



## ARCO Permian

600 North Marienfeld  
Midland, TX 79701-4373  
P.O. Box 1610  
Midland, TX 79702-1610  
Telephone 915-688-5570  
Facsimile 915-688-5956  
Email [ecasbee@mail.arco.com](mailto:ecasbee@mail.arco.com)

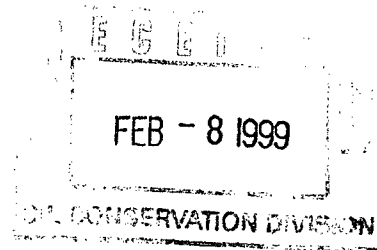
Elizabeth A. Casbeer  
Regulatory/Compliance Analyst

DHC 3/1/99

2209

February 3, 1999

New Mexico Oil Conservation Division  
ATTN: David Catanach  
2040 S. Pacheco Street  
Santa Fe, NM 87505



RE: Application of ARCO Permian  
for Downhole Commingling on  
West Redlake "4" Federal Well Number 2 and  
Lago Rosa "4" Federal Well Number 5  
Red Lake (QGSA) and Empire (Yeso) Fields  
Eddy Co., NM

Mr. Catanach:

ARCO Permian respectfully requests administrative approval for downhole commingling on the West Redlake "4" Federal Well Number 2 and Lago Rosa "4" Federal Well Number 5. Attached are the supporting documents for this application.

If you have any questions, please contact me at 915/688-5570. Please send the approved permit to:

ARCO Permian  
ATTN: E. A. CASBEER, Room 959-54  
P. O. Box 1610  
Midland, TX 79702

Yours very truly,

Elizabeth A. Casbeer  
Regulatory Compliance Analyst

### Attachments

xc: Bureau of Land Management  
Carlsbad Resource Area  
P. O. Box 1778  
Carlsbad, NM 88220  
Larry Henson - EUN  
Dennis Braaten - 62923/MIO  
Donald Knipe - 61323/MIO  
Central Files - 041/MIO  
R/C Files

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88241-1980  
DISTRICT II  
811 South First St., Artesia, NM 88210-2835  
DISTRICT III  
1000 Rio Brazos Rd, Aztec, NM 87410-1693

State of New Mexico  
Energy, Minerals and Natural Resources Department  
OIL CONSERVATION DIVISION  
2040 S. Pacheco  
Santa Fe, New Mexico 87505-6429

Form C-107-A  
New 3-12-96

APPROVAL PROCESS:  
\_\_\_ Administrative \_\_\_ Hearing  
EXISTING WELLBORE  
\_\_\_ YES \_\_\_ NO

APPLICATION FOR DOWNHOLE COMMINGLING

ARCO Permian P.O. Box 1610, Midland, TX 79702

Operator Address  
West Red Lake "4" Fed. No.2 C-4-185-27E Eddy  
Lease Well No. Unit Ltr. - Sec - Twp - Rge County

OGRID NO. Property Code API NO. 30-015-03186 Spacing Unit Lease Types: (check 1 or more)  
Federal ☒ , State , (and/or) Fee

The following facts are submitted in support of downhole commingling:	Upper Zone	Intermediate Zone	Lower Zone
1. Pool Name and Pool Code	Red Lake (QGSA)		Empire (YES0)
2. Top and Bottom of Pay Section (Perforations)	to be perforated 1700'-2250'		2905'-3154'
3. Type of production (Oil or Gas)	Oil		Oil
4. Method of Production (Flowing or Artificial Lift)	Art. Lift		Art. Lift
5. Bottomhole Pressure Oil Zones - Artificial Lift: Gas & Oil - Flowing: Estimated Current All Gas Zones: Measured Current Estimated Or Measured Original	a. (Current) 70 after Perf & Put on Pump b. (Original)	a. b.	a. 75 b.
6. Oil Gravity (° API) or Gas BTU Content	40-42° API		42° API
7. Producing or Shut-In?	Awaiting perfs		Producing
Production Marginal? (yes or no)	Expected in 3 to 6 months		yes
* If Shut-In, give date and oil/gas/water rates of last production Note: For new zones with no production history, applicant shall be required to attach production estimates and supporting data	Date: Rates: N/A	Date: Rates:	Date: Rates: N/A
* If Producing, give date and oil/gas/water rates of recent test (within 60 days)	Date: Rates: N/A	Date: Rates:	Date: 12/5/98 Rates: 9BOPD, 60MCFGPD 23BWPD
8. Fixed Percentage Allocation Formula - % for each zone	Oil: 70 % Gas: 70 %	Oil: % Gas: %	Oil: 30 % Gas: 30 %

