Unocal North American
Oil & Gas Division
Unocal Corporation
1004 North Big Spring, P.O. Box 671
Midland, Texas 79702
Telephone (915) 682-9731

UNOCAL 76

March 30, 1992

Southwestern Region
Andrews District

State of New Mexico
Energy & Minerals Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Dear Sirs:

Please find attached the original and one copy of Form C-108, Application for Authorization to Inject, and its supporting documents. This application is to convert our State 35 #6 well to disposal in order to economically handle produced water from other wells on the lease.

If you should require further information or would like to discuss this application, I may be reached at the letterhead address or by phone at (915) 682-9731.

Sincerely,

Union Oil Company of California
dba UNOCAL

Greg Fitzgerald
Senior Petroleum Engineer

GNF:ren

Attachment

cc: OCD Hobbs District Office

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

OIL CONSERVATION DIVISION
RECEIVED
MAR 31 01

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Union Oil Company of California

Address: P.O. Box 3100, Midland, Texas 79702

Contact party: Greg Fitzgerald Phone: 915/682-9731

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 ☒ 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: Greg Fitzgerald Title Senior Petroleum Engineer

Signature: _____ Date: 3/30/92

* 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. Item X - Logs submitted with Form C-105 upon completion (approximately 12/12/89).

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

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

CALCULATED CEMENT TOPS for AREA OF REVIEW RANDOM GROUP

Proposed Injection Well: UNOCAL - State 35 No. 6 - Maljamar (GSA) Unit
Proposed Injection Zone: 4378 to 4764 Formation: Grayburg/San Andres
Minimum Required TOC: 3878 Feet Yield: 70%

Well Name	No.	Type	T.D.	Casing	Depth	Borehole	Cement	TOC	Remarks
State "CL"	#1	PROD	8880	11.75	315	15.5	250 sx	(56)	
				8.625	3095	10.25	250	1,861	
				4.5	8879	6.875	1600	(90)	
State "CM"	#2	PROD	8890	11.75	315	15.5	300 sx	(130)	
				8.625	3199	10.25	250	1,965	
				4.5	8890	6.875	1250	1,883	
State 35	#2	PROD	8805	11.75	352	15.5	400 sx	(241)	
				8.625	3110	10.25	500	641	
				4.5	8804	6.875	300	7,122	
Wyatt "A"	#9	PROD	8925	11.75	299	15.5	375 sx	(257)	
				8.625	3149	10.25	775	(678)	
				5.5	8925	6.875	450	4,920	
State 35	#1	PROD	8812	11.75	360	15.5	275 sx	(48)	
				8.625	3805	10.25	500	1,336	
				5.5	8795	6.875	500	4,345	
State 35	#4	PROD	4281	8.625	356	12.25	175 sx	6	
				5.5	4000	7.25	635	(310)	
								ERR	
Lea State "K6"	#1	PROD	8870	8.625	3255	10.25	150 sx	2,514	
				7	6930	8.25	150	5,738	
				4.5	8869	6.25	285	6,575	Top of 4.5" Liner @ 6812'
Corbin State	#1	PROD	4100	13.375	292	17	350 sx	(189)	
			PBTD	8.625	2780	12.25	1200	378	
				4.5	4100	6.875	485	1,381	
Philmex	#21	PROD	4800	8.625	1490	14.25	1000 sx	313	
				5.5	4800	7.75	800	736	
								ERR	
Philmex	#25	PROD	4800	8.625	1500	14.25	1000 sx	323	
				5.5	4000	8.25	1400	(1,607)	
								ERR	

Numbers in () denote negative values, i.e., cement circulated to surface.

UNOCAL'S FIGURES INDICATE TOC @ 4437'
WILL STILL NEED TO SQZ AFTER CHECKING WITH CHEVRON TO MAKE SURE AVAIL. CMT. DATA IS GOOD. IF CHEVRON'S RECORDS INDICATE CEMENT ABOVE REQUIRED INTERVAL (TO AT LEAST 3900'), WILL GO AHEAD & APPROVE.

VI.

