

MERRION OIL & GAS CORPORATION

610 REILLY AVE. • P. O. Box 840

FARMINGTON, NEW MEXICO 87499

DIVISION

February 9, 1990

REC FEB 12 PM 9 52

Mr. Frank Chavez
N.M. Oil Conservation Commission
1000 Rio Brazos
Aztec, New Mexico 87410

Subject: Federal 15-2 H
1,980' FNL & 990' FWL
Sec. 15, T19N, R5W
McKinley Co., N.M.

Case No
9754

M.S.

Dear Frank:

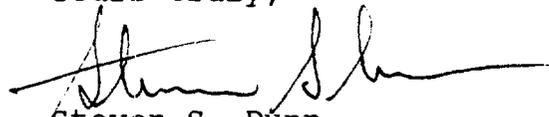
In accordance with Division Order No. R-9079 Section 8, I have enclosed a copy of the final directional survey along with a final report which specifies the depth and location of the terminus of the Federal 15-2 H horizontal wellbore. Also enclosed is a well history through the drilling phase.

We have completed our drilling operations on the well and are now ready to commence the completion. We plan to test the well and therefore request a test allowable of 15,000 Bbls of oil. We propose to produce the well at an initial rate of 500 BPD, the test allowable would let us pump test for approximately 30 days if 100% oil is produced. Our transporter for the oil will be Conoco Transportation, Inc., Box 1429, Bloomfield, New Mexico 87413.

A Completion Report along with other required forms will be filed after testing.

If further information is needed please let me know.

Yours truly,


Steven S. Dunn
Operations Manager

SSD:ks

Enc.

cc: Michael Stogner

MERRION OIL & GAS CORPORATION
PAPERS WASH FIELD

FEDERAL 15-2
HORIZONTAL REDRILL
FINAL WELL REPORT

February 1990

I. SUMMARY INFORMATION

Well Name : Federal 15 No. 2

Surface Location : McKinley County, New Mexico
1960' FNL, 999' FWL
Sec 15, T 19 N, R 5 W

Elevations : 6,616' RKB
6,604' GL

Entrada Sandstone Interval
Top : 2,374' FNL, 815' FWL
5,378' MD
5,163' TVD

Base : 2,730' FNL, 574' FWL
5,809' MD
5,175' TVD

Total Depth : 5,180' TVD
6,084' MD

Well Status : Entrada Sandstone Oil Producer

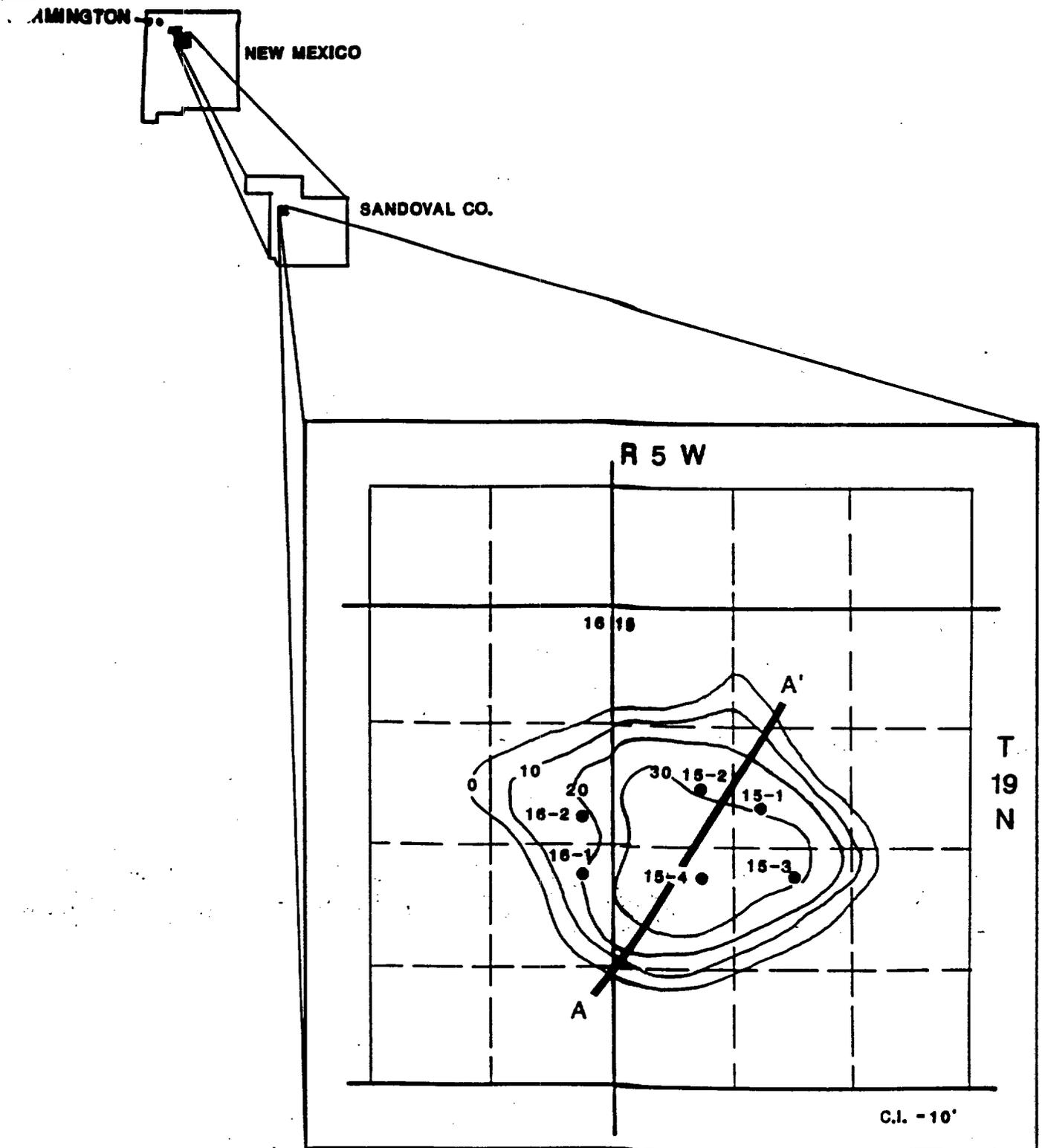
Rigs
Preparation : Ram Service Co Rig 1
Drilling : Walters Drilling Inc. Rig 4
Testing/Completion : Unknown

Rig Arrivals
Preparation : November 13, 1989
Drilling : January 18, 1990
Testing/Completion : February 6, 1990

Time on well
Preparation : 21 days
Drilling : 17 days
Testing/Completion : 7 days

