

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. 10970*  
*ORDER NO. R-10149*

**APPLICATION OF MERRION OIL & GAS CORPORATION FOR DOWNHOLE  
COMMINGLING AND AN UNORTHODOX COAL GAS WELL LOCATION, RIO  
ARRIBA COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on May 12, 1994, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 11th day of July, 1994 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) The applicant in this case, Merrion Oil & Gas Corporation ("Merrion"), is the owner and operator of the Carnahan Com Well No. 1 (API No. 30-045-08946), located 990 feet from the South and East lines (Unit P) of Section 35, Township 30 North, Range 12 West, NMPM, San Juan County, New Mexico.

(3) Said well was originally drilled and completed in the winter of 1960-1961 as a Basin-Dakota gas well. In early 1972 the Dakota interval was plugged back and the well was recompleted to the Flora Vista-Mesaverde Pool where it produced until May, 1990, at which time it was shut-in when it was no longer able to produce from the Mesaverde interval. At this time Merrion is proposing to plug back the existing Mesaverde perforations in the wellbore and recomplete up-hole in both the Undesignated Fulcher Kutz-Pictured Cliffs Pool, in which the SE/4 of said Section 35 will be dedicated to form a standard 160-acre gas spacing and proration unit, and the Basin-Fruitland Coal (Gas) Pool, in which the E/2 of said Section 35 will be dedicated to form a standard 320-acre gas spacing and proration unit.

(4) The applicant now seeks authority to commingle production from both the Pictured Cliffs and Fruitland Coal intervals in said wellbore.

(5) Since the proposed recompletion of the well into the Basin-Fruitland Coal (Gas) Pool would result in the location being an "off-pattern" unorthodox coal gas well location, Merrion originally sought in this matter an exception to the well location restriction provisions (see Rule 7) of the Special Rules and Regulations for the Basin Fruitland Coal (Gas) Pool, as promulgated by Division Order No. R-8768, as amended.

(6) Subsequent to this hearing the Division issued on May 19, 1994 Administrative Order NSL-3393, which order approved the subject Carnahan Com Well No. 1 as an unorthodox Basin-Fruitland Coal Gas well location; therefore, that portion of the immediate application requesting approval of an unorthodox coal gas well location for said well is deemed unnecessary and should now be dismissed.

(7) Testimony presented by the applicant indicates that gas production capabilities from both the Pictured Cliffs and Fruitland Coal intervals in this general area of the San Juan Basin are expected to be marginal in nature, thereby making the downhole commingling of both zones practical in order to adequately recover Basin-Fruitland Coal gas and conventional Pictured Cliffs gas reserves underlying both respective proration units in a prudent manner.

(8) The ownership within the Basin-Fruitland Coal (Gas) Pool and the Undesignated Fulcher Kutz-Pictured Cliffs Gas Pool underlying each respective proration unit is not common.

(9) The applicant has notified all working interests owning an interest in either the Pictured Cliffs or Fruitland Coal interval within the subject proration units of its proposed downhole commingling.

(10) The applicant further demonstrated through its evidence and testimony that:

- (a) there will be no crossflow between the two commingled pools;
- (b) neither commingled zone exposes the other to damage by produced liquids;
- (c) the fluids from each zone are compatible with the other;
- (d) the bottomhole pressure of the lower pressure zone should not be less than 50 percent of the bottomhole pressure of the higher pressure zone adjusted to a common datum; and,

- (e) the value of the commingled production is not less than the sum of the values of the individual production.

(11) No offset operator and/or interest owner appeared at the hearing in opposition to the proposed application.

(12) Due to the nature of gas production from the Basin-Fruitland Coal (Gas) Pool, straight allocation of gas volumes from both zones is not appropriate. The applicant therefore seeks the adoption of a monthly allocation formula, based on initial production test and known/assumed parameters from the Pictured Cliffs zone whereby its initial rate, estimated ultimate recovery, and decline rate can be determined. Any production rate over what is calculated for the Pictured Cliffs utilizing the applied formula can be attributed to the Fruitland coal gas interval. See Exhibit "A" attached hereto and made a part hereof for additional reference.

(13) Approval of this application is in the best interest of conservation, will serve to prevent waste and protect correlative rights.

(14) The operator should be responsible for reporting the monthly gas production from said well by utilizing the proposed allocation formula.

(15) An annual report should be submitted by the operator to both the Aztec and Santa Fe offices of the Division showing the complete computations for each month.