9. If allocation formula is based upon something other than current or past production, or is based upon some other method, submit attachments with supporting data and/or explaining method and providing rate projections or other required data.
10. Are all working, overriding, and royalty interests identical in all commingled zones? ☒ Yes \_\_\_ No  
If not, have all working, overriding, and royalty interests been notified by certified mail? \_\_\_ Yes \_\_\_ No  
Have all offset operators been given written notice of the proposed downhole commingling? ☒ Yes \_\_\_ No
11. Will cross-flow occur? \_\_\_ Yes ☒ No If yes, are fluids compatible, will the formations not be damaged, will any cross-flowed production be recovered, and will the allocation formula be reliable. \_\_\_ Yes \_\_\_ No (If No, attach explanation)
12. Are all produced fluids from all commingled zones compatible with each other? ☒ Yes \_\_\_ No
13. Will the value of production be decreased by commingling? \_\_\_ Yes ☒ No (If Yes, attach explanation)
14. If this well is on, or communitized with, state or federal lands, either the Commissioner of Public Lands or the United States Bureau of Land Management has been notified in writing of this application. ☒ Yes \_\_\_ No
15. NMOCD Reference Cases for Rule 303(D) Exceptions: ORDER NO(S). \_\_\_\_\_
16. ATTACHMENTS:  
\* C-102 for each zone to be commingled showing its spacing unit and acreage dedication.  
\* Production curve for each zone for at least one year. (If not available, attach explanation.)  
\* For zones with no production history, estimated production rates and supporting data.  
\* Data to support allocation method or formula.  
\* Notification list of all offset operators.  
\* Notification list of working, overriding, and royalty interests for uncommon interest cases.  
\* Any additional statements, data, or documents required to support commingling.

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

SIGNATURE Elizabeth A. Casbeer TITLE Reg/Comp. Analyst DATE 2/3/99  
TYPE OR PRINT NAME Elizabeth A. Casbeer TELEPHONE NO. ( 915 ) 688-5570

# WELLBORE SCHEMATIC

## ARCO PERMIAN WEST REDLAKE 4 FED. NO. 2

330' FNL & 1550' FWL (C)

Sec. 4, T-18-S, R-27-E,

Eddy County, NM

API: 30-015-03186

Spudded: 05/22/98

Completed: 07/13/98

Surface Casing 8 5/8" 24#  
Cmt'd w/525 sx, Circ.  
Shoe @ 1155'

KB: 3555'

GL: 3548'

Production Casing 5-1/2" 15.5#  
Cement w/650 sx, Shoe @ 3800'  
Cement Circulated to Surface

### Perforations

2905- 3171' (50 shots)

TD @ 3800'

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTOPERATOR'S COPY  
SUBMIT IN DUPLICATE

(See other instructions on reverse side)

FORM APPROVED  
OMB NO. 1004-0137  
Expires: February 28, 1995

## WELL COMPLETION OR RECOMPLETION REPORT AND LOG\*

1a. TYPE OF WELL: OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other _____		5. LEASE DESIGNATION AND SERIAL NO. LC-065478-A	
b. TYPE OF COMPLETION: NEW WELL <input checked="" type="checkbox"/> WORK OVER <input type="checkbox"/> DEEP-EN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. RESVR <input type="checkbox"/> Other _____		6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
2. NAME OF OPERATOR ARCO Permian		7. UNIT AGREEMENT NAME	
3. ADDRESS AND TELEPHONE NO. P.O. Box 1610, Midland, TX 79702		8. FARM OR LEASE NAME, WELL NO. WEST REDLAKE "4" 2 FEDERAL	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface 330' FNL, 1650' FWL At top prod. interval reported below		9. API WELL NO. 30-015-03186	
At total depth		10. FIELD AND POOL, OR WILDCAT EMPIRE (YESO)	
14. PERMIT NO.		DATE ISSUED	
15. DATE SPUDDED 5/22/98		16. DATE T.D. REACHED 5/29/98	
17. DATE COMPL. (Ready to prod.) 7/13/98		18. ELEVATIONS (DF, RKB, RT, GR, ETC.)* 3575	
19. ELEV. CASINGHEAD		20. TOTAL DEPTH, MD & TVD 3350	
21. PLUG, BACK T.D., MD & TVD 3301		22. IF MULTIPLE COMPL., HOW MANY*	
23. INTERVALS DRILLED BY →		ROTARY TOOLS X	
24. PRODUCING INTERVAL(S), OF THIS COMPLETION - TOP, BOTTOM, NAME (MD AND TVD)* 2905-3154 (YESO)		25. WAS DIRECTIONAL SURVEY MADE	
26. TYPE ELECTRIC AND OTHER LOGS RUN		27. WAS WELL CORED N	

