



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

May 2, 1996

**Merrion Oil & Gas Corporation  
P. O. Box 840  
Farmington, New Mexico 87499  
Attention: George Sharpe**

*Administrative Order DD-110(H)  
High Angle/Horizontal  
Supplement Order No. 1*

Dear Mr. Sharpe:

Reference is made to your application dated March 8, 1996 for authorization to drill three additional horizontal drainholes within the Papers Wash Entrada (Unit) High Angle/Horizontal Drilling Project Area, approved by Division Administrative Order DD-110(H), dated August 18, 1995 and corrected on August 24, 1995, which comprises the W/2 of Section 15 and the SE/4 NE/4 and NE/4 SE/4 of Section 16, both in Township 19 North, Range 5 West, NMPM, designated and Undesignated Papers Wash-Entrada Oil Pool, McKinley County, New Mexico.

**The Division Director Finds That:**

- (1) The application by Merrion Oil & Gas Corporation ("Merrion") has been duly filed under the provisions of:
  - (a) Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995; and,
  - (b) all applicable provisions of said Division Administrative Order DD-110(H), as corrected.
- (2) Both the PWU Well No. 3, formerly the Navajo Allotted "15" Well No. 3 (API No. 30-031-20502), located at a standard oil well location 2310 feet from the South line and 2000 feet from the West line (Unit K) of said Section 15 and the Papers Wash Unit Well No. 4, formerly the Navajo Allotted "15" Well No. 4 (API No.

**30-031-20503**), located at a standard oil well location 2310 feet from the South line and 990 feet from the West line (Unit L) of said Section 15 were originally drilled and completed within the Papers Wash-Entrada Oil Pool in 1977.

- (3) The applicant/operator proposes to recomplete the PWU Well No. 4 by drilling one or possibly two horizontal drainholes to the south;
- (4) From the PWU Well No. 3 the applicant/operator is proposing to kick-off in a southwesterly direction with one horizontal drainhole;
- (5) All drainholes will be drilled with a +350 foot radius arc and extend a distance of 800 to 1,000 feet within the oil bearing Entrada sand;
- (6) Any horizontal drainhole herein approved by this order will be governed by the provisions set forth in said Order DD-110(H), as corrected; and,
- (7) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

**IT IS THEREFORE ORDERED THAT:**

(1) Merrion Oil and Gas Corporation ("Merrion") is hereby authorized to recomplete its existing PWU Well No. 3, formerly the Navajo Allotted "15" Well No. 3 (API No. **30-031-20502**), located at a standard oil well location 2310 feet from the South line and 2000 feet from the West line (Unit K) of Section 15, Township 19 North, Range 5 West, NMPM, McKinley County, New Mexico, by plugging-back, milling a window in the existing production casing, kick-off from the vertical in a southwesterly direction with a +350 foot radius arc, build to an angle of approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet.

(2) Merrion is further authorized to recomplete its existing PWU Well No. 4, formerly the Navajo Allotted "15" Well No. 4 (API No. **30-031-20503**), located at a standard oil well location 2310 feet from the South line and 990 feet from the West line (Unit L) of said Section 15 with one or possibly two horizontal drainholes drilled to the south in the same manner as described-above.

- (3) All above-described horizontal drainholes shall be subject to all provisions of



Administrative Order DD-110(H)  
Supplement Order No. 1  
Merrion Oil & Gas Corporation  
May 2, 1996  
Page 3

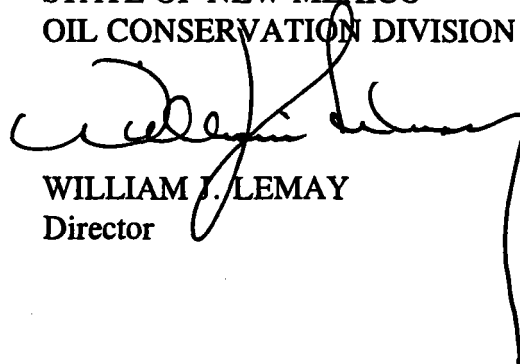
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Division Administrative Order DD-110(H), dated August 18, 1995 and corrected on August 24, 1995.

(4) 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

S E A L

cc: Oil Conservation Division - Aztec  
U. S. Bureau of Land Management - Farmington

DD-110.51

Rec: 3-18-96

May 1, 1996

Susp: NA

Released: 5-1-96

**Merrion Oil & Gas Corporation  
P. O. Box 840  
Farmington, New Mexico 87499**

**Attention: George Sharpe**

*Administrative Order DD-110(H)  
High Angle/Horizontal  
Supplement Order No. 1*

Dear Mr. Sharpe:

Reference is made to your application dated March 8, 1996 for authorization to drill three additional horizontal drainholes within the Papers Wash Entrada (Unit) High Angle/Horizontal Drilling Project Area, approved by Division Administrative Order DD-110(H), dated August 18, 1995 and corrected on August 24, 1995, which comprises the W/2 of Section 15 and the SE/4 NE/4 and NE/4 SE/4 of Section 16, both in Township 19 North, Range 5 West, NMPM, designated and Undesignated Papers Wash-Entrada Oil Pool, McKinley County, New Mexico.

**The Division Director Finds That:**

- (1) The application by Merrion Oil & Gas Corporation ("Merrion") has been duly filed under the provisions of:
  - (a) Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995; and,
  - (b) all applicable provisions of said Division Administrative Order DD-110(H), as corrected.
- (2) Both the PWU Well No. 3, formerly the Navajo Allotted "15" Well No. 3 (API No. 30-031-20502), located at a standard oil well location 2310 feet from the South line and 2000 feet from the West line (Unit K) of said Section 15 and the Papers Wash Unit Well No. 4, formerly the Navajo Allotted "15" Well No. 4 (API No. 30-031-20503), located at a standard oil well location 2310 feet from the South line and 990 feet from the West line (Unit L) of said Section 15 were

originally drilled and completed within the Papers Wash-Entrada Oil Pool in 1977.

- (3) The applicant/operator proposes to recomplete the PWU Well No. 4 by drilling one or possibly two horizontal drainholes to the south;
- (4) From the PWU Well No. 3 the applicant/operator is proposing to kick-off in a southwesterly direction with one horizontal drainhole;
- (5) All drainholes will be drilled with a +350 foot radius arc and extend a distance of 800 to 1,000 feet within the oil bearing Entrada sand;
- (6) Any horizontal drainhole herein approved by this order will be governed by the provisions set forth in said Order DD-110(H), as corrected; and,
- (7) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

**IT IS THEREFORE ORDERED THAT:**

(1) Merrion Oil and Gas Corporation ("Merrion") is hereby authorized to recomplete its existing PWU Well No. 3, formerly the Navajo Allotted "15" Well No. 3 (API No. 30-031-20502), located at a standard oil well location 2310 feet from the South line and 2000 feet from the West line (Unit K) of Section 15, Township 19 North, Range 5 West, NMPM, McKinley County, New Mexico, by plugging-back, milling a window in the existing production casing, kick-off from the vertical in a southwesterly direction with a +350 foot radius arc, build to an angle of approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet.

(2) Merrion is further authorized to recomplete its existing PWU Well No. 4, formerly the Navajo Allotted "15" Well No. 4 (API No. 30-031-20503), located at a standard oil well location 2310 feet from the South line and 990 feet from the West line (Unit L) of said Section 15 with one or possibly two horizontal drainholes drilled to the south in the same manner as described-above.

(3) All above-described horizontal drainholes shall be subject to all provisions of Division Administrative Order DD-110(H), dated August 18, 1995 and corrected on August 24, 1995.

(4) 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

S E A L

cc: Oil Conservation Division - Aztec  
U. S. Bureau of Land Management - Farmington

# MERRION

OIL & GAS

DD-110,51

*Received*

March 8, 1996

3-18-96

Mr. Michael Stogner  
New Mexico Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87503

**Re: Application for Administrative Approval  
To Drill Horizontal Well  
Under Provisions of Order No. DD-110H  
Papers Wash Entrada Unit  
McKinley County, New Mexico**

Dear Mr. Stogner:


The referenced order allows for the drilling of horizontal wellbores within the Papers Wash Entrada Unit. This application requests approval for specific wells to be drilled under the provisions of that order.

Merrion has drilled two horizontal wellbores to date in the Unit, both out of the PWU-1 wellbore. Merrion now plans to plug back the PWU-4 wellbore and drill a horizontal well either to the southeast or the southwest from that wellbore. Depending on the success, Merrion may drill a second horizontal from the PWU-4 in the alternative direction. In addition, we may drill horizontal wells from the PWU-2 wellbore to the southeast on the PWU-3 wellbore to the southwest. All the possible horizontals are shown on Exhibit 1. DD-110(11)

All wellbores will be drilled with a + 350' radius arc and will penetrate a horizontal distance of 800 to 1000 feet in the Entrada Formation. None of the wellbores will have a horizontal or producing portion of said wellbore within 330 feet of the outer boundary of the project area. The total allowable assigned to the project area shall be equal to 750 BOPD times the total number of 40 acre tracts within the project area that are traversed by a horizontal drainhole. The operator shall comply with all other provisions of the referenced order.

Please call me with any questions at (505) 327-9801.

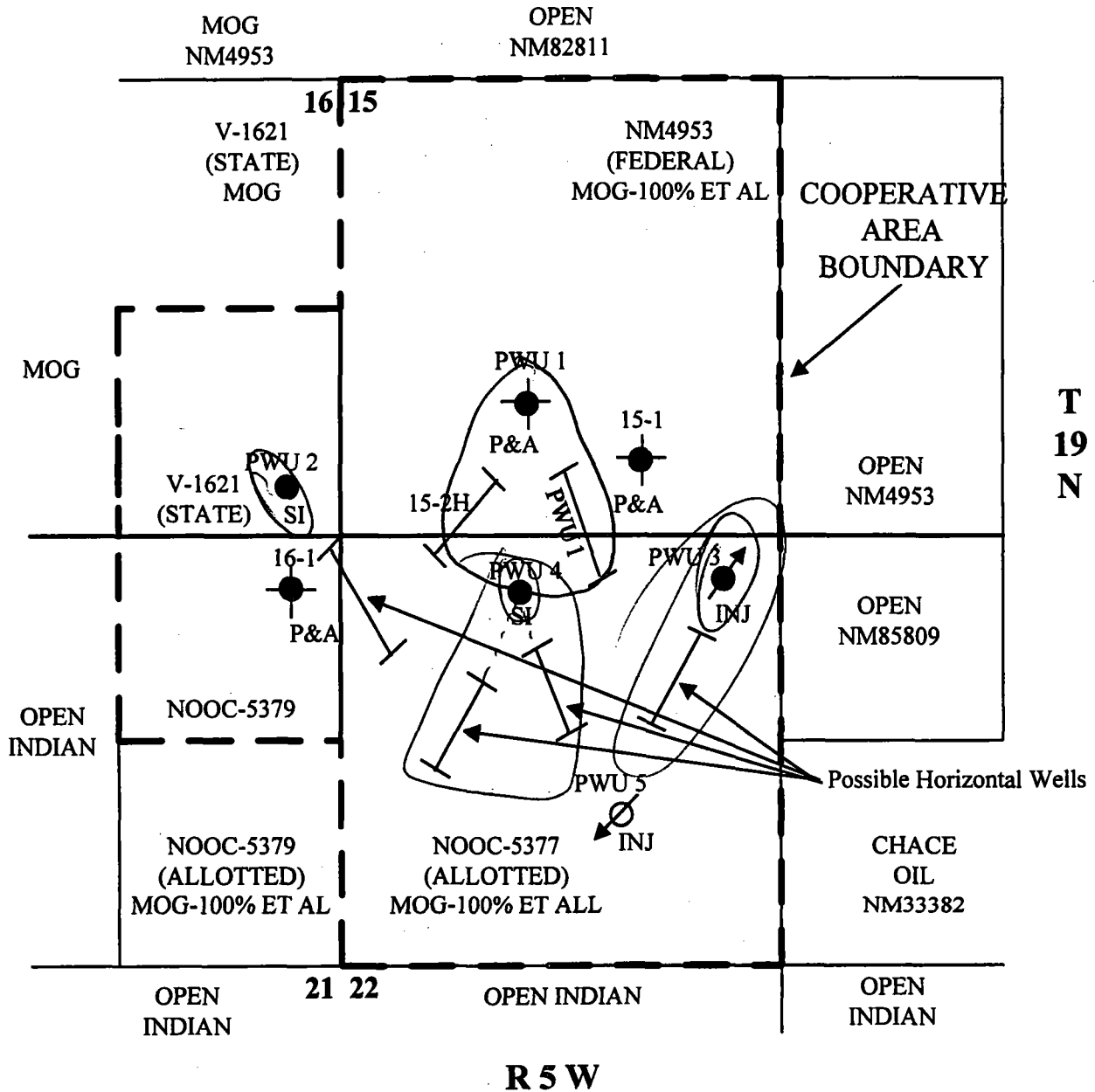
Sincerely,

  
George F. Sharpe

xc: Unit File, OCD-Aztec, Jim Johnson



# EXHIBIT 1 LAND PLAT



**PAPERS WASH ENTRADA FIELD**  
**McKinley County, New Mexico**  
**LEASE MAP**

## **Mike Stogner**

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**From:** Ernie Busch  
**To:** Mike Stogner  
**Subject:** MERRION OIL&GAS CORP(DD)>  
**Date:** Monday, March 25, 1996 8:40AM  
**Priority:** High

PWU #4  
RECOMMEND: APPROVAL



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

August 24, 1995

Merrion Oil & Gas Corporation  
P. O. Box 840  
Farmington, New Mexico 87499

Attention: George Sharpe

***CORRECTED***  
*Administrative Order DD-110(H)*  
High Angle/Horizontal

Dear Mr. Sharpe:

Reference is made to your application dated May 31, 1995 for authorization to initiate a high angle/horizontal directionally drilling project in the designated and Undesignated Papers Wash-Entrada Oil Pool within a "cooperative area" comprising four separate leases to be operated by Merrion Oil & Gas Corporation in Sections 15 and 16, Township 19 North, Range 5 West, NMPM, McKinley County, New Mexico.

**The Division Director Finds That:**

- (1) The application by Merrion Oil & Gas Corporation ("Merrion") has been duly filed under the provisions of Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995;
- (2) The Papers Wash-Entrada Oil Pool currently comprises the NW/4, N/2 SW/4, and SE/4 SW/4 of Section 15, the SE/4 NE/4 and NE/4 SE/4 of Section 16, and the NE/4 NW/4 of Section 22, Township 19 North, Range 5 West, NMPM, McKinley County, New Mexico and is subject to the statewide rules and regulations for oil wells, as promulgated by Rule 104.C(1)(a), which provides for 40-acre oil spacing and proration units, or drilling units, and requires that wells be located no closer than 330 feet to the outer boundary of a single 40-acre oil spacing and proration unit;
- (3) A special depth bracket oil allowable of 750 barrels of oil per day per 40-acre unit was established for said pool by Division Order No. R-5419, dated April 26, 1977;

- (4) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. The resulting "dune-like" structures, having porosity and permeability, act as the reservoir for trapping the accumulation of oil in the Entrada formation. The Eagle Mesa-Entrada Pool is in contact with a large aquifer and hydrodynamically active fresh ground water flowing to the southwest beneath the oil accumulation. This strong drive acts to tilt the oil-water contact in the direction of flow; conventionally drilled (vertical) wells in this pool experience significant "water coning", whereby the water below the oil moves upward to the wellbore, a process that has left a significant amount of "attic" oil sidetracked or by-passed between wells; by drilling horizontally across the top of the structure, the applicant is attempting to drain this otherwise unrecoverable attic oil by alleviating this coning action; such horizontal drainhole will act to create a small pressure drop along the large area found in a long horizontal drainhole instead of a large pressure drop through a small area available to a vertical wellbore;
- (5) The "project area" proposed by Merrion would consist of an area comprising 400 acres covered by a cooperative agreement underlying the following described acreage in McKinley County, New Mexico:

**TOWNSHIP 19 NORTH, RANGE 5 WEST, NMPM**

Section 15: W/2

Section 16: SE/4 NE/4 and NE/4 SE/4;

- (6) Within this project area Merrion seeks:
- a) the ability to traverse section, quarter section and quarter-quarter section lines within the project area in order to form non-standard oversized and irregular sized spacing and proration units to accommodate such wellbores;
  - b) drill the proposed horizontal wellbores to within 330 feet of the outer boundary of the project area; and,
  - c) the assignment of an allowable for a horizontally drilled well based upon the number of standard 40-acre proration units which are developed or traversed by a horizontal wellbore;
- (7) Initially, it is Merrion's intent to utilize the existing wellbores on its PWU Well No. 1 (API No. 30-031-20499), formerly the Federal "15" Well No. 2, located 1980 feet from the North line and 990 feet from the West line (Unit E), of said Section 15 and its PWU Well No. 2 (API No. 30-031-20522), formerly the State "2-16-19-5" Well No. 2, located 2310 feet from the North line and 330 feet from the East line (Unit H), of said Section

16 to drill short radius horizontal drainholes a lateral distance of 800 to 1,000 feet;

- (8) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Merrion Oil and Gas Corporation ("Merrion") for high angle/horizontal directional drilling within a "project area", in the designated and Undesignated Papers Wash-Entrada Oil Pool within a "cooperative area" comprising four separate leases to be operated by Merrion underlying the following described acreage in McKinley County, New Mexico:

**TOWNSHIP 19 NORTH, RANGE 5 WEST, NMPM**

Section 15: W/2

Section 16: SE/4 NE/4 and NE/4 SE/4.