Well	Type	Construction	Date Drilled	Location	Depth	Completion
State "CL" #1	Oil	11-3/4" csg @ 315' w/250 sx 8-5/8" csg @ 3095' w/250 sx 4-1/2" csg @ 8879' w/1600 sx	5/18/62	330' FNL, 1980' FWL, Sec. 2 T-18-S, R-33-E, Lea County, New Mexico	8880'	Perf'd 8702-98 Abo Formation
State "CL" #3	Oil	11-3/4" csg @ 315' w/300 sx 8-5/8" csg @ 3200' w/250 sx 4-1/2" csg @ 8890' w/?	7/12/62	330' FNL, 990' FWL, Sec. 2 T-18-S, R-33-E, Lea County, New Mexico	8890' PBTD 8650	Initial Completion 8776-8812 Abo Formation Recomplete 4771-4833 Grayburg Formation
State "CM" #2	Oil	11-3/4" csg @ 315' w/300 sx 8-5/8" csg @ 3199' w/250 sx 4-1/2" csg @ 8890' w/1250 sx	7/11/62	825' FNL, 1980' FEL, Sec. 2 T-18-S, R-33-E, Lea County, New Mexico	8890'	Perf'd 8704-43 Abo Formation
Wyatt "A" #9	Oil	11-3/4" csg @ 299' w/375 sx 8-5/8" csg @ 3149' w/775 sx 5-1/2" csg @ 8925' w/450 sx	10/24/62	500' FSL, 330' FEL, Sec. 34 T-17-S, R-33-E, Lea County, New Mexico	8925'	Perfs 8824-38 Abo Formation
State 35 #1	Oil	11-3/4" csg @ 360' w/275 sx 8-5/8" csg @ 3805' w/500 sx 5-1/2" csg @ 8795' w/500 sx	4/1/62	760' FSL, 330' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	8812'	Openhole 8795-8812 Abo Formation
State 35 #2	Oil	11-3/4" csg @ 352' w/400 sx 2-5/8" csg @ 3110' w/500 sx 4-1/2" csg @ 8804' w/300 sx	8/17/62	330' FSL, 1650' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	8805'	Perf'd 8766-8800 Abo Formation
State 35 #3	Oil	11-3/4" csg @ 350' w/275 sx 8-5/8" csg @ 4032' w/550 sx 4-1/2" csg @ 8793' w/450 sx	12/9/62	1650' FSL, 330' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	8794'	Perf'd 8742-77 Abo Formation
State 35 #4	Oil	8-5/8" csg @ 356' w/175 sx 5-1/2" csg @ 4000' w/635 sx	11/24/76	1750' FSL, 330' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	4000'	Perf'd 3873-3901 Queen Formation
State 35 #5	Oil	8-5/8" csg @ 1610' w/775 sx 5-1/2" csg @ 4803' w/965 sx	2/5/89	2310' FSL, 1980' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	4803'	Perf'd 4393-4614 Grayburg 4678-4772 San Andres
State 35 #6	Oil	8-5/8" csg @ 1605' w/800 sx 5-1/2" csg @ 4850' w/1330 sx	10/3/89	990' FSL, 1980' FWL, Sec. 35 T-17-S, R-33-E Lea County, New Mexico	4850'	Perf'd 4378-4764 Grayburg-San Andres Formation

Well	Type	Construction	Date Drilled	Location	Depth	Completion
Lea-State "KG" #1	Oil	13-3/8" csg @ 374' w/225 sx 8-5/8" csg @ 3255' w/150 sx 7" csg @ 6930' w/150 sx 4-1/2" liner from 6812-8869 w/285 sx	3/6/63	330' FSL, 2310' FEL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	8870'	Perf'd 8707-8836 Abo Formation
Nix-State #1	D&A	13-3/8" csg @ 320' w/325 sx 9-5/8" csg @ 2825' w/600 sx	1/8/60	2310' FSL, 1650' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	9500'	D&A
Ne-Mex #1	D&A	8-5/8" csg @ 1528' w/650 sx	3/16/44	1980' FSL, 1980' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	4765'	D&A
Corbin State #1	Oil	13-3/8" csg @ 292' w/350 sx 8-5/8" csg @ 2780' w/1200 sx 4-1/2" csg @ 4100' w/485 sx	5/3/78	2310' FNL, 330' FWL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	9000' PBTD 4100'	Perf'd 3856-77 Queen Formation
Philmex #21	Oil	8-5/8" csg @ 1490' w/1000 sx 5-1/2" csg @ 4800' w/800 sx 5-1/2" csg @ 4800' w/800 sx	7/3/87	1980' FWL, 1980' FEL, Sec. 35 T-17-S, R-33-E, Lea County, New Mexico	4800'	Perf'd 4325-4546 Grayburg-San Andres Formation
Philmex #25	Oil	8-5/8" csg @ 1500' w/1000 sx 5-1/2" csg @ 4000' w/1400 sx	10/7/87	1980' FNL, 1980' FWL, Sec.35 T-17-S, R-33-E, Lea County, New Mexico	4800'	Perf'd 4332-4550 Grayburg Formation

III. A.

1. Union State "35" lease, well #6, Maljamar (Grayburg-San Andres) Field, 1980' FWL and 990' FSL, Sec. 35, T-17-S, R-33-E, Lea County, New Mexico.