28. CASING RECORD (Report all strings set in well)					
CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT PULLED
8-5/8	24	1100	11	CIRC	NA
5-1/2	15.5	3350	7-7/8	CIRC	NA

29. LINER RECORD				30. TUBING RECORD		
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SIZE	DEPTH SET (MD)	PACKER SET (MD)
				2-7/8	2954	

31. PERFORATION RECORD (Interval, size and number) 2905-3154 1 SPF 50 HOLES	32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC. DEPTH INTERVAL (MD) 2905-3154 AMOUNT AND KIND OF MATERIAL USED FRAC W/ 2700 GAL 15% 45500 GAL LINEAR GEL 95325 #SD
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33.* PRODUCTION							
DATE FIRST PRODUCTION 7/13/98		PRODUCTION METHOD (Flowing, gas lift, pumping - size and type of pump) PUMPING				WELL STATUS (Producing or shut-in) PRODUCING	
DATE OF TEST 7/14/98	HOURS TESTED 24	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL - BBL 51	GAS - MCF. 28	WATER - BBL 441	GAS - OIL RATIO 549
FLOW. TUBING PRESS. 70	CASING PRESSURE 70	CALCULATED 24-HOUR RATE →	OIL - BBL	GAS - MCF.	WATER - BBL	OIL GRAVITY - API (CORR.) 40.0	

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) SOLD	TEST WITNESSED BY
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35. LIST OF ATTACHMENTS

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED

TITLE REGULATORY COMPLIANCE

DATE 7/27/98

(See Instructions and Spaces for Additional Data on Reverse Side)

DISTRICT I  
P.O. Box 1880, Hobbs, NM 88241-1880

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised February 10, 1994  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

DISTRICT II  
P.O. Drawer 100, Artesia, NM 88211-0710

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

DISTRICT IV  
P.O. Box 2088, Santa Fe, NM 87504-2088

OIL CONSERVATION DIVISION

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-03186	Pool Code 96210	Pool Name EMPIRE (YESO)
Property Code 22950	Property Name WEST RED LAKE "4" FEDERAL	Well Number 2
OGRID No. 000990	Operator Name ARCO PERMIAN	Elevation 3548

Surface Location

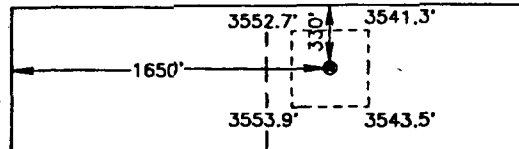
UL or lot No. 7	Section 4	Township 18 S	Range 27 E	Lot Idn	Feet from the 330	North/South line NORTH	Feet from the 1650	East/West line WEST	County EDDY
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Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
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Dedicated Acres 40	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

		NAD27 SPC NME X=514462=E Y=648386=N	
LOT 8 39.92 AC.	LOT 7 39.37 AC.	LOT 6 37.70 AC.	LOT 5 37.73 AC.
LOT 9 38.93 AC.	LOT 10 38.43 AC.	LOT 11 37.23 AC.	LOT 12 37.28 AC.
LOT 16 38.85 AC.	LOT 15 38.64 AC.	LOT 14 37.82 AC.	LOT 13 37.61 AC.
LOT 17 38.64 AC.	LOT 18 38.43 AC.	LOT 19 38.01 AC.	LOT 20 37.80 AC.

