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October 1, 1984

Bureau of Land Management
Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

Attention Mr. EArl R. Cunningham, District Manager

Subject: Administrative Application for
Infill Well Findings for
Doyle Hartman E. J. Wells No. 16
Section 5, Township 25 South,
Range 37 East, 2310' FSL & 610' FWL
Jalmat (Gas) Pool
Lea County, New Mexico

Gentlemen:

Application is hereby made for an administrative infill well finding effective with initial gas deliveries for the described well in accordance with Exhibit "A", Oil Conservation Division, New Mexico Department of Energy and Minerals, Order R-6013-A. The following constitute the requirements of the said Order:

Rule 5: Attached are copies of the Forms C-101 and C-102.

Rule 6: The name of the pool in which the infill well has been drilled is the Jalmat Pool, and the standard spacing therefor is 640 acres.

Rule 7: The non-standard proration unit and unorthodox well location were approved administratively by Order No. NSL-1823, a copy of which is attached hereto. This Order was executed June 22, 1984, by Mr. Joe D. Ramey, Director of the Oil Conservation Division.

Rule 8: See attached Table No. 1, "Summary of Required Information, Rule 8, Exhibit "A", Order No. R-6013-A" for requirements of Sections "a." through "f.". Also required by Section "g." is "a clear and concise statement indicating why the existing well(s) on the proration unit cannot effectively and efficiently drain the portion of the reservoir covered by the proration unit." The Jalmat (Gas) Pool well to which the present 120-acre non-standard proration unit was assigned was

the El Paso Natural Gas Company E. J. Wells No. 13; this well produced a mean daily volume of 20 MCF/day for the months of January-June 1984, with an accumulative gas production of 3,084.6 MMCF as of July 1, 1984. As can be ascertained from the attached summarized completion data with well log for the Doyle Hartman (El Paso Natural Gas Co.) E. J. Wells No. 13, this well is completed over an 80-foot thick interval in the lower portion of the Yates formation between depths of 3000 feet and 3080 feet. (This interval does not correlate with any of the perforated interval in the Doyle Hartman E. J. Wells No. 16.) The Doyle Hartman E. J. Wells No. 16 is completed over a 100-foot thick gross interval between depths of 2927 feet and 3034 feet containing an estimated 59 feet of net effective pay. Also, the volumes of stimulation were greatly different for these wells, as is summarized below:

	Doyle Hartman E. J. Wells #13	Doyle Hartman E. J. Wells #16
Gross Completion Interval, feet	80	107
Est. Net Effective Pay Thickness, Feet	44	59
Volume of Stimulation		
Acid, gallons	None	4,800
Fracture Treatment		
Gallons	None	112,700
Lbs. of Proppant	None	253,000
Volume of Stimulation Per Foot of Est Net Effective Pay		
Gallons/Foot	None	1,910
Lbs./Foot	None	4,288

Therefore, the infill Doyle Hartman E. J. Wells No. 16 has 1.34 times as much net effective pay included in its completion interval as does the pre-existing Doyle Hartman E. J. Wells No. 13; and, assuming that the effectiveness of stimulation is a direct function of the volume of stimulation per foot of estimated net effective pay thickness, the infill Hartman E. J. Wells No. 16 has been stimulated much more effectively than was the Hartman

E. J. Wells No. 13. Assuming that the comparative drainage efficiency is a function of the product of the ratios of net pay thickness and stimulation volume per foot of net pay thickness, then the infill Hartman E. J. Wells No. 16 has a comparative drainage efficiency of 2,561. to 4,750. times that of the pre-existing Hartman E. J. Wells No. 13.

In addition, the most recent shut-in wellhead pressure reported for the pre-existing Doyle Hartman E. J. Wells No. 13 was 59.2 psia on May 3, 1983, while the shut-in wellhead pressure for the infill Doyle Hartman E. J. Wells No. 16 was 171.2 psia on September 6, 1984.

Therefore, the reason that the pre-existing Hartman E. J. Wells No. 13 cannot effeciently and effectively drain the portion of the reservoir covered by proration unit can be summarized as follows:

1. The E. J. Wells No. 13 was completed in less than all of the estimate net effective pay present.
2. The completion interval for the pre-existing Doyle Hartman Wells No. 13 is in the lower Yates, while the completion interval of the infill Doyle Hartman Wells No. 16 is in the upper Yates. The completion intervals do not correlate.
3. The net effective pay in which the E. J. Wells No. 13 was completed was not stimulated, as compared to the Hartman E. J. Wells no. 16, which was effectively stimulated.
4. The lack of effective and efficient drainage is demonstarated by the substantial variation observed in the shut-in wellhead pressures between the pre-existing Hartman E. J. Wells No. 13 and the infill Hartman E. J. Wells No. 16.