(2) Merrion is further authorized to proceed with their initial plans to recomplete its existing PWU Well No. 1 (API No. 30-031-20499), formerly the Federal "15" Well No. 2, located 1980 feet from the North line and 990 feet from the West line (Unit E), of said Section 15 and its PWU Well No. 2 (API No. 30-031-20522), formerly the State "2-16-19-5" Well No. 2, located 2310 feet from the North line and 330 feet from the East line (Unit H), of said Section 16 by plugging-back, milling a window in the existing production casing, kick-off from the vertical, drill a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet.

**PROVIDED HOWEVER THAT** any drainhole drilled from either of said wellbores may traverse section, quarter section and quarter-quarter section lines within the project area provided that the horizontal or producing portion of any drainhole shall be located no closer than 330 feet from the outer boundary of the above-described "project area".

**PROVIDED FURTHER THAT** the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations.

(3) The applicant shall notify the supervisor of the Aztec District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Aztec offices of the Division upon completion.

(4) The allowable assigned to the proration units designated to each well in the Snake Eyes-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be

Corrected Administrative Order DD-110(H)  
Merrion Oil & Gas Corporation  
August 24, 1995  
Page 4

equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

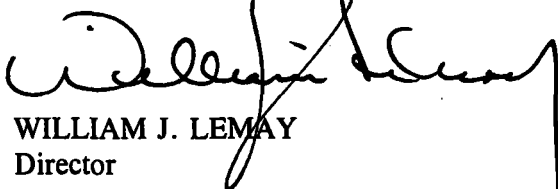
(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) 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

S E A L

cc: Oil Conservation Division - Aztec  
U. S. Bureau of Land Management - Farmington  
File: Case 11,329  
Case 11,274

DD-NOR. MZ

**OIL CONSERVATION DIVISION**

August 17, 1995

Rec: 6/6/95  
Effective Rec. Date:

6/13/95

Susp. 7/3/95

Released 8/18/95

Merrion Oil & Gas Corporation  
P. O. Box 840  
Farmington, New Mexico 87499

Attention: George Sharpe

*Corrected*

Administrative Order DD-<sup>110</sup> (H)  
High Angle/Horizontal

Dear Mr. Sharpe:

Reference is made to your application dated May 31, 1995 for authorization to initiate a high angle/horizontal directionally drilling project in the designated and Undesignated Papers Wash-Entrada Oil Pool within a "cooperative area" comprising four separate leases to be operated by Merrion Oil & Gas Corporation in Sections 15 and 16, Township 19 North, Range 5 West, NMPM, McKinley County, New Mexico.

**The Division Director Finds That:**

- (1) The application by Merrion Oil & Gas Corporation ("Merrion") has been duly filed under the provisions of Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995;
- (2) The Papers Wash-Entrada Oil Pool currently comprises the NW/4, N/2 SW/4, and SE/4 SW/4 of Section 15, the SE/4 NE/4 and NE/4 SE/4 of Section 16, and the NE/4 NW/4 of Section 22, Township 19 North, Range 5 West, NMPM, McKinley County, New Mexico and is subject to the statewide rules and regulations for oil wells, as promulgated by Rule 104.C(1)(a), which provides for 40-acre oil spacing and proration units, or drilling units, and requires that wells be located no closer than 330 feet to the outer boundary of a single 40-acre oil spacing and proration unit;
- (3) A special depth bracket oil allowable of 750 barrels of oil per day per 40-acre unit was established for said pool by Division Order No. R-5419, dated April 26, 1977;
- (4) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. The resulting "dune-like" structures, having porosity and permeability, act as the reservoir for trapping the accumulation of oil in the Entrada formation. The Eagle Mesa-Entrada Pool is in contact with a large aquifer and hydrodynamically active fresh ground water flowing to the southwest beneath the oil accumulation. This strong drive acts to tilt the oil-water contact in the direction of flow; conventionally drilled (vertical) wells in this pool experience significant "water coning", whereby the water below the oil moves upward to the wellbore, a process that has left a significant amount of "attic" oil sidetracked or by-passed between wells; by drilling horizontally across the top of the structure, the applicant is attempting to drain this otherwise unrecoverable attic oil by alleviating this coning action; such horizontal

drainhole will act to create a small pressure drop along the large area found in a long horizontal drainhole instead of a large pressure drop through a small area available to a vertical wellbore;

- (5) The "project area" proposed by Merrion would consist of an area comprising <sup>400</sup>~~\*\*\*\*\*~~ acres covered by a cooperative agreement underlying the following described acreage in McKinley County, New Mexico:

**TOWNSHIP 19 NORTH, RANGE 5 WEST, NMPM**

Section 15: W/2

Section 16: SE/4 NE/4 and NE/4 SE/4;

- (6) Within this project area Merrion seeks:
- a) the ability to traverse section, quarter section and quarter-quarter section lines within the project area in order to form non-standard oversized and irregular sized spacing and proration units to accommodate such wellbores;
  - b) drill the proposed horizontal wellbores to within 330 feet of the outer boundary of the project area; and,
  - c) the assignment of an allowable for a horizontally drilled well based upon the number of standard 40-acre proration units which are developed or traversed by a horizontal wellbore;
- (7) Initially, it is Merrion's intent to utilize the existing wellbores on its PWU Well No. 1 (API No. 30-031-20499), formerly the Federal "15" Well No. 2, located 1980 feet from the North line and 990 feet from the West line (Unit E), of said Section 15 and its PWU Well No. 2 (API No. 30-031-20522), formerly the State "2-16-19-5" Well No. 2, located 2310 feet from the North line and 330 feet from the East line (Unit H), of said Section 16 to drill short radius horizontal drainholes a lateral distance of 800 to 1,000 feet;
- (8) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

**IT IS THEREFORE ORDERED THAT:**

- (1) The application of Merrion Oil and Gas Corporation ("Merrion") for high angle/horizontal directional drilling within a "project area", in the designated and Undesignated Papers Wash-Entrada Oil Pool within a "cooperative area" comprising four separate leases to be operated by Merrion underlying the following described acreage in McKinley County, New Mexico:

**TOWNSHIP 19 NORTH, RANGE 5 WEST, NMPM**



*Administrative Order DD-\*\*\*\*\* (H)*

*August \*\*\*\*\**

*Page No. 3*

Section 15: W/2

Section 16: SE/4 NE/4 and NE/4 SE/4.

(2) Merrion is further authorized to proceed with their initial plans to recomplete its existing PWU Well No. 1 (API No. 30-031-20499), formerly the Federal "15" Well No. 2, located 1980 feet from the North line and 990 feet from the West line (Unit E), of said Section 15 and its PWU Well No. 2 (API No. 30-031-20522), formerly the State "2-16-19-5" Well No. 2, located 2310 feet from the North line and 330 feet from the East line (Unit H), of said Section 16 by plugging-back, milling a window in the existing production casing, kick-off from the vertical, drill a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet.

PROVIDED HOWEVER THAT any drainhole drilled from either of said wellbores may traverse section, quarter section and quarter-quarter section lines within the project area provided that the horizontal or producing portion of any drainhole shall be located no closer than 330 feet from the outer boundary of the above-described "project area".

PROVIDED FURTHER THAT the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations.

(3) The applicant shall notify the supervisor of the Aztec District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Aztec offices of the Division upon completion.

(4) The allowable assigned to the proration units designated to each well in the Snake Eyes-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) 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

*Administrative Order DD-\*\*\*\*\* (H)*

*August \*\*\*\*\**

*Page No. 4*

S E A L

cc: Oil Conservation Division - Aztec  
U. S. Bureau of Land Management - Farmington  
File: Case 11,329  
Case 11,274

*****							P.01	*
TRANSACTION REPORT								*
							AUG-18-95 FRI 04:05 PM	*
DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	*
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AUG-18	04:01 PM	915053265900	4' 42"	9	SEND	OK		*
*****								*



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

August 18, 1995

**Merrion Oil & Gas Corporation  
P. O. Box 840  
Farmington, New Mexico 87499**

**Attention: George Sharpe**

*Administrative Order DD-110(H)*  
**High Angle/Horizontal**

Dear Mr. Sharpe:

Reference is made to your application dated May 31, 1995 for authorization to initiate a high angle/horizontal directionally drilling project in the designated and Undesignated Snake Eyes-Entrada Oil Pool on Merrion Oil & Gas Corporation's Santa Fe fee lease in Sections 19, 20, and 21, Township 21 North, Range 8 West, NMPM, San Juan County, New Mexico.

**The Division Director Finds That:**

- (1) The application by Merrion Oil & Gas Corporation ("Merrion") has been duly filed under the provisions of Rule 111.D and E of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division"), revised by Division Order No. R-10388, issued by the Oil Conservation Commission in Case 11,274 on June 13, 1995;
- (2) The Snake Eyes-Entrada Oil Pool currently comprises the N/2 of Section 20, Township 21 North, Range 8 West, NMPM, San Juan County, New Mexico and is subject to the statewide rules and regulations for oil wells, as promulgated by Rule 104.C(1)(a), which provides for 40-acre oil spacing and proration units, or drilling units, and requires that wells be located no closer than 330 feet to the outer boundary of a single 40-acre oil spacing and proration unit;
- (3) A special depth bracket oil allowable of 750 barrels of oil per day per 40-acre unit was established for said pool by Division Order No. R-5421, dated April 26, 1977;
- (4) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. The resulting "dune-



like" structures, having porosity and permeability, act as the reservoir for trapping the accumulation of oil in the Entrada formation. The Eagle Mesa-Entrada Pool is in contact with a large aquifer and hydrodynamically active fresh ground water flowing to the southwest beneath the oil accumulation. This strong drive acts to tilt the oil-water contact in the direction of flow; conventionally drilled (vertical) wells in this pool experience significant "water coning", whereby the water below the oil moves upward to the wellbore, a process that has left a significant amount of "attic" oil sidetracked or by-passed between wells; by drilling horizontally across the top of the structure, the applicant is attempting to drain this otherwise unrecoverable attic oil by alleviating this coning action; such horizontal drainhole will act to create a small pressure drop along the large area found in a long horizontal drainhole instead of a large pressure drop through a small area available to a vertical wellbore;

- (5) The "project area" proposed by Merrion would consist of a single fee lease which comprises 1040 acres, or 26 40-acre units, underlying the following described area in San Juan County, New Mexico:

**TOWNSHIP 21 NORTH, RANGE 8 WEST, NMPM**

Section 19: E/2 NE/4 and NE/4 SE/4

Section 20: All

Section 21: NW/4, N/2 SW/4, and SW/4 SW/4;

- (6) Within this project area Merrion seeks:
- a) the ability to traverse section, quarter section and quarter-quarter section lines within the project area in order to form non-standard oversized and irregular sized spacing and proration units to accommodate such wellbores;
  - b) drill the proposed horizontal wellbores to within 330 feet of the outer boundary of the project area; and,
  - c) the assignment of an allowable for a horizontally drilled well based upon the number of standard 40-acre proration units which are developed or traversed by a horizontal wellbore;



- (7) Initially, it is Merrion's intent to utilize the existing wellbores on its Santa Fe "20" Well No. 1 (API No. 30-045-22291), located 1800 feet from the North line and 2110 feet from the East line (Unit G), of said Section 20 and its Santa Fe "20" Well No. 3 (API No. 30-045-22568), located 2220 feet from the North line and 990 feet from the East line (Unit H), of said Section 20 to drill short radius horizontal drainholes a lateral distance of 800 to 1,000 feet; and,
- (8) It appears the applicant has satisfied all of the appropriate requirements prescribed in said Rule 111.D and E, the subject application should be approved and the well should be governed by the provisions contained within this order and all other applicable provisions of Division General Rule 111.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Merrion Oil and Gas Corporation ("Merrion") for high angle/horizontal directional drilling within a "project area", in the designated and Undesignated Snake Eyes-Entrada Oil Pool on its Santa Fe fee lease comprising the following described 1040 acres in San Juan County, New Mexico, is hereby approved:

**TOWNSHIP 21 NORTH, RANGE 8 WEST, NMPM**

Section 19: E/2 NE/4 and NE/4 SE/4

Section 20: All

Section 21: NW/4, N/2 SW/4, and SW/4 SW/4.

(2) Merrion is further authorized to proceed with their initial plans to recomplete its existing Santa Fe "20" Well No. 1 (API No. 30-045-22291), located 1800 feet from the North line and 2110 feet from the East line (Unit G), of said Section 20 and its Santa Fe "20" Well No. 3 (API No. 30-045-22568), located 2220 feet from the North line and 990 feet from the East line (Unit H), of said Section 20 by plugging-back, milling a window in the existing production casing, kick-off from the vertical by drilling a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand, and continue drilling horizontally a distance of 800 to 1,000 feet.

**PROVIDED HOWEVER THAT** any drainhole drilled from either of said wellbores may traverse section, quarter section and quarter-quarter section lines within the project area provided that the horizontal or producing portion of any drainhole shall be located no closer than 330 feet from the outer boundary of the above-described "project area".



10/10/10

10/10/10

10/10/10

**PROVIDED FURTHER THAT** the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations.

(3) The applicant shall notify the supervisor of the Aztec District office of the Division of the date and time said wellbore surveys are to be conducted so that they may be witnessed. The applicant shall further provide a copy of said wellbore surveys to the Santa Fe and Aztec offices of the Division upon completion.

(4) The allowable assigned to the proration units designated to each well in the Snake Eyes-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

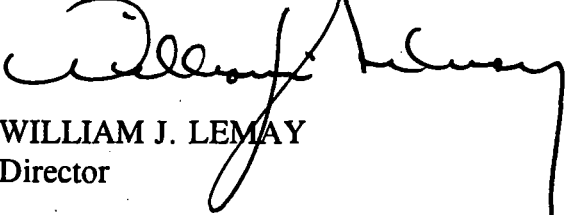
(5) The operator shall comply with all requirements and conditions set forth in Division General Rule 111.E(2) and any applicable requirements in 111.D and F.

(6) Form C-105 shall be filed in accordance with Division Rule 1105 and the operator shall indicate thereon true vertical depth (TVD) in addition to measured depths (MVD).

(7) 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

S E A L

cc: Oil Conservation Division - Aztec  
U. S. Bureau of Land Management - Farmington  
File: Case 11327

State of New Mexico  
**ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT**  
Santa Fe, New Mexico 87505



**OIL CONSERVATION DIVISION**

*Docketed*



June 27, 1995

Merrion Oil & Gas Corporation  
P. O. Box 840  
Farmington, New Mexico 87499

Attention: George Sharpe

*RE: Division Case Nos. 11327, 11328, and 11329  
Applications for high angle/horizontal directional drilling  
projects in the San Juan Basin of Northwest New Mexico.*

Dear Mr. Sharpe:

Per our telephone conversation yesterday concerning the subject applications, all three will now be considered under the provisions of revised Division General Rule 111, as promulgated by Division Order No. R-10388, see copy attached. The three cases already docketed for hearing on June 29, 1995 will be continued to the hearing scheduled for July 13, 1995, this will assure that these matters will be handled in a quick and prompt manner should a protest be filed or a glitch arise so that an administrative order could not be issued.

Should you have any questions or comments concerning this matter, please call me in Santa Fe at (505) 827-8185.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael E. Stogner".