**OPERATOR CERTIFICATION**

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

*Elizabeth A. Casbeer*  
Signature  
ELIZABETH A. CASBEER  
Printed Name  
REG. COMP. ANALYST  
Title  
7/27/95  
Date

**SURVEYOR CERTIFICATION**

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

OCTOBER 30, 1997

Date Surveyed JLP  
Signature & Seal of Professional Surveyor  
NEW MEXICO  
11-06-97  
P.W.O. Num. 87-1760  
Certificate No. JOHN E. WEST, 878  
RONALD E. EIDSON, 3238  
G. EIDSON, 12641

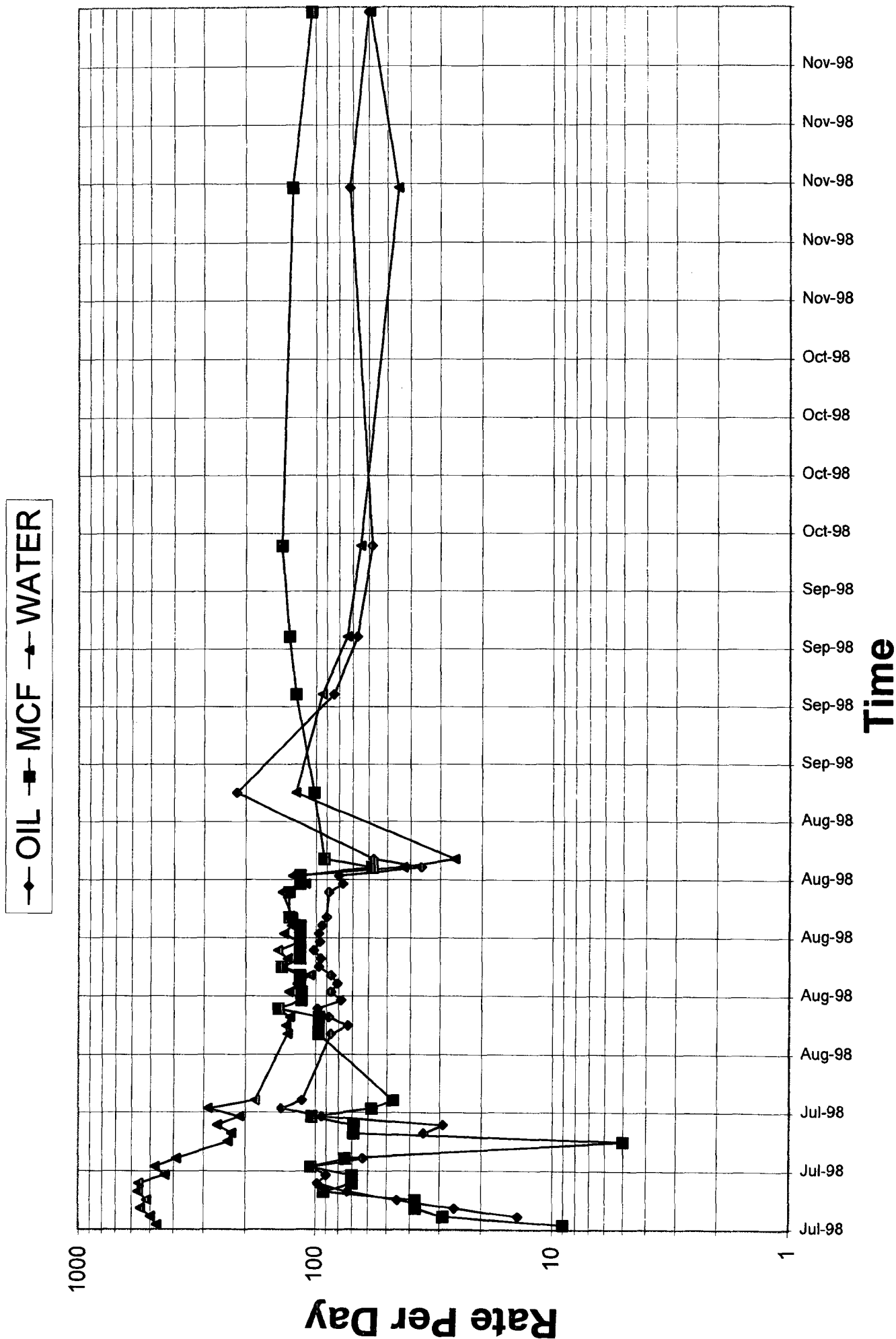
## **West Red Lake "4" Federal No. 2**

### **Allocation Formula**

<b>Well Name</b>	<b>Producing Formation</b>	<b>Daily Production Test (3 mo. Avg. Oct, Nov, Dec. 98')</b>	<b>% of Total</b>
<b>Lago Rosa "4" Federal No. 4</b>	<b>Red Lake (QGSA)</b>	<b>63 BO/123 MCF/56 BW</b>	<b>68 %</b>
<b>Lago Rosa "4" Federal No. 5</b>	<b>NE Red Lake (Glor-Yeso)</b>	<b>30 BO/37 MCF/91 BW</b>	<b>32 %</b>

