ENERGY AND MINERALS DEPARTMENT

STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [ ] yes [X] no

II. Operator: Marathon Oil Company

Address: P.O. Box 552, Midland, TX 79702

Contact party: Engineering Manager Phone: (915)682-1626

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? [ ] yes [XX] no
If yes, give the Division order number authorizing the project ________.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

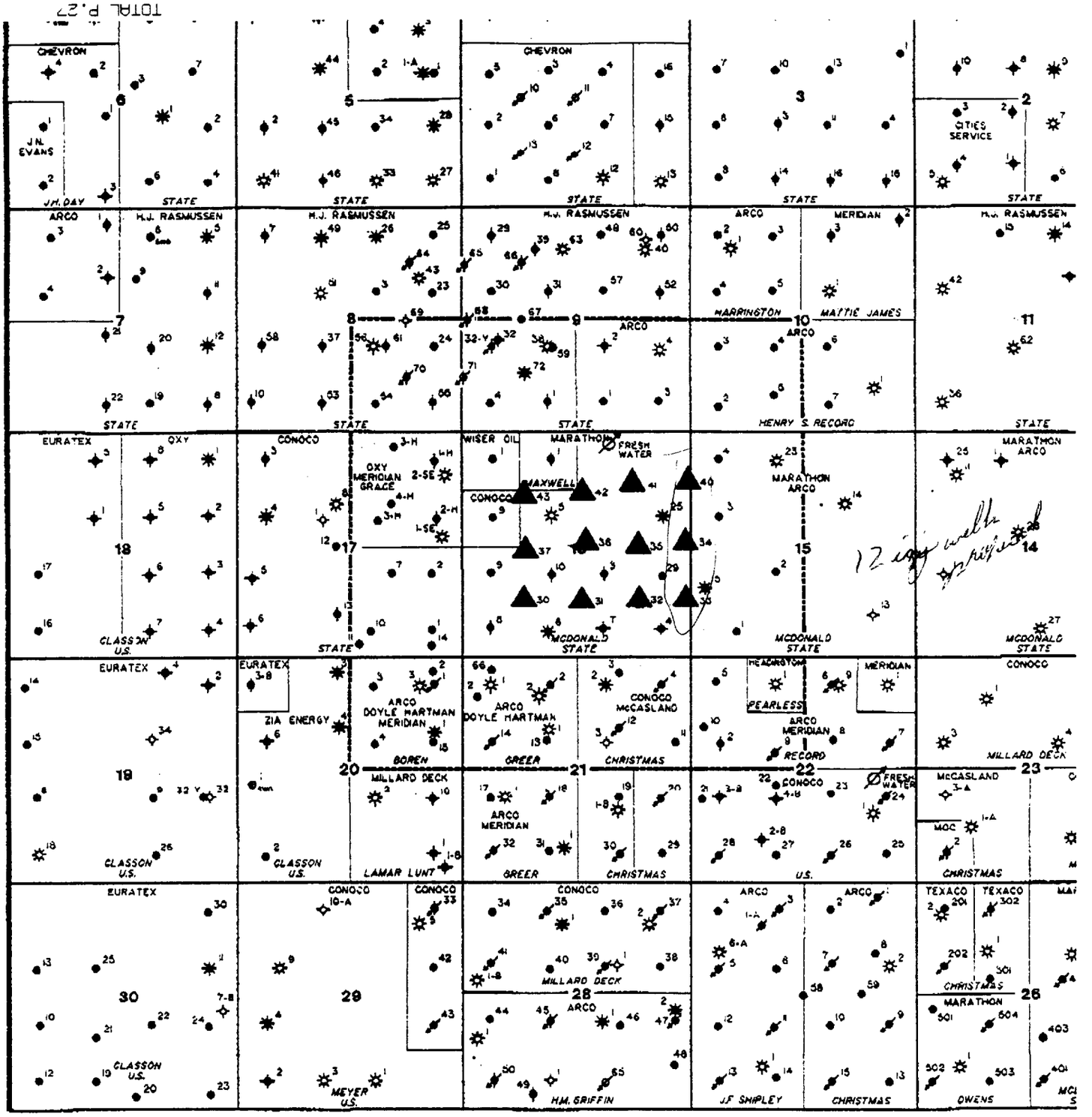
Name: Dave J. Loran Title: Engineering Manager, Midland Oper

Signature: David J Loran Date: 2/22/91

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. ________

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

Marathon Exhibit No. 8
Case No. 10269



MARATHON OIL COMPANY	MID-CONTINENT REGION

McDONALD STATE A/C & 1-A WATERFLOOD

LEA COUNTY, NEW MEXICO

——— AREA OF REVIEW

▲ PROPOSED WATER INJECTION WELL

– 2 P+A'ed wells

OFFSET OPERATORS

MCDONALD STATE ACCOUNT 1 LEASE

ARCO Oil and Gas Company
Box 1610
Midland, Texas 79702

Wiser Oil Company
700 Petroleum Bldg.
Wichita Falls, Texas 76301

Conoco
P. O. Box 1959
Midland, Texas 79702

H. J. Rasmussen
6 Desta Dr. Suite 5850
Midland, Texas 79705

Meridian Oil
21 Desta Dr.
Midland, Texas 79701

OXY USA Incorporated
P. O. Box 1919
Midland, Texas 79702

Doyle Hartman
P. O. Box 10426
Midland, Texas 79701

Headington Oil
7557 Rambler Rd. Suite 1150
Dallas, Texas 75231

Dallas McCasland
P. O. Box 206
Eunice, New Mexico 88231

- EXHIBIT C -

SURFACE OWNERS AND LESSEES

MCDONALD STATE ACCOUNT 1 LEASE

State of New Mexico
C/O Commissioner of Public Lands
P. O. Box 1148
Santa Fe, New Mexico 87504-1148

Dasco Land Corporation
P. O. Box 2545
Hobbs, New Mexico 88240

ATTACHMENT TO FORM C-108

MARATHON'S MCDONALD STATE A/C 1 LEASE

SECTION

III. Well Data: See attached well diagram sheet for proposed injection well schematic and proposed tubular data. All injection wells will be newly drilled wells, no existing wells will be converted to injection service. The next higher zone productive of hydrocarbons in the area around the injection wells is the Jalmat Zone (Jalmat Field) at approximately 3,300'. The next lower zone productive of hydrocarbons in the area is the Strawn Sand (Langley Strawn Field) at approximately 9,900'.