Michael E. Stogner  
Chief Hearing Officer/Engineer

cc: OCD - Aztec  
Files: Case No. 11327  
Case No. 11328  
Case No. 11329

**VILLAGRA BUILDING - 408 Galisteo**  
Forestry and Resources Conservation Division  
P.O. Box 1948 87504-1948  
827-5830  
Park and Recreation Division  
P.O. Box 1147 87504-1147  
827-7485

**2040 South Pacheco**  
Office of the Secretary  
827-5950  
Administrative Services  
827-5925  
Energy Conservation & Management  
827-5900  
Mining and Minerals  
827-5970  
Oil Conservation  
827-7131

**STATE OF NEW MEXICO  
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION**

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

**CASE NO. 11274  
Order No. R-10388**

**APPLICATION OF MERIDIAN OIL INC. TO  
ESTABLISH A STATEWIDE ADMINISTRATIVE  
PROCEDURE FOR APPROVAL OF DIRECTIONAL  
DRILLING PROJECTS IN THE STATE OF  
NEW MEXICO.**

**ORDER OF THE COMMISSION**

**BY THE COMMISSION:**

This cause came on for hearing at 9 o'clock a.m. on April 27, 1995, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 13<sup>th</sup> day of June, 1995, the Commission, a quorum being present, having considered the record and being fully advised in the premises,

**FINDS THAT:**

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

(2) There was a consensus among industry and government that there is a need for revision of Rule 111 to provide for administrative approval for directionally drilled wells under certain circumstances, in particular intentionally deviated directional wells which have been approved only after notice and hearing or in certain pools with special provision contained therein.

(3) Although Meridian Oil Inc. was the applicant and all present agreed to the concept of administrative approval for directionally drilled wells, additional testimony was provided by Amoco Production Company, Marathon Oil Company, Mobil Exploration and Production, Phillips Petroleum Company, Permian Basin Petroleum Association, New Mexico Oil and Gas Association, and New Mexico Oil Conservation Division. Differences of opinion centered around an expanded version of the proposed rule change incorporating more definitions and greater reporting requirements for applicants and a shorter version with condensed definitions and reduced reporting requirements.

(4) The more condensed rule changes provide for greater efficiencies without sacrificing clarity or important documentation.

(5) Meridian Oil Inc. recommended rule provisions which would address correlative rights within affected proration units. Marathon Oil Company and Amoco Production Company supported a simplified rule which allows for operator decisions concerning the need for additional wells.

(6) Operational decisions and equity issues should be addressed under provisions of the operating agreement that deal with "operations by less than all parties" and not by regulations.

(7) The rule changes incorporated in Exhibit "A", attached hereto and made a part hereof, will not affect wells deviated intentionally for mechanical and/or operational reasons and will make the process for application and approval of directionally drilled wells more efficient and less costly without causing waste or impairing correlative rights.

**IT IS THEREFORE ORDERED THAT:**

(1) Division Rule 111 be amended to read as shown on Exhibit "A" attached to and made part of this Order.

(2) Revised Rule 111 shall be effective on the date of this Order.

(3) Jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinafter designated.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*Bill Weiss*

WILLIAM R. WEISS, Member

*G Carlson*

GARY CARLSON, Member

*William J. Lemay*  
WILLIAM J. LEMAY, Chairman

S E A L

**EXHIBIT "A"**  
**CASE NO. 11274**  
**ORDER NO. R-10388**

**RULE 111-Deviation Tests/Deviated Wells and Directional Wells:**

**A. Definitions:** The following definitions shall apply to this Rule:

(1) Deviated Well - means any wellbore which is intentionally deviated from vertical but not with an intentional azimuth. Any deviated well is subject to Rule 111-B and C.

(2) Directional Well - means a wellbore which is intentionally deviated from vertical with an intentional azimuth. Any directional well is subject to Rule 111-D.

(3) Vertical Well - means a well that does not have an intentional departure or course deviation from the vertical.

(4) Drilling Unit - means the surface acreage assigned to a vertical wellbore in accordance with NMOCD Rule 104. Included in this definition is a "unit of proration for oil or gas" as defined by the Division and all non-standard such units previously approved by the Division.

(5) Wellbore - means the interior surface of a cased or open hole through which drilling, production, or injection operations are conducted.

(6) Project Well - means any well drilled, completed, produced or injected into as either a deviated well or as a directional well.

(7) Project Area - means one or more drilling units which are to be dedicated to the project well.

(8) Producing Area - means all points that lie along a rectangular or square window formed by plotting the measured distance from the North, South, East and West boundaries of a project area inside of which a vertical wellbore can be drilled and produced in conformity with the setback requirements from the outer boundary of a standard spacing and proration unit for the applicable pool(s).

(9) Penetration Point - means the point where the wellbore penetrates the top of the pool from which it is intended to produce.

(10) Azimuth - means the deviation in the horizontal plane of a wellbore expressed in terms of compass degrees.

(11) Kick-off Point - means the point at which the wellbore is intentionally deviated from vertical.

(12) Terminus - means the farthest point attained along the wellbore.

(13) Producing Interval - means that portion of the wellbore drilled inside the vertical limits of a pool, between its penetration point and its terminus and within the producing area.

(14) Lateral - means any portion of a wellbore past the point where the wellbore has been intentionally departed from the vertical.

**B. Deviation Tests:**

Any well which is drilled or deepened shall be tested at reasonably frequent intervals to determine the deviation from the vertical. Such tests shall be made at least once each 500 feet or at the first bit change succeeding 500 feet. A tabulation of all deviation tests run, sworn to and notarized, shall be filed with Form C-104, Request for Allowable and Authorization to Transport Oil and Natural Gas. When the deviation averages more than five degrees in any 500-foot interval, the operator shall include the calculations of the maximum possible horizontal displacement of the hole and the Division Director may require that a directional survey be run to establish the location of the producing interval(s). Upon request from the Division Director, any well which was deviated in an indeterminate direction or toward the vertical shall be directionally surveyed.

**C. Deviated Wellbores:**

(1) The Supervisor of the appropriate Division District may approve the written request of an operator to drill a deviated wellbore or to deviate an existing wellbore to:

- (a) straighten a crooked hole by deviating towards the vertical;
- (b) side track junk in the hole by deviating in an indeterminate direction (no intentional azimuth);
- (c) side track an existing wellbore by deviating in an indeterminate direction (no intentional azimuth) for the purpose of recompleting into an existing producing formation or plugging the originally completed formation and recompleting into a different formation.

(2) The Supervisor of the appropriate Division District may require any request for a deviated well to be submitted for administrative approval by the Division Director.

(3) Applications for administrative approval for a deviated well shall:

- (a) be filed in duplicate and shall be accompanied by plats showing both the surface location of the subject well, its spacing unit and all adjoining spacing units;
- (b) state the reason(s) for deviating the subject well; and
- (c) shall include a statement or plat showing the names and addresses of all operators of spacing units, or working interest owners of undrilled spacing units offsetting the unit in which the project is located and attesting that applicant, on or before the same date the application was submitted to the Division, has sent notification to all those parties by submitting a copy of the application to them by certified mail return receipt requested and advising them that if they have an objection, it must be filed in writing within twenty (20) days of the date notice was sent.

(4) The bottomhole location of any deviated well shall be at an orthodox well location or an unorthodox location previously approved pursuant to Rule 104 and shall be considered acceptable if the actual subsurface location in the formation to be produced is orthodox or is no more than 50 feet from the approved subsurface location.

(5) The Division Director may approve the application for a deviated well upon receipt of waivers from all offset operators or owners of undrilled tracts or if no offset operator or owner has entered an objection to the project within 20 days after the application was received by the Director.

**D. Directional Wellbore:**

(1) The Division Director, shall have the authority without notice and hearing to administratively approve a directional wellbore project when:

- (a) the surface location of the proposed or existing project well is within the boundaries of the project area, consisting of a single or multiple drilling unit(s), substantially in the form of either a square or a rectangle, as applicable, being a legal subdivision of the U.S. Public Land Survey;
- (b) the producing interval of the wellbore(s) is totally confined to a producing area. The wellbore(s) may be re-oriented to any azimuth based upon a change in conditions either geologic or mechanical, which is encountered either before or after the commencement of a project, but only insofar as the producing interval(s) remains totally confined to the producing area;
- (c) the project area includes either a single drilling unit or multiple contiguous drilling units; and,



- (d) the project well includes either a single lateral or multiple laterals which conform to conditions (a) and (b) above.

(2) To obtain administrative approval to drill a directional well, the applicant shall file a written application in duplicate with the Division Director, copy to the appropriate OCD District Supervisor, which shall include:

- (a) a statement addressing the reason(s) for directionally drilling the subject well;
- (b) a plat indicating the section, township and range in which the well is to be drilled, the project area, the proposed surface location, the producing area for the project well, any existing wells in the applicable pool(s) in the proposed project area, all offsetting drilling units in the applicable pool(s) and their associated operator, and any wells in those units;
- (c) a vertically oriented plan view (cross-sectional view) for the subject well including the true vertical depth of the top and bottom of the subject pool, degree of angle to be built in the project wellbore(s), the true vertical and the measured depth of the estimated kickoff point, the estimated penetration point and the lateral length;
- (d) a horizontal plan view for the subject well and its spacing unit showing the drilling unit and drilling-producing window, including the estimated azimuth and maximum length of the lateral(s) to be drilled;
- (e) a type log section on which is identified the top and bottom of the subject pool; and,
- (f) a statement or plat showing the names and addresses of all operators of spacing units, or working interest owners of undrilled spacing units offsetting the unit in the applicable pool(s) in which the project is located and attesting that applicant, on or before the same date the application was submitted to the Division, has sent notification to all those parties by submitting a copy of the application to them by certified mail return receipt requested and advising them that if they have an objection, it must be filed in writing within twenty (20) days of the date notice was sent.

(3) The maximum allowable assigned to the project area when dealing with prorated pools shall be based upon of the number of standard proration units (or approved non-standard proration and spacing units) for that pool any portion of which is within a distance of the producing lateral of the directional wellbore not greater than the footage setback distance for locating a vertical well from the outer boundary of a spacing unit for that pool.

**E. Requirements/Conditions of Administrative Approval:**

(1) The Division Director may approve the application upon receipt of waivers from all offset operators or owners of undrilled tracts or if no offset operator or owner has entered an objection to the project within 20 days after the application was received by the Director.

(2) Any order issued by the Director approving an application for a directional wellbore shall require that:

- (a) the applicant shall conduct a directional survey on the wellbore after directional drilling operations in order that the direction, extent and terminus of said wellbore may be determined to be in compliance with the provision of any order with copies submitted to the Santa Fe NMOCD and to the NMOCD-district office in which the well is located; and,
- (b) the Supervisor of the appropriate Division District shall be notified of the approximate time all directional surveys are to be conducted. All directional surveys run on any well in any manner for any reason must be filed with the Division upon completion of the well. The Division shall not assign an allowable to a well until the operator has submitted an affidavit that all such directional surveys have been filed.

**F. Additional Matters:**

(1) The Division Director, at the request of an offset operator, may require any operator to make a directional survey of any well. The directional survey and all associated costs shall be at the expense of the requesting party and shall be secured in advance by a \$5,000 indemnity bond posted with and approved by the Division. The requesting party may designate the well survey company and the survey may be witnessed by the Division and the operator.

(2) The Division Director, may, at his discretion, set any application for administrative approval for public hearing.

(3) Permission to deviate or directionally drill any wellbore for any reason or in any manner not provided for in this rule shall be granted only after notice and hearing.



# **MERRION**

OIL & GAS

OIL CONSERVATION DIVISION  
RECEIVED

'95 JUN 6 AM 8 52

May 31, 1995

Mr. William Lemay  
New Mexico Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87503

Re: **Application for Administrative Approval - Special Pool Rules  
For Unorthodox Locations, Non-Standard Spacing Units,  
and Special Allowables  
To Facilitate Additional Horizontal Drilling  
Papers Wash Entrada Cooperative Area (Unit)  
McKinley County, New Mexico**

11324

Dear Mr. Lemay:

Order R-9079 (Exhibit 1) gave your approval for an unorthodox location and special allowables to permit Merrion to drill a horizontal well from the PWU #1 location (previously Fed 15-2H) in the Papers Wash Entrada Cooperative Area. Merrion requests your administrative approval for special pool rules to allow for additional horizontal wells within the Cooperative Area. This application reviews the performance of the PWU #1, describes why Merrion wants to drill additional wells, and outlines the special pool rules that are needed to allow Merrion to do so.

## **HISTORY**

In our application for Order R-9079, Merrion described how oil is trapped in the top of preserved Entrada dunes. We discussed the fact that a strong bottom water drive resulted in severe water coning, which left significant unrecovered "attic oil" in the top of the dune between wells. The successful redrilling of the PWU #1 as a horizontal well (see Exhibit 2 for land plat and well location) in March of 1990 demonstrated the validity of our theory. The PWU #1 has produced approximately 106,000 barrels of oil since being redrilled (see Exhibit 3 for production plot).

## **FUTURE PLANS**

The success of the PWU #1 has led to the possibility of additional development within the Cooperative Area boundaries with either horizontal or vertical wells (see Exhibit 4, remaining net pay map). The near term plan is to utilize either the PWU #1 wellbore (the well is now close to its economic limit) or the PWU #2 wellbore to drill another horizontal extension. Depending on the success of that well, additional horizontal and or vertical wells could be justified.

**REQUESTED SPECIAL POOL RULES**

Merrion requests the following special pool rules:

- 1.) Merrion is authorized to institute a short radius drilling pilot project, hereinafter referred to as the "project area", in the Papers Wash Entrada Oil Pool within the Papers Wash Entrada Cooperative Area comprising the following described 400 acres in McKinley County, New Mexico:

**TOWNSHIP 19N, RANGE 5W, NMPM**

Section 15: E/2

Section 16: SE/4 NE/4, and NE/4 SE/4

- 2.) Special operating provisions for additional horizontal or vertical wells within the Papers Wash Cooperative Area will be promulgated that allow for:
  - a.) No vertical well or any portion of a horizontal well shall be closer than 330 feet to the outer boundary of the Cooperative Area;
  - b.) No surface well location shall be located closer than 10 feet to an interior quarter quarter section line;
  - c.) The allowable assigned to the Cooperative Area shall be 750 barrels of oil per day times the number of 40 acre tracts that are either developed by conventionally drilled wells or traversed by a horizontal drain hole.

These provisions should be identical to those approved for the Eagle Mesa Entrada Secondary Unit, Order R-10213, attached hereto as Exhibit 5.

**SUPPORTING INFORMATION**

The following information is provided in support of this request:

- 1.) All of the lands within the project area are unitized for the purposes of horizontal drilling and water injection. The Cooperative Agreement covering these lands is attached as Exhibit 6. Ownership within the Cooperative Area is common, so all interest owners will benefit proportionately from any well drilled.
- 2.) The special pool rules will protect correlative rights by providing additional drilling, which will benefit the royalty owners.

Page 3  
May 31, 1995

- 3.) Copies of this application were sent certified mail to the following offset lease owners (see Exhibit 2):

Chaco Oil Co, Inc.  
313 Washington SE  
Albuquerque, New Mexico 87108

Bureau of Indian Affairs  
Attn: Mary Lou Drywater  
P.O. Box 1060  
Gallup, New Mexico 87305

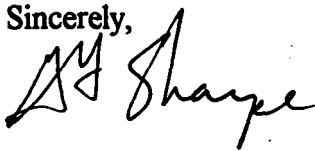
Bureau of Land Management  
Attn: Duane Spencer  
1235 La Plata Highway  
Farmington, New Mexico 87401

**SUMMARY**

Special pool rules are needed to allow additional horizontal wells to be drilled in the Papers Wash Cooperative Area. This will protect correlative rights through increased royalty payments. Therefore, we request your prompt attention to this matter.

Please call me at (505) 327-9801 with questions or comments.