2. Surface Casing: 8-5/8" set at 1605'. Cemented w/800 sx in a 12-1/4" hole. Cement circulated to surface.

   Production Casing: 5-1/2" set at 4850'. Cemented w/1330 sx in a 7-7/8" hole. Cement circulated to surface.

3. Injection Tubing: 2-7/8" 6.5# J-55 8rd EUE tbg. Internally plastic coated w/Tuboscope TK-70 or equivalent. Set at approximately 4350'.

4. Injection Packer: OTIS Perma-Trieve Type "PR" packer (or equivalent). Set at approximately 4340'.

B.

1. Injection Formation: Grayburg-San Andres
   Field: Maljamar (Grayburg-San Andres) Field

2. Injection Interval: 4378-4764'.
   Perforated Casing Completion.

3. Originally drilled as a Grayburg-San Andres producer.

4. No other perforations in well.

5. Possible Yates gas production from interval approximately 1400 ft. deep. Abo Reef oil production from depth of approximately 6000 ft.

VII.

1. Estimated Average Injection Rate is 900 BWPD.
   Max anticipated injection is 1800 BWPD.
   Daily volume of fluid to be disposed is 300 BWPD.

2. The disposal system will be a closed system.

3. Estimated average injection pressure is 250 psig.
   Maximum anticipated injection pressure is 800 psig.

4. Injection water will be from other wells on the same lease producing from either the Grayburg-San Andres or the Abo formations. Water analysis are attached. Waters are compatible.

5. Disposal zone is productive of oil and gas within stated limits.

VIII. XII. The proposed SWD well is spudded on the surface caliche layer of the principal aquifer of the Caprock area, the Ogallala Formation. The Ogallala, of Pliocene (Tertiary) age, comprises semiconsolidated fine-grained calcareous sands, some clays and silts, and some gravels. An apparent water table was encountered at 156

feet, 3964 feet above sea level. Hydrologic maps show this Ogallala water table dipping southeast at about 10 feet per mile (Flg. 1).

The Ogallala Aquifer overlies, at the 264-foot level (3853' elevation), an erosional surface cut on the top of Triassic rocks. These are, for the most part, red sandstones and shales of the Dockum Group. Small amounts of high-sulfate ground water can be produced from this interval. At 1120 feet, (2997' elev.), the triassic rocks overlie the Dewey Lake Red Beds of the uppermost Permian. These sandstones and shales appear to be cemented with anhydrite and gypsum. Any ground water from this 426-foot zone is likely to be high in sulfur. Casing 8-5/8" in diameter is set at 1604 feet (1513 feet above sea level), 58' into the Rustler Anhydrite below the base of the Permo-Triassic Red Beds. The Rustler caps the upper Permian evaporites, 2200 feet thick, mostly salt, with some anhydrite, dolomite, shale, and potash salt.

It is probable that the red beds of the Permo-Triassic, with the Rustler anhydrite, act as a barrier to fluid interchange between the fresh-water aquifers and the Permian evaporites below. The evaporate section, from 1546 to 2720 feet of drilled depth, in turn acts as a seal for petroleum reservoir fluids in the Permian strata below, and their plasticity would cause them to seal fractures and faults. Fresh water from above would threaten the integrity of the evaporite sequence, but there is no evidence of significant salt solution-collapse in the State "35" #6 or in neighboring wells. The 20-foot-deep sinkhole, or "Buffalo Wallow", cradling the subject location thus is the result primarily of shallow solution and surface arosional processes.

The proposed salt-water injection zones are over 260 feet below sea level, in a gross interval from 4378 to 4762 feet in depth in the upper San Andres dolomite and in the overlying Grayburg formation. A 90-foot gross interval of the upper San Andres porous dolomite, 32 gross feet of basal Premier Sand of the Grayburg, and a four-foot interval of sandy dolomite higher in the Grayburg are perfed and will be used for injection. Correlative zones are under active waterflood north of Union's lease. The upper Grayburg is mostly tight, anhydritic dolomite. Above the top of the Grayburg (4259' MD), the Queen, Seven Rivers, Yates and Tansill formations (all upper Permian) are mostly anhydrite, up to the top Tansill, or base of the Salado Evaporites, at 2720 feet drilled depth. There are minor porous sandstones interspersed and isolated within the four anhydritic formations; the only significant of these is the 35-foot-thick Shattuck Sand at the top of the Queen (3885' MD), which is heavily salt-water-saturated. Fluids from the currently water-flooded disposal zones are thus impeded from communication upward by a mostly anhydrite section of over 1500 feet, whose impermeability and plasticity are unlikely to leave unsealed any vertical conduits. With the mostly salt section of over 2000 feet next up the hole, a good casing program can assure protection of near-surface potable water zones in the vicinity of the Union "35" #6 State well.