V. Area of Review: See attached map.

VI. Well Data in Area of Review: See attached well data sheets.

VII. 1. Proposed average daily rate 4,800 BWPD, 400 BWPD/Well.
Proposed average maximum daily rate 6,000 BWPD, 500 BWPD/Well.

2. The proposed system will be closed.

3. Proposed average surface injection pressure 1,000 psig.
Proposed maximum surface injection pressure 1,400 psig.
(Note: Applicant is requesting surface injection pressures in excess of 0.2 psi/ft.

4. Injection Water Source: Capitan Reef (Texaco's Jal Water Supply System), Produced Water
Compatibility tests (see attached water analysis)

5. Not applicable.

VIII. Geologic Data Injection Zone: The proposed injection zone will be the bottom 100 feet of the Seven Rivers formation and the entire Queen formation. The productive intervals of the Seven Rivers and Queen formations are fine-grained, well cemented sandstones, interbedded with fine to medium crystalline gray dolomite. The injection interval occurs at a depth of 3,500 to 3,800 feet from the surface.

The underground source of drinking water overlying the zone of injection is the Ogallala, the bottom of which occurs at 215' in Section 16. There are no known sources of drinking water below the zone of injection.

IX. The stimulation program for the proposed injection wells will be to acidize with approximately 5,000 gals. Hydraulic fracturing with 5,000 to 10,000 gals. carrying 1-2 ppg of sand will be considered subject to injectivity testing.

X. Log and test data on each proposed injection well will be forwarded to the Commission as it is obtained.

XI. See attached water analysis sheets for freshwater wells shown on area of review map.

XII. Not applicable.

XIII. Proof of Notice: See attached letter of notice to surface owners, surface lessees and offset operators sent by registered mail and return receipts.

SRB/073.274/sk

PROPOSED INJECTION WELL LOCATIONS

MCDONALD STATE ACCOUNT 1 LEASE

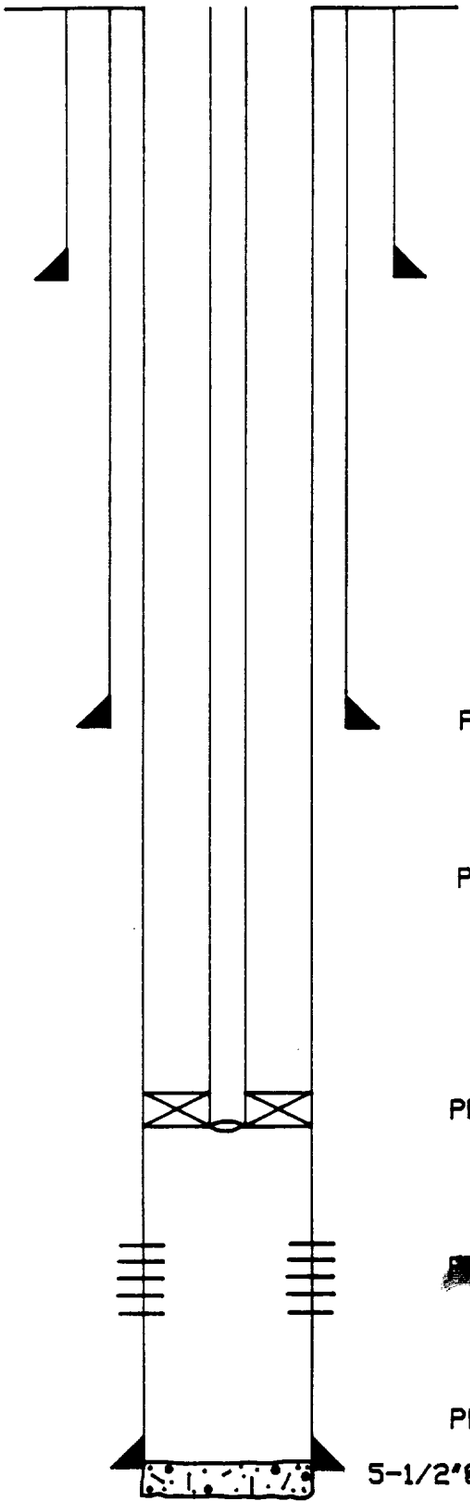
WELL NO.	LOCATION	SECTION	TOWNSHIP, RANGE
30	1,390' FSL & 1,260' FWL	16	T-22-S, R-36-E
31	1,340' FSL & 2,620' FWL	16	T-22-S, R-36-E
32	1,340' FSL & 1,260' FEL	16	T-22-S, R-36-E
33	1,340' FSL & 10' FEL	16	T-22-S, R-36-E
34	2,620' FSL & 25' FEL	16	T-22-S, R-36-E
35	2,660' FSL & 1,310' FEL	16	T-22-S, R-36-E
36	2,620' FSL & 2,650' FWL	16	T-22-S, R-36-E
37	2,620' FSL & 1,330' FWL	16	T-22-S, R-36-E
40	1,340' FNL & 25' FEL	16	T-22-S, R-36-E
41	1,340' FNL & 1,310' FEL	16	T-22-S, R-36-E
42	1,340' FNL & 2,650' FWL	16	T-22-S, R-36-E
43	1,360' FNL & 1,330' FWL	16	T-22-S, R-36-E

TYPICAL
WELL DATA SHEET

MCDONALD STATE A/C 1
SECTION 16, T-22S, R-36E
LEA COUNTY, NEW MEXICO

MARATHON OIL COMPANY

TYPICAL PROPOSED WATER INJECTION WELL



PROPOSED CONDUCTOR CASING: 14", 42# SET @ 40'
CIRC CEMENT TO SURFACE

PROPOSED SURFACE CASING: 8-5/8",24# K-55 SET @ 450', CIRC CEMENT TO SURFACE.