Sincerely,



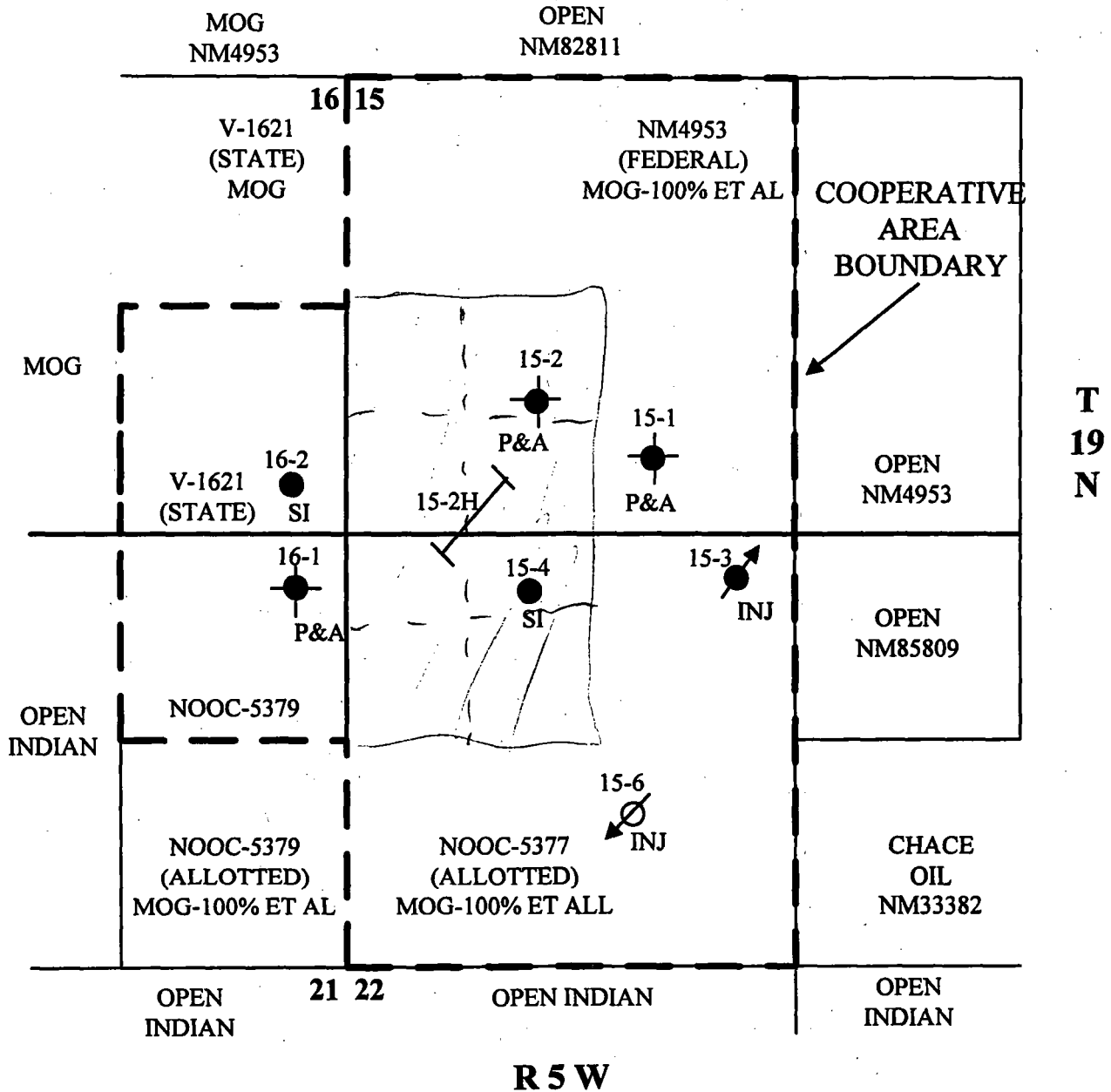
George F. Sharpe  
Manager - Oil & Gas Investments

xc: Unit File  
Pitco  
Jim Johnson

## **EXHIBITS**

- 1      **Order R-9079 For Unorthodox Location and Special Operating Rules for the Papers Wash Entrada Cooperative Area**
- 2      **Land Plat with Unit Boundaries**
- 3      **PWU #1 Production Plot**
- 4      **Remaining Net Pay Map**
- 5      **Order R-10213 - Special Operating Rules for the Eagle Mesa Secondary Unit**
- 6      **Cooperative Agreement for Horizontal Drilling and the Injection of Gas and Water in the Papers Wash Area**

# EXHIBIT 2 LAND PLAT

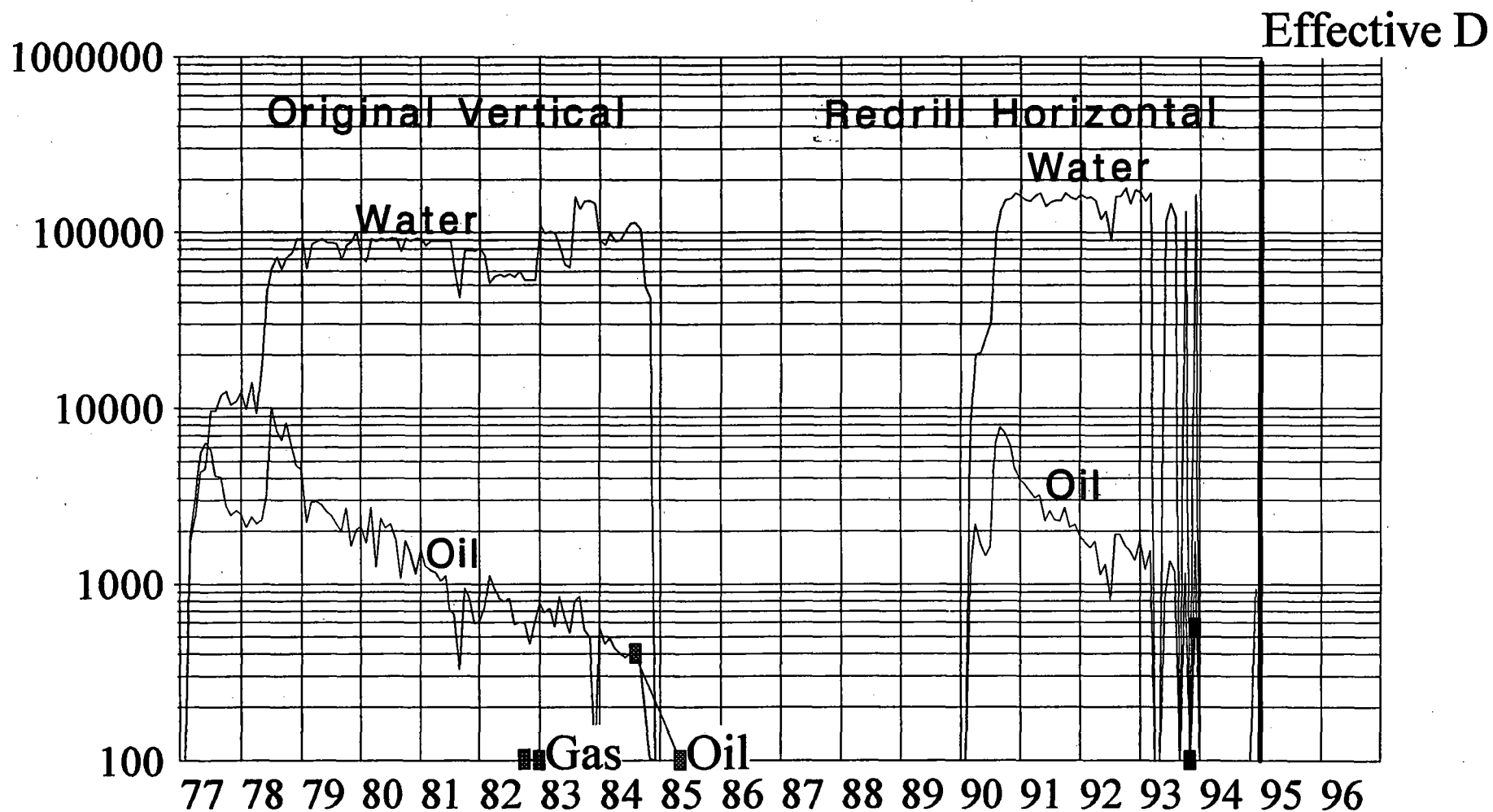


**PAPERS WASH ENTRADA FIELD**  
**McKinley County, New Mexico**  
**LEASE MAP**



# EXHIBIT 3

## PWU 1, Papers Wash ENRD



PWU 1  
Papers Wash ENRD  
MOG  
McKinley, NM

	<u>Oil (bbl)</u>	<u>Gas (mcf)</u>	<u>Water (bbl)</u>
Cumulative:	285,768	4	12,341,490
Remaining:	0	0	0
Ultimate:	285,768	4	12,341,490

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. 9754  
ORDER NO. R-9079

APPLICATION OF MERRION OIL AND GAS  
CORPORATION FOR A HORIZONTAL DIRECTIONAL  
DRILLING PILOT PROJECT, SPECIAL OPERATING  
RULES THEREFOR, NON-STANDARD OIL PRORATION  
UNIT, UNORTHODOX OIL WELL LOCATION, AND  
SIMULTANEOUS DEDICATION, MCKINLEY COUNTY,  
NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on September 6, 1989, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 14th day of December, 1989, 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, Merrion Oil and Gas Corporation, seeks the formation of an 80-acre non-standard oil spacing and proration unit in the Papers Wash-Entrada Oil Pool comprising the SW/4 NW/4 and the NW/4 SW/4 of Section 15, Township 19 South, Range 5 West, NMPM, McKinley County, New Mexico, for the purpose of initiating a horizontal drilling pilot project therein and to further promulgate special rules and provisions within said pilot project area including the designation of a target window limiting the horizontal displacement of a wellbore and special allowable considerations.

(3) This proposed pilot project area is within the boundaries of the Papers Wash-Entrada Oil Pool well spacing which is governed by statewide general rules.

Case No. 9754  
Order No. R-9079  
Page No. 2

(4) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. These small "dune-like" structures, having high porosity and permeability act as the reservoir for trapping the accumulations of oil in the Entrada formation.

(5) The Papers Wash-Entrada Oil Pool is a strong water drive reservoir and the character of the oil found in this pool is paraffin base, low asphalt, and low viscosity (32.5° API).

(6) Conventionally drilled (vertical) oil wells in this pool experience water coning quite early and after water break through occurs, the well produces large volumes of water and relatively low volumes of oil, which results in very high operating costs, low oil recovery, and less efficient drainage.

(7) By drilling a horizontal well along the crest of one of these oil-bearing subterranean dunes, the applicant is attempting to alleviate coning by creating a small pressure drop along the large length of a horizontal wellbore instead of a large pressure drop through a small area available to a vertical wellbore.

(8) Also, there should be less produced water to handle, thereby lowering operating costs; and, because there will be larger reservoir contact by a horizontal wellbore, more efficient oil production should result in better drainage.

(9) The applicant proposes to plug-back, sidetrack and directionally drill horizontally through the Entrada formation in its Federal "15" Well No. 2 located 1980 feet from the North line and 990 feet from the West line (Unit E) of said Section 15 or, in the alternative, to drill a new well for the same purpose at an unorthodox surface location 1400 feet from the North line and 550 feet from the West line of said Section 15. The horizontal wellbore in either well is to be drilled in a southerly direction within a target window described as a rectangle 1250 feet wide and 2350 feet long, the north end of the rectangle being 1400 feet from the North line of said Section 15, with the western side formed by the Section line, provided however, the well should not encroach closer than 330 feet to any tract which is not of common ownership to that of the said non-standard proration unit in the Entrada formation.

(10) Said prescribed area limiting the horizontal displacement of the wellbore would allow for flexibility, serve to minimize risk and maximize the success of such a completion.

(11) To ensure the protection of correlative rights, the applicant is seeking to unitize the area around the proposed non-standard proration unit (Division Case No. 9840).

(12) There was no objection to the subject application by any interested party.

Case No. 9754  
Order No. R-9079  
Page No. 3

(13) Currently there is an existing Papers Wash-Entrada Gas Pool producing well within the proposed project area operated by the applicant, this being the Navajo Allotted 15 Well No. 5 located 2310 feet from the South line and 990 feet from the West line (Unit L) of said Section 15.

(14) By Division Order No. R-5419, dated April 26, 1977, a special depth bracket allowable of 750 barrels per day was established for said pool.

(15) Since the project area consists of essentially two 40-acre proration units, the applicant proposed that the project be assigned an allowable of 1500 barrels of oil per day, which is equal to twice the normal allowable assigned a 40-acre proration unit in the Papers Wash-Entrada Oil Pool.

(16) For the purpose of assignment of allowable and the reporting of production, the applicant proposes to simultaneously dedicate the Entrada production from the SW/4 NW/4 and the NW/4 SW/4 of said Section 15 to the proposed horizontal well and to the Navajo Allotted 15 Well No. 5 and the Federal "15" Well No. 2, if it is not used for the horizontal drilling.

(17) The non-standard proration unit, as described above, should not become effective until such time as the horizontal wellbore is completed and placed on production and will cease at such time as the horizontal wellbore is properly plugged and abandoned.

(18) The applicant should be required to determine the actual location of the kick-off point prior to directional drilling operations. Also, the applicant should notify the supervisor of the Aztec District Office of the Division of the proposed direction of the deviated hole and of the date and time of the commencement of directional drilling in order that the same may be witnessed.

(19) The applicant should be required to conduct a directional survey on the lateral portion of the wellbore during or after completion of the drilling operations on the well and submit a copy of said survey to both the Santa Fe and Aztec Offices of the Division.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Merrion Oil and Gas Corporation for a horizontal directional drilling pilot project consisting of the SW/4 NW/4 and NW/4 SW/4 of Section 15, Township 19 South, Range 5 West, NMPM, Papers Wash-Entrada Oil Pool, McKinley County, New Mexico, forming a non-standard 80-acre oil spacing and proration unit is hereby approved.

Case No. 9754  
Order No. R-9079  
Page No. 4

(2) The applicant is further authorized to plug-back, sidetrack and directionally drill horizontally through the Entrada formation in its Federal "15" Well No. 2 located 1980 feet from the North line and 990 feet from the West line (Unit E) of said Section 15 or, in the alternative, to drill a new well for the same purpose at an unorthodox surface location 1400 feet from the North line and 550 feet from the West line of said Section 15. The horizontal wellbore in either well is to be drilled in a southerly direction within a target window described as a rectangle 1250 feet wide and 2350 feet long, the north end of the rectangle being 1400 feet from the North line of said Section 15, with the western side formed by the Section line, provided however, the wellbore should not encroach closer than 330 feet to any tract which is not of common ownership to that of the said non-standard proration unit in the Entrada formation.

(3) The aforementioned 80-acre non-standard oil proration unit shall be simultaneously dedicated to the proposed horizontal well and to the applicant's Navajo Allotted 15 Well No. 5 and the Federal "15" Well No. 2 if it is not the horizontal well; production from said pool from the wells dedicated to the unit may be produced in any proportion.

(4) Said unit shall be assigned an acreage dedication factor of 2.0 to be assessed toward the depth bracket allowable for said pool.

(5) This non-standard proration unit shall not become effective until such time as the horizontal wellbore is completed and placed on production and shall cease at such time as the horizontal well is properly plugged and abandoned. At that time, the Navajo Allotted 15 Well No. 5 shall be re-dedicated to its current proration unit comprising the SW/4 NW/4 of said Section 15 and the Federal "15" Well No. 2 shall be dedicated to its current proration unit comprising the NW/4 SW/4 of said Section 15.

(6) The geographic location of the kick-off point for the proposed horizontal well shall be determined prior to directional drilling. Also, the operator shall notify the supervisor of the Aztec District Office of the Division of the proposed direction of the deviated hole and of the date and time of the directional drilling in order that the same may be witnessed.

(7) The applicant shall conduct a directional drilling survey on the well during or after completion of horizontal drilling operations.


(8) Upon completion of the horizontal drilling operations on the well, the applicant shall file a copy of said directional drilling survey along with a final report specifying the depth and location of the terminus of said horizontal wellbore to both the Santa Fe and Aztec Offices of the Division.

Case No. 9754  
Order No. R-9079  
Page No. 5

(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.

