the Pecos Slope-Abo Gas Pool.

(16) The pilot infill drilling program in the Pecos Slope-Abo Pool was implemented by Yates in two phases. Phase I consisted of the drilling of the six infill wells approved by Division Order No. R-9976 and Phase II consisted of nine additional infill wells drilled pursuant to Division Order R-9976-A, as amended by Division Order No. R-9976-B.

(17) The location of each of the fifteen pilot infill well locations drilled by Yates was selected based on:

- (a) available sand thickness;
- (b) areas with wells that had good cumulative production; and
- (c) distance from existing wells and calculated drainage areas.

(18) Per Yates' testimony the fifteen wells drilled in this pilot infill drilling program were located throughout a five township area that is representative of the Abo formation throughout this portion of southeastern New Mexico.

(19) The geologic information obtained from the Pecos Slope-Abo pilot project establishes that:

- (a) the Abo formation is comprised of channel sands which are vertically stacked with varying lateral continuity;
- (b) the individual producing stingers are not continuous from well to well;
- (c) there is partial communication between wells as shown by the aggregate bottomhole pressure data obtained from offsetting wells; and
- (d) infill wells encounter new reserves that will not be recovered by existing wells.

(20) The engineering results of the Pecos Slope-Abo pilot infill drilling program are:

- (a) of the fifteen infill wells which were drilled in the pilot project area, ten were successful wells, three were marginal wells and two were dry holes;
- (b) Bottomhole Pressures:
 - (1) the pilot project wells produce from multiple zones in the Abo formation;
 - (2) because the bottomhole pressures obtained from each well is an aggregate pressure from all zones producing into the wellbore, no pilot infill well encountered the original reservoir pressure for the Abo formation of 1,125 psia;
 - (3) twelve of the fifteen pilot infill wells encountered higher bottomhole pressures than offsetting wells;
 - (4) the average pilot infill well bottomhole pressure is almost 800 psia; and
 - (5) the average pressure of offsetting wells is less than 300 psia.
- (c) Production Rates:
 - (1) the production rate for the average pilot infill wells is approximately 750 MCFD; and
 - (2) the production rate for the average offsetting well is less than 100 MCFD.
- (d) Reserves:
 - (1) the average pilot project infill well (including the three marginal wells and the two dry holes) will recover 544 MMCF;

- (2) the average successful pilot project infill well will recover almost 800 MMCF;
- (3) the average remaining reserves in each offset well is less than 200 MMCF; and
- (4) overall the fifteen pilot infill wells will produce a total of 8.0 BCF of reserves that would otherwise be left in the ground.

(21) Conclusions from this pilot project indicate that with the current engineering and geological technology, operators of Abo gas wells within the Pecos Slope Area:

- (a) will have the ability to select well locations that will enable the remaining reserves in the Abo formation to be produced;
- (b) will encounter substantial new reserves that will not be recovered by existing wells thereby preventing waste; and
- (c) will have the opportunity to determine if an infill well is necessary for an existing 160-acre spacing unit and the ability to drill it.

(22) Such infill development of the Pecos Slope Area will result in the drilling of wells that are necessary to produce the remaining reserves in the Abo formation.

(23) Such infill development in unprorated gas pools is contrary to the current Division rules and to Division policy at the time of the hearing. Historically, prorationing is instituted in gas pools for the following reasons:

- (a) there is more than one producer of gas;
- (b) the total deliverability of the producing wells in the pool exceeds the reasonable market demand for the gas from that pool;
- (c) the pool contains several wells with fractional acreage factors or non-standard gas spacing and proration units; and,
- (d) multiple-well units exist.

(24) Within the Pecos Slope Area there are numerous wells and numerous operators.

(25) There is sufficient market for all gas produced from this pool and, therefore, prorationing of this pool is not required to assure each operator in the pool access to market.

(26) For the reasons stated above artificial allowable restrictions on production from this pool, at this time, could damage the economics of proposed infill development so that necessary wells would not be drilled.

