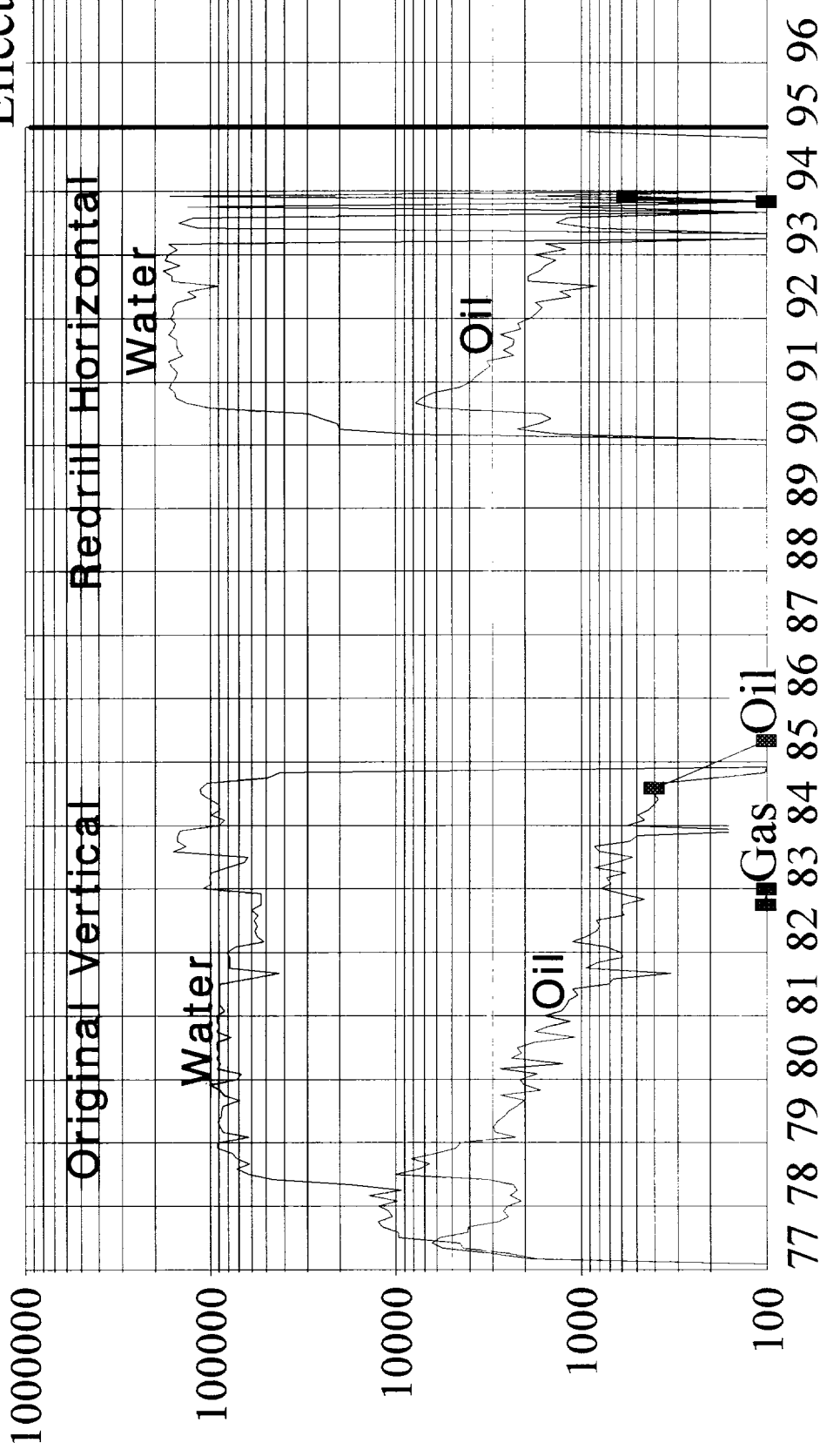


# EXHIBIT 3

## PWU 1, Papers Wash ENRD

Effective D



PWU 1 Papers Wash ENRD MOG McKinley, NM	Cumulative:		Oil (bbl)	Gas (mcf)	Water (bbl)
	Remaining:		285,768	4	12,341,490
	Ultimate:		0	0	0
			285,768	4	12,341,490

# 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 "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 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

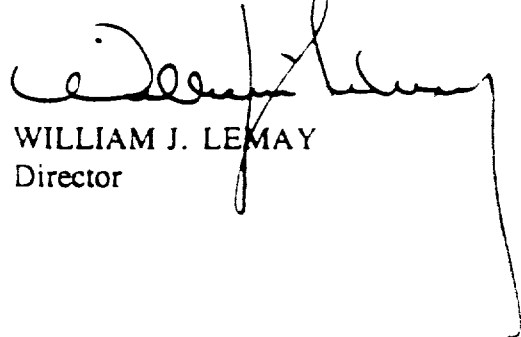
- (A). The allowable assigned to the proration units designated to the Eagle Mesa-Entrada Oil Pool within the Unit Area shall be assigned by the supervisor of the Division's Aztec district office and shall be equal to 750 barrels of oil per day times the number of standard 40-acre tracts within each 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