**The above production test represents stable production from a San Andres producer (Lago Rosa "4" Federal No. 4) and a Yeso producer (Lago Rosa "4" Federal No. 5) . We believe these rates of production represent an acceptable means to allocate production. See attached production plots and tabulated data.**

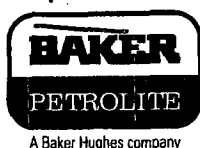
# Lago Rosa "4" Fed #4 (San Andres)



LagoRosa Fed 4 #4

<b>Lago Rosa "4" Federal No. 4</b>				
<b>DATE</b>	<b>WELL</b>	<b>OIL</b>	<b>MCF</b>	<b>WATER</b>
12/5/1998	#4	60	104	59
11/14/1998	#4	72	126	45
10/2/1998	#4	58	140	65
9/21/1998	#4	67	130	74
9/14/1998	#4	84	122	94
9/2/1998	#4	218	102	122
8/25/1998	#4	57	92	26
8/24/1998	#4	36	58	43
8/23/1998	#4	80	117	126
8/22/1998	#4	77	117	111
8/21/1998	#4	88	130	139
8/18/1998	#4	90	130	126
8/17/1998	#4	94	117	127
8/16/1998	#4	97	117	137
8/15/1998	#4	96	117	117
8/14/1998	#4	102	117	145
8/13/1998	#4	95	117	132
8/12/1998	#4	97	140	140
8/11/1998	#4	86	117	106
8/10/1998	#4	81	117	120
8/9/1998	#4	86	115	130
8/8/1998	#4	78	115	115
8/7/1998	#4	98	144	145
8/6/1998	#4	88	97	129
8/5/1998	#4	73	97	134
8/4/1998	#4	86	97	132
7/27/1998	#4	114	47	182
7/26/1998	#4	140	58	288
7/25/1998	#4	94	104	212
7/24/1998	#4	29	69	263
7/23/1998	#4	35	69	229
7/22/1998	#4	0	5	237
7/20/1998	#4	63	75	391
7/19/1998	#4	104	105	479
7/18/1998	#4	90	70	435
7/17/1998	#4	98	70	560
7/16/1998	#4	73	92	564
7/15/1998	#4	45	38	518
7/14/1998	#4	26	38	552
7/13/1998	#4	14	29	500
7/12/1998	#4	0	9	470