IX. Zone will be acidized with approximate 3000 gals 15% HCl. Rock salt will be used to divert the acid into all the perforations. This should insure adequate stimulation.

X.

Date	Remarks	BOPD/BWPD/MCF
12/7/89	Initial Production Pumping	44/811/34

XI. None producing in the stated area.

State 35 #6 Well

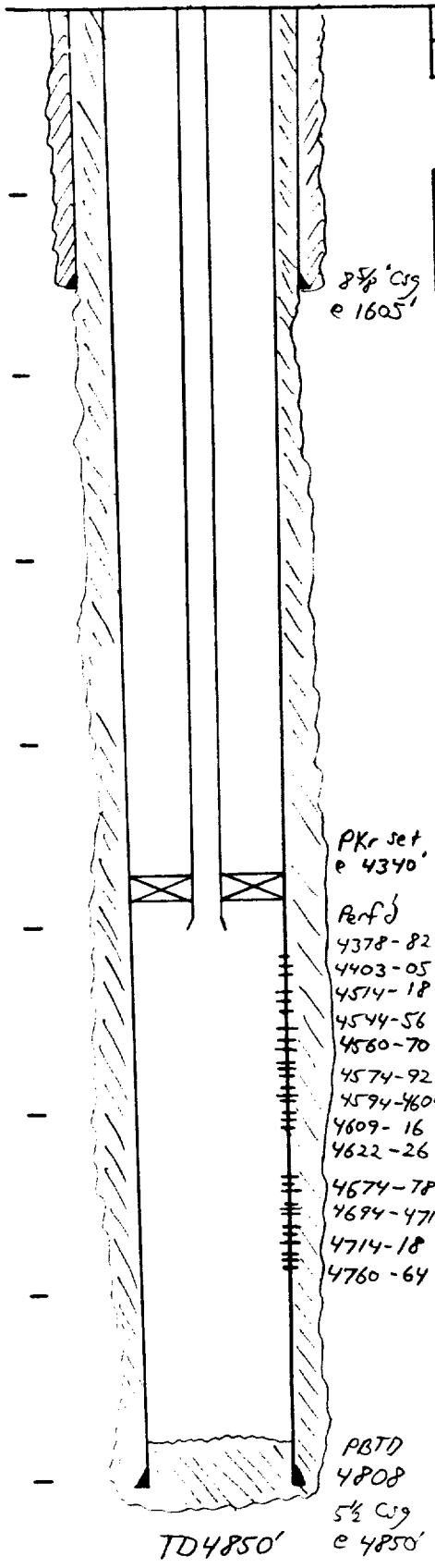
WELL PROFILE

LOCATION: 1980' FWL, 993' FSL, Sec 35, T17S, R33E BY: S. Fitzgerald DATE: 7/1/92
Lea County, New Mexico

ELEVATIONS: 4101 GL

K.B. to T.H. –

K.B. to GRD. –



CASING DATA:

8 5/8" 24# Csg set @ 1605' in 12¼" hole. Cmt w/ 800 sx. Circ Cmt to Surf

5½" 15.5# J-55 8rd ST&C Csg set @ 4850' in 7 7/8" hole. Cmt w/ 1330 sx Cl 'C' Cmt. Circ to Surf.

TUBING SETTING: (Proposed)

DESCRIPTION	LENGTH	DEPTH
① 2 7/8" 6.5# J-55 8rd EUE TSg		
② ON/off tool w/ integral Prof Nipple		4336'
③ OTIS Type "PR" Perma-Trieve PKr (or equivalent)		4340'
④ Wireline Re-entry Guide		4341'

ROD DATA:

SIZE	LENGTH	NUMBER	TYPE

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : UNOCAL
Date : 11-08-1991
Location: CORBIN ABO STATE - #35-1 (on 11-04-1991)

	Sample 1
Specific Gravity:	1.053
Total Dissolved Solids:	74078
pH:	7.20
IONIC STRENGTH:	1.382

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	102	2040
Magnesium	(Mg^{+2})	60.0	729
Sodium	(Na^{+1})	1110	25500
Iron (total)	(Fe^{+2})	0.039	1.10
Barium	(Ba^{+2})	0.009	0.600
Manganese	(Mn^{+2})	0.001	0.030
ANIONS:			
Bicarbonate	(HCO_3^{-1})	3.60	220
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	58.8	2830
Chloride	(Cl^{-1})	1210	42800