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**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 purposes 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:

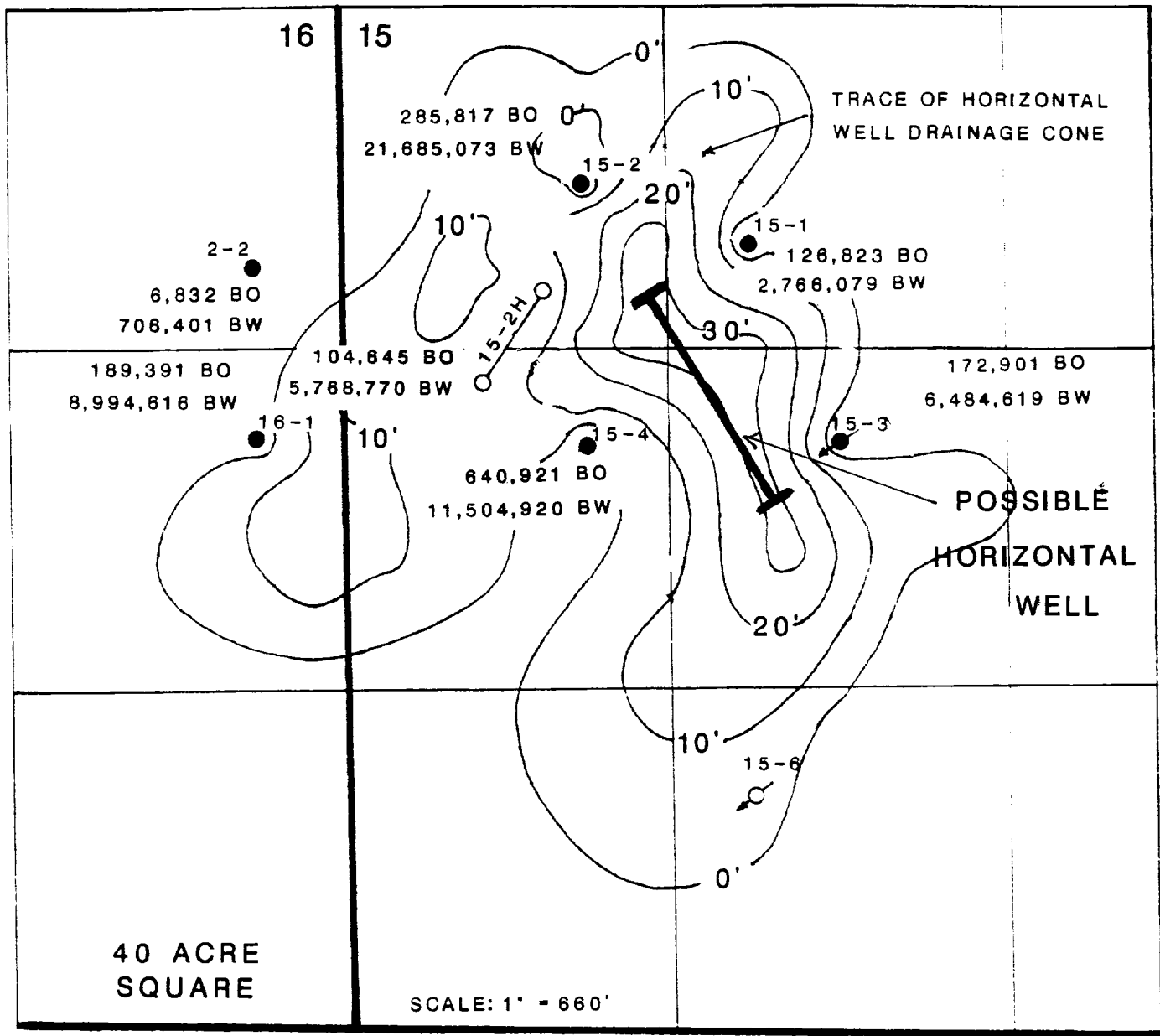
- (a) A Cooperative Operator so selected shall accept in writing the duties and responsibilities of Cooperative Operator; and
- (b) the selection shall have been approved by the AO.

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.

# 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

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 purposes 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 Participatllon = 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.

[illegible]

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.

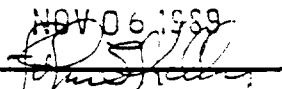

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed and have set opposite their respective names the date of execution.