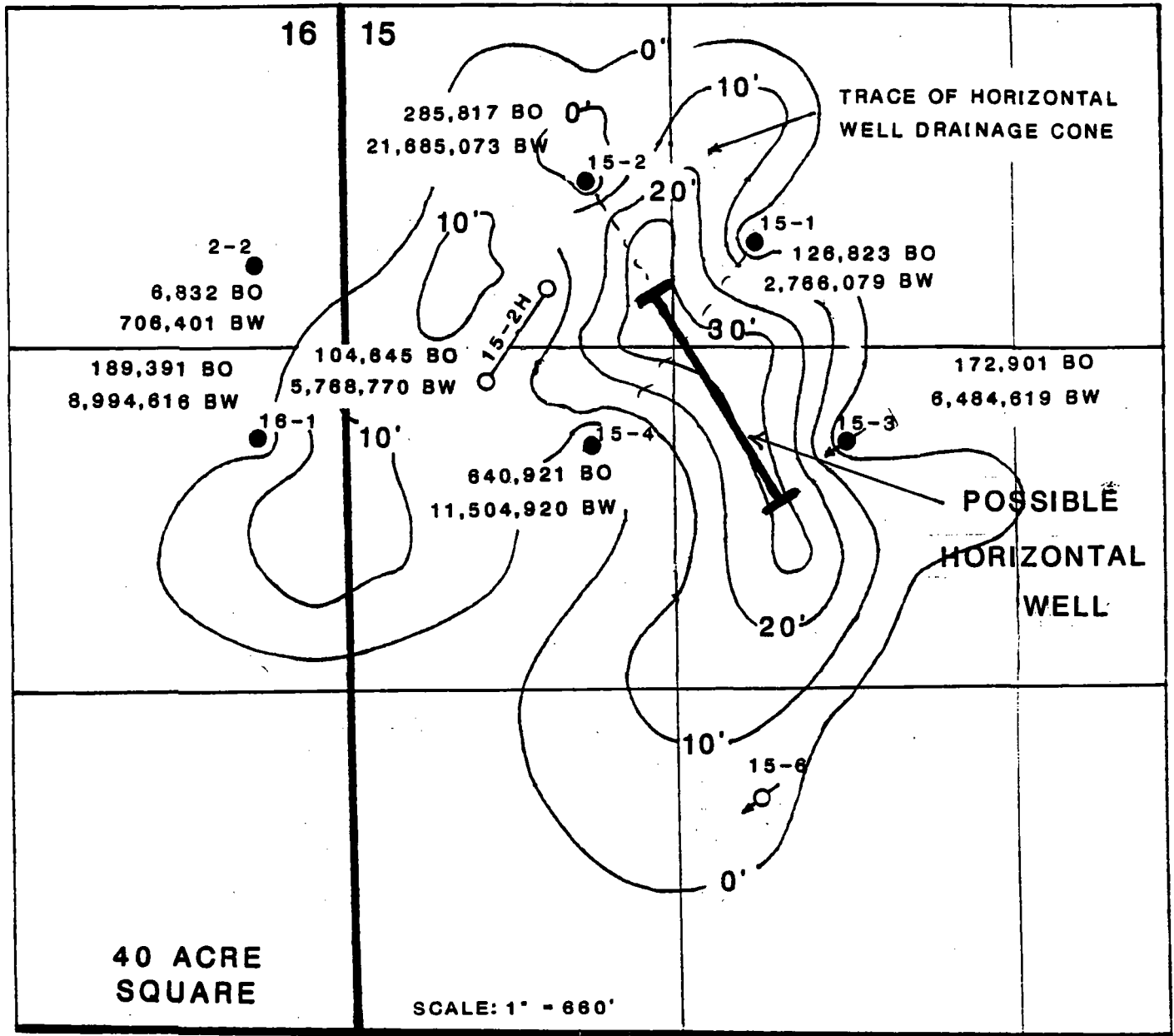
STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION



WILLIAM J. LEMAY  
Director

S E A L

# EXHIBIT 4



## MERRION OIL & GAS

PAPERS WASH ENTRADA FIELD

McKINLEY COUNTY, NEW MEXICO

T 19 N R 5 W

REMAINING NET PAY

OOIP = 3,680,000 BO

FIELD CUM = 1,422,685 BO

HORIZ RESERVES

= 269,400 BO

# EXHIBIT 5

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. 10971  
ORDER NO. R-10213

APPLICATION OF MERRION OIL & GAS CORPORATION FOR A HIGH  
ANGLE/HORIZONTAL DIRECTIONAL DRILLING PILOT PROJECT AND THE  
PROMULGATION OF SPECIAL OPERATING RULES THEREFOR, SANDOVAL  
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 30th day of September, 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 matter, Merrion Oil and Gas Corporation ("Merrion"), seeks authority to institute a short radius high angle/horizontal directional drilling pilot project, hereinafter referred to as the "project area", in the designated and Undesignated Eagle Mesa-Entrada Oil Pool on its Eagle Mesa Entrada Secondary (Federal) Unit comprising the following described 280 acres in Sandoval County, New Mexico:

### TOWNSHIP 19 NORTH, RANGE 4 WEST, NMPM

Section 11:	SE/4 SE/4
Section 12:	SW/4 SW/4
Section 13:	W/2 NW/4
Section 14:	N/2 NE/4 and SE/4 NE/4.



(3) Within the project area the applicant seeks authority to:

- (a) utilize the existing wellbores on its Federal "12" Well No. 1 (API No. 30-043-20175), located 460 feet from the South line and 330 feet from the West line (Unit M), of said Section 12 and its Navajo 13 "C" Well No. 1 (API No. 30-043-20181), located 430 feet from the North line and 330 feet from the West line (Unit D), of said Section 13 to drill short radius horizontal drainholes a lateral distance of 800 to 1,000 feet;
- (b) the ability to traverse section, quarter section and quarter-quarter section lines within the project area in order to form non-standard oversized and irregular sized spacing and proration units to accommodate such wellbores;
- (c) drill the proposed horizontal wellbores to within 330 feet of the outer boundary of the project area; and,
- (d) the assignment of an allowable for a horizontally drilled well based upon the number of standard 40-acre proration units which are developed or traversed by a horizontal wellbore.

(4) The applicant further seeks the promulgation of special operating rules and procedures within the project area including provisions for administrative authorization of further horizontal wellbores, and the assignment of a special oil allowable or formula for the project area.

(5) The proposed project area is located within the governing limits of the Eagle Mesa-Entrada Oil Pool which is currently administered under the Statewide Rules and Regulations which require standard 40-acre spacing and proration units with wells to be located no closer than 330 feet from the outer boundary of the spacing unit. A special oil allowable of 750 barrels of oil per day and a limiting gas-oil ratio of 2,000 cubic feet of gas per barrel of oil exists for said pool, as promulgated by Division Order No. R-5118, as amended.

(6) The Entrada formation in this area was deposited as an eolian sand overlain by lacustrine limestones and anhydrites of the Todilto formation. The resulting "dune-like" structures, having porosity and permeability, act as the reservoir for trapping the accumulation of oil in the Entrada formation. The Eagle Mesa-Entrada Pool is in contact with a large aquifer and hydrodynamically active fresh ground water flowing to the southwest beneath the oil accumulation. This strong drive acts to tilt the oil-water contact in the direction of flow.

(7) According to the testimony presented by the applicant conventionally drilled (vertical) wells in this pool experience significant "water coning", whereby the water below the oil moves upward to the wellbore, a process that has left a significant amount of "attic" oil sidetracked or by-passed between wells. By drilling horizontally across the top of the structure, the applicant is attempting to drain this otherwise unrecoverable attic oil by alleviating this coning action. Such horizontal drainhole will act to create a small pressure drop along the large area found in a long horizontal drainhole instead of a large pressure drop through a small area available to a vertical wellbore.

(8) Evidence further indicates that once water breakthrough has occurred in a conventionally drilled vertical wellbore, water volume increases dramatically and oil production decreases substantially, resulting in high operating costs. With horizontal drainholes, the poolwide volume of produced water should decrease, thereby lowering operating costs.

(9) Approval of this application is in the best interest of conservation, exhibits sound engineering practices, will serve to prevent the waste of otherwise unrecoverable reserves, and with the formation of a Unit will further serve to protect correlative rights.

(10) Adoption of special procedures allowing for administrative approval of additional horizontal drainholes in the Entrada formation within the Eagle Mesa Entrada Secondary (Federal) Unit will serve to promote such supplemental drilling activity in fields nearing depletion and should aid in expediting any further request to drill drainholes in this Unit without the necessity for additional hearings.

(11) The allowable assigned to either a single proration unit or the project area should be assigned by the supervisor of the Aztec district office of the Division and should be based upon the number of standard 40-acre proration units within the project area which are developed or traversed by a horizontal wellbore.

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

(13) The applicant initially proposes to recomplete its Federal "12" Well No. 1 and Navajo 13 "C" Well No. 1 by plugging-back, milling a window in the existing production casing, kick-off from the vertical by milling a window in the existing production casing, drill a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet.

(14) Certain provisions should be included within this approval to assure orderly development and depletion of this reservoir with horizontal drainholes and the continued protection of correlative rights within the area of this Unit:

- (a) no portion of a wellbore, either vertical or horizontal should be closer than 330 feet to the outer boundary of the Eagle Mesa Entrada Secondary (Federal) Unit;
- (b) the applicant should be required to conduct a directional survey on the vertical portion of a wellbore prior to commencing directional drilling operations, and on the horizontal portion of the wellbore during or subsequent to completion of directional drilling operations in order that direction, extent and terminus of said wellbore may be determined to be in compliance with the terms of this order;
- (c) the applicant should further be required to submit copies of said directional surveys to the Santa Fe and Aztec offices of the Division; and,
- (d) the applicant should notify the supervisor of the Aztec District Office of the Division of the date and time of commencement of directional drilling operations and of the conductance of any directional surveys on the proposed well in order that these operations may be witnessed.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Merrion Oil and Gas Corporation ("Merrion") to institute a short radius high angle/horizontal directional drilling pilot project, hereinafter referred to as the "project area", in the designated and Undesignated Eagle Mesa-Entrada Oil Pool on its Eagle Mesa Entrada Secondary (Federal) Unit comprising the following described 280 acres in Sandoval County, New Mexico, is hereby approved:

**TOWNSHIP 19 NORTH, RANGE 4 WEST, NMPM**

Section 11:	SE/4 SE/4
Section 12:	SW/4 SW/4
Section 13:	W/2 NW/4
Section 14:	N/2 NE/4 and SE/4 NE/4.

(2) Merrion is further authorized to proceed with their initial plans to recomplete its existing Federal "12" Well No. 1 (API No. 30-043-20175), located 460 feet from the South line and 330 feet from the West line (Unit M), of said Section 12 and its Navajo "13" Well No. 1 (API No. 30-043-20181), located 430 feet from the North line and 330 feet

from the West line (Unit D), of said Section 13 by plugging-back, milling a window in the existing production casing, kick-off from the vertical by milling a window in the existing production casing, drill a short radius curve hole to approximately 90 degrees so as to encounter the upper portion of the oil bearing Entrada sand and continue drilling horizontally a distance of 800 to 1,000 feet. Provided however that;

- 2500 6480 5208
- (a) any drainhole drilled from either of said wellbores may traverse section, quarter section and quarter-quarter section lines within the project area provided that the horizontal or producing portion of any drainhole shall be located no closer than 330 feet from the outer boundary of the project area;
  - (b) the applicant shall determine the actual location of the kick-off points in each well prior to commencing directional drilling operations. Also, the applicant shall conduct a directional survey on the lateral portion of any horizontal wellbore during or after completion of drilling operations;
  - (c) the applicant shall notify the supervisor of the Aztec district office of the Division of the date and time of conductance of any directional surveys in order that the same may be witnessed;
  - (d) the applicant shall submit copies of all directional surveys conducted on the subject well to both the Santa Fe and Aztec offices of the Division; and,
  - (e) the allowable assigned to the proration units designated to each well in the Eagle Mesa-Entrada Oil Pool shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole.

(3) Special operating provisions for additional horizontal/high angle wellbores within said Eagle Mesa Entrada Secondary (Federal) Unit are hereby promulgated as follows:

**SPECIAL OPERATING RULES AND REGULATIONS  
FOR THE  
EAGLE MESA ENTRADA SECONDARY (FEDERAL) UNIT**

---

**RULE 1.** The surface location of any well within said Unit Area shall be located no closer than 330 feet to the outer boundary of the unitized area, nor closer than 10 feet to any section, quarter section, or quarter-quarter section lines or subdivision inner boundary.

**RULE 2.** The Director of the Division may grant an exception to the surface well location requirements of Rule 2 without notice and hearing when an application has been filed for an unorthodox surface well location necessitated by topographic conditions or the recompletion of a well previously drilled to a deeper horizon. All operators and/or owners of undrilled tracts or unleased mineral interests offsetting the proposed location 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 operators and/or owners of undrilled tracts or unleased mineral interests offsetting the proposed surface location or if no objection to the unorthodox surface location has been entered within twenty days after the Director has received the application.

**RULE 3.**

(A). The Director of the Division is hereby authorized to administratively approve intentionally deviated wells in the Eagle Mesa Entrada Secondary (Federal) Unit for the purpose of penetrating the Entrada formation by means of a wellbore drilled horizontally, provided the following conditions are complied with:

- (1) the surface location of the proposed well is a standard location or the applicant has obtained approval of an unorthodox surface oil well location as provided for in Rule (2), above; and,
- (2) no producing portion of a horizontal wellbore shall enter or exit the Entrada formation outside of a "drilling window" which is not in accordance with the setback requirements of Rule (1), above, provided however, that the aforementioned 10 foot setback distance requirement from any internal subdivision boundary within said Unit Area shall not apply to horizontal drainholes.

- (B). To obtain administrative approval for additional deviated horizontal drainholes within the Unit, the applicant shall file such request in writing with the Aztec and Santa Fe offices of the Division and shall further provide a copy of such application to all operators and/or owners of undrilled tracts or unleased mineral interests offsetting the proposed proration unit for said well by registered or certified mail, and the application shall state that such notice has been furnished. The application shall include the following information:
- (1) a copy of Division Form C-102 identifying the proposed proration unit to be dedicated to the well and any other wells within this proposed unit;
  - (2) a land plat that identifies the ownership of all offsetting tracts to the proposed proration unit; and,
  - (3) schematic drawings of the proposed well completion or recompletion which fully describe the casing, tubing, perforated or openhole interval, kick-off point, and proposed trajectory of the drainhole section.
- (C). The Division Director may approve the application upon receipt of written waivers from all parties described above or if no objection to the intentionally deviated horizontal wellbore has been entered within twenty days after the Director has received the application. If any objection to the proposed intentionally deviated horizontal well is received within the prescribed time limit as described above, the Director shall, at the applicant's request, set said application for public hearing before a Division Hearing Examiner.
- (D). During or upon completion of drilling operations the operator shall further be required to conduct an acceptable directional survey on the vertical and lateral portions of the wellbore and shall submit a copy of said survey to the Santa Fe and Aztec offices of the Division.
- (E). The operator shall notify the supervisor of the Aztec District Office of the Division of the date and time of commencement of directional drilling operations and of the conductance of any directional surveys on the proposed well in order that these operations may be witnessed.

- (F). The Director, at his discretion, may set any application for intentionally deviated horizontal wellbores for public hearing before a Division Hearing Examiner.

**RULE 4.** Allowables shall be assigned in the following manner

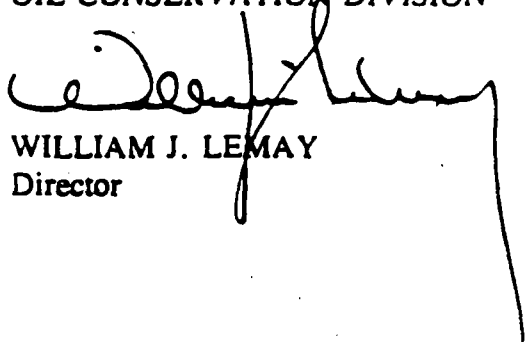
- (A). The allowable assigned to the proration units designated to the Eagle Mesa-Entrada Oil Pool within the Unit Area shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each designated proration unit that are developed/traversed by a horizontal drainhole; or,
- (B). The supervisor of the Division's Aztec district office may assign a "project allowable" based on the number of 40-acre tracts that are either developed by conventionally drilled wells or traversed by a horizontal drainhole. The operator may produce the assigned project allowable from the wells within the project area in any proportion.

**RULE 5.** The Director of the Division may rescind the authority for any horizontal drainhole if the perforated or openhole portion of such wellbore is located closer to the Unit Area boundary than permitted by these rules or if it should appear that such rescission is necessary to prevent waste or protect correlative rights.