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.16	-17
104°F	40°C	0.80	-17
122°F	50°C	1.1	-17
140°F	60°C	1.4	-17
168°F	76°C	2.0	-13
176°F	80°C	2.2	-13

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : UNOCAL
Date : 11-08-1991
Location: CORBIN STATE ABO - #35-5 (on 11-04-1991)

	Sample 1
Specific Gravity:	1.148
Total Dissolved Solids:	207732
pH:	7.20
IONIC STRENGTH:	3.711

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	120	2400
Magnesium	(Mg^{+2})	100	1220
Sodium	(Na^{+1})	3340	76900
Iron (total)	(Fe^{+2})	0.025	0.700
Barium	(Ba^{+2})	0.004	0.300
Manganese	(Mn^{+2})	0.003	0.090
ANIONS:			
Bicarbonate	(HCO_3^{-1})	4.80	293
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	61.4	2950
Chloride	(Cl^{-1})	3500	124000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	1.0	-22
104°F	40°C	1.6	-22
122°F	50°C	1.9	-22
140°F	60°C	2.3	-22
168°F	76°C	2.8	-23
176°F	80°C	3.0	-23

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : UNOCAL
Date : 11-08-1991
Location: CORBIN STATE ABO - #35-1 & 35-5 COMPATIBILITY (on 11-04-1991)

	Sample 1
Specific Gravity:	1.101
Total Dissolved Solids:	140905
pH:	7.20
IONIC STRENGTH:	2.547

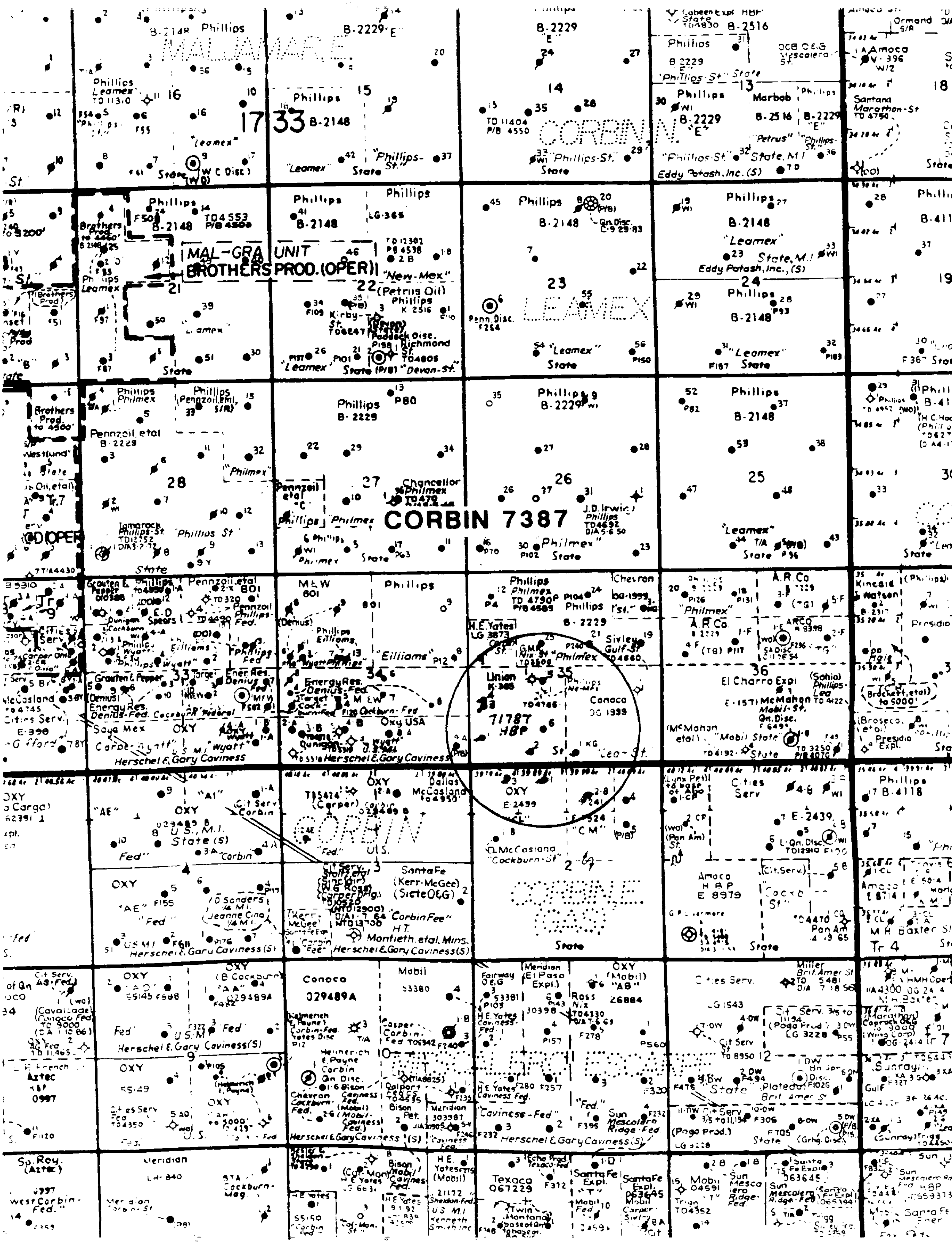
CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	111	2220
Magnesium	(Mg^{+2})	80.0	972
Sodium	(Na^{+1})	2230	51200
Iron (total)	(Fe^{+2})	0.032	0.900
Barium	(Ba^{+2})	0.007	0.450
Manganese	(Mn^{+2})	0.002	0.060
ANIONS:			
Bicarbonate	(HCO_3^{-1})	4.20	256
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	60.1	2890
Chloride	(Cl^{-1})	2350	83400
DISSOLVED GASES			
Carbon Dioxide	(CO_2)		0
Hydrogen Sulfide	(H_2S)		0
Oxygen	(O_2)		0