Well Costs :
Preparation : \$
Drilling : \$
Testing/Completion : \$
Total Cost : \$

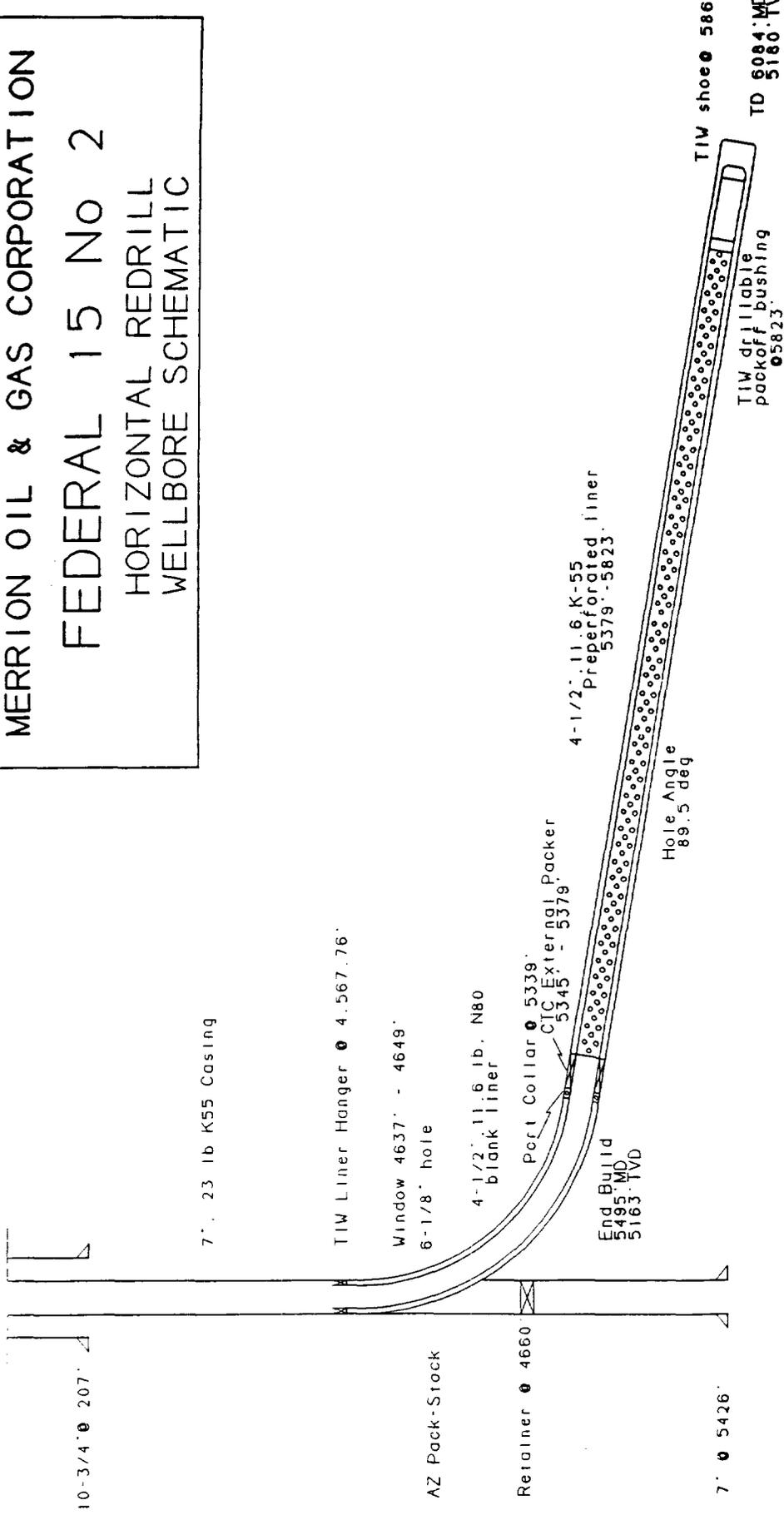
PAPERS WASH. ENTRADA FIELD LOCATION AND NET PAY ISOPACH



ORIGINAL OIL IN PLACE - 4,377,566 BO
EST. PRIMARY RECOVERY - 1,313,270 BO

MERRION OIL & GAS CORPORATION
 FEDERAL 15 No 2
 HORIZONTAL REDRILL
 WELLBORE SCHEMATIC

Elevations 6814' KB
 6804' GL



ADB 02/90

TD 6084' W
 5160' W

II. EXECUTIVE SUMMARY

The Papers Wash oil pool is located in McKinley County, New Mexico, approximately 75 miles southeast of Farmington, New Mexico. It lies in the Chaco Slope province of the San Juan Basin, and was discovered by Dome Petroleum, in October 1976 with the Federal 15 No. 1 well. Papers Wash is typical of Entrada oil pools in the basin, in that it is an oil accumulation in what was once a large Entrada sand dune. The reservoir rock is a very clean, fine to medium grained sandstone with porosity of 25% and air permeabilities between 300 and 800 md. The oil has a gravity of around 32° API, GOR too small to measure, and viscosity of around 8 cp under reservoir conditions. The reservoir drive is base water.

Production histories of this and similar Entrada reservoirs, are characterized by early water cuts which rapidly exceed 99%, often requiring the lifting of fluid volumes in excess of 4,000 BPD to maintain economic oil rates. Well production ceases when the high water cut causes poor economics. The mechanism believed to be responsible for the high water cut during production is the formation of an extensive water cone around the wellbore. This is due to the unfavorable mobility ratio in combination with a thin oil column and the highly permeable reservoir rock, and there is a further possibility that the problem was aggravated by formation damage caused by poor drilling practices.

Based upon studies of previously drilled and tested Entrada wells, there is evidence of severe formation damage, with calculated skins of around +12. The damage mechanism is thought to be principally reduction in relative permeability to oil, due to the increased water saturation around the wellbore caused by filtrate invasion from the drilling fluid. A secondary, and potentially more serious damage mechanism is plugging of the sand face by particles from the mud. Pore sizes measured in a detailed reservoir study of the nearby Eagle Mesa field suggest that the Entrada sandstone may be particularly susceptible to this type of damage.

The objective of the Federal 15 No. 2 horizontal redrill was to determine the economic impact of a horizontal completion on the ultimate recovery of the original oil in place. Intuitive thinking led to the belief that the low unit pressure drawdown of a horizontal wellbore would greatly retard the onset of high water cuts, assuming that the wellbore was placed in a manner which allowed it to avoid intersecting existing water cones, and that it was placed as high as possible above the base of the movable oil.