(27) *However, in pools with multiple well units, violations of correlative rights can result where unrestricted production creates the potential for drainage that is not equalized by counter-drainage. 660 feet from the outer boundary of a spacing unit with unrestricted flow is the rule in the Abo formation. Operators of offsetting acreage can counter such drainage with wells that are set back of equal distance. Such wells with unrestricted production located closer than the required 660 foot set back could serve to drain acreage to which that well is not entitled. If a well to counter this drainage is not drilled or cannot be drilled then restricted flow rates on the close well would serve to offset any inequities. However, there currently is no mechanism in place to adequately restrict production on wells in such a large and well developed area that has unrestricted production. In the Division consolidated hearing of Case Nos. 11283 and 11355 such a situation developed where two wells were drilled 330 feet off of a common quarter section line or proration unit boundary. Further, there exists only in a relatively small area in the upper tier of Township 6 South, NMPM, Chaves County, New Mexico the potential for and/or existence of non-standard gas spacing and proration units due to a variation in the legal subdivision of the U. S. Public Land Surveys. The creation of non-standard gas spacing and proration units for any other reason, such as the formation of two 80-acre units within a quarter section, could also be detrimental to prudent and reasonable development of Abo gas within this "Pecos Slope Area".*

Finding: To assure integrity of further and unrestricted development of Abo gas wells within the Pecos Slope Area, non-standard gas well locations and non-standard spacing and proration units for reasons other than a variation in the legal subdivision of the U. S. Public Land Surveys should be authorized only after notice and hearing.

(28) Evidence presented by the applicant and Division records indicate only a few shallower 40-acre oil wells within the Pecos Slope Area. Therefore to ease the administrative burden on operators, the requirement for authorizing non-standard gas well locations that are closer than 330 feet from the quarter-quarter section or subdivision inner

boundary should be eliminated. However, a 10 foot from such quarter-quarter section or subdivision inner boundary restriction should be implemented for well location and identification purposes.

(29) If infill development results in the impairment of correlative rights at a later date, the Division on its own motion or on the application of any operator in the pool can call a hearing to determine whether prorationing would serve to protect correlative rights in this pool.

(30) Infill drilling of an optional second Abo gas well on each 160-acre spacing unit in the Pecos Slope Area will serve to prevent the waste of natural gas and with the above-described restrictions will not impair the correlative rights of operators in this pool and should be approved.

IT IS THEREFORE ORDERED THAT:

(1) The South Pecos Slope-Abo Gas Pool in Chaves County, New Mexico, consisting of the following described area, is hereby abolished:

<u>TOWNSHIP 8 SOUTH, RANGE 25 EAST, NMPM</u>		<u>TOWNSHIP 10 SOUTH, RANGE 24 EAST, NMPM</u>	
Section 32:	E/2	Section 1:	All
<u>TOWNSHIP 9 SOUTH, RANGE 24 EAST, NMPM</u>		Sections 12 and 13:	All
Sections 13 through 15:	All	Sections 24 and 25:	All
Sections 24 and 25:	All	Section 36:	All
Section 36:	All.	<u>TOWNSHIP 10 SOUTH, RANGE 25 EAST, NMPM</u>	
<u>TOWNSHIP 9 SOUTH, RANGE 25 EAST, NMPM</u>		Sections 1 through 26:	All
Sections 1 through 36:	All	Sections 34 through 36:	All
<u>TOWNSHIP 9 SOUTH, RANGE 26 EAST, NMPM</u>		<u>TOWNSHIP 10 SOUTH, RANGE 26 EAST, NMPM</u>	
Sections 1 through 24:	All	Section 2:	NE/4
Section 26:	W/2	Section 6:	N/2 and SW/4
Sections 27 through 34:	All	Section 7:	S/2
Section 35:	W/2	Sections 19 and 20:	All
<u>TOWNSHIP 9 SOUTH, RANGE 27 EAST, NMPM</u>		Section 31:	All
Section 6:	All	<u>TOWNSHIP 11 SOUTH, RANGE 25 EAST, NMPM</u>	
Sections 18 and 19:	All	Section 3:	All
Section 20:	SW/4	Section 4:	S/2
		Section 8:	All
		Section 9:	N/2.

(2) The Pecos Slope-Abo Gas Pool in Chaves County, New Mexico, as heretofore classified, defined, and described, is hereby extended to include therein:

TOWNSHIP 8 SOUTH, RANGE 25 EAST, NMPM
Section 32: E/2

TOWNSHIP 9 SOUTH, RANGE 24 EAST, NMPM
Sections 13 through 15: All
Sections 24 and 25: All
Section 36: All.