PROPOSED TUBING: [redacted] J-55 SET @ 3550'
[redacted] TUBING.

PROPOSED PACKER: BAKER AD-1 TENSION SET @ 3520'

[redacted] HOLES.

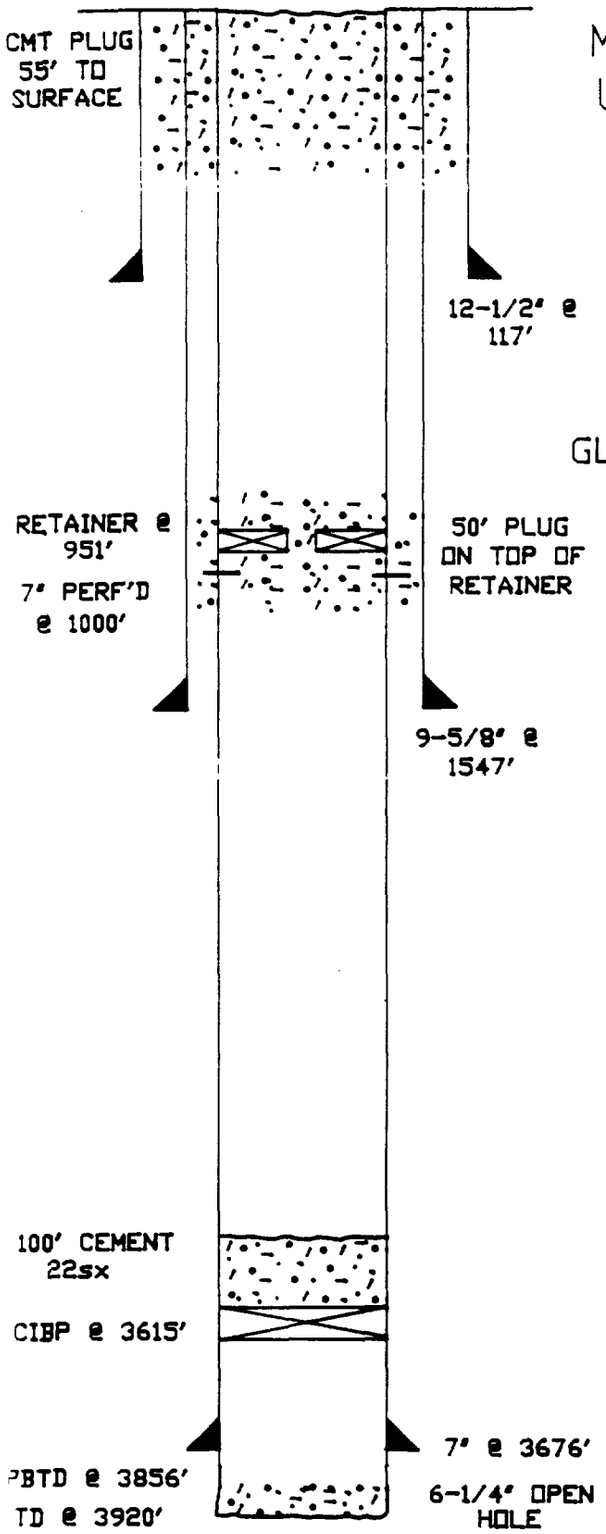
PROPOSED PRODUCTION CASING: 5-1/2", 15.5# K-55 SET @ 3900', CIRC. CEMENT TO SURFACE.

5-1/2"@ 3900'

PROPOSED INJECTION FORMATION: (LOWER SEVEN RIVERS QUEEN) 3500'-3850'.

Limited to Queen

WELL DATA SHEET



MCDONALD STATE A/C 1 NO. 4
UNIT P, 660' FSL & 660' FEL
SECTION 16, T-22S, R-36E
SOUTH EUNICE FIELD
LEA COUNTY, NEW MEXICO
PLUG AND ABANDONED

GL: 3552' KB: 3563' TD: 3920' PBTD: 3856'