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.45	-25
104°F	40°C	1.1	-26
122°F	50°C	1.4	-26
140°F	60°C	1.7	-26
168°F	76°C	2.3	-28
176°F	80°C	2.4	-28

Comments:
COMPATIBILITY = CORBIN STATE ABO #35-1 & #35-5 = 50/50 MIX

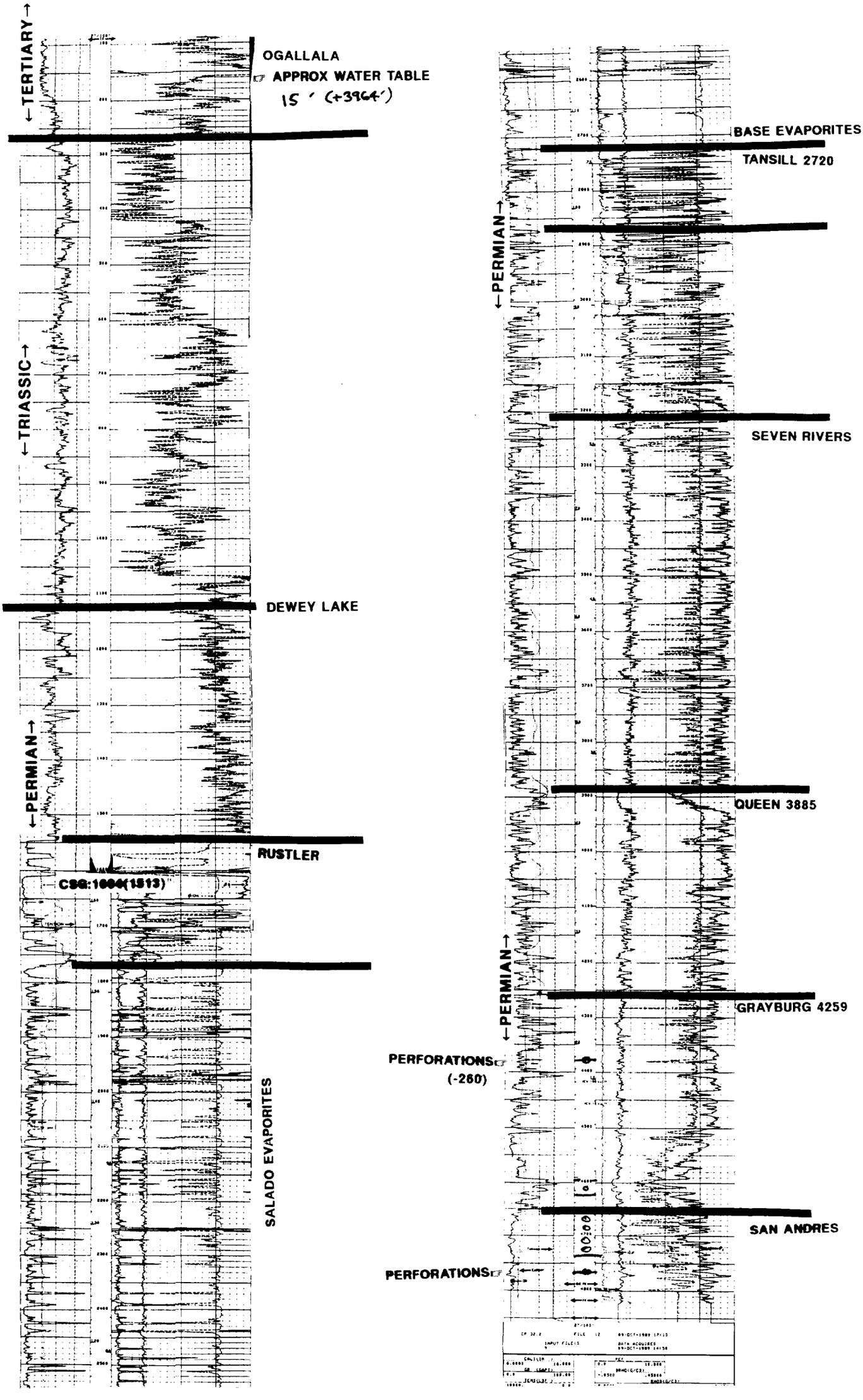
LARGE FORMAT EXHIBIT HAS BEEN REMOVED AND IS LOCATED IN THE NEXT FILE



CORBIN 7387
MAL-GRA UNIT
BROTHERS PROD. (OPER)
CORBIN N.
LEAMEX
17 33
Phillips
B-2148
B-2229
B-2516
"Leamex"
State
"Philmex"
"Phillips-St."
Eddy Potash, Inc. (S)
Eddy Potash, Inc., (S)
Marbob
"Petrus"
"New-Mex"
(Petrus Oil)
Penn. Disc.
Pennzoil, etal
Chancellor
J.D. Irwin
Tamarack
"Eilliams"
Phillips Eilliams
Energy Res.
Denius-Fed.
Union
K-365
71787
HBP
Conoco
OG 1999
Chevron
Sivley
Gulf-St.
El Charro Expl.
McMahon
Mobil-St.
"Mobil" State
A.R.Co.
ARCO
Kincaid & Watson
Presidio
Herschel E. Gary Caviness
Grauten & Pepper
Cities Serv.
OXY
E-2439
U.S. M.I.
State (S)
"Corbin"
"Fed."
Dallas McCasland
D. McCasland
"Cockburn-St"
Santa Fe
(Kerr-McGee)
(Siete O&G)
"Corbin Fee"
H.T. Montieth, etal, Mins.
Herschel E. Gary Caviness (S)
Amoco
HBP
E 8979
M.R. Baxter
Tr 4
Conoco
029489A
Mobil
Meridian (El Paso Expl.)
Fairway O&G
Ross Nix
"AB"
26884
"Caviness - Fed"
Sun
Mescalero Ridge - Fed
State
Plateau
Brit. Amer. St.
Sunray
Gulf
Aztec
Chevron Cockburn-Fed.
Bison Pet.
Meridian
Texaco
067229
Santa Fe Expl.
Mobil
Sun
Sp. Roy. (Aztec)
West Corbin-Fed.

PROPOSED DISPOSAL WELL: UNOCAL STATE "35"#6

SEC 35 T17S R33E



LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

Affidavit of Publication

STATE OF NEW MEXICO)
) ss.
COUNTY OF LEA)