- (4) 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

S E A L

## EXHIBIT 6

**CONFIDENTIAL**

### COOPERATIVE AGREEMENT

FOR HORIZONTAL DRILLING AND THE INJECTION OF GAS AND H<sub>2</sub>O

IN THE  
PAPERS WASH AREA  
COUNTY OF MCKINLEY  
STATE OF NEW MEXICO

#### TABLE OF CONTENTS

<u>SECTION</u>		<u>PAGE</u>
	Preliminary Recitals.....	1
1	Enabling Act and Regulations.....	1
2	Cooperative Area.....	2
3	Expansion of Cooperative Area.....	2
4	Cooperative land and Cooperative Substances.....	2
5	Tracts Qualified for Participation.....	3
6	Cooperative Operator.....	3
7	Resignation or Removal of Cooperative Operator.....	7,8
8	Successor Cooperative Operator.....	4
9	Accounting Provisions and Cooperative Operating Agr.	4
10	Rights and Obligations of Cooperative Operator.....	5
11	Plan of Operation.....	5
12	Participation and Allocation of Production.....	5,6
13	Royalty Settlement.....	7
14	Rental Settlement.....	7
15	Conservation.....	8
16	Drainage.....	8
17	Gauge of Merchantable Oil.....	8
18	Leases and Contracts Conformed and Extended.....	8,9
19	Covenants Run with Land.....	9
20	Effective Date.....	9
21	Term.....	9
22	Termination by Working Interest Owners.....	10
23	Rate of Prospecting, Development and Production.....	10
24	Appearances.....	10
25	Notices.....	10
26	No Waiver of Certain Rights.....	11
27	Unavoidable Delay.....	11
28	Nondiscrimination.....	11
29	Loss of Title.....	11
30	Subsequent Joinder.....	12
31	Counterparts.....	12
32	Taxes.....	12
33	No Partnership.....	12
	Exhibit A: Map of Cooperative Area and Net Pay	
	Exhibit A Con't: Allocation of Remaining Primary Production	
	Exhibit B: Description of Cooperative Area & Tract Participation	
	Exhibit C: Yearly Plan of Development	



**COOPERATIVE AGREEMENT  
FOR HORIZONTAL DRILLING AND THE INJECTION OF GAS OR H<sub>2</sub>O  
IN THE PAPERS WASH AREA  
COUNTY OF MCKINLEY  
STATE OF NEW MEXICO**

THIS COOPERATIVE AGREEMENT, entered into as the 8th day of September, 1989, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as the "parties hereto",

**WITNESSETH:**

WHEREAS, the parties hereto are the owners of working, royalty, or other oil and gas interests in the Cooperative Area subject to this Cooperative Agreement; and

WHEREAS, the term "Working Interest" as used herein shall mean the interest held in Cooperative Substances or in lands containing Cooperative Substances by virtue of a lease, operating agreement, fee title, or otherwise, which is chargeable with and obligated to pay or bear all or a portion of the costs of drilling, producing, and operating the land under the Cooperative Agreement.

WHEREAS, the Mineral Leasing Act of February 25, 1920, 41 Stat. 437, as amended, 30 U.S.C. Sec. 181 et Seq., authorizes Federal lessees and their representatives to unite or cooperate with each other, or jointly or separately with others, in collectively adopting and operating a cooperative plan of development or operation of any oil or gas pool, field, or like area, or any part thereof for the proposes of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior, or his representative, to be necessary or advisable in the public interest; and

WHEREAS, it is the purpose of the parties hereto to conserve natural resources, prevent waste, to obtain additional hydrocarbon production which would not be available by normal lease development, and secure other benefits obtainable through development and operation of the Area subject to this Cooperative Agreement under the terms, conditions, and limitations herein set forth;

1. **ENABLING ACT AND REGULATIONS.** The Mineral Leasing Act of February 25, 1920, as amended, supra, and all valid, pertinent regulations, including operating and cooperative plan regulations, heretofore issued thereunder or valid, pertinent and reasonable regulations hereafter issued thereunder are accepted and made a part of the Cooperative Agreement as to Federal lands, provided such regulations are not inconsistent with the terms of this Agreement.

**2. COOPERATIVE AREA.** The area specified on the plat attached hereto marked Exhibit "A" is hereby designated and recognized as constituting the Cooperative Area, containing 480 acres, more or less.

Exhibit "A" shows in addition to the boundary of the Cooperative Area, the boundaries and identity of tracts and leases in said Area to the extent known to the Cooperative Operator. Also, Exhibit "A" attached hereto, is a schedule showing the percentage of participation credited to each Tract in the Cooperative Area based upon a presumed one hundred percent (100%) commitment for primary and secondary production. (Tract means each parcel of land described as such and given a Tract number in Exhibit "B"). Exhibits "A" and "B" shall be revised by the Cooperative Operator whenever changes in the Cooperative Area render such revision necessary, or when requested by the Authorized Officer, hereinafter referred to as "AO". Also, Exhibit "B" attached hereto is a schedule showing to the extent known to the Cooperative Operator the acreage, percentage and kind of ownership of oil and gas interests in all lands in the Cooperative Area (Tract participation). Exhibit "C" attached hereto sets out the basic plan of development which will be updated each year on or before January 15th, and will be supplemented with sundry notices.

**3. EXPANSION OF COOPERATIVE AREA.** The Cooperative Area may, with the approval of the AO, be expanded to include therein any additional lands whenever such expansion is necessary or advisable to conform with the purpose of this Agreement and, with prior consent of the AO, Cooperative Operator, acting on behalf of the Working Interest Owners collectively, after being duly authorized by them as provided for in the Cooperative Operating Agreement, has negotiated an agreement or agreements with the owners of such lands fixing the tract participation of each Tract and providing for the commitment of the interest of such owners to this Agreement and to the Cooperative Operating Agreement. Whenever the Cooperative Agreement is enlarged so as to admit additional land Exhibit "A" shall be revised as set forth in Section 12, Participation and Allocation of Production.

After due consideration of all pertinent information, the expansion shall, upon approval by the AO, become effective as of the date prescribed in the notice thereof.

**4. COOPERATIVE LAND AND COOPERATIVE SUBSTANCES.** All land committed to this Agreement as provided in Section 5, Tracts Qualified for Participation, as to the Cooperative Formation defined immediately below, shall constitute land referred to herein as "Cooperative Land" or "land subject to this Agreement". All oil and gas in and produced from the Cooperative Formation under the terms of this Agreement is called "Cooperative Substances".

The Cooperative Formation shall mean the Entrada Formation as identified by the Resistivity log run in the Navajo 15-4 well, located in Section 15, Township 19 North, Range 5 West, McKinley County, New Mexico, with the top of the Cooperative Formation being found at a depth of 5200 feet below the surface and the base of the Cooperative Formation being found at a depth of 5398 below the surface.

5. **TRACTS QUALIFIED FOR PARTICIPATION.** Inasmuch as the objective of the Cooperative Agreement is to have lands in the Cooperative Area operated and entitled to participation under the terms hereof, no joinder shall be considered a commitment to the Cooperative Agreement unless the Tract involved is qualified under this Section. On or after the effective date hereof, the Tracts within the Cooperative Area which, shall be entitled to participation in the production of Cooperative Substances therefrom shall be those Tracts within the Cooperative Area more particularly described in Exhibit "B" that are qualified as follows:

Each Tract as to which Working Interest Owners owning one hundred percent (100%) of the Working Interests have signed or ratified this Agreement and the Cooperative Operating Agreement, and as to which (1) all Working Interest Owners in such Tract join in a request for inclusion of such Tract in Cooperative Participation upon the basis of such commitment status, and further as to which (2) seventy-five percent (75%) or more of the combined voting interests of Working Interest Owners in all Tracts vote in favor of the acceptance of such Tract as qualified. The voting interest of each Working Interest Owner shall be equal to the ratio (expressed in percentage) which the total of such Working Interest Owner's percentage participation in all Tracts which qualify, bears to the total percentage participation of all Working Interest Owners in all Tracts which qualify as such percentages are shown on Exhibit "A".

6. **COOPERATIVE OPERATOR.** Merrion Oil and Gas Corporation is hereby designated as Cooperative Operator, and by signature hereto as Cooperative Operator agrees and consents to accept the duties and obligations of Cooperative Operator for the development and production of Cooperative Substances as herein provided.

7. **RESIGNATION OR REMOVAL OF COOPERATIVE OPERATOR.** Cooperative Operator shall have the right to resign as any time, but such resignation shall not become effective so as to release Cooperative Operator from the duties and obligations of Cooperative Operator and terminate that Operator's rights as such for a period of six (6) months after notice of intention to resign has been served by Cooperative Operator on all Working Interest Owners and the AO, and until all wells are placed in a satisfactory condition for suspension or abandonment, whichever is required by the AO, unless a new Cooperative Operator shall have been selected and accepted and shall have taken over and assumed the duties and obligation of Cooperative Operator prior to the expiration of said period.

The resignation of Cooperative Operator shall not release the Cooperative Operator from any liability for default by hereunder occurring prior to the effective date of its resignation.

The resignation or removal of Cooperative Operator under this Agreement shall not terminate its right, title, or interest as the owner of a working interest or other interest in Cooperative Substances, but upon the resignation or removal of Cooperative Operator becoming effective, such Cooperative Operator shall deliver possession of all wells, equipment, materials, and appurtenances used in conducting the Cooperative operations and owned by the Working Interest Owners to the new duly qualified successor Cooperative Operator or to the owners thereof if no such new Cooperative Operator is elected, to be used for the purpose of conducting Cooperative operations hereunder. Nothing herein shall be construed as authorizing removal of any material, equipment, and appurtenances needed for the preservation of any wells.

8. **SUCCESSOR COOPERATIVE OPERATION.** Whenever the Cooperative Operator shall tender his or its resignation as Cooperative Operator or a change of Cooperative Operator is negotiated by Working Interest Owners, a successor Cooperative Operator shall be selected by Working Interest Owners voting according to their respective Tract participation in all Cooperative Land by a majority vote. Such selection shall not become effective until:

- (a) A Cooperative Operator so selected shall accept in writing the duties and responsibilities of Cooperative Operator; and
- (b) the selection shall have been approved by the AO.

If no successor Cooperative Operator is selected and qualified as herein provided, the AO at his election may declare this Cooperative Agreement terminated.

9. **ACCOUNTING PROVISIONS AND COOPERATIVE OPERATIONS AGREEMENT.** If the Cooperative Operator is not the sole owner of Working Interests, costs and expenses incurred by Cooperative Operator in conducting Cooperative Operations hereunder shall be paid and apportioned among and borne by the owners of Working Interests, all in accordance with the agreement or agreements, whether one or more, separately or collectively, entered into by and between the Cooperative Operator and the owners of Working Interests. Any agreement or agreements, whether one or more, entered into between the Working Interest Owners and the Cooperative Operator as provided in this section are herein referred to as the "Cooperative Operating Agreement".

Such Cooperative Operating Agreement shall also set forth such other rights and obligations as between Cooperative Operator and the Working Interest Owners as may be agreed upon by Cooperative Operator and the Working Interest Owners, however, no such Cooperative Operating Agreement shall be deemed either to modify any of the terms and conditions of this Cooperative Agreement or to relieve the Cooperative Operator of any right or obligation established under this Cooperative Agreement, and in case of any inconsistency or conflict between the Cooperative Agreement and the Cooperative Operating Agreement, this Cooperative Agreement shall prevail.

10. **RIGHTS AND OBLIGATIONS OF COOPERATIVE OPERATOR.** Except as otherwise specifically provided herein, the exclusive right, privilege, and duty of exercising any and all rights of the parties hereto, including surface rights, which are necessary or convenient for prospecting for, producing, storing, allocating, and distributing the Cooperative Substances are hereby delegated to and shall be exercised by the Cooperative Operator as herein provided. Nothing herein, however, shall be construed to transfer title to any land or to any lease or operating agreement, it being understood that under this Agreement the Cooperative Operator, in its capacity as Cooperative Operator, shall exercise the rights of possession and use vested in the parties hereto for the proposes herein specified.

11. **PLAN OF OPERATION.** It is recognized and agreed by the parties hereto that the Cooperative Area is developed and productive, and only such drilling as is incidental to horizontally drilled well (s), or gas, or H<sub>2</sub>O injection or a pressure maintenance program is contemplated.

Inasmuch as the primary purpose of this Cooperative Agreement is to permit the institution and consummation of the drilling of horizontal well (s) a gas or H<sub>2</sub>O injection program for the maximum economic production of Cooperative Substances consistent with good engineering and conservation practices, Cooperative Operator, concurrently with the filing of this Cooperative Agreement for final approval by the AO, shall submit to the AO for approval, a plan of operation for the Cooperative Area, and upon approval thereof by the AO, such plan shall constitute the future operating obligations of the Cooperative Operator under this Cooperative Agreement. Thereafter, said plan may be modified or supplemented when necessary to meet changed conditions or to protect the interest of all parties to the Cooperative Agreement. Reasonable diligence shall be exercised in complying with the obligations of any approved plan of operation.

Cooperative Operator shall have the right to inject into the Cooperative formation any substances, but specifically natural gas, H<sub>2</sub>O, or carbon dioxide for secondary recovery or pressure maintenance purposes in accordance with a plan of operation approved by the AO, including the right to drill and maintain injection wells on the Cooperative Land and completed in the Cooperative Formation, and to use abandoned well or wells producing from the Cooperative Formation for said purpose, and the parties hereto, to the extent of their rights and interests, hereby grant to the Cooperative Operator the right to use as much of the surface of the land within the Cooperative Area as may be reasonably necessary for the operation and the development of the Cooperative Area hereunder.

12. **PARTICIPATION AND ALLOCATION OF PRODUCTION.** Beginning at 7:00 a.m. on the date of first production of the horizontal well, the Tract Participation of each Tract shall be based upon the following factors and formula:

**Tract Participation = Acre Feet of Pay Under Tract/ (divided by)  
Total Acre Feet of Pay of Total Area Minus  
the Primary Production Allocated to the  
Cooperative Unit Tract of the Producing  
Well as Set Out in Exhibit "A".**

The figure set forth opposite each Tract in Exhibit "A" represents the Tract Participation to which such Tract is entitled if all Tracts are committed hereto and qualified as of the effective date of this agreement.

Promptly after approval of the Cooperative Agreement, if all Tracts are not qualified hereto, Cooperative Operator shall revise Exhibit "A" to show the Tracts qualified to this Agreement by setting forth opposite each Tract a revised tract participation therefore, which shall be calculated by using the same Tract factors and formula which were used to arrive at the Tract Participation of each tract as set out in the original Exhibit "A" but applying the same only to those Tracts which are qualified effective as of the effective date of this Cooperative Agreement.

If after the effective date of this Agreement any Tract or Tracts are subsequently committed hereto and qualified because of expansion of the Area under Section 3, Expansion of Cooperative Area, or any Tract or Tracts are subsequently qualified under the provision of Section 5, Tracts Qualified for Participation, and Section 30, Subsequent Joinder, or if any Tract is eliminated from the Cooperative Agreement as provided in Section 29, Loss of Title, the schedule of participation as shown in Exhibit "A" shall be revised by the Cooperative Operator to show the new Tract Participation of all the then qualified Tracts; and the revised Exhibit "B", upon approval by the AO,

shall govern the allocation of production from the effective date thereof until a new schedule is so approved. In any such revised Exhibit "A", pursuant to this paragraph, the Tract Participation of the previously qualified Tracts shall remain in the same ratio one to the other.

~~On the day of operation operations are commenced and thereafter all  
Cooperative Substances producing hereunder (except any produced used in  
connection with operations for production, including operations for other  
production, for pressure maintenance or secondary  
recovery operations) shall be allocated to the Cooperative Unit Tract of the  
AO, or  
unavailable, shall be deemed to be produced from the Tract of the  
Cooperative Unit Tract for the purpose of determining any benefits accruing under this  
Agreement. Each such substance shall have allocated to it that percentage of said  
production equal to its Tract Participation effective hereunder during the respective  
period such Cooperative Substances were produced, as set out in Exhibit "A".~~

The amount of Cooperative Substances allocated to each Tract shall be deemed to be produced from such Tract irrespective of the location of the wells from which the same is produced and regardless of depletion of wells or Tracts.

13. **ROYALTY SETTLEMENT.** The United States, under existing contract, is entitled to take in kind a share of the substance now produced cooperatively from any tract, shall hereafter be entitled to the right to take in kind their share of the Cooperative Substances allocated to such tract, and Cooperative Operator shall make deliveries of such royalty share taken in kind in conformity with the applicable contracts, laws, and regulations. Settlement for Royalty Interest not taken in kind shall be made by Working Interest Owners responsible therefore under existing contracts, laws, and regulations on or before the last day of each month for Cooperative Substances produced during the preceding calendar month; provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any royalties due under their leases.

If gas obtained from lands or formations not subject to this Agreement is introduced into the Cooperative Formation hereunder, for use in repressuring, stimulation of production, or increasing ultimate recovery, which shall be in conformity with a plan first approved by the AO, a like amount of gas less appropriate deduction for loss or depletion from any cause, may be withdrawn from the Cooperative Formation, royalty free as to dry gas, but not as to the products extracted therefrom; provided that such withdrawal shall be at such time and in such amount as may be provided in the approved plan of operation or as may otherwise be consented to by the AO as conforming to good petroleum engineering practice; and provided further, that such right of withdrawal shall terminate on the termination of this Cooperative Agreement.