The Federal 15 No. 2 well was shut in November 1984, after producing almost 120,000 bbls of oil. At the time of shut-in, the well had been producing at a water cut of 99.75%. The well was cased with 7", 23 lb/ft, K-55 grade casing, and had a Reda G-110 electric submersible pump at 3073' on a string of 3-1/2" 9.3 lb/ft J-55 tubing.

Ram Services Rig No. 1 was moved into location on November 15, 1989, to prepare the well for sidetracking through the 7" casing. The 3-1/2" tubing and Reda pump were pulled and laid down, and the well was cleaned out to the Entrada perforations. After running a Schlumberger METT corrosion log in the casing, a cement plug was set above the Entrada perforations. The casing log showed all pipe to be in good condition, except for some minor corrosion around 2,000'. A remedial cement job was then performed in the planned kick-off interval, by perforating at 4,665' and 4610', then setting a cement retainer on wireline at 4,660'. After stinging in and establishing circulation, cement was circulated behind the casing.

After tripping out, the hole was filled with water, and the casing was pressure tested, but took fluid at 2 bbl/min at 700 psi. A 7" packer was run, and the casing leaks were located in the interval between 1,930' and 2,020'. A cement plug was spotted open-ended across the interval, and after pulling out of the plug, the zone was squeezed to 1200 psi. The cement was drilled out, and the casing was pressure tested again, but bled from 1,000 psi to 600 psi in 4 minutes. A dry test indicated fluid entry at about 1 bbl/hr. A bit trip was then made, and the cement was dressed off to the top of the cement retainer.

The well was surveyed with a surface read-out gyro, and a test was made of the Point Lookout formation, by perforating 1,954' to 1,956'. Swabbing failed to produce any oil or gas. Following the test, tubing was run open-ended to 2,020', and injection was established. A balanced plug was set, and after pulling out of the plug, squeezed away to 1500 psi. After WOC, the plug was drilled out and the casing was successfully tested to 1500 psi. The rig was rigged down and moved out on December 5, 1989.

The drilling phase commenced on January 18, 1990, using Walters Drilling Inc., Rig No. 4. Following a slow rig-up, due to heavy snow, an AZ casing whipstock system was oriented to S40°W and used to open a window from 4,637' to 4,649'. This required two days and four runs; a starter mill, two window mills, and a dressing run with a taper mill.

A double bend 4-3/4" downhole motor assembly was picked up and run in the hole to build the angle. The mud system was displaced to a low weight, PHPA polymer mud during the first

bit run. Two runs were made with the assembly, to a depth of 4,987' and an inclination of around 32°, using a conventional steering tool and side entry sub for directional control. At that point, it became apparent that a higher build rate was required to achieve the target, so a short DIR motor with a 3° bent sub was run to continue the angle build. Two runs were made with this motor, to a depth of 5,230' and an inclination of about 65°. At that depth, the motor stalled repeatedly, and was pulled to pick up a new motor. The directional surveys from the steering tool were becoming suspect at that time, as the tool was at its accuracy limit of 60°.

A new motor was picked up, and while making up the orienting sub, the mule shoe key was dropped in the hole. The assembly was run in the hole to the top of the casing whipstock, and a more accurate survey instrument was run. The well was re-surveyed on the trip in the hole, with the new survey placing the wellbore position higher than previously calculated. This eliminated the need for the higher build rate of the short DIR motor, which was tripped back out of the hole. The double bend motor assembly was re-run, and successfully completed the build at 5,495' and 90° inclination. During the run, the Entrada sandstone was encountered 13' TVD high at 5,378' MD, 5,163' TVD. The angle build interval required a total of 5-1/2 days.

A stabilized steerable motor holding assembly was made up and reamed in through the angle build. New hole was drilled to 5,609' MD, at which point the surveys indicated that the assembly was dropping angle mildly. A trip was made, and the assembly was adjusted to give slight build. Drilling proceeded to 5,738, at which depth the assembly was drilled oriented high side in an attempt to stay higher in the structure. A steering tool was used during the slide, and when pulled, bird's nested the line inside the drill pipe. The pipe became temporarily stuck during the removal of the bird's nest, but was freed quickly with rotation after overpull failed to move it.

Drilling proceeded without incident to 5,809', at which depth a reverse drilling break occurred. Examination of the cuttings samples showed that the well had drilled out of the sand, back in to the overlying anhydrite. Drilling continued to a depth of 6084', where a loss of 400 psi of pump pressure was noted. a survey was taken, and the assembly was tripped out of the hole. It was discovered that the downhole motor had parted at the top saver sub, leaving the motor and the bit in the hole. The lateral reach section of the hole took 3 days.

An overshot was dressed with a 4-3/4" spiral grapple, and run in the hole. The fish was tagged, and appeared to be caught by torque and weight indications, but would not come

free with 130,000 lbs overpull. The overshot would not release, and a stringshot was run at 1800' to back off the pipe and allow the kelly to be removed, so that a second stringshot could be pumped down the hole to the overshot. The second stringshot released the overshot, and a fishing assembly consisting of an overshot, bumper sub, jars and accelerators was run twice, without success. The problem was thought to be the overshot working alongside the fish, so a new assembly was run with a bent joint of drillpipe between the overshot and the bumper sub. This assembly failed to pass through the window in the 7" casing, and was pulled to reduce the bend. It hung up at the casing whipstock on the second attempt. Fishing operations took 2-1/2 days.

Fishing operations were terminated as being uneconomic, and a taper mill/string mill assembly was run to dress off suspected damage to the top of the whipstock. A bit was then run to bottom, and the hole was conditioned to run casing.

The 4-1/2" liner string, with a pre-perforated interval, CTC external packer and cementing port collar, was made up and run in the hole. The 2-7/8" stinger and cementing swab assembly was run inside the liner, and the liner hanger was made up. The liner was run in the hole on drill pipe, and was washed to bottom from 5738' to 5864'. After circulating, the liner was hung with the hanger at 4568' and the shoe at 5864', and the running tool was released from the liner.

Cement was batch mixed and displaced down the workstring, but while attempting to inflate the CTC packer, the landing seat for the cementing plug sheared out prematurely, allowing the cement to U-tube through the upper pre-perforated liner interval. The inner string was picked up to the port collar, and the displacement was completed, with 240 psi static pressure at the end of the displacement. The port collar was closed, and the inner string pulled to the top of the liner and circulated out. No cement returns were seen.

The drill pipe and tubing were laid down, and a temperature survey was run inside the 4-1/2" liner, encountering cement inside at 5049', and indicating a cement top outside at the same depth. The rig was released at 0600 hrs, February 5, 1990. Total time on the drilling phase was 17 days.