Joyce Clemens being first duly sworn on oath deposes and says that he is Adv. Director of THE LOVINGTON DAILY LEADER, a daily newspaper of general paid circulation published in the English language at Lovington, Lea County, New Mexico; that said newspaper has been so published in such county continuously and uninterruptedly for a period in excess of Twenty-six (26) consecutive weeks next prior to the first publication of the notice hereto attached as hereinafter shown; and that said newspaper is in all things duly qualified to publish legal notices within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico.

That the notice which is hereto attached, entitled

Notice Of Application For Injection Permit

and numbered ..... in the

..... Court of Lea County, New Mexico, was published in a regular and entire issue of THE LOVINGTON DAILY LEADER and not in any supplement thereof, on ~~the same day of the week~~ for one (1) day ~~consecutive weeks~~ beginning with the issue of March 17, 19 92

and ending with the issue of March 17, 19 92

And that the cost of publishing said notice is the sum of $ 9.73

which sum has been (Paid) (~~Assessed~~) as Court Costs

Joyce Clemens

Subscribed and sworn to before me this 17th day of March, 19 92

Mrs. Jean Stevens

Notary Public, Lea County, New Mexico

My Commission Expires Sept. 28, 19 94

LEGAL NOTICE
NOTICE OF
APPLICATION FOR
INJECTION PERMIT

Union Oil Company of California, dba Unocal, 1004 N. Big Spring, Midland, Texas 79701 (Attn: Greg Fitzgerald 915/682-9731) is applying for an injection permit for its Union State "35" lease, well #6. This well is located 1980' FWL, 990' FSL, Sec. 35, T-17-S, R-33-E, Lea County, New Mexico. It will be used to dispose of produced water from other wells located on the lease. The interval of injection will be the Grayburg-San Andres formations between 4378 to 4764'. Maximum injection rates are anticipated to be 1800 BWPD at a maximum injection pressure of 800 psig.