Rule 9:
Sec. 2. Requires that a formation structure map be submitted; attached is a Yates formation structure map for the area including and surrounding the Doyle Hartman (El Paso Natural Gas Co.) E. J. Wells No. 16.

Sec. b. Requires that the "volume of increased ultimate recovery expected to be obtained and a narrative describing how the increase was determined" be submitted. The estimated ultimate gas recovery for the Doyle Hartman E. J. Wells No. 16 is 351.9 MMCF. Since the estimated remaining gas to be recovered from the proration unit assigned to this infill well from the E. J. Wells No. 13 is 1.8 MMCF, the increased ultimate recovery is 350.1 MMCF. The estimate of increased recovery for the Doyle Hartman E. J. Wells No. 16 was accomplished as follows:

(1) Well logs for Doyle Hartman E. J. Wells No. 16 were analyzed, resulting in the following:

Mean Porosity, Fraction of Bulk Volume	0.18
Mean Connate Water Saturation, Fraction of Net Effective Pore Volume	0.23
Net Effective Pay Thickness, Feet	59.

Since the gross pay thickness constituting potential gas reservoir for the E. J. Wells No. 16 is 90 feet, the above represents a net effective pay thickness to gross pay thickness ratio of 66 percent.

(2) The production tests for the Doyle Hartman E. J. Wells No. 16 performed on September 6, 1984, were analyzed, resulting in the following:

Stabilized Deliverability Coefficient, MCF/day per $psia^2$	0.016637
Initial Stabilized Wellhead Shut-in Pressure (Pc), psia	171.2
Initial Gas Formation Volume Factor scf/rcf	11.67

(3) The results of steps (1) and (2) were then combined, resulting in the following:

Original Gas-in-place MMCF/Acre	4.11
MMCF/120 Acres	493.4
Estimated Gas Recovery Factor, Fraction of Original Gas-in-place	0.713
Estimated Ultimate Recovery, MMCF per 120 Acres	351.9

Sec. c. Other supporting data submitted include the following:

Summarized completion data with well logs for both the pre-existing and application wells

Gas Production History Tabulation and Graph for Doyle Hartman (El Paso Natural Gas Co.) E. J. Wells No. 13 (the pre-existing well).

Form 9-330 for the Hartman E. J. Wells No. 16

Complete New Mexico Oil Conservation Division (NMOCD) Forms on file for both the pre-existing Doyle Hartman E. J. Wells No. 13 and the infill Doyle Hartman E. J. Wells No. 16

New Mexico Oil Conservation Division Order No. NSL-1823

We believe that the above adequately documents this request and has been prepared in accordance with Exhibit "A", Order R-6013-A; however, we should be pleased to supply anything else which you might require in this connection.

Very truly yours,

Wm. P. Aycock, P.E.

WPA/bw

Enclosures

TABLE NO. 1

SUMMARY OF REQUIRED INFORMATION, RULE 8, EXHIBIT "A", ORDER R-6013-A,
(SECTIONS "a." THROUGH "f.")
NATURAL GAS POLICY ACT INFILL FINDINGS, ADMINISTRATIVE PROCEDURE

SECTION OF RULE 8	RULE 8 REQUIREMENT	PRE-EXISTING WELL DOYLE HARTMAN, OPERATOR*	INFILL APPLICATION WELL DOYLE HARTMAN, OPERATOR
a.	Lease Name and Well Location	E. J. Wells No. 13 1980' FSL & 660' FWL	E. J. Wells No. 16 2310' FSL & 610' FWL
b.	Spud Date	March 4, 1947	August 23, 1984
c.	Completion Date	Langlie Mattix May 3, 1947 Jalmat November 5, 1953	September 6, 1984
d.	Mechanical Problems	None	None
e.	Current Rate of Production	Produced 20 MCF/day, avg. for January-June 1984	Form 9-330: 160 MCF/day on September 6, 1984
f.	Date of Plug and Abandonment	Not Plugged	Not Plugged

*PREVIOUSLY EL PASO NATURAL GAS CO.