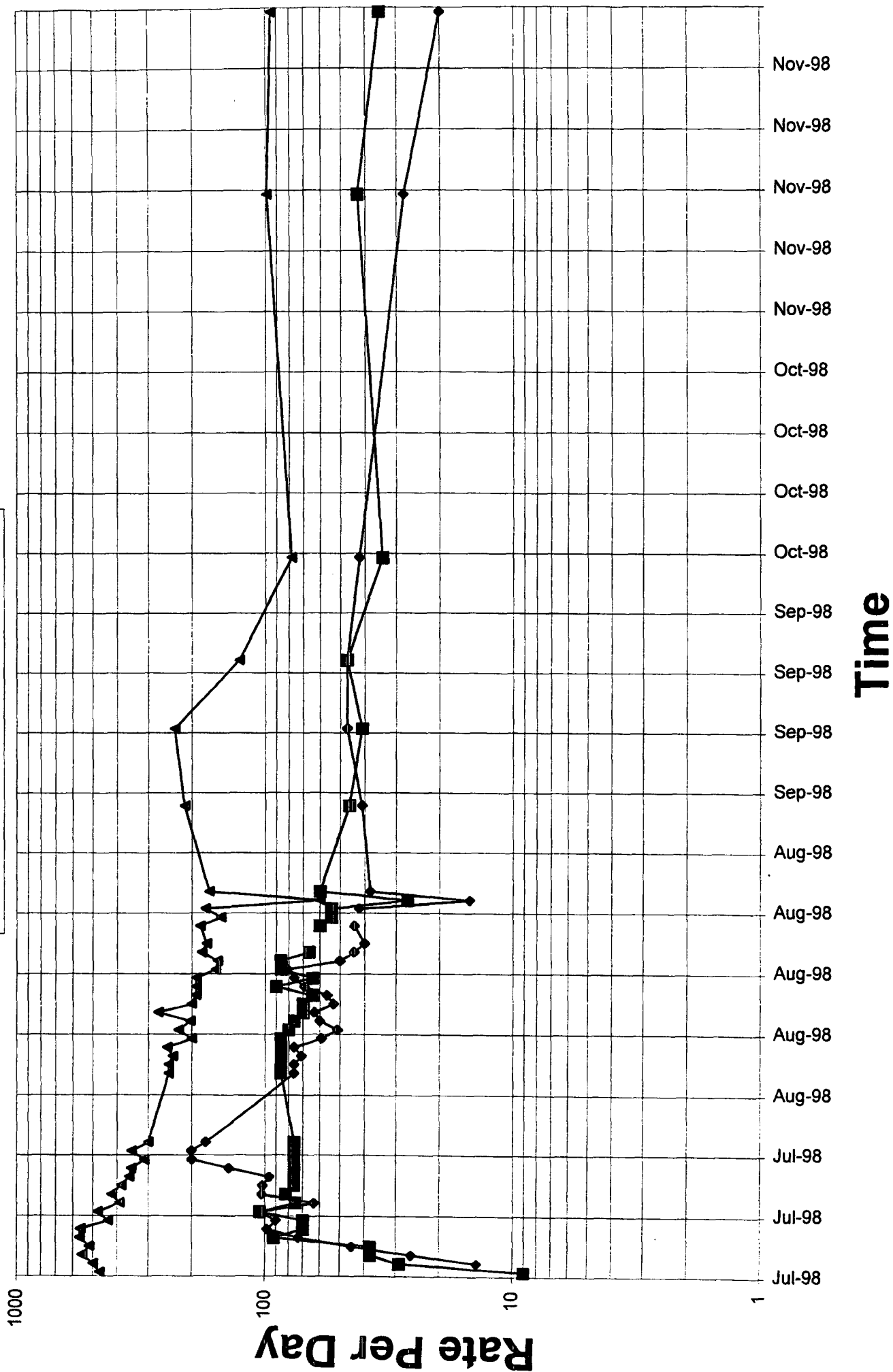
Analysis: 22439

## Water Analysis Report from Baker Petrolite

Summary of Mixing Waters		
Sample Number	106617	106618
Company	ARCO	ARCO
Lease Well Sample Location	WEST RED LAKE (Yeso) 4 FED #2 WELLHEAD	WEST RED LAKE (San Andres) 4 FED #1 WELLHEAD
<b>Anions (mg/L)</b>		
Chloride	89,760	59,004
Bicarbonate	793	964
Carbonate	0.00	0.00
Sulfate	4,229	5,003
Phosphate	0.00	0.00
Borate	0.00	0.00
Silicate	0.00	0.00
<b>Cations (mg/L)</b>		
Sodium	56,118	36,831
Magnesium	641	525
Calcium	2,559	2,662
Strontium	48.0	27.0
Barium	0.10	0.20
Iron	1.00	0.90
Potassium	402	215
Aluminum	0.00	0.00
Chromium	0.00	0.00
Copper	0.00	0.00
Lead	0.00	0.00
Manganese	0.00	0.00
Nickel	0.00	0.00
Anion/Cation Ratio	1.00	1.00
TDS (mg/L)	154,551	105,233
Density (g/cm)	1.10	1.06
Sampling Date	7/23/98	7/23/98
Account Manager	DON BLACKSTOCK	DON BLACKSTOCK
Analyst	SHEILA DEARMAN	SHEILA DEARMAN
Analysis Date		7/29/98
pH at time of sampling	6.10	6.50
pH at time of analysis		
pH used in Calculations	6.10	6.50