TOWNSHIP 9 SOUTH, RANGE 25 EAST, NMPM
Sections 1 through 36: All

TOWNSHIP 9 SOUTH, RANGE 26 EAST, NMPM
Sections 1 through 24: All
Section 26: W/2
Sections 27 through 34: All
Section 35: W/2

TOWNSHIP 9 SOUTH, RANGE 27 EAST, NMPM
Section 6: All
Sections 18 and 19: All
Section 20: SW/4

TOWNSHIP 10 SOUTH, RANGE 24 EAST, NMPM
Section 1: All
Sections 12 and 13: All
Sections 24 and 25: All
Section 36: All

TOWNSHIP 10 SOUTH, RANGE 25 EAST, NMPM
Sections 1 through 26: All
Sections 34 through 36: All

TOWNSHIP 10 SOUTH, RANGE 26 EAST, NMPM
Section 2: NE/4
Section 6: N/2 and SW/4
Section 7: S/2
Sections 19 and 20: All
Section 31: All

TOWNSHIP 11 SOUTH, RANGE 25 EAST, NMPM
Section 3: All
Section 4: S/2
Section 8: All
Section 9: N/2.

(3) Special Rules and Regulations for the Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, as previously defined, described, and amended above, are hereby promulgated to permit the optional drilling of a second well on each 160-acre gas spacing and proration unit as follows:

**SPECIAL RULES AND REGULATIONS
FOR THE PECOS SLOPE-ABO GAS POOL**

Rule 1. Each well completed in the Pecos Slope-Abo Gas Pool or in the Abo formation within one mile thereof, and not nearer to or within the limits of another designated Abo gas pool, shall be spaced, drilled, operated and produced in accordance with the Special Rules and Regulations hereinafter set forth.

Rule 2. The initial well and the infill well, in the event a second well is drilled on any spacing unit, shall be located on a standard unit containing 160 acres, more or less, consisting of the NE/4, SE/4, SW/4 or NW/4 of a governmental quarter section.

Rule 3. The Director of the Division may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a single governmental quarter section and the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Lands Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Director has received the application. The formation of a non-standard gas spacing and proration unit for reasons other than a variation in the legal subdivision will only be granted after notice and hearing.

Rule 4. The initial well and the infill well, in the event a second well is drilled on any spacing unit, may be located at any location on the spacing unit provided neither well shall be located closer than 660 feet to any outer boundary of a governmental quarter section nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary. The plats (Form C-102) accompanying the Application for Permit to Drill (OCD Form C-101 or Federal Form 9-331-C) for the second well on a spacing unit shall have outlined thereon the boundaries of the unit and shall show the location of the first well on the unit as well as the proposed new well.

Rule 5. Location exceptions to Rule 4 above shall only be granted after notice and hearing.

IT IS FURTHER ORDERED THAT:

(4) Special Rules and Regulations for the West Pecos Slope-Abo Gas Pool, Chaves County, New Mexico, as previously defined, described, and amended above, are hereby promulgated to permit the optional drilling of a second well on each 160-acre gas

spacing and proration unit as follows:

**SPECIAL RULES AND REGULATIONS
FOR THE WEST PECOS SLOPE-ABO GAS POOL**

Rule 1. Each well completed in the Pecos Slope-Abo Gas Pool or in the Abo formation within one mile thereof, and not nearer to or within the limits of another designated Abo gas pool, shall be spaced, drilled, operated and produced in accordance with the Special Rules and Regulations hereinafter set forth.

Rule 2. The initial well and the infill well, in the event a second well is drilled on any spacing unit, shall be located on a standard unit containing 160 acres, more or less, consisting of the NE/4, SE/4, SW/4 or NW/4 of a governmental quarter section.

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Rule 4. The initial well and the infill well, in the event a second well is drilled on any spacing unit, may be located at any location on the spacing unit provided neither well shall be located closer than 660 feet to any outer boundary

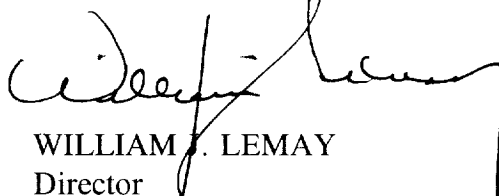
of a governmental quarter section nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary. The plats (Form C-102) accompanying the Application for Permit to Drill (OCD Form C-101 or Federal Form 9-331-C) for the second well on a spacing unit shall have outlined thereon the boundaries of the unit and shall show the location of the first well on the unit as well as the proposed new well.

Rule 5. Location exceptions to Rule 4 above shall only be granted after notice and hearing.

(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

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