(16) Any condensate production should be allocated entirely to the Pictured Cliffs interval. Water production should be reported in a manner acceptable to the supervisor of the Aztec district office of the Division.

(17) Any change in the method of gas allocation between the two pools should be made only after due notice and hearing.

(18) To afford the Division an opportunity to assess the potential of waste and to expeditiously order the appropriate remedial action, the operator should notify the Aztec District Office of the Division any time the subject well is shut-in for seven consecutive days.

IT IS THEREFORE ORDERED THAT:

(1) The application of Merrion Oil & Gas Corporation ("Merrion"), for authority to commingle Undesignated Fulcher Kutz-Pictured Cliffs Pool gas and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Carnahan Com Well No. 1 (API No. 30-045-08946), located 990 feet from the South and East lines (Unit P) of Section 35, Township 30 North, Range 12 West, NMPM, San Juan County, New Mexico, is hereby approved.

(2) Said well shall be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the E/2 of said Section 35 and to a standard 160-acre gas spacing unit for the Undesignated Fulcher Kutz-Pictured Cliffs Pool being the SE/4 of said Section 35.

(3) The portion of this application requesting an unorthodox coal gas well location for the subject well shall be dismissed.

(4) The allocation of gas from both zones shall be subject to the monthly allocation formula hereby adopted for this well, as further referenced in Exhibit "A" attached hereto and made a part hereof.

(5) The operator is responsible for reporting the monthly gas production from the subject well to the Division by utilizing the allocation formula herein adopted.

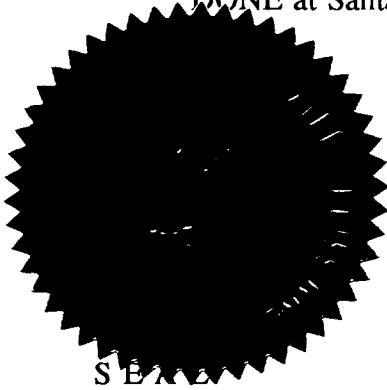
(6) Any condensate production from the subject well shall be allocated entirely to the Undesignated Fulcher Kutz-Pictured Cliffs Pool. Water production shall be reported in a manner acceptable to the supervisor of the Aztec District Office of the Division.

(7) Any variance in the method of gas allocation herein approved by this order shall be made only after due notice and hearing.

(8) The operator of the subject well shall immediately notify the supervisor of the Aztec District Office of the Division any time the well has been shut-in for seven consecutive days and shall concurrently present, to the Division, a plan for remedial action.

(9) 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

A handwritten signature in black ink, appearing to read 'William J. Lemay', written over the printed name and title.

## Exhibit "A"

CASE NO. 10970

DIVISION ORDER NO. R-10149

MERRION OIL & GAS CORPORATION

**CARNAHAN COM WELL NO. 1**

API NO. 30-045-08946

### MONTHLY GAS PRODUCTION ALLOCATION FORMULA

#### Step One: Calculate Pictured Cliffs Reserves From Volumetrics

$$G_p = \{7758 * \emptyset * h * A * (1-S_w)/B_g\} * \text{BTU Factor} * R_f$$

#### WHERE:

$G_p$  = ULTIMATE PICTURED CLIFFS GAS RESERVES IN MMBTU  
 $7758$  = STANDARD BARRELS PER ACRE-FOOT CONVERSION  
 $\emptyset$  = POROSITY = 18%  
 $h$  = NET PAY THICKNESS = 30 FEET  
 $A$  = DRAINAGE AREA = 160 ACRES  
 $S_w$  = WATER SATURATION = 50%  
 $B_g$  = GAS FORMATION VOLUME FACTOR (RVB/Mcf) =  $(5.04 * z * T)/P$ .

#### WHERE:

$z$  = GAS DEVIATION FACTOR AT RESERVOIR CONDITIONS = 0.94.

$T$  = RESERVOIR TEMPERATURE (DEGREES) = 100 F = 560 R.