SURFACE CASING: 12-1/2",48# SET @ 117',CMT W/100sx

INTERMEDIATE: 9-5/8",40# SET @ 1547', CMT W/1200sx

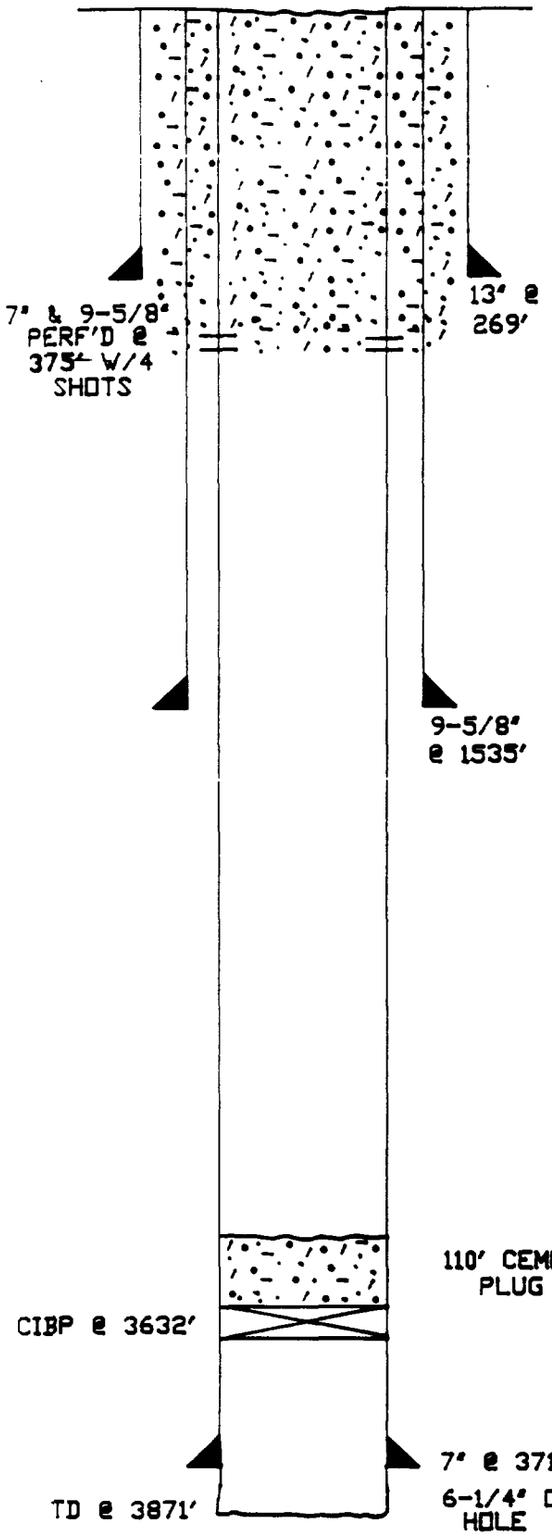
PRODUCTION: 7",24# SET @ 3676', CMT W/400sx

HISTORY: THE MCDONALD STATE A/C 1 NO. 4 WAS DRILLED AND COMPLETED IN MARCH, 1936. IP 35 BOPD, 0 BWPD AND 25 MCFD. 3/38 WELL WAS PLUGGED BACK FROM 3920' TO 3856' IN OCTOBER, 1962 THIS WELL WAS P&A'D AS FOLLOWS: SET CAST IRON BRIDGE PLUG IN 7" CASING @ 3615'. SPOTTED 100' CMT PLUG FROM 3615' TO 3515' W/22sx. PERF'D 7" @ 1000'. SET CAST IRON CEMENT RETAINER @ 951'. CMT W/200sx AND HAD GOOD CEMENT RETURNS TO SURFACE, SPOTTED CEMENT PLUG FROM 55' TO SURFACE. CUT OFF 7" AND INSTALLED WELL MARKER.

WELL DATA SHEET

MCDONALD STATE A/C 1 NO. 7
UNIT O, 660' FSL & 1980' FEL
SECTION 16, T-22S, R-36E
SOUTH EUNICE FIELD
LEA COUNTY, NEW MEXICO
PLUG AND ABANDONED

GL: 3540' KB: 3551' TD: 3871'



CEMENT PLUG FROM 375' TO SURFACE, IN 7" AND 9-5/8" CASING.

SURFACE CASING: 13", 50# SET @ 269', CMT W/200sx

INTERMEDIATE: 9-5/8", 36# SET @ 1535', CMT W/500sx

PRODUCTION: 7", 24# SET @ 3710', CMT W/600sx

HISTORY: THE MCDONALD STATE A/C 1 WELL NO. 7 WAS DRILLED AND COMPLETED IN JULY 1937. IP 90 BOPD. IN OCTOBER, 1962 THIS WELL WAS P&A'D AS FOLLOWS: SET CIBP IN CSG @ 3632', SPOTTED 110' CEMENT PLUG ON TOP OF CIBP. PERF'D 7" W/4 HOLES @ 375'. APPEARED TO HAVE SHOT BOTH 7" AND 9-5/8" CSG. CIRCULATED CEMENT DOWN 7" AND GOT GOOD RETURNS THROUGH 7" AND 9-5/8" ANNULUS SPACE. CLOSED VALVE ON 9-5/8", CONTINUED CIRCULATING CEMENT AND GOT GOOD RETURNS THROUGH 9-5/8" SURFACE CSG ANNULUS SPACE. CUT OFF 7" CSG AND INSTALLED WELL MARKER.