Merrion Oil & Gas Corp.
Federal 15-2 Champ MS

Input File : F152CH1.SUR

Page 1

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Minimum Curvature Method

Traditional Units

Vertical Section Azimuth : 210.00

M.Depth (ft)	Inc. (deg)	Azimuth (deg)	TVD (ft)	V.Sect (ft)	North (ft)	East (ft)	Closure (ft)	DLS °/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
100.00	0.48	87.08	100.00	-0.23	0.02	0.42	0	0.48
200.00	0.27	230.38	200.00	-0.23	-0.11	0.66	1	0.71
300.00	0.50	161.70	300.00	0.28	-0.67	0.61	1	0.47
400.00	0.42	167.02	399.99	0.84	-1.44	0.83	2	0.09
500.00	0.38	161.45	499.99	1.32	-2.12	1.02	2	0.06
600.00	0.42	182.78	599.99	1.87	-2.80	1.11	3	0.15
700.00	0.42	142.77	699.99	2.34	-3.45	1.31	4	0.29
800.00	0.43	71.30	799.98	2.20	-3.62	1.89	4	0.50
900.00	0.60	49.30	899.98	1.42	-3.16	2.64	4	0.26
1000.00	0.62	42.68	999.97	0.40	-2.42	3.40	4	0.07
1100.00	0.60	29.25	1099.97	-0.65	-1.57	4.03	4	0.14
1200.00	0.68	48.97	1199.96	-1.74	-0.72	4.73	5	0.23
1300.00	0.83	18.50	1299.95	-3.01	0.35	5.41	5	0.42
1400.00	0.97	35.02	1399.94	-4.56	1.73	6.12	6	0.29
1500.00	0.82	24.50	1499.93	-6.12	3.08	6.90	8	0.22
1600.00	0.80	12.50	1599.92	-7.50	4.41	7.35	9	0.17
1700.00	0.60	11.00	1699.91	-8.66	5.61	7.60	9	0.20
1800.00	0.38	16.83	1799.91	-9.47	6.44	7.80	10	0.23
1900.00	0.22	62.12	1899.91	-9.96	6.84	8.06	11	0.27
2000.00	0.17	202.83	1999.91	-9.98	6.80	8.18	11	0.37
2100.00	0.58	192.08	2099.90	-9.35	6.17	8.01	10	0.41
2200.00	0.72	178.22	2199.90	-8.33	5.04	7.93	9	0.21
2300.00	0.78	158.52	2299.89	-7.37	3.78	8.20	9	0.26
2400.00	0.78	141.42	2399.88	-6.70	2.62	8.87	9	0.23
2500.00	0.63	149.17	2499.87	-6.18	1.61	9.58	10	0.18
2600.00	0.68	149.67	2599.87	-5.62	0.63	10.16	10	0.05
2700.00	0.62	138.90	2699.86	-5.15	-0.29	10.81	11	0.14
2800.00	0.47	139.78	2799.85	-4.84	-1.01	11.43	11	0.15
2900.00	0.67	152.68	2899.85	-4.39	-1.85	11.97	12	0.24
3000.00	0.38	155.12	2999.84	-3.88	-2.67	12.37	13	0.29
3100.00	0.08	191.55	3099.84	-3.62	-3.04	12.50	13	0.32
3200.00	0.08	216.00	3199.84	-3.49	-3.16	12.44	13	0.03
3300.00	0.33	219.32	3299.84	-3.13	-3.44	12.22	13	0.25
3400.00	0.55	196.70	3399.84	-2.38	-4.12	11.90	13	0.28
3500.00	0.83	177.08	3499.83	-1.31	-5.30	11.80	13	0.36
3600.00	1.22	148.72	3599.82	-0.19	-6.94	12.39	14	0.63
3700.00	1.93	164.70	3699.78	1.51	-9.47	13.39	16	0.83
3800.00	2.42	157.82	3799.71	3.99	-13.05	14.63	20	0.55
3900.00	2.77	165.05	3899.60	6.99	-17.34	16.05	24	0.48

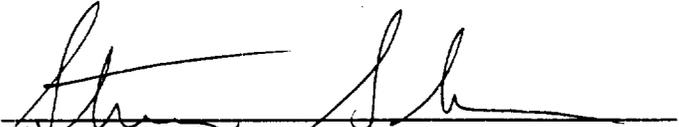
M.Depth (ft)	Inc. (deg)	Azimuth (deg)	TVD (ft)	V.Sect (ft)	North (ft)	East (ft)	Closure (ft)	DLS °/100
4000.00	3.12	166.02	3999.47	10.66	-22.32	17.33	28	0.35
4100.00	2.88	166.48	4099.34	14.44	-27.40	18.57	33	0.24
4200.00	2.58	167.45	4199.22	17.92	-32.04	19.65	38	0.30
4300.00	2.75	165.90	4299.11	21.30	-36.56	20.72	42	0.18
4400.00	2.18	173.40	4399.02	24.55	-40.78	21.53	46	0.65
4500.00	1.97	170.92	4498.95	27.41	-44.37	22.02	50	0.23
4600.00	1.27	153.28	4598.91	29.35	-47.05	22.79	52	0.85
4635.00	0.80	150.00	4633.91	29.69	-47.61	23.08	53	1.35
4676.00	3.00	160.00	4674.88	30.52	-48.87	23.59	54	5.41
4714.00	6.60	176.30	4712.75	32.98	-51.98	24.07	57	10.04
4745.00	10.00	179.60	4743.42	36.78	-56.45	24.21	61	11.07
4776.00	13.30	185.10	4773.78	42.34	-62.70	23.91	67	11.22
4807.00	16.90	188.30	4803.70	49.76	-70.71	22.94	74	11.92
4838.00	20.00	191.40	4833.10	58.98	-80.37	21.24	83	10.49
4870.00	22.10	199.10	4862.97	70.08	-91.42	18.19	93	10.84
4900.00	25.00	202.60	4890.47	81.91	-102.61	13.91	104	10.73
4931.00	28.40	202.70	4918.16	95.72	-115.47	8.54	116	10.97
4962.00	31.90	202.70	4944.97	111.16	-129.83	2.54	130	11.29
4993.00	36.10	203.90	4970.66	128.38	-145.74	-4.33	146	13.72
5024.00	40.30	205.30	4995.02	147.46	-163.16	-12.32	164	13.83
5053.00	44.20	208.30	5016.48	166.92	-180.55	-21.12	182	15.14
5083.00	48.50	210.10	5037.18	188.62	-199.49	-31.72	202	14.98
5117.00	52.30	209.80	5058.85	214.81	-222.18	-44.79	227	11.20
5148.00	56.00	211.70	5077.01	239.93	-243.77	-57.65	250	12.93
5178.00	59.80	211.70	5092.95	265.32	-265.38	-71.00	275	12.67
5216.00	63.90	215.80	5110.88	298.74	-293.22	-89.62	307	14.38
5246.00	66.40	217.10	5123.48	325.79	-315.11	-105.80	332	9.21
5277.00	69.20	218.60	5135.19	354.22	-337.77	-123.41	360	10.08
5309.00	72.70	219.50	5145.64	384.08	-361.25	-142.46	388	11.26
5339.00	74.90	218.80	5154.01	412.52	-383.59	-160.65	416	7.67
5370.00	77.10	217.30	5161.51	442.30	-407.28	-179.19	445	8.51
5401.00	80.40	216.60	5167.55	472.48	-431.57	-197.46	475	10.87
5432.00	84.20	216.10	5171.71	503.01	-456.31	-215.66	505	12.36
5451.00	86.50	216.20	5173.25	521.83	-471.60	-226.83	523	12.12
5484.00	90.00	213.60	5174.25	554.69	-498.65	-245.70	556	13.21
5515.00	90.70	213.20	5174.06	585.63	-524.53	-262.76	587	2.60
5555.00	90.10	212.80	5173.79	625.58	-558.07	-284.55	626	1.80
5610.00	89.60	213.60	5173.93	680.49	-604.09	-314.67	681	1.72
5669.00	89.50	213.60	5174.39	739.37	-653.23	-347.31	740	0.17
5764.00	90.00	214.10	5174.81	834.16	-732.13	-400.23	834	0.74
5857.00	88.60	213.20	5175.94	926.96	-809.54	-451.76	927	1.79
5950.00	88.70	213.60	5178.13	1019.77	-887.16	-502.94	1020	0.44
6012.00	89.60	213.50	5179.05	1081.64	-938.82	-537.20	1082	1.46
6084.00	89.60	213.50	5179.56	1153.51	-998.86	-576.94	1154	0.00