$P$  = PICTURED CLIFFS RESERVOIR PRESSURE AS MEASURED DURING INITIAL COMPLETION (PSIA)

BTU FACTOR = MMBTU/MCF FROM INITIAL PICTURED CLIFFS GAS ANALYSIS

$R_f$  (RESERVOIR RECOVERY FACTOR) = 85%

#### THEREFORE:

$$G_p = \{7758 \text{ Bbls./ac.-ft.} * 0.18 * 30 \text{ ft.} * 160 \text{ ac.} * (1.0 - 0.5) / [5.04 * 0.94 * 560 / P]\} * \text{BTU Factor} * 0.85$$

OR

$$G_p = 1074 \text{ (MCF/PSIA)} * P \text{ (PSIA)} * \text{BTU Factor (MMBTU / Mcf)}$$

**Step Two: Calculate Pictured Cliffs Initial Monthly Production Rate**

$$Q_{pc}(1) = Q_t(1) * \{Q_{pc}(\text{test}) / [Q_{pc}(\text{test}) + Q_{fc}(\text{test})]\}$$

And

$$Q_{pci}(\text{decline}) = Q_{pc}(1) * 30.4 / \text{Days Produced}(1)$$

**WHERE:**

$Q_{pc}(1)$  = FIRST MONTH PICTURED CLIFFS PRODUCTION IN MMBTU/MONTH  
 $Q_t(1)$  = FIRST MONTH TOTAL PRODUCTION IN MMBTU/MONTH  
 $Q_{pc}(\text{test})$  = FINAL PICTURED CLIFFS FLOW TEST IN MMBTU/DAY  
 $Q_{fc}(\text{test})$  = FINAL FRUITLAND COAL FLOW TEST IN MMBTU/DAY  
 $\text{Days Produced}(1)$  = NUMBER OF DAYS WELL WAS ON IN THE FIRST MONTH  
 $Q_{pci}(\text{decline})$  = INITIAL MONTHLY PRODUCTION RATE TO BE USED IN FORECASTING FUTURE PICTURED CLIFFS PRODUCTION IN MMBTU/MONTH

**Step Three: Calculate Pictured Cliffs Abandonment Rate**

$$Q_{pca} = \text{Operating Cost} / \{\text{Price} * \text{NRI} * (1.0 - \text{Tax})\}$$

**WHERE:**

$Q_{pca}$  = PICTURED CLIFFS ABANDONMENT RATE IN MMBTU/MONTH  
 $\text{Operating Cost}$  = MONTHLY OPERATING EXPENSE = \$500.00/MONTH  
 $\text{Price}$  = WELLHEAD GAS PRICE = \$1.65/MMBTU  
 $\text{NRI}$  = AVERAGE NET REVENUE INTEREST = 84%  
 $\text{Tax}$  = STATE AND LOCAL SEVERANCE AND ADVALOREM TAXES = 9%

**THEREFORE:**

$$Q_{pca} = \$500.00 / \{\$1.65 * 0.84 * (1.0 - 0.09)\} = 396 \text{ MMBTU/MONTH}$$

**Step Four: Calculate Pictured Cliffs Decline Rate**

$$D = \{Q_{pci}(\text{decline}) - Q_{pca}\} / G_p$$

**WHERE:**

$D$  = NOMINAL DECLINE RATE (Fraction/Month)  
 $Q_{pci}(\text{decline})$  = INITIAL MONTHLY PRODUCTION RATE IN MMBTU/MONTH AS

CALCULATED IN STEP TWO

Qpca = PICTURED CLIFFS ABANDONMENT RATE IN MMBTU/MONTH  
= 396 MMBTU/MONTH  
Gp = ULTIMATE PICTURED CLIFFS GAS RESERVES IN MMBTU AS CALCULATED  
IN STEP ONE.

**Step Five: Calculate Future Pictured Cliffs Production In Future Month "X"**

$$Q_{pc}(x) = Q_{pci}(\text{decline}) * \exp\{-D * t(x)\}$$

**WHERE:**

Qpc(x) = PICTURED CLIFFS PRODUCTION IN MMBTU FOR A GIVEN MONTH "x"  
Qpci(decline) = INITIAL MONTHLY PRODUCTION RATE IN MMBTU/MONTH AS  
CALCULATED IN STEP TWO  
D = NOMINAL DECLINE RATE (Fraction/Month) AS CALCULATED IN STEP FOUR  
t(x) = NUMBER OF MONTHS FROM INITIAL PRODUCTION TO A GIVEN MONTH "x"

**Step Six: Calculate Fruitland Coal Rate In Future Month "X"**

$$Q_{fc}(x) = Q_t(x) - Q_{pc}(x)$$

**WHERE:**

Qfc(x) = FRUITLAND COAL PRODUCTION IN MMBTU FOR A GIVEN MONTH "x"  
Qt(x) = TOTAL WELL PRODUCTION IN MMBTU FOR A GIVEN MONTH "x"  
Qpc(x) = PICTURED CLIFFS PRODUCTION IN MMBTU FOR A GIVEN MONTH "x" AS  
CALCULATED IN STEP FIVE