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Marathon McDonald State A/C 1 No. 3	6/35	3,819'	3,748'	13-3/8"	287'	300/Circ	3,581'-3,666'	A 2,000 gal	SI OW	
1,980' FSL and 1,980' FEL				9-5/8"	1,575'	400/732'Cal	3,686'-3,748' OH	A 4,900 gal		
Section 16, T-22-S, R-36-E				7"	3,686'	600/Circ				
Marathon McDonald State A/C 1 No. 4	4/36	3,920'	P&A	13-3/8"	117'	85/Circ	3,676'-3,920' OH	A 3,000 gal	P&A	Well Plugged in 1962
660' FSL and 660' FEL				9-5/8"	1,547'	1,200/Circ		A 3,000 gal		
Section 16, T-22-S, R-36-E				7"	3,676'	400/1944'Cal				
Marathon McDonald State A/C 1 No. 5	12/36	6,202'	3,605'	13-3/8"	270'	800/Circ	3,125'-3,460'	A 6,000 gal	SI GW	
1,980' FNL and 1,980' FWL				9-5/8"	1,453'	400/610'Cal	3,700'-3,813' OH	A 2,000 gal		
Section 16, T-22-S, R-36-E				7"	3,700'	400/1944'Cal		F 45,600 gal., 152,000#		
Marathon McDonald State A/C 1 No. 6	5/37	3,848'	3,635'	13-3/8"	260'	250/Circ	3,058'-3,530'	A 1,000 gal	GW	
660' FSL and 1,980' FWL				9-5/8"	1,619'	500/565' Cal		F 10,000 gal. oil, 10,000#		
Section 16, T-22-S, R-36-E				7"	3,657'	400/1901' Cal				
Marathon McDonald State A/C 1 No. 7	7/37	3,871'	P&A	13"	269'	200/Circ	3,710'-3,871' OH	A 3,000 gal	P&A	Well Plugged in 1962
660' FSL and 1,980' FEL				9-5/8"	1,535'	500/Circ		A 5,000 gal		
Section 16, T-22-S, R-36-E				7"	3,710'	600/Circ		A 8,000 gal		
Marathon McDonald State A/C 1 No. 8	9/37	3,850'	3,756'	13-3/8"	216'	200/Circ	3,526'-3,648'	A 1,000 gal	SI OW	
660' FSL and 660' FWL				9-5/8"	1,545'	600/Circ	3,667'-3,756'	A 6,500 gal		
Section 16, T-22-S, R-36-E				7"	3,667'	600/Circ				
Marathon McDonadl State A/C 1 No. 9	10/37	3,856'	3,856'	13-3/8"	208'	200/Circ	3,566'-3,634'	A 3,000 gal	OW	
1,980' FSL and 660' FWL				9-5/8"	1,513'	500/Circ	3,662'-3,856' OH	A 7,500 gal		
Section 16, T-22-S, R-36-E				7"	3,662'	300/2,345'Cal				

SRB/068.274/kp

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Marathon McDonald State A/C 1 No. 10 1,980' FSL and 1,980' FWL Section 16, T-22-S, R-36-E	4/38	3,850'	3,768'	13-3/8" 9-5/8" 7" 5-1/2" (liner)	255' 1,509' 3,655' 3,597'- 3,846'	200/Circ 200/1088' Cal 500/Circ 68/3597'	3,682'-3,767'	F 10,000 gal oil, 7,500#	SI OW	
Marathon McDonald State A/C 1 No. 29 1,980 FSL and 660' FEL Section 16, T-22-S, R-36-E	4/77	3,997'	3,810'	8-5/8" 4-1/2"	349' 3,997'	410/Circ. 1,450'/Circ.	3,634'-3,806'	A 2,000 gal A 6,000 gal	OW	
Marathon McDonald A/C 1 No. 25 1,980' FNL and 660' FEL Section 16, T-22-S, R-36-E	1/42	3,953	3,654'	12-1/2" 8-5/8" 4-1/2"	191' 1,468' 3,712'	200/Circ 400/Circ 90/3,451' Cal	3,272'-3,422'	A 7,000 gal A 1,500 gal F 45,312 gal, (152,000#)	GW	4-1/2" casing cement squeezed in 1954 by pumping 325 sacks down 4-1/2"-8-5/8" annulus using tubing. Circulated.
Marathon McDonald State A/C 1-A No. 1 660- FSL and 990' FWL Section 15, T-22-S, R-36-E	5/55	3,910'	3,872'	10-3/4" 5-1/2"	362 3,909	200/Circ. 1,750/Circ	3,728'-3,836'	A 1,500 gal F 10,000 gal, 10,000#	OW	
Marathon McDonald State A/C 1-A No. 2 1,980' FSL and 1,980' FWL Section 15, T-22-S, R-36-E	6/55	3,920'	3,919'	9-5/8" 7"	390 3,919	200/Circ. 1,750/Circ.	3,795'-3,911'	A 750 gal F 7,500 gals, 7,500# A 2,200 gal F 36,000 gal, 49,500#	OW	
Marathon McDonald State A/C 1-A No. 3 1,980' FNL and 66' FWL Section 15, T-22-S, R-36-E	8/55	3,905'	3,856'	9-5/8" 7"	394 3,905'	250/Circ. 190/2,950'	3,787'-3,854'	A 500 gals F 7,500 gals, 7,500# F 40,000 gals, 60,000#	OW	