MERRION OIL & GAS CORPORATION

FEDERAL 15 NO. 2 H
1,980' FNL & 990' FWL
Sec. 15, T19N, R5W
McKinley Co., N.M.

STATE OF NEW MEXICO)
) SS
COUNTY OF SAN JUAN)

I, Steven S. Dunn, being first duly sworn, depose and state that the foregoing depth and hole deviation figures are true and correct to the best of my information and belief.



Steven S. Dunn

Subscribed and sworn before me this 9th day of February, 1990.

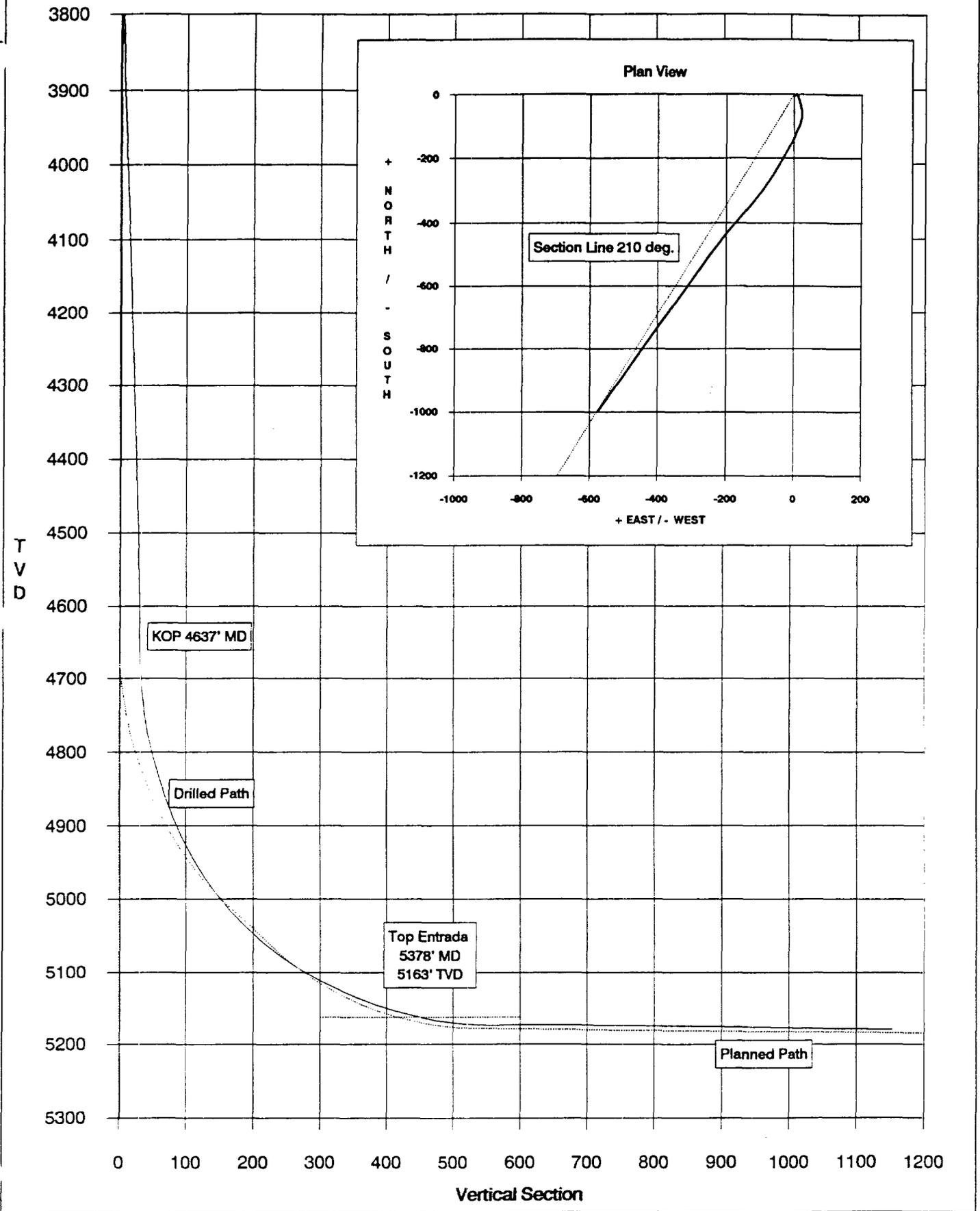


Notary Public

My commission expires:

3-16-90

Federal 15-2 Directional Plot



Note: All in feet

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

WELL API NO. 30-03120499
5. Indicate Type of Lease STATE <input type="checkbox"/> FEE <input type="checkbox"/>
6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)	
1. Type of Well: OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER	7. Lease Name or Unit Agreement Name Federal 15
2. Name of Operator Merrion Oil & Gas Corporaiton	8. Well No. 2 H
3. Address of Operator P. O. Box 840, Farmington, New Mexico 87499	9. Pool name or Wildcat Papers Wash Entrada
4. Well Location Unit Letter <u>E</u> <u>1,980</u> Feet From The <u>North</u> Line and <u>990'</u> Feet From The <u>West</u> Line Section <u>15</u> Township <u>19N</u> Range <u>5W</u> NMPM <u>McKinley</u> County	10. Elevation (Show whether DF, RKB, RT, GR, etc.) <u>6,925'</u>

11. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	PLUG AND ABANDONMENT <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>		CASING TEST AND CEMENT JOB <input type="checkbox"/>	
OTHER: _____ <input type="checkbox"/>		OTHER: <u>Well History</u> <input checked="" type="checkbox"/>	

12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

See attached well history.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Steven S. Dunn TITLE Operations Manager DATE 2/9/90

TYPE OR PRINT NAME _____ TELEPHONE NO. _____

(This space for State Use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

FEDERAL 15 NO. 2

November 15, 1989

MIRU Ram. Build reserve pit. SDON. (CCM)

November 16, 1989

Current Operation: TOH w/ 3-1/2" EUE tubing and Reda pump. (CCM)

November 17, 1989

Finished nipple up BOPs. TIH w/ casing scraper and 6-1/8" bit. Tagged fill @ 5,180' K.B. Drilled out to 5,195' K.B., two foot below Entrada perfs. Very hard drilling. TOH w/ tubing bit and scraper. Rigged up Schlumberger and ran M.E.T.T. casing inspection log from 4,750' K.B. to 4,550' K.B. across kickoff pt. then from D.V. tool @ 2,785' K.B. to 207'. SWI. SDON.

November 18, 1989

TIH open ended to 5,195' K.B. Circulate with rig pump to load the hole with produced water. Circulated oil to rig pit. Rigged up Dowell and mixed and pumped 50 sx Class "G" neat cement. Yield - 1.15 cu ft/sk. Displace to spot (TOC calculated 5,000 ft) and TOH w/ 2-7/8" tbg. Rigged up Schlumberger, perforated squeeze hole 4 shots/ft @ 4,665' K.B. and 4,610' K.B. Ran "Baker" wireline cement retainer and set @ 4,660' K.B. Rigged down wireline. TIH w/ stinger on 2-7/8" EUE tbg. Pressure tested tbg to 2,000 psi. Held good. Stung through retainer. Established injection rate of 3 BPM @ 810 psi. w/ full circulation behind pipe. Shut down. Get cement wt up to 15.6 lb/cuft in tub, mix and pump 35 sx class "G" cement w/ 0.6% fluid loss additive. Displace w/ water to spot. Stung out of retainer. Pulled tbg. to 4,475' K.B. Reversed out 1-1/2 Bbls cement and reversed clean. Pulled 60' of tbg. and SWI. SDON. (CCM)

November 19, 1989

TOH w/ 2-7/8" tbg and retainer stinger. Loaded the hole w/ water to pressure test csg. Pumped into csg @ 2 BPM, 700 psi w/ rig pump. TIH w/ Baker 47 "B" model "C" fullbore packer. Isolated csg leaks to be in 90' section of csg from 1,930' K.B. to 2,020' K.B. All other csg tests to 1,200 psi. 1985' - 2020' pumping @ 920 psi, .5 BPM. 1930' - 1985', 2 BPM @ 700 psi. TOH w/ tbg and removed

November 19, 1989

fullbore pkr and unloader. TIH open ended to 2,044' K.B. Mixed and spotted 75 sx class "G" cement w/ 0.5% fluid loss additive. Displace to spot. Pulled tbg reverse @ 1,662' K.B. Reversed out 1.5 Bbls.cement. Squeeze away 5 Bbls @ 730 psi, .5 BPM. Squeezed 3.25 Bbls away, staging @ 10 to 15 min. intervals, pumping 1/2 to 1/4 Bbls/stage. Squeezed to 1,200 psi. Pressure @ 1,150 psi. in 7 min. SWI. SDOWE. (CCM)

November 20, 1989

Current Operation: SDOWE. (CCM)

November 21, 1989

TOH w/ 2-7/8" tbg. TIH w/ 6-1/8" bit and csg. scraper. Tagged cement @ 1,845' K.B. Drilled good hard cement and fell through @ 2,035' K.B. Pressure tested csg. to 1,000 psi. Bled to 600 psi in 4 min. SWI. SDON. (CCM)

November 22, 1989

TOH w/bit & scraper. TIH with Model "R" packer on 2-7/8" tbg with 62' of tail pipe, set packer @ 1898' KB. Swabbed dry, wait on fluid entry 1 hr, had 200' of entry, approximately 1 bbl/hr water with a skim of oil. Repeated procedure 4 hrs with same result. TOH with Model "R" pkr. SDON. (CCM)

November 23, 1989

TIH w/ bit and scraper. Tag cement @ 4,480'. Drilled very hard cement and cleaned out to retainer @ 4,660'. TOH w/ tbg, bit and scraper. Shut down over long weekend. (Carl)

November 24 - 27, 1989

Shut down over long weekend. (Carl)

November 28, 1989

Current Operation: Rigged up Scientific Drilling International. Ran surface readout Gyro log from retainer @ 4,660' K.B. to surface. Shut well in. SDON. (CCM)

November 29, 1989

Current Operation: Rig up Petro Wireline. RIH w/ perforating gun. Perforate four .50 holes @ 1,954' - 1,956'. RIH w/ pkr and 2-7/8" tbg. Set pkr @ 1,832' - bottom of tbg @ 1,955'. Rig up swab. Made four runs to swab tbg dry. Made five runs, 30 min. apart. Recovered 2 Bbls over tbg capacity. Last two runs dry. Rig up pump. Pressure up to 1,500 psi. Bleed down to 1,100 psi. Pressure up to 1,500 psi. Bleed down to 1,400 psi then broke back to 1,000 psi. Pumped 6 Bbls into perfs @ 1/2 Bbls per min, 800 psi. ISIP: 600 psi. Swab well and recovered tbg capacity plus 1/2 Ebl. Fluid recovered was cloudy, cement colored water. No oil, no gas. (Lack 5-1/2 Bbs for total fluid recovery) SDON. (ARM)

November 29, 1989

Current Operation: Rig up Petro Wireline. RIH w/ perforating gun. Perforate four .50 holes @ 1,954' - 1,956'. RIH w/ pkr and 2-7/8" tbg. Set pkr @ 1,832' - bottom of tbg @ 1,955'. Rig up swab. Made four runs to swab tbg dry. Made five runs, 30 min. apart. Recovered 2 Bbls over tbg capacity. Last two runs dry. Rig up pump. Pressure up to 1,500 psi. Bleed down to 1,100 psi. Pressure up to 1,500 psi. Bleed down to 1,400 psi then broke back to 1,000 psi. Pumped 6 Bbls into perfs @ 1/2 Bbls per min, 800 psi. ISIP: 600 psi. Swab well and recovered tbg capacity plus 1/2 Ebl. Fluid recovered was cloudy, cement colored water. No oil, no gas. (Lack 5-1/2 Bbs for total fluid recovery) SDON.