If natural gasoline, liquid petroleum gas fractions or other liquid hydrocarbon substances (herein collectively called "LPGS") which were not extracted from gas produced from the Cooperative Formation are injected into the Cooperative Formation, which shall be in conformity with a plan of operation first approved by the AO, Working Interest Owners shall be entitled to recover, royalty free, part of all such "LPGS" pursuant to such conditions and formulas as may be prescribed or approved by the AO.

Royalty due the United States shall be computed as provided in the operating regulations and paid in value or delivered in kind as to all Cooperative Substances on the basis of the amounts thereof allocated to Cooperative Federal land as provided herein at the rates specified in the respective Federal leases, or at such lower rates as may be authorized by law or regulation; provided that for leases on which the royalty rate depends on the daily average production per well, said average production shall be determined in accordance with the operating regulations as though the Cooperative Lands were a single consolidated lease.

14. **RENTAL SETTLEMENT.** Rental or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefore under existing contracts, laws, and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof due under their leases. Rental and minimum royalty for lands of the United States subject to this Agreement shall be paid at the rate specified in the respective leases from the United States unless such rental or minimum royalty is waived, suspended or reduced by law or by approval of the Secretary or his duly authorized representative.

15. **CONSERVATION.** Operations hereunder and production of Cooperative Substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by or pursuant to State or Federal law or regulation.

16. **DRAINAGE.** The Cooperative Operator shall take appropriate and adequate measures to prevent drainage of Cooperative Substances from Cooperative Land by wells on land not subject to this Agreement, or with prior consent of the Director, pursuant to applicable regulations pay a fair and reasonable compensatory royalty as determined by the AO. In the event compensatory royalty is so paid, it shall be treated in the same manner as Cooperative Substances.

17. **GAUGE OF MERCHANTABLE OIL.** Cooperative Operator shall make a proper and timely gauge of all lease and other tanks within the Cooperative Area and associated with the operation of the Cooperative Land in order to ascertain the amount of merchantable oil above the pipeline connections in such tanks at 7:00 a.m. on the date injection operations are commenced. All such oil shall be and remain the property of the parties entitled thereto the same as if the Cooperative Agreement had no been formed; and such parties shall promptly remove said oil from said tanks. Any such oil not so removed shall be sold by Cooperative Operator for the account of parties entitled thereto, subject to the payment of all royalties, overriding royalties, production payments, and all other payments under the terms and provisions of the applicable lease, leases, or other contracts.

18. **LEASES AND CONTRACTS CONFORMED AND EXTENDED.** The terms, conditions, and provisions of all leases, subleases, and other contracts relating to exploration, drilling, development, or operation for oil or gas of lands committed to this Agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect; and the parties hereto hereby consent that the Secretary shall and by his approval hereof, or by the approval hereof by his duly authorized representative, does hereby establish, alter, change, or revoke the drilling, producing, rental, minimum royalty, and royalty requirements of Federal leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this Agreement, and, without limiting the generality of the foregoing, all leases, subleases, and contracts are particularly modified in accordance with the following:

(a) The development and operation of lands subject to this Agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned Tract subject to this Agreement, regardless of whether there is any development of any particular part or Tract of the Cooperative Land, notwithstanding anything to the contrary in any lease, operating agreement, or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.



(b) Drilling and production operations performed hereunder upon any Tract of Cooperative Land will be accepted and deemed to be performed upon and for the benefit of each and every Tract of Cooperative Land, and no lease shall be deemed to expire by reason of failure to drill or produce wells situated on the land therein embraced.

(c) Suspension of drilling or producing operations on all Cooperative Land pursuant to direction or consent of the Secretary or his duly authorized representative shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every Tract of Cooperative Land.

(d) Each lease, sublease, or contract relating to the exploration, drilling, development, or operation for oil or gas of lands committed to this Agreement, which, by its terms might expire prior to the termination of this Agreement; is hereby extended beyond any such term so provided therein so that it shall be continued in full force and effect for and during the term of this Agreement.

19. **COVENANTS RUN WITH LAND.** The covenants herein shall be construed to be covenants running with the land with respect to the interest of the parties hereto and their successors in interest until this Agreement terminates, and any grant, transfer, or conveyance, of interest in land or leases subject hereto shall be and hereby is conditioned upon the assumption of all privileges and obligations hereunder by the grantee, transferee, or other successor in interest. No assignment or transfer of any working interest shall be binding upon Cooperative Operator nor shall any transfer of any Royalty Interest or other interest be binding on the Working Interest Owner responsible for payment or settlement thereof, until the first day of the calendar month after Cooperative Operator or the responsible Working Interest Owner, as the case may be, is furnished with the original, photostat, or certified copy of the instrument of transfer.

20. **EFFECTIVE DATE.** This agreement shall become binding upon each party who executes or ratified it as of the date of execution or ratification by such party and shall become effective as of 7:00 a.m. on the day of approval of this agreement by the Secretary of the Interior or his duly authorized representative and injection of any substance into the Cooperative Formation for secondary recovery or pressure maintenance purposes as set out herein.

21. **TERM.** The term of this Agreement shall be for and during the time that Cooperative Substances are capable of being produced in quantities sufficient to pay for the cost of producing same from wells on Cooperative Land unless sooner terminated by the Director as provided in Section 8, Successor Cooperative Operator, or by the Working Interest Owners as provided in Section 22, Termination by Working Interest Owners.

**22. TERMINATION BY WORKING INTEREST OWNERS.** This agreement may be terminated at any time by Working Interest Owners owning ninety percent (90%) or more of the participation percentage in the Cooperative Land with the approval of the AO. Notice of any such termination shall be given by the Cooperative Operator to all parties hereto.

Upon termination of this Agreement, the parties hereto shall be governed by the terms and provisions of the leases and contract affecting the separate Tracts.

If not specified otherwise by the leases cooperating under this Agreement, basic Royalty Owners hereby grant Working Interest Owners a period of six (6) months after termination of this Agreement in which to salvage, sell, distribute, or otherwise dispose of the personal property and facilities used in connection with Cooperative operations.

**23. RATE OF PROSPECTING, DEVELOPMENT AND PRODUCTION.** The Director is hereby vested with authority to alter or modify from time to time in his discretion the quantity and rate of production under this Agreement when such quantity and rate is not fixed pursuant to Federal or State law or does not conform to any statewide voluntary conservation or allocation program, which is established, recognized, and generally adhered to by the majority of operators in such state, such authority being hereby limited to alteration or modification in the public interest, the purpose thereof and the public interest to be served thereby to be stated in the order of alteration or modification. Without regard to the foregoing, the Director is also hereby vested with authority to alter or modify from time to time in his discretion the rate of prospecting and development and the quantity and rate of production under this Agreement when such alteration or modification is in the interest of attaining the conservation objectives stated in this Agreement and is not in violation of any applicable Federal or State law.

Powers in this section vested in the Director shall only be exercised after notice to Cooperative Operator and opportunity for hearing to be held not less than fifteen (15) days from notice.

**24. APPEARANCES.** Cooperative Operator shall, after notice to other parties affected, have the right to appear for and on behalf of any and all interests affected hereby before the Department of the Interior and to appeal from orders issued under the regulations of said Department or to apply for relief from any of said regulations or in any proceedings relative to operations before the Department of the Interior or any other legally constituted authority; provided, however, that any other interested party shall also have the right at his own expense to be heard in any such proceeding.

**25. NOTICES.** All notices, demand, or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given, if given in writing, or personally delivered to the party or sent by postpaid registered or certified mail, addressed to such party at the address such party has furnished to the party sending the notice, demand, or statement.

26. **NO WAIVER OF CERTAIN RIGHTS.** Nothing in this Agreement contained shall be construed as a waiver by any party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the State of New Mexico, or of the United States, or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive, provided, however, each party hereto except the United States covenants that during the existence of this Agreement, such part shall not resort to any action at law or in equity to partition the Cooperative Land or the facilities used in the development or operation thereof and to that extent waives the benefits all laws authorizing such partition.

27. **UNAVOIDABLE DELAY.** All obligations under this Agreement except the payment of money, shall be suspended while, but only so long as, the Cooperative Operator despite the exercise of due care and diligence is prevented from complying with such obligations, in whole or in part, by strikes, acts of God, Federal, State, or municipal law or agencies, unavoidable accidents, uncontrollable delays in transportation, inability to obtain necessary materials in open market, or other matters beyond the reasonable control of the Cooperative Operator, whether similar to matters herein enumerated or not.

28. **NON-DISCRIMINATION.** In connection with the performance of work under this Agreement, the Cooperative Operator agrees to comply with all the provisions of Section 202 (1) to (7) inclusive, of Executive Order 11246, 30 F.R. 12319, which are hereby incorporated by reference in this Agreement.

29. **LOSS OF TITLE.** In the event title to any Tract of Cooperative Land shall fail and the true owner cannot be induced to join in this Cooperative Agreement, such Tract shall be automatically regarded as not committed hereto and there shall be such readjustment of future costs and benefits as may be required on account of the loss of such title. In the event of a dispute as to title as to any Royalty, Working Interest, or other interest subject hereto, payment or delivery on account thereof may be withheld without liability for interest until the dispute is finally settled; provided that as to Federal land or leases, no payments for funds due the United States should be withheld, but such funds shall be deposited as directed by the AO to be held as unearned money pending final settlement of the title dispute, and then applied as earned or returned in accordance with such final settlement.

Cooperative Operator as such is relieved from any responsibility for any defect or failure of any title hereunder.

**30. SUBSEQUENT JOINDER.** After the effective date of this Agreement, the commitment of any interest in any Tract within the Cooperative Area shall be upon such equitable terms as may be negotiated by Working Interest Owners and the owner of such interest. After the effective date hereof, joinder by a Royalty Owner must be consented to in writing by the Working Interest Owner committed hereto and responsible for the payment of any benefits that may accrue hereunder in behalf of such Royalty Interest. Joinder by any Royalty Owner at any time must be accompanied or preceded by appropriate joinder by the Owner of the corresponding Working Interest in order for the interest to be regarded as effectively committed. Joinder to the Cooperative Agreement by a Working Interest Owner at any time must be accompanied by appropriate joinder to the Cooperative Operating Agreement in order for the interest to be regarded as committed to this Cooperative Agreement. Except as may otherwise herein be provided, subsequent joinders to this Agreement shall be effective as of the first day of the month following the filing with the AO of duly executed counterparts of all or any papers necessary to establish commitment of any Tract to this Agreement unless objection to such joinder is made within thirty (30) days by the Director.

**31. COUNTERPARTS.** This Agreement may be executed in any number of counterparts, no one of which needs to be executed by all parties, or may be ratified or consented to by separate instrument in writing specifically referring hereto and shall be binding upon all those parties who have executed such a counterpart, ratification, or consent hereto with the same force and effect as if all such parties had signed the same document and regardless of whether or not it is executed by all other parties owning or claiming an interest in the lands within the above-described Cooperative Area. Execution hereof by any party in one capacity shall also constitute execution in any other capacity.

**32. TAXES.** The Working Interest Owners shall render and pay for their account and the account of the Royalty Owners all valid taxes on or measured by the Cooperative Substances in and under or that may be produced, gathered, and sold from the land covered by this agreement after its effective date, or upon the proceeds derived therefrom. The Working Interest Owners on each tract shall and may charge the proper proportion of said taxes to Royalty Owners having interest in said Tract, and may currently retain and deduct a sufficient amount of the Cooperative Substances or derivative products, or new proceeds thereof, from the allocated share of each Royalty Owner to secure reimbursement for the Taxes so paid. No such taxes shall be charged to the United States.

**33. NO PARTNERSHIP.** It is expressly agreed that the relation of the parties hereto is that of independent contractors and nothing contained in this agreement, expressed or implied, nor any operations conducted hereunder, shall create or be deemed to have created a partnership or association between the parties hereto or any of them.

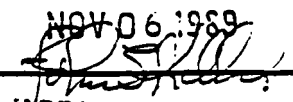
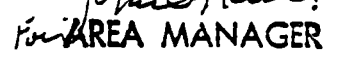
IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed and have set opposite their respective names the date of execution.

MERRION OIL & GAS CORPORATION

  
Cooperative Operator  
J. Gregory Merrion, President

Bureau of Land Management  
Approval:

APPROVED

By:  NOV 06 1989  
Date:  AREA MANAGER

ACKNOWLEDGEMENT


STATE OF NEW MEXICO )  
§  
COUNTY OF SAN JUAN )

BEFORE ME, the undersigned authority, a Notary Public in and for said county and State, on this day personally appeared J. Gregory Merrion, known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of MERRION OIL & GAS CORPORATION, a corporation, and that he executed the same as the act of such corporation for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER BY HAND AND SEAL OF OFFICE, this the 12<sup>th</sup> day of October, 1989.

My Commission Expires:

12-11-89

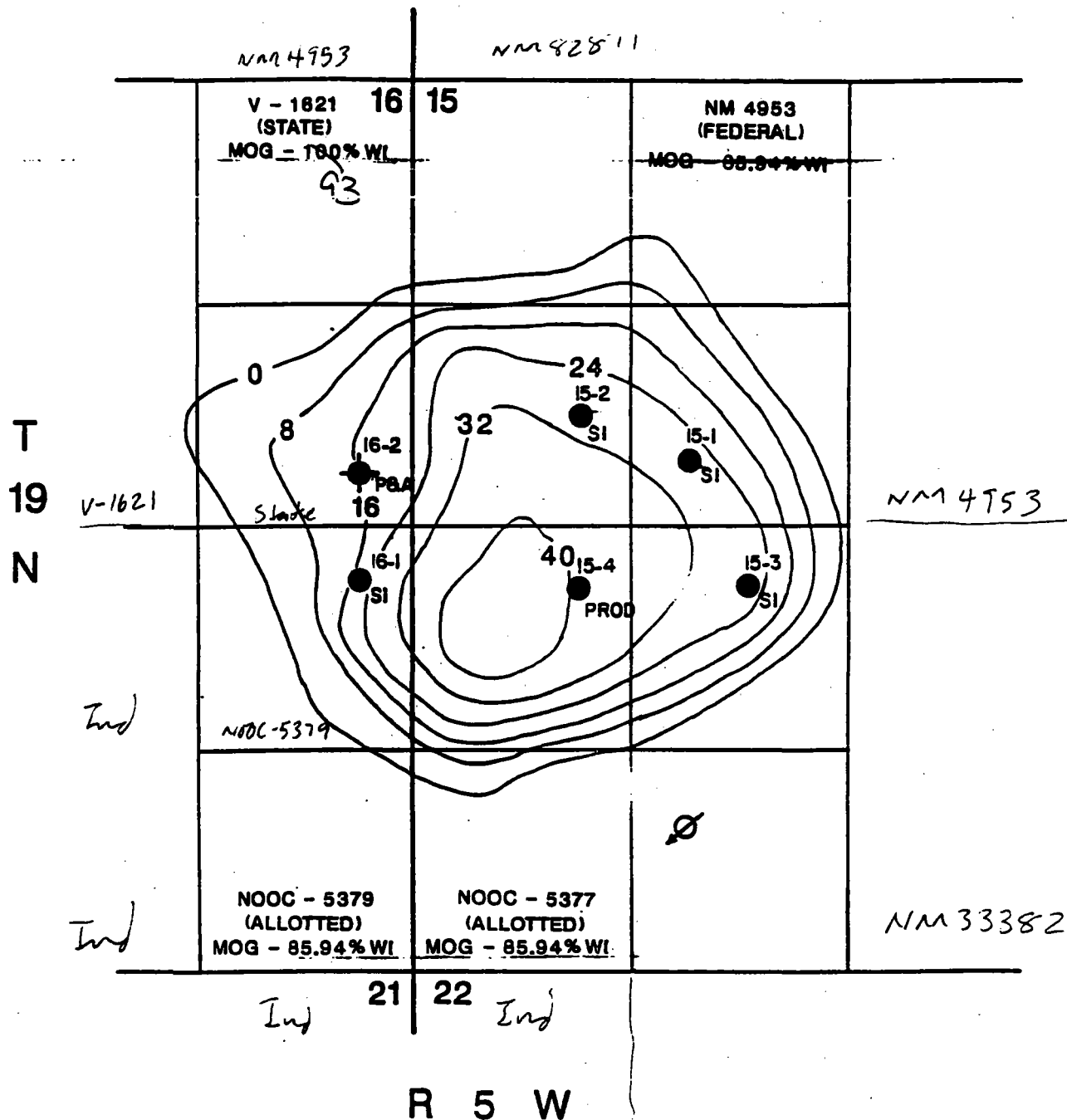
  
Notary Public

END OF ACKNOWLEDGEMENT

# EXHIBIT NO. A

CASE NO. - 9754

SEPT. 6, 1989



PAPERS WASH ENTRADA FIELD

McKINLEY COUNTY, NEW MEXICO

NET PAY - LEASE MAP

SCALE : 1" = 1000'

**EXHIBIT "A"**  
**Continued**

**ALLOCATION OF REMAINING PRIMARY PRODUCTION  
PAPERS WASH FIELD**

Attached to and made a part of that certain Cooperative Agreement  
dated September 8, 1989

All production from the acreage covered by the Cooperative Agreement shall be allocated as follows:

1.) To account for the reserves from the Navajo 15-4 and 16-1 wells, the production from the Cooperative Agreement area will first be allocated to the leases from which these wells produce. The allocation formula is as follows:

**Lease NOOC-5377. (Navajo 15-4)**

<u>Phase</u>	<u>Reserves (BO)</u>	<u>Daily Prod. Rate (BOPD)</u>	<u>Oper. Exp. (\$/BO)</u>	<u>Total Operating Exp.</u>
I	27,100 <i>484 days</i>	56	9.50	257,450
II	27,100 <i>531 days</i>	51	10.50	284,550
III	27,100 <i>589 days</i>	46	11.55	<u>313,005</u>
TOTALS	81,300			885,005

**Lease NOOC-5379. (Navajo 16-1)**

<u>Phase</u>	<u>Reserves (BO)</u>	<u>Daily Prod. Rate (BOPD)</u>	<u>Oper. Exp. (\$/BO)</u>	<u>Total Operating Exp.</u>
I	11,000 <i>440 days</i>	25	12.78	140,580

2.) Additional production which exceeds that to be allocated as primary, shall be considered secondary and allocated to all leases within the Cooperative Agreement area on an acre-foot basis.