MERRION OIL & GAS CORPORATION

  
Cooperative Operator  
J. Gregory Merrion, President

Bureau of Land Management  
Approval:

APPROVED <sup>FH</sup>

By:   
Date: <sup>NOV 06 1989</sup>  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

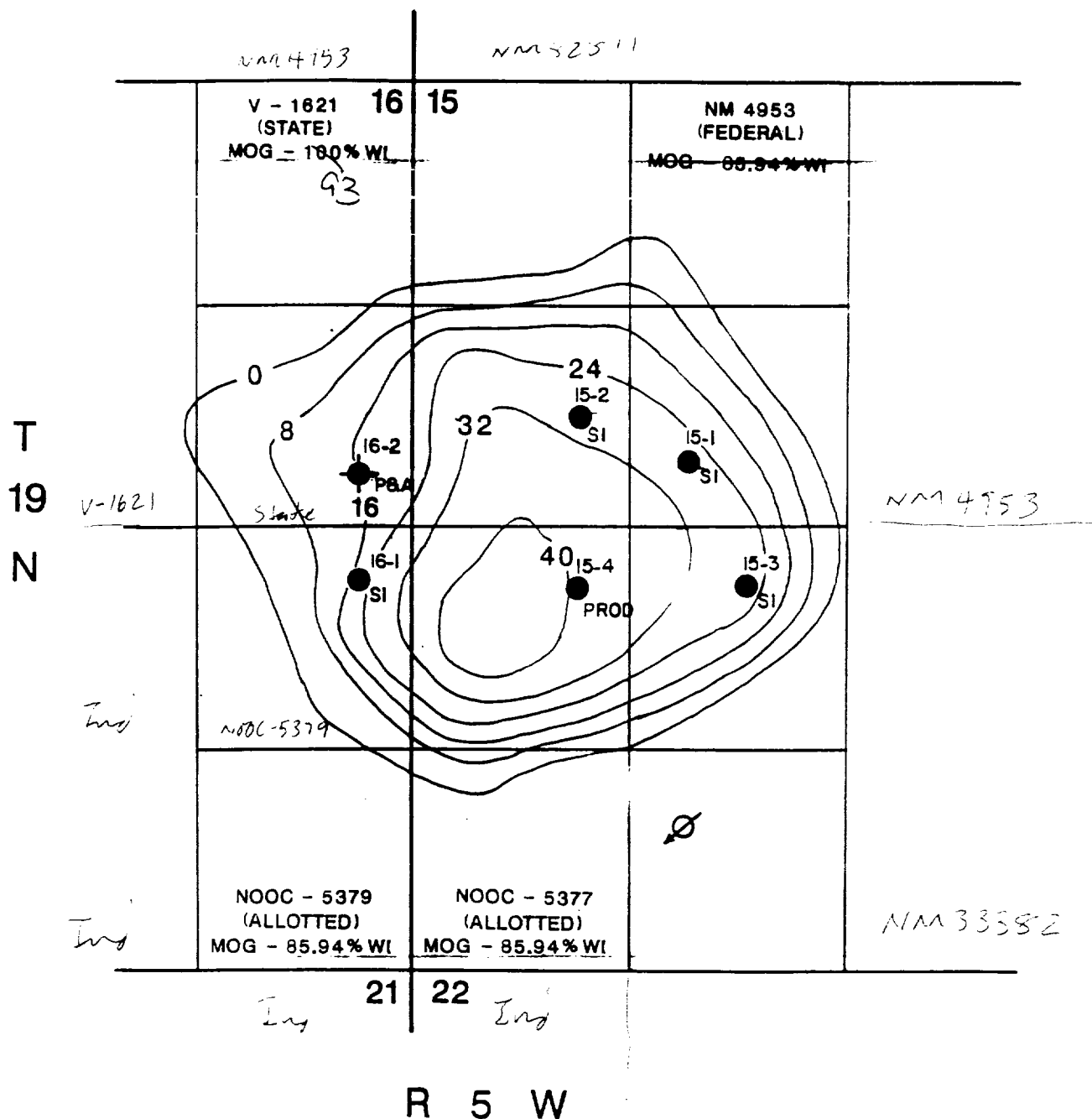
END OF ACKNOWLEDGEMENT



# 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	<u>27,100</u> <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**

## **Navaio 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:

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

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

## **Navaio 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 O&RI	ENTRADA FORMATION WORKING INTEREST	NET PAY% PER ACRE
1	T19N-R5W NMPM SEC 15: SW/4	160.00/a	NOOC-5377 HBP	MOG PITCO	NONE	MOG 85.9375% PITCO 14.0625%	45.43%
2	T19N-R5W SEC 16: NE/4 SE/4	40.00/a	NOOC-5379 HBP	MOG PITCO	NONE	MOG 85.9375% PITCO 14.0625%	7.25%
3	T19N-R5W SEC 16: SE/4 NE/4	40.00/a	V-1621 10/15/90	MOG PITCO	NONE	MOG 93.00% PITCO 7.00%	7.34%
4	T19N-R5W SEC 15: NW/4	<u>160.00/a</u>	NM-4953 HBP	MOG PITCO	LUCY M. ENGLISH- PRATER .3% HANLAN OIL CORP. 2.7%	MOG 85.9375% PITCO 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%
Pitco	13.55%
<u>Total</u>	<u>100%</u>

## **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)

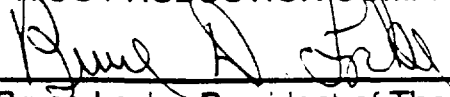
This Ratification and Joinder shall be effective as to the undersigned's interests in any lands and leases, or interests therein, and royalties presently held or which may arise under existing option agreements or other interests in Cooperative substances, covering any lands within the Cooperative Area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

  
\_\_\_\_\_