(ARM)

November 30, 1989

Current Operation: Recovered 6 Bbls over load, water w/ skim of oil, no gas. Preparing to squeeze.

Tbg open overnight. Initial fluid level had 450' of fluid in tbg. First run had a little oil on top then all water. Swabbed well down making one run/hr, getting 1/4 Bbls/hr of dark brown water with a very light film of oil and no gas. Recovered 6 Bbls total fluid today. Unseat pkr and moved to 2,040' K.B. Set pkr and test down tbg to 1,500 psi for 15 min. Held good. Unset pkr and TOH w/ tbg and pkr. (CCM)

December 1, 1989

Current Operation: Finish TOH w/ 2-7/8" tbg and 7" pkr. TIH open ended to 2020' KB. Rigged up Western to spot cement plug. Broke circulation with 15 Bbls water. Injection rate 1/4 Bbl/min @ 800 psi. Mixed and pumped 50 sx Class "H" cement w/ .6% fluid loss additive with yield of 1.05%. Displaced with 10 Bbls water to balance plug. Pull tbg to 1792' KB. Reverse clean with 15 Bbls water. 1-1/2 Bbls cement return to surface. Pull tbg to 1667'. Squeeze away cement. Pumped 1-1/2 Bbls water @ 1500 psi. Held pressure 15 min. Bleed pressure back and recovered 3/4 Bbls water. Pressure up to 1500 psi again, used 3/4 Bbls water, bleed pressure down to 1000 psi and shut well in. WOC. (ARM)

December 2, 1989

Current Operation: TOH w/ 2-7/8" tbg. TIH w/ bit and scraper. Tag cement @ 1,841'. Drill out cement. Fell out of cement @ 2,045'. Circulate hole clean and pressure test casing to 1,500 psi. Okay. Start TOH. SDON.

December 5, 1989

Current Operation: POH laying down 2-7/8" tbg., 7" casing scraper and bit. RIH w/ remaining 2-7/8". POH laying down on racks. Rig down equipment. Rig down unit. SDON. (ARM)

December 8, 1989

Discontinued from morning report pending resumption of drilling operations.

January 19, 1990 (Day No. 1) ON REPORT

PBTD: 4,660'

Current Operation: RIH w/ pack stock.
RU Walters Rig No. 4. Bit No. 1 - 6-1/8" starter mill. Mud - water. (CCM)

HOURLY BREAKDOWN

Rig up	6.5
Drilled rat and mouse hole	1.75
Nippled up BOP	5.75
Made up AZ pack stock assembly	2
RIH picking up drill collars and drill pipe	<u>8</u>
	24

January 20, 1990 (Day No. 2)

TD: 4,643'

Current Operation: TOH w/ window mill. Drilled 6' in last 24 hours. Mud Wt: 8.4, Vis: 36. Bit No. 1 - 6-1/8" starter mill. Bit No. 2 - 6-1/8" window mill. (CCM)

January 21, 1990 (Day No. 3)

TD: 4,649'

Current Operation: Pick up BHA. Drilled 6' in last 24 hours. Mud Wt: 8.6, Vis: 56. Bit No. 3 - 6-1/8" window mill. Bit No. 4 - 6-1/8" taper mill. (CCM)

January 22, 1990 (Day No. 4)

TD: 4,839'

Current Operation: RIH w/ bit No. 6. Drilled 190' in last 24 hours. Mud Wt: 8.4; Vis: 43. Bit No. 5 - 6-1/8" Reed. Bit No. 6 - 6-1/8" HTC M646. (CCM)

January 23, 1990 (Day No. 5)

TD: 4,967'

Current Operation: TIH w/ new bottom hole assembly. (CCM)

January 23, 1990HOURLY BREAKDOWN

PU 8 jts HWDP. RIH to 4,800'	4
Ran and seated steering tool.	
Tagged bottom.	1.25
Drilled to 4,844'. Steering tool failed.	.50
POH to side entry sub. Pulled steering tool. Repaired cable head.	
Reran steering tool - ran to bottom @ 4,844'.	3.25
Drilled from 4,844' - 4,987'. Need more build rate to achieve target.	8
Circulated and pumped slug.	.50
POH. Layed down excess drill pipe.	4.50
Changed bit and motor. RIH.	2

January 24, 1990 (Day No. 6)

TD: 5144'

Current Operation: POH

HOURLY BREAKDOWN

4.75 RIH, LD 4 steel DCs.
 1.75 Ran & seated steering tool, Rn to btm.
 13.50 Drld fr 4987'-5144'.
 .50 Circ, pumped slug.
 3.50 POH to side entry sub, rec steering tool, POH.

January 25, 1990 (Day No. 7)

TD: 5230'

Current Operation: Waiting for new motor.

HOURLY BREAKDOWN

5.50 Finished POH. Changed bit, RIH.
 1.25 Ran steering tool, tagged bottom.
 10.25 Drilled from 5144'-5230'. Slow ROP, motor stalling.
 Lost ± 200 psi off bottom pump pressure - motor failed.
 6.50 Pumped slug, recovered steering tool. POH. LD motor.
 .50 Waited for new Dir 475 motor to arrive at location.

January 26, 1990 (Day No. 8)

TD: 5238'

Current Operation: Drilling

HOURLY BREAKDOWN

4 Waited for new motor to arrive.
 1 Changed top sub on motor to 3-1/2" IF
 2.50 Made up and tested motor, oriented mule shoe key - lost
 key in hole - made new key.
 2.50 RIH to 4700'.
 1.50 Ran Champ II steering tool, made up side entry sub. RIH,
 surveying every 30'.
 .50 Drilled to 5238' to work past junk.
 2.25 POH to side entry sub, recovered steering tool.
 3 POH, LD Dir motor and bent sub
 4.25 Made up double bend motor. RIH.
 1.50 Ran steering tool, side entry sub, tagged bottom.