RB/068.274/kp

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Marathon McDonald State A/C 1-A No. 4 660' FNL and 660' FWL Section 15, T-22-S, R-36-E	1/56	3,907'	3,868'	9-5/8" 7"	422' 3,906'	300/Circ. 200/3,205'	3,727'-3,830' 3,727'-3,830'	A 500 gal F 10,000 gal, 10,000# F 10,000 gal, 15,000#	OW	
Marathon Maxwell State No. 1 660' FNL and 1,980' FWL Section 16, T-22-S, R-36-E	9/35	3,926'	3,926'	16" 8-5/8" 7"	120' 1,521' 3,709'	105/Circ 1,000/Circ 600/Circ	3,709'-3,926' OH	A 1,000 gal A 3,000 gal	SI OW	
ARCO McDonald State "WN" No. 23 660' FNL and 1,980' FWL Section 15, T-22-S, R-36-E	5/74	3,710'	3,695'	7-5/8" 4-1/2"	429' 3,710'	250/Surf Cal 500/1320' Cal	3,320'-3,667'	A 2,000 gal F 45,000 gal, 32,000#	GW	
ARCO McDonald State "WN" No. 15 1,650' FSL and 330' FWL Section 15, T-22-S, R-36-E	12/30	3,900'	3,493'	20" 16" 10" 8-5/8" 6-5/8"	255' 542' 1,570' 3009' 3813'	25/230' Cal 75/361' Cal 150/1449' Cal 275/1570' Cal 25/3646' Cal	3,400'-3,493'		GW	Originally Marathon's McDonald State A/C No. 1
Wiser Oil Co. Shell "A" State No. 1 660' FNL and 660 FWL Section 16, T-22-S, R-36-E	5/37	3,872'	3,872'	13-3/8" 9-5/8" 7"	243' 1,467' 3,675'	100/148' Cal 450/519' Cal 250/2577' Cal	3,553'-3,628' 3,675'-3,872' OH	A 1,000 gal F 10,000 gal, 15,000#	OW	
Conoco State "E" No. 9 1,980 FNL and 660' FWL Section 16, T-22-S, R-36-E	8/37	3,868'	3,845'	10-3/4" 7-5/8" 5-1/2"	240' 1,531' 3,663'	175/Surf Cal 425/225' Cal 425/304' Cal	3,663'-3,845' OH	A 1,500 gal A 1,500 gal A 5,000 gal A 5,000 gal	OW	
H. J. Rasmussen State "A" A/C 1 No. 70 1,295 FSL and 1,295' FEL Section 8, T-22-S, R-36-E	11/83	3,900'	3,900'	8-5/8" 5-1/2"	573' 3,900'	375/Surf Cal 950/281' Cal	3,752'-3,889'	A 2,300 gal A 2,000 gal A 2,300 gal A 1,600 gal	SI WIW	
H. J. Rasmussen State "A" A/C 2 No. 55 660' FSL and 660' FEL Section 8, T-22-S, R-36-E	4/61	3,850'	3,840'	8-5/8" 5-1/2"	322' 3,850'	300/Surf Cal 250/2898' Cal	3,774'-3,835'	F 20,000 Gal, 20,000#	SI OW	

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
. J. Rasmussen State "A" A/C 2 No. 72 1,410' FSL and 1,440' FWL Section 9, T-22-S, R-36-E	3/84	3,900'	3,670'	8-5/8" 5-1/2"	598' 3,900'	375/Surf Cal. 950/281' Cal.	3,135'-3,359'	A 1,500 gal F 42,000 gal, 65,000#	GW	
. J. Rasmussen State "A" A/C 2 No. 4 660' FSL and 660' FWL Section 9, T-22-S, R-36-E	7/37	3,878'	3,878'	13-3/8" 8-5/8" 7"	245' 1,505' 3,640'	200/55' Cal. 600/546' Cal. 150/3069'Cal.	3,640'-3,878' OH		OW	
. J. Rasmussen State "A" A/C 2 No. 71 1,295' FSL and 25' FWL Section 9, T-22-S, R-36-E	9/83	3,900'	3,890'	8-5/8" 5-1/2"	588' 3,900'	375/Surf Cal. 950/281' Cal.	3,763'-3,877'	A 1,800 gal A 3,000 gal	SI WIW	
. J. Rasmussen State "A" A/C 2 No. 1 660' FSL and 1,974' FWL Section 9, T-22-S, R-36-E	7/35	3,835'	3,835'	13-3/8" 9-5/8" 7"	249' 1,498' 3,698'	200/59' Cal. 800/Surf Cal. 600/1064' Cal.	3,698'-3,835' OH	A 3,000 gals	TA OW	
RCO State 157 "A" No. 1 660' FSL and 1,980' FEL Section 9, T-22-S, R-36-E	10/36	4,000'	3,700'	13-3/8" 8-5/8" 5-1/2"	224' 1,443' 3,731'	NA 400/803'Cal. 275/2683' Cal.	3,638'-3,673'	A 1,000 gal. F 20,000 gal, 30,000#	OW	
RCO State 157 "A" No. 3 660' FSL and 660' FEL Section 9, T-22-S, R-36-E	5/58	3,850'	3,845'	8-5/8" 5-1/2"	330' 3,850'	250/Surf Cal. 200/3088' Cal.	3,656'-3,782'	F 20,000 gals, 20,000# A 1,000 gals F 18,000 gals, 30,000#	OW	
RCO H.S. Record "WN" No. 2 560' FSL and 660' FWL Section 10, T-22-S, R-36-E	3/58	3,797'	3,796'	8-5/8" 5-1/2"	1,493' 3,796'	500/Surf Cal. 500/2044' Cal.	3,667'-3,795'	A 1,000 gals A 15,000 gals, 15,000# A 1,500 gals F 25,000 gals, 43,000#	OW	

