

**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:**

**APPLICATION OF LEGEND NATURAL GAS III, LP FOR SPECIAL RULES  
AND REGULATIONS FOR THE NORTH HAY HOLLOW-BONE SPRING  
POOL, EDDY COUNTY, NEW MEXICO.**

**CASE NO. 15076  
ORDER NO. R-13907**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This case came on for hearing at 8:15 a.m. on January 23, 2014, at Santa Fe, New Mexico, before Examiner Richard I. Ezeanyim.

NOW, on this 14<sup>th</sup> day of October, 2014, 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) Legend Natural Gas III, LP ("Legend" or "Applicant") seeks an order establishing special rules and regulations for the North Hay Hollow-Bone Spring Pool (**Pool Code 30216**), including a special depth bracket allowable of 375 barrels of oil per day for a standard 40-acre oil spacing and proration unit.

(3) By Order No. R-8065 issued in Case No. 8740 on October 31, 1985, the Division created the North Hay Hollow-Bone Spring Pool, originally consisting of 160 acres of the following lands in Township 25 South, Range 27 East, NMPM, Eddy County, New Mexico.

**Township 25 South, Range 27 East, NMPM**

Section 26: NE/4

(4) The Legend wells producing from the North Hay Hollow-Bone Spring Pool are outside the current horizontal limits of this pool. As a result, in Case No. 15182

(Order No. R- 13908), Legend Natural Gas III, L.P sought to expand the horizontal limits of the North Hay Hollow-Bone Spring Pool to include the following described lands in Township 25 South, Ranges 27 and 28 East, NMPM, Eddy County, New Mexico.

Township 25 South, Range 27 East, NMPM

Section 12: All  
Section 13: All  
Section 23: E/2  
Section 24: All  
Section 25: All  
Section 26: NE/4

Township 25 South, Range 28 East, NMPM

Section 7: E/2  
Section 17: W/2  
Section 18: All  
Section 19: All  
Section 20: W/2  
Section 29: W/2  
Section 30: All

(5) The discovery well for the Pool is the Amoco Fed. Well No. 1 (API No. 30-015-23848), located in Unit A of Section 26, Township 25 South, Range 27 East, NMPM. It was an oil well with its top perforation in the Bone Spring formation at 5,877 feet subsurface. As a result, the Pool's current depth bracket allowable is 107 barrels of oil per day. Under the Division's statewide rules and regulations, spacing in the Pool is 40 acres, with wells to be located no closer than 330 feet to a quarter-quarter section line, with a limiting gas-oil ratio (GOR) of 2,000 cubic feet of gas per barrel of oil.

The Applicant appeared at the hearing through counsel and presented the following testimony:

(6) The main producing interval in the Pool is the 2nd Bone Spring Sand, at depths below 8,000 feet subsurface.

(7) The 2nd Bone Spring Sand interval is continuous across the Pool, and it dips slightly from west to east. The gross thickness of this interval is approximately 280 to 320 feet across the Pool.

(8) The Applicant is the operator of the State GQ Com. Well No. 3H (API No. 30-015-40867) located in the E/2 E/2 of Section 7, Township 25 South, Range 28 East, NMPM, which was completed at a vertical depth below 8,000 feet subsurface. It was initially capable of producing in excess of 1,000 barrels of oil per day. The Applicant has also drilled other wells in the E/2 of Section 7, and with these infill wells the current allowable will easily be exceeded.

(9) The drive mechanism of the reservoir is solution gas drive.

(10) The original oil in place (OOIP) calculations in the E/2 of Section 7 show that the half section has approximately 3993.5 MBO of oil in place. Estimated ultimate recovery (EUR) from the E/2 of Section 7; calculated from decline curve analysis, is 442 MBO.

(11) There is no evidence of reservoir damage or waste as a result of increasing the allowable from 107 to 375 barrels of oil per day.

(12) Notice of this application was provided to all the operators within the pool and within one mile of the pool.

(13) No operator appeared at the hearing to oppose the granting of this application.

(14) The granting of this application is in the best interest of conservation, the prevention of waste, and the protection of correlative rights.

The Division concludes as follows:

(15) The evidence presented indicates that the reservoir produces by solution gas drive or dissolved gas drive mechanism. There is no primary or pre-existing gas cap, and upon depletion, there is no secondary or developed gas cap. The only available predominant energy that moves the oil to the wellbore is the expansion of the solution gas

(16) The diagnostic fracture injection test (DFIT), coupled with the pressure-volume-temperature (PVT) analysis conducted by the Applicant, indicate that the initial reservoir pressure is approximately 4,150 pounds per square inch (psi), the bubble point pressure of the reservoir is 4,011 psi, and an estimated permeability of 0.003 millidarcy (md). These reservoir parameters indicate that the reservoir is tight and under-saturated with no formation free gas present in the reservoir.

(17) In a solution gas drive reservoir of this nature with no initial free gas present, no water drive or gravity drainage, the rate of production is independent of estimated ultimate recovery. The reservoir is not damaged or harmed by high production rates; therefore, waste is not induced. Correlative rights are protected by the setback requirements.

(18) With a calculated OOIP of 3993.5 MBO and EUR of 442 MBO in the E/2 of Section 7, only eleven percent (11%) of the original oil in place will be produced from this half section, which is poor, but typical of solution gas drive reservoirs. This eleven percent number will not be reached if the allowable in the units are restricted to 107 barrels of oil per day.

(19) This reservoir is tight with average permeability of 0.003 md and low porosity that ranges from 4% to 6%. Since the reservoir will not be damaged or harmed by high production rates, and correlative rights will be protected, it is advantageous to produce as much liquid hydrocarbons as possible from this tight reservoir before and after the bubble point pressure of the reservoir is reached.

(20) In the interest of conservation, this application should be approved to prevent waste and protect correlative rights.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Legend Natural Gas III, LP, to establish special rules and regulations for the North Hay Hollow-Bone Spring Pool (**Pool Code 30216**), including a special depth bracket allowable of 375 barrels of oil per day for a standard 40-acre oil spacing and proration unit, is hereby **approved**.

(2) The following Special Pool Rules and Regulations are promulgated for the North Hay Hollow-Bone Spring Pool with the horizontal boundary described in Finding Paragraph (4) above.

**SPECIAL POOL RULES AND REGULATIONS  
FOR  
THE NORTH HAY HOLLOW-BONE SPRING POOL**

**Rule 1:** Each well completed or recompleted in the North Hay Hollow-Bone Spring Pool, or within one mile thereof and not nearer to or within the limits of another Bone Spring pool, shall be drilled, spaced, operated, and produced in accordance with the Special Rules hereinafter set forth.

**Rule 2:** The allowable for a standard proration unit shall be based on a depth bracket allowable of 375 barrels of oil per day. In the event there is more than one well on a 40-acre proration unit, the operator may produce the allowable assigned to the unit from the wells in any proportion.

**Rule 3:** All other rules shall conform to the Division's statewide rules.

(3) Jurisdiction of this case 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.



SEAL

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

JAMI BAILEY  
Director