January 27, 1990 (Day No. 9)

TD: 5,495'

Current Operation: RIH to 4,750'. Drilled 257' in the last 24 hours.

January 28, 1990 (Day No. 10)

TD: 5,609'

Current Operation: RIH. Drilled 114' in the last 24 hours.

January 29, 1990 (Day No. 11)

TD: 5,924'

Current Operation: Drilling. Drilled 315' in the last 24 hours.

January 30, 1990 (Day No. 10)

TD: 6,084' KB

Current Operation: Fishing for mud motor and bit after twist off.
(SSD)

January 30, 1990 (Day No. 12)

TD: 6,084' KB

Current Operation: RIH with overshot.
Drilled 160' in last 24 hours.

January 31, 1990 (Day No. 13)

TD: 6,084'

Current Operation: POH w/ fish.

February 1, 1990 (Day No. 14)

TD: 6,084'

Current Operation: Try to work through window.

February 5, 1990 (Day No. 16)

TD: 6,084' KB

Current Operation: Cementing 4-1/2" liner.

February 6, 1990 (Day No. 17)

TD: 6,084'

Current Operation: Rig down.

February 6, 1990 **OFF REPORT**

Current Operation: Waiting on completion.



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

February 1, 1990

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

Mr. Tommy Roberts
Tansey, Rosebrough,
Gerding & Strother
Attorneys at Law
P. O. Box 1020
Farmington, New Mexico 87499

Re: CASE NO. 9754
ORDER NO. R-9079-A

Applicant:

Merrion Oil and Gas Corporation

Dear Sir:

Enclosed herewith are two copies of the above-referenced
Division order recently entered in the subject case.

Sincerely,

Florene Davidson

FLORENE DAVIDSON
OC Staff Specialist

Copy of order also sent to:

Hobbs OCD x
Artesia OCD x
Aztec OCD x

Other _____



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

December 20, 1939

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

Mr. Tommy Roberts
Tansey, Rosebrough,
Gerding & Strother
Attorneys at Law
P. O. Box 1020
Farmington, New Mexico 87499

Re: CASE NO. 9754
ORDER NO. R-9079

Applicant:

Merrion Oil and Gas Corporation

Dear Sir:

Enclosed herewith are two copies of the above-referenced
Division order recently entered in the subject case.

Sincerely,

Florene Davidson

FLORENE DAVIDSON
OC Staff Specialist

Copy of order also sent to:

Hobbs OCD x
Artesia OCD x
Aztec OCD x

Other _____

State of New Mexico



W.R. HUMPHRIES
COMMISSIONER



OLD -
Case File

Commissioner of Public Lands

P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

November 14, 1989

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

RE: Cooperative Agreement #NM-80104

ATTN: Crystal Williams

Gentlemen:

We received your letter, dated November 13, 1989, and the enclosed Cooperative Agreement between Merrion Oil and Gas and Pitco Production Company. Please be advised that we cannot approve your cooperative agreement because it does not follow the guidelines expressed in New Mexico Statutes or State Land Office Rules. As such, State Lease V-1621 will be considered to produce on a lease basis as governed by the lease contract.

If you have any questions regarding our policies or the formation of a recognized Unit in the State of New Mexico, please contact Susan Howarth at (505) 827-5791.

Very truly yours,

W. R. HUMPHRIES,
COMMISSIONER OF PUBLIC LANDS

BY:

Floyd O. Prando
FLOYD O. PRANDO, Director
Oil and Gas Division
(505) 827-5749



CONSERVATION DIVISION

United States Department of the Interior

NOV 7 AM 8 56

BUREAU OF LAND MANAGEMENT
FARMINGTON RESOURCE AREA
1235 LAPLATA HIGHWAY
FARMINGTON, NEW MEXICO 87401



IN REPLY REFER TO:
NM-80104 (GC)
3180 (019)

YOUR FILE COPY

Merrion Oil and Gas Corporation
P. O. Box 840
Farmington, NM 87499

Gentlemen:

An approved copy of the Cooperative Agreement, McKinley County, New Mexico is enclosed. The agreement has been assigned number NM-80104 and is effective the same date as approved.

You are requested to furnish all interested principles with appropriate evidence of this approval.

If you have any questions, please contact Kenny Howell at (505) 327-5344.

Sincerely,

For Ron Fellows
Area Manager

Enclosures

COOPERATIVE AGREEMENT

FOR HORIZONTAL DRILLING AND THE INJECTION OF GAS AND H₂O

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 H₂O
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.

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 H₂O 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 H₂O 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, H₂O, 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 date injection operations are commenced, and thereafter, all Cooperative Substances producing hereunder (except any part thereof used in conformity with good operating practices for drilling, operating, camp, an other production or development purposes, for pressure maintenance or secondary recovery operations in accordance with a plan of operation approved by the AO, or unavoidably lost), shall be deemed to be produced from the several Tracts of Cooperative Land, and for the purpose of determining any benefits accruing under this Agreement each such Tract 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 any 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 not 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

J. Gregory Merrion
Cooperative Operator
J. Gregory Merrion, President

Bureau of Land Management
Approval:

APPROVED

By: *[Signature]* ^{NOV 06 1989}
Date: For 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 12th day of October, 1989.

My Commission Expires:
12-11-89

[Signature]
Notary Public

Insert

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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	56	9.50	257,450
II	27,100	51	10.50	284,550
III	<u>27,100</u>	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	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 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	PERCENT OF ORRI	NAME OF OWNER & PERCENT OF ORRI	ENTRADA FORMATION WORKING INTEREST	NET PAY% PER ACRE	
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	160.00/a	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%	39.98%

TOTALS 400.00/a
Based upon the above tract participation

TOTALS

100%

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

MOG	86.45%
Pitco	13.55%
Total	100%

**PAPERS WASH FIELD
REMAINING PRIMARY RESERVES**

Navajo 15-4

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

Operating Expense: 182,000 * \$.09 = \$16,380 per month.
 Economic Limit: $\frac{16,380}{18 \times .833 \times .92} = 1187$ BO per month.

Remaining Primary Reserves:

$$N_p = \frac{(2000 - 1187) 12}{.12} = 81,300 \text{ BO} \qquad t = \ln \frac{2000}{1187} = 4.35 \text{ years}$$

Navajo 16-1

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

Operating Expense: 105,800 * \$.09 = \$9,522 per month.
 Economic Limit: $\frac{9,522}{18 \times .833 \times .92} = 690$ BO per month.

Remaining Primary Reserves:

$$N_p = \frac{(800 - 690) 12}{.12} = 11,000 \text{ BO} \qquad t = \ln \frac{800}{690} = 1.23 \text{ years}$$

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 Rospective 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



Notary Public