SRB/068.274/kp

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
ARCO H. S. Record "WN" No. 5 860' FSL and 1,980' FWL Section 10, T-22-S, R-36-E	3/81	3,921'	3,880'	8-5/8" 5-1/2"	1,100' 3,921'	800/Surf Cal. 1,350'/Surf Cal.	3,690'-3,865'	A 1,000 gals F 38,250 gals, 87,000#	OW	
Meridian Oil, Inc. Citgo "SE" State No. 2 990' FNL and 330' FEL Section 17, T-22-S, R-36-E	7/77	3,900'	3,875'	8-5/8" 4-1/2"	442' 3,900'	300/Surf Cal. 950/1148' Cal.	3,645'-3,805'	A 5,000 gals F 53,000 gals, 90,000#	GW	
Oxy USA, State "H" No. 1 660' FNL and 660' FEL Section 17, T-22-S, R-36-E	10/37	3,914'	3,914'	13" 9-5/8" 7"	234' 1,471' 3,680'	25/28 Cal. 450/523 Cal. 200/2802' Cal.	3,680'-3,914' OH	A 4,000 gals	SI OW	
Meridian Oil Citgo "SE" State No. 1 2,310' FNL and 480' FEL Section 17, T-22-S, R-36-E	3/77	3,850'	3,810'	8-5/8" 4-1/2"	423' 3,850	225/Surf Cal. 1,550/Surf. Cal.	3,637'-3,791'	A 50,000 gals F 55,000 gals, 95,000#	GW	
Oxy USA State H No. 1 1,980' FNL and 660' FEL Section 17, T-22-S, R-36-E	10/55	3,815'	3,815'	8-5/8" 5-1/2"	1,427' 3,691	600/Surf Cal. 250/2739' Cal	3,470'-3,585' 3,691'-3,815' OH	A 500 gals F 6,000 gals, 6,000# A 500 gals F 15,000 gals, 15,000#	SI OW	
Conoco State "E" No. 2 1,980' FSL and 660' FEL Section 17, T-22-S, R-36-E	12/37	3,858'	3,858'	10-3/4" 7-5/8" 5-1/2"	291' 1,476' 3,714'	225/73' Cal. 450/93' Cal. 425/355' Cal.	3,672'-3,712' 3,714'-3,858' OH	A 1,000 gls A 3,780 Gals	OW	
~~Conoco State "E" No. 14~~ ~~330' FSL and 660' FEL~~ ~~Section 17, T-22-S, R-36-E~~	3/89	9,700'		13-3/8" 8-5/8" 5-1/2"	1,365' 6,415' 6080'-9700' (Line)	~~1,300/130'~~ Cal. ~~1,800/3537'~~ Cal. ~~500/6271'~~ Cal.	9,066'-9,530'	A 5,000 gals	OW	

SRB/068.274/kp

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PERFORATED INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Conoco State "E" No. 1 660' FSL and 660 FEL Section 17, T-22-S, R-36-E	9/37	3,842'	3,842'	10-3/4" 7-5/8" 5-1/2"	379' 1,495' 3,663'	285/64' Cal. 700/Surf. Cal. 425/304'Cal.	3,663'-3,842' OH	A 1,000 gals A 2,000 gals A 5,000 gals	OW	
ARCO Langley Boren No. 2 330' FNL and 660' FEL Section 20, T-22-S, R-36-E	11/88	10,100	9,531'	13-3/8" 8-5/8" 5-1/2"	1,400' 6,405' 6189'-10100' (Line)	1,175/284' Cal. 1,835/3471' Cal. 975'/6386' Cal.	9,062'-9,612'	A 11,354 gals	OW	
Conoco SRQU No. 1 660' FNL and 660' FEL Section 20, T-22-S, R-36-E	4/37	3,830'	3,830'	13-3/8" 9-5/8" 7"	211' 1,490' 3,687'	250/Surf Cal. 400/647' Cal 300/2370' Cal.	3,687'-3,830' OH	A 2,000 gals A 4,000 gals A 2,000 gals	WIW	
Doyle Hartman Boren & Greer Gas Com No. 3 660' FNL and 940' FEL Section 20, T-22-S, R-36-E	6/82	3,600'		8-5/8" 5-1/2"	457' 3,600'	275/Surf Cal. 830/438' Cal.	2,978'-2,986'	A 1,000 gals F 6,000 gals, 34,000#	TA GW	
Conoco SRQU No. 4 660' FNL and 660' FEL Section 21, T-22-S, R-36-E	5/36	3,884'	3,884'	13-3/8" 9-5/8" 7"	203' 1,502' 3,688'	150/60' Cal. 450/554'Cal. 225/2700' Cal.	3,689'-3,884' OH	A 4,000 gals.	WIW	
Dallas McCasland Devonian Christmas #2 660' FNL and 1,980' FEL Section 21, T-22-S, R-36-E	6/37	3,855'	3,360'	13-3/8" 9-5/8" 7"	192' 1,531' 3,688'	150/49' Cal. 375/741' Cal. 225/2700' Cal.	3,120'-3,370'	A 5,000 gals	GW	
Conoco SRQU No. 3 330' FNL and 1,650' FEL Section 21, T-22-S, R-36-E	1/56	3,842	3,806'	8-5/8" 5-1/2"	299' 3,841'	300/Surf Cal. 750/984' Cal.	3,768'-3,800'	F 10,000 gals, 10,000#	OW	

SRB/068.274/kp

WELL DATA

AREA OF REVIEW: MCDONALD STATE A/C 1 LEASE

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PERFORATED INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
onoco SRQU No. 2 660' FNL and 1,980' FWL Section 21, T-22-S, R-36-E	2/37	3,794'	3,794'	13-3/8" 9-5/8" 7"	202' 1,522' 3,693'	25/178' Cal. 450/574' Cal. 325/2226' Cal.	3,693'-3,794' OH	A 6,000 gals	WIW	
oyle Hartman Boren & Greer No. 2 890' FNL and 1,780' FWL Section 21, T-22-S, R-36-E	6/78	3,800'	3,410'	8-5/8" 5-1/2"	450' 3,800'	280/Surf Cal. 450/2086' Cal.	3,178'-3,380'	F 43,840 gals, 43,500#	TA GW	
oyle Hartman Boren & Greer Gas Com #1 660' FNL and 660' FWL Section 21, T-22-S, R-36-E	6/37	3,830'		13-3/8" 9-5/8" 7" 5"	214' 1,537' 2,923' 3,678'	200/24' Cal. 800/Surf Cal. 400/1167' Cal. 100/2904' Cal.			SI GW	
RCO Langley Greer No. 2 890' FNL and 330' FWL Section 21, T-22-S, R-36-E	5/90	9,800'	9,350'	13-3/8" 8-5/8" 5-1/2"	394' 4,007' 9,800'	420/Surf Cal. 2,200/487' Cal. 1,415/4410' Cal.	9,006'-9,160'	A 2,250 gals	OW	
onoco SRQU No. 66 330' FNL and 660' FWL Section 21, T-22-S, R-36-E	4/75	3,900'	3,884'	8-5/8" 5-1/2"	510' 3,900'	275/Surf Cal. 150/3329' Cal.	3,604'-3,815'	A 300 gals F 15,000 gals, 30,000#	OW	
eadington Oil Peerless, et al Com #1 660' FNL and 1,980' FWL Section 22, T-22-S, R-36-E	1/54	3,492'		9-5/8" 7"	1,600' 3,492'	750/19' Cal. 708/384' Cal.	3,350'-3,478'		GW	
onoco SRQU No. 5 660' FNL and 660' FWL Section 22, T-22-S, R-36-E	10/35	3,844'	3,844'	13-3/8 9-5/8 7"	157' 1,560' 3,664'	NA 1,000/Surf Cal. 450/1688' Cal.	3,664'-3,844' OH	A 3,000 gals	OW	