# PAPERS WASH FIELD REMAINING PRIMARY RESERVES

## Navajo 15-4

Current rate: 2,000 BOPM  
180,000 BWPM  
 182,000

Operating Expense:  $182,000 * \$0.09 = \$16,380$  per month.  
 Economic Limit:  $\frac{16,380}{18 \times .833 \times .92} = 1187$  BO per month.

Remaining Primary Reserves:

$$N_p = \frac{(2000 - 1187) 12}{.12} = 81,300 \text{ BO}$$

$$t = \ln \frac{2000}{1187} = 4.35 \text{ years}$$

## Navajo 16-1

Current Rate: 800 BOPM  
105,000 BWPM  
 105,800

Operating Expense:  $105,800 * \$0.09 = \$9,522$  per month.  
 Economic Limit:  $\frac{9,522}{18 \times .833 \times .92} = 690$  BO per month.

Remaining Primary Reserves:

$$N_p = \frac{(800 - 690) 12}{.12} = 11,000 \text{ BO}$$

$$t = \ln \frac{800}{690} = 1.23 \text{ years}$$



**PAPERS WASH LEASE OWNERSHIP INDEX  
EXHIBIT "B"**

**TRACT PARTICIPATION**

Attached to and made a part of that certain Cooperative Agreement  
dated September 8, 1989

TRACT NO.	LEGAL DESCRIPTION	NO OF ACRES	LEASE SERIAL NO & EXPIR DATE	LESSEE OF RECORD	NAME OF OWNER & PERCENT OF ORRI	ENTRADA FORMATION WORKING INTEREST	NET PAY% PER ACRE F
1	T19N-R5W NMPM SEC 15: SW/4	160.00/a	NOOC-5377 HBP	MOG PITCO	85.9375% 14.0625% NONE	MOG PITCO	85.9375% 14.0625% 45.43%
2	T19N-R5W SEC 16: NE/4 SE/4	40.00/a	NOOC-5379 HBP	MOG PITCO	85.9375% 14.0625% NONE	MOG PITCO	85.9375% 14.0625% 7.25%
3	T19N-R5W SEC 16: SE/4 NE/4	40.00/a	V-1621 10/15/90	MOG PITCO	93.00% 7.00% NONE	MOG PITCO	93.00% 7.00% 7.34%
4	T19N-R5W SEC 15: NW/4	<u>160.00/a</u>	NM-4953 HBP	MOG PITCO	85.935% 14.065% LUCY M. ENGLISH- PRATER .3% HANLAN OIL CORP. 2.7%	MOG PITCO	85.9375% 14.0625% <u>39.98%</u>

TOTALS 400.00/a  
Based upon the above tract participation

TOTALS

100%

MOG's & Pitco's WI in the Cooperative Agreea is as follows:

MOG	86.45%	100% - 13.55%
Pitco	13.55%	100% - 86.45%
Total	100%	100%

## **EXHIBIT "C"**

### **PLAN OF OPERATION**

**ATTACHED TO AND MADE A PART OF THAT CERTAIN COOPERATIVE AGREEMENT DATED  
SEPTEMBER 8, 1989**

**Merrion Oil & Gas Corporation (Merrion), as Operator of the Papers Wash Cooperative Unit plans to re-enter the 15-2 well located in the SW/4 SW/4 of Section 15, Township 19 North, Range 5 West, and plugback, sidetrack and drill a horizontal well across the Papers Wash Entrada reservoir. If the Federal 15-2 well is not usable, then Merrion will drill a new well. Prior to initiating said operation, Merrion will submit the proper A.P.D. for BLM approval.**

**Merrion is in the process of evaluating the feasibility of initiating an injection program designed to enhance production. Merrion will submit a detailed Plan of Operation for BLM approval prior to commencing any type of secondary or tertiary flood.**

**Also, in addition to the above, Merrion shall submit to the BLM an updated Plan of Operation each year on or before January 15th.**

**RATIFICATION AND JOINDER OF COOPERATIVE AGREEMENT**  
**AND**  
**COOPERATIVE OPERATING AGREEMENT**

In consideration of the execution of the Cooperative Agreement for the Development and Operation of the **PAPERS WASH POOL**, McKinley County, State of New Mexico, dated October 26, 1989, in form approved by the Secretary of the Interior, and in consideration of the execution or ratification by other working interest owners of the contemporary Cooperative Operating Agreement which relates to said Cooperative Agreement, the undersigned hereby expressly ratifies, approves and adopts said Cooperative Agreement, and also said Cooperative Operating Agreements as fully as though the undersigned had executed the original instrument. Cooperative Operating Agreement referenced herein is that certain Operating Agreement effective January 1, 1978 (DANTF GROUP)


This Ratification and Joinder shall be effective as to the undersigned's interests in any lands and leases, or interests therein, and royalties presently held or which may arise under existing option agreements or other interests in Cooperative substances, covering any lands within the Cooperative Area which the undersigned may be found to have an oil or gas interest.

This Ratification and Joinder shall be binding upon the undersigned, its heirs, devisees, assigns or successors in interest.

EXECUTED this 1st day of November, 1989

TRACT(S) 1, 2, 3 & 4

PITCO PRODUCTION COMPANY

  
Bruce Locke, President of The Prospective Investment and Trading Company, Ltd., Managing Partner  
Address: P.O. Box 35368  
Tulsa, OK 75153

STATE OF OKLAHOMA

COUNTY OF Tulsa

BEFORE ME, the undersigned Notary Public in and for the County and State aforesaid, this day personally appeared the within named Bruce Locke who acknowledged that he signed and delivered the foregoing conveyance on the day and year therein named, as a free and voluntary act.

GIVEN, under my hand and seal this 1st day of November, 1989

My Commission Expires:

February 19, 1993



**CASE 11328:** Application of Merrion Oil & Gas Corporation for a high angle/horizontal directional drilling pilot project and for the promulgation of special operating rules therefor, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks to initiate a high angle/horizontal directional drilling pilot project in the Media-Entrada Oil Pool within its proposed Media Entrada Secondary (Federal) Unit comprising portions of Sections 14, 15, 22, and 23, Township 19 North, Range 3 West. Further, the applicant seeks the promulgation of special operating rules and procedures for wells within said Unit Area including provisions for administrative authorization for horizontal wells, the formation of oversized and irregular shaped spacing and proration units to accommodate such wellbores, the assignment of a special oil allowable or formula for the project area and the designation of a target window such that horizontal or producing portions of such a wellbore shall be no closer than 330 feet to the outer boundary of the project area. Said area is located approximately 14 miles southwest of Cuba, New Mexico.

**CASE 11329:** Application of Merrion Oil & Gas Corporation to amend Division Order No. R-9079, to extend the horizontal limits of the existing high angle/horizontal directional drilling pilot project area, and to adopt additional special operating rules therefor, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks to amend Division Order No. R-9079 by extending the project area approved therein to include the N/2 NW/4, SE/4 NW/4, NE/4 SW/4, and S/2 SW/4 of Section 15 and the SE/4 NE/4 and NE/4 SE/4 of Section 16, of Township 19 North, Range 5 West. Further, the applicant seeks the promulgation of special operating rules and procedures for wells within said Cooperative Area including provisions for administrative authorization for horizontal wells, the formation of oversized and irregular shaped spacing and proration units to accommodate such wellbores, the assignment of a special oil allowable or formula for the project area and the designation of a target window such that horizontal or producing portions of such a wellbore shall be no closer than 330 feet to the outer boundary of the project area. Said area is located approximately 22 miles northwest of San Luis, New Mexico.

**CASE 11270:** (Continued from June 15, 1995, Examiner Hearing.)

Application of Maralo, Inc. for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface to the base of the Morrow formation underlying Lots 3 and 4, the S/2 NW/4, and the SW/4 (W/2 equivalent) of Section 3, Township 19 South, Range 28 East, thereby forming a 320.90-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent, which presently includes but is not necessarily limited to the Undesignated Millman-Wolfcamp Gas Pool, Undesignated Millman-Atoka Gas Pool, Undesignated North Turkey Track-Atoka Gas Pool, and Undesignated Millman-Morrow Gas Pool. Said unit is to be dedicated to a well to be drilled at a standard gas well location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as the operator of the well and unit, and a charge for risk involved in drilling and completing said well. Said unit is located approximately 3 miles east-southeast of the old Illinois Oil Camp.

**CASE 11330:** Application of Meridian Oil Inc. for downhole commingling, a non-standard gas proration unit, dual completion, and an unorthodox gas well location, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval to downhole commingle conventional East Blanco-Pictured Cliffs Pool gas production with coal gas production from the Basin-Fruitland Coal (Gas) Pool and to dual said commingled production with gas production from the Blanco-Mesaverde Pool within the wellbore of its San Juan "30-4" Unit Well No. 40 to be drilled at an unorthodox gas well location for all three zones 2450 feet from the South line and 2270 feet from the East line (Unit J) of Section 21, Township 30 North, Range 4 West. The E/2 of said Section 21 is to be dedicated to said well in all three zones thereby forming a standard 320-acre gas spacing and proration unit in the Basin-Fruitland Coal (Gas) Pool and Blanco-Mesaverde Pool and a non-standard unit for the East Blanco-Mesaverde Pool. Said unit is located approximately 18 miles southwest of Dulce, New Mexico.

**CASE 11297:** (Continued from June 15, 1995, Examiner Hearing.)

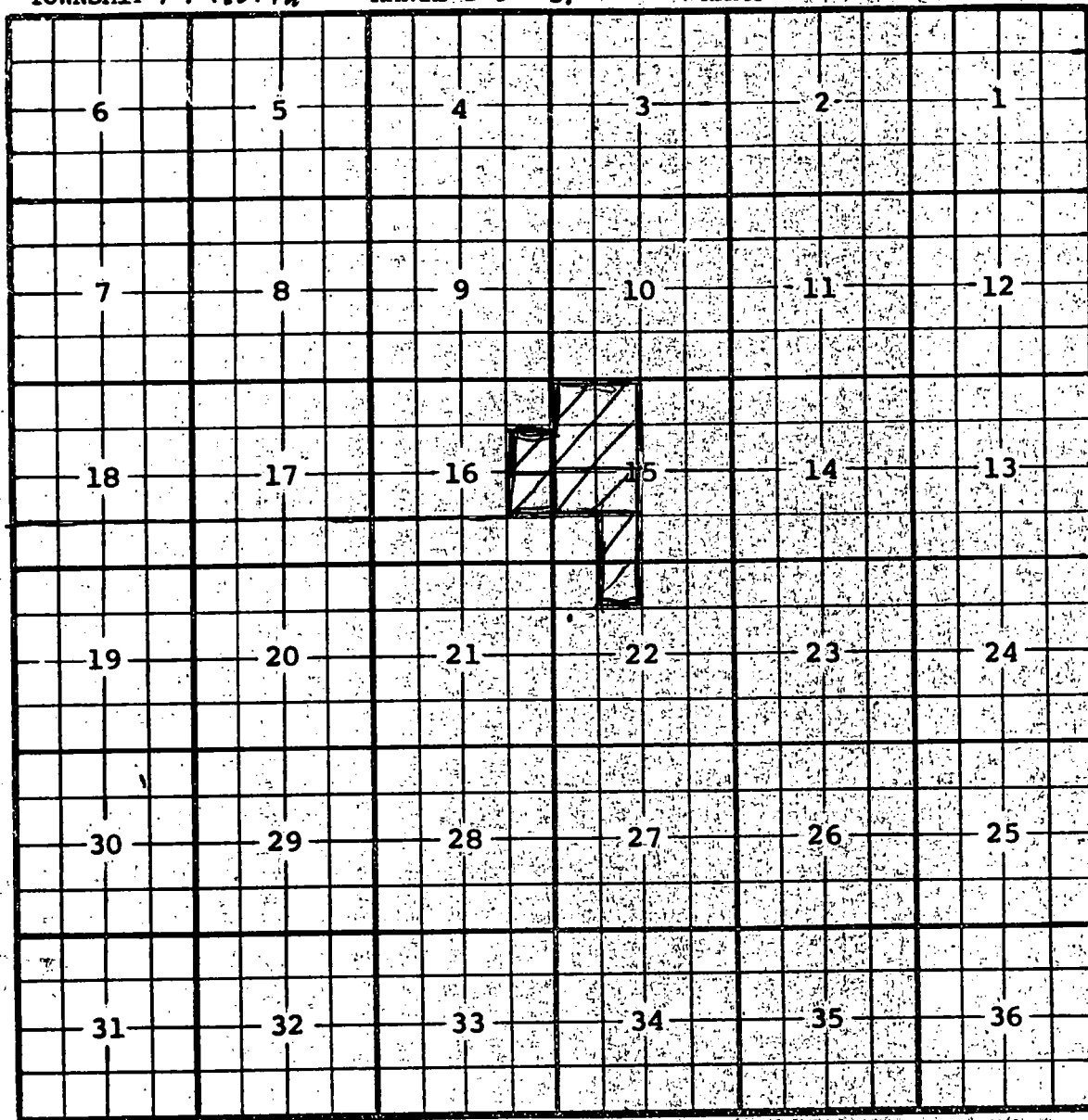
Application of Exxon Corporation for a waterflood project, qualification for the recovered oil tax rate pursuant to the "New Mexico Enhanced Oil Recovery Act" for said project, and for 18 non-standard oil well locations, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval to institute a waterflood project in the designated and Undesignated Avalon-Delaware Pool within its proposed Avalon Delaware Unit Area (being the subject of Case No. 11298) located in portions of Townships 20 and 21 South, Ranges 27 and 28 East, by the injection of water through 18 new wells to be drilled as injection wells and one well to be converted from a producing oil well to an injection well. Applicant further seeks to qualify this project for the recovered oil tax rate pursuant to the "New Mexico Enhanced Oil Recovery Act" (Law 1992, Chapter 38, Sections 1 through 5). Applicant further seeks approval to drill 18 new producing wells throughout the project area at locations considered to be unorthodox. The proposed unit area is centered approximately 8 miles north of Carlsbad, New Mexico.

COUNTY McKinley POOL Papers Wash - Entrada Oil

TOWNSHIP 19 North

RANGE 5 West

NMPM



Description:  $NW\frac{1}{4}$  Sec 15 (R-5401, 3-15-77)

Ext:  $N\frac{1}{2}SW\frac{1}{4}$  Sec 15 (R-5470, 7-1-77) Ext:  $SE\frac{1}{4}SW\frac{1}{4}$  Sec 15, -

-  $NE\frac{1}{4}SE\frac{1}{4}$  Sec 16,  $NE\frac{1}{4}NW\frac{1}{4}$  Sec 22 (R-5779, 8-1-78)

Ext:  $SE\frac{1}{4}NE\frac{1}{4}$  Sec 16 (R-9516, 6-3-91)