# Lago Rosa "4" Fed #5 (Yeso)

◆ OIL    ■ MCF    ▲ WATER



<b>Lago Rosa "4" Federal No. 5</b>				
<b>DATE</b>	<b>WELL</b>	<b>OIL</b>	<b>MCF</b>	<b>WATER</b>
12/5/1998	#5	20	35	95
11/14/1998	#5	28	43	99
10/3/1998	#5	42	34	78
9/21/1998	#5	47	47	128
9/13/1998	#5	47	41	235
9/4/1998	#5	41	46	214
8/25/1998	#5	38	60	170
8/24/1998	#5	15	27	60
8/23/1998	#5	42	54	176
8/22/1998	#5	*	54	152
8/21/1998	#5	44	60	185
8/19/1998	#5	40		174
8/18/1998	#5	44	66	182
8/17/1998	#5	50	86	157
8/16/1998	#5	81	86	160
8/15/1998	#5	76	64	192
8/14/1998	#5	69	90	192
8/13/1998	#5	56	64	192
8/12/1998	#5	53	70	201
8/11/1998	#5	63	70	273
8/10/1998	#5	60	76	203
8/9/1998	#5	51	80	226
8/8/1998	#5	59	86	200
8/7/1998	#5	76	86	252
8/6/1998	#5	71	86	239
8/5/1998	#5	76	86	248
8/4/1998	#5	76	86	248
7/27/1998	#5	175	76	300
7/26/1998	#5	200	76	350
7/25/1998	#5	199	76	311
7/24/1998	#5	141	76	352
7/23/1998	#5	96	76	358
7/22/1998	#5	102	76	385
7/21/1998	#5	103	82	420
7/20/1998	#5	63	75	391
7/19/1998	#5	104	105	479
7/18/1998	#5	90	70	435
7/17/1998	#5	98	70	560
7/16/1998	#5	73	92	564
7/15/1998	#5	45	38	518
7/14/1998	#5	26	38	552
7/13/1998	#5	14	29	500
7/12/1998	#5	0	9	470

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ARCO Permian  
Downhole Commingling  
Lago Rosa "4" Federal Well No. 5  
API: 30-015-30234  
1500' FSL & 1115' FWL (L)  
Section 4, T-18-S, R-27-E  
Eddy County, New Mexico

ARCO Permian  
Downhole Commingling  
West Redlake "4" Federal Well No. 2  
API: 30-015-03186  
330' FNL & 1550' FWL (C)  
Section 4, T-18-S, R-27-E  
Eddy County, New Mexico

### **Surface Owners for Unit L:**

Bureau of Land Management  
Carlsbad Resource Area  
P. O. Box 1778  
Carlsbad, NM 88220

Bogle, Ltd.  
P. O. Box 460  
Dexter, NM 88230-0460

### **Surface Owners for Unit C:**

Bureau of Land Management  
Carlsbad Resource Area  
P. O. Box 1778  
Carlsbad, NM 88220

Bogle, Ltd.  
P. O. Box 460  
Dexter, NM 88230-0460

### **Offset Operators:**

Altura Energy, Ltd.  
Attn: Mr. Jerry D. West  
P.O. Box 4294  
Houston, TX 77210-4294

Devon Energy Corp.  
Attn: Mr. Ken Gray  
20 North Broadway #1500  
Oklahoma City, OK 73102

Exxon Corporation  
P. O. Box 2180  
Houston, TX 77252-2180

### **Offset Operators:**

Altura Energy, Ltd.  
Attn: Mr. Jerry D. West  
P.O. Box 4294  
Houston, TX 77210-4294

Devon Energy Corp.  
Attn: Mr. Ken Gray  
20 North Broadway #1500  
Oklahoma City, OK 73102

Exxon Corporation  
P. O. Box 2180  
Houston, TX 77252-2180

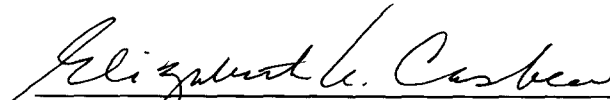
ARCO Permian  
P. O. Box 1610  
Midland, TX 79702

**STATE OF TEXAS**

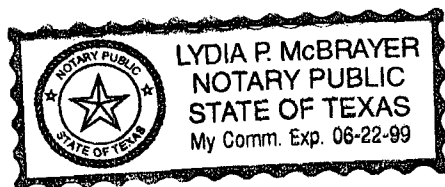
**COUNTY OF MIDLAND**

**BEFORE ME**, the undersigned authority on this day personally appeared Elizabeth A. Casbeer, an Regulatory Compliance Analyst with **ARCO Permian**, who being by me duly sworn, deposes and states that the persons listed on the foregoing attached list have been sent a copy on February 3, 1999, of the New Mexico Oil Conservation Division Form C-107 entitled, "Application For Downhole Commingling" for the West Redlake "4" Federal Well Number 2 and Lago Rosa "4" Federal Well Number 5, located in Section 4, T18S, R27E, Eddy County New Mexico.

**ARCO Permian**

  
Elizabeth A. Casbeer

**SUBSCRIBED AND SWORN TO** before me on February 3, 1999, to certify which witness my hand and seal of office.



  
NOTARY PUBLIC, STATE OF TEXAS