P O BOX 1468
MONAHANS, TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 191128

TO: Mr. Jim Keil
P. O. Box 552, Midland, TX 79702

SAMPLE RECEIVED 1-18-91
RESULTS REPORTED 1-18-91

COMPANY Marathon Oil Company LEASE McDonald Acct.
FIELD OR POOL
SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Produced water - taken from heater-treater @ #1-A. 1-18-91
NO. 2 Raw water - taken from Texaco Supply Line. 1-18-91
NO. 3
NO. 4
REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0265	1.0075		
pH When Sampled	6.8	6.8		
pH When Received	6.98	6.79		
Bicarbonate as HCO_3	1,781	1,098		
Supersaturation as $CaCO_3$	0	0		
Undersaturation as $CaCO_3$	--	--		
Total Hardness as $CaCO_3$	8,100	2,700		
Calcium as Ca	940	660		
Magnesium as Mg	1,397	255		
Sodium and/or Potassium	10,819	2,186		
Sulfate as SO_4	2,038	1,388		
Chloride as Cl	19,885	3,622		
Iron as Fe	0.04	0.08		
Barium as Ba	0	0		
Turbidity, Electric	38	261		
Color as Pt	25	20		
Total Solids, Calculated	36,861	9,209		
Temperature °F.	65	60		
Carbon Dioxide, Calculated	463	285		
Dissolved Oxygen,	0.000	*		
Hydrogen Sulfide	159	477		
Resistivity, ohms/m at 77° F.	0.220	0.750		
Suspended Oil	27	500		
Filtrable Solids as mg/l	22.3	71.4		
Volume Filtered, ml	750	650		
Results Reported As Milligrams Per Liter				
Additional Determinations And Remarks	*Unable to determine due to high oil content.			

It is apparent in the turbidity readings of the mixtures that due to the substantial amount of oil in the supply water, they do not reflect what would be expected from any influence from compatibility but rather reflect oil separation at different rates. A careful examination of the analytical results has revealed no evidence of any potential incompatibility between these waters, therefore clearly indicating that no scaling potential or precipitation would be expected to result from combining these waters. We do note that the supply water has a rather high level of

- CONTINUED ON PAGE 2 -

Form No. 3

By ___

17

P O BOX 1468
MONAHANS, TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 191128 (Page 2)

TO: Mr. Jim Keil
P. O. Box 552, Midland, TX 79702

SAMPLE RECEIVED 1-18-91

RESULTS REPORTED 1-18-91

COMPANY Marathon Oil Company LEASE McDonald Acct.

FIELD OR POOL

SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Mixture of 25% Produced Water and 75% Supply Water.

NO. 2 Mixture of 50% Produced Water and 50% Supply Water.

NO. 3 Mixture of 75% Produced Water and 25% Supply Water.

NO. 4

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.				
pH When Sampled				
pH When Received				
Bicarbonate as HCO_3				
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$				
Calcium as Ca				
Magnesium as Mg				
Sodium and/or Potassium				
Sulfate as SO_4				
Chloride as Cl				
Iron as Fe				
Barium as Ba				
Turbidity, Electric - actual	175	153	59	
Color as Pt				
Total Solids, Calculated				
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide				
Resistivity, ohms/m at 77° F.				
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				
Theoretical Compatible Turbidity	205	150	94	

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks suspended oil, but we suspect this is at least partially the result of the sample point. However, some oil would be expected to be present in this supply water. We note in our microscopic examination of the suspended solids that the particles were all extremely fine material associated with the suspended oil. Therefore, the level of the filtrable solids is of questionable significance in regard to injection quality.

Form No. 3

By W C Martin

Waylan C. Martin, M.A.

P O BOX 1468
MONAHANS TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 191127

TO: Mr. Jim Keil
P. O. Box 552, Midland, TX 79702

SAMPLE RECEIVED 1-15-91
RESULTS REPORTED 1-18-91

COMPANY Marathon Oil Company LEASE McDonald Acct. #1

FIELD OR POOL

SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Raw water - taken from North Ranch water well. 1-15-91

NO. 2 Raw water - bailed from South Ranch water well. 1-15-91

NO. 3

NO. 4

REMARKS: Samples taken by Tom Elrod, Martin Water Laboratories, Inc.

CHEMICAL AND PHYSICAL PROPERTIES				
	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0019	1.0023		
pH When Sampled				
pH When Received	7.50	7.39		
Bicarbonate as HCO_3	249	57		
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	300	485		
Calcium as Ca	80	102		
Magnesium as Mg	24	56		
Sodium and/or Potassium	96	150		
Sulfate as SO_4	92	3		
Chloride as Cl	148	540		
Iron as Fe	0.22	40.0		
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	689	908		
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide	0.0	0.0		
Resistivity, ohms/m at 77° F.	10.44	5.24		
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				
Nitrate, as N	0.5	0.7		

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

Form No. 3

By

Waylan C. Martin, M.A.