Objections or request for public hearing from persons who can show they are adversely affected should be filed with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days of publication.

Randy Dillon

Published in the Lovington Daily Leader March 17, 1992.

STATE OF TEXAS

COUNTY OF Midland

BEFORE ME, the undersigned authority, on this day personally appeared Gregory N. Fitzgerald, who being by me duly sworn, deposes and says copies of the attached application were mailed to the names and addresses as listed on the following date, to wit:

March 30, 1992.

SUBSCRIBED and sworn to before me this the 30th day of MARCH, 1992, to certify which witness my hand and seal of office.

SHARON L. MILLER NOTARY PUBLIC STATE OF TEXAS EXPIRES 6-25-94

Sharon L. Miller
Notary Public in and for

Midland County, Texas

Pearce Trust
c/o Fred Pearce
1717 Jackson Blvd.
Pecos, Texas 79772

Phillips Petroleum Company
P.O. Box 2130
Hobbs, New Mexico 88240

OXY USA, Inc.
Box 50250
6 Desta Drive, Suite 6000
Midland, Texas 79710

Conoco, Inc.
10 Desta Drive, Suite 100 W
Midland, Texas 79705

27 | 26 | 34 | 35 | 3 | 2

T 17 S

PHILLIPS
PHILMEX
9
4158
11482 Pwc
-461 1963

-500

27
4149
4800 Psa
-402 1988

-400

28
4146
4800 Psa
-441 1988

26
4139
4800 Psa
-394 1988

4145
4800 Psa
1988

31 IRWIN
ST. PHILLIPS-1
4143
4692 Psa
1950
-447

-300

PHILLIPS
PHILMEX-11
4140
4702 Pgb
1970
-286

16
4129
6200 Pgl
1982

30
4141
4800 Psa
1988

-300

23
4133
4800 Psa
1988
-385

PHILLIPS
LEAMEX-44
4121
4800 Psa
1988
-475

PHILLIPS
PHILMEX

12
4143
4790 Psa
-351 1971

-400

24
4119
4800 Psa
-419 1987

-418
CHEVRON
LEA KG ST.-3
4116
4750 Psa
1988

PHILLIPS
PHILMEX-18
4809 Psa
1984
-423

PHILLIPS
PHILMEX-20
4127
4800 Psa
1987
-415

ARCO
STATE F-1
4122
4715 Psa
1955
-455

25
4128
4800 Psa
1987
-423

21
4128
4800 Psa
-420 1987

19
4127
4800
-425 Psa
1987

YATES
CORBIN 35 ST.-1
4134
9000 Pa
-443 1978

PHILLIPS
EILLIAMS-8
4850 Psa
1979

GMK
NIX ST.1
4134
9500 Pa
1960

SINCL.
STATE F-4
4119
4679 Psa
1955

-500

UNOCAL
STATE
-514

5-35
4133
-520 4803 Psa
1989

-477

NL

PHILLIPS
NE-MEX-1
4543 Psa
1944

SIVLEY
GULF ST.-1
4128
4651 Psa
1956

EN. RES.
DENIUS-8
4151
8845 Pa
-509 1961

3-35
4130
-520 8794 Pa
1963

-600

1-35
4141
8812 Pa
-548 1962

CITIES
WYATT A FED-9
4142
8925 Pa
1985
-667

-635

2-35
4129
8805 Pa
1962

GULF
LEA ST. KG-1
4132
8870 Psa
-544 1963

-700

-800

3
4137
8902 Pa
1962

-859

1
4137
8880 Pa
1962
-853

CITIES
STATE CL

-900

2
4131
8890 Pa
1962
-807

4
4125
9000 Pa
1962

-800

5
4126
8900 Pa
1962

-900

1
4108
8810 Pa
-638 1963

-700

2
4103
8806 Pa
1963
-753

PAN AM
STATE CP

McCASLAND
COCKBURN B ST.-1
4136
6963 Pgl
1958

- PROP LOC
- CROSS SECTION

- UNION - OPERATOR
- *STATE-1* - WELL NAME & NO.
- 2523 - REFERENCE ELEVATION
- 9668 Pst - TD/FORMATION AT TD
- 1977 - COMPLETION DATE

PRODUCTION CODE

- QUEEN
- GRAYBURG
- GRAYBURG/SAN ANDRES
- ABO

- Psa - SAN ANDRES
- Pgl - GLORIETA
- Pa - ABO
- Pwc - WOLFCAMP

PLAT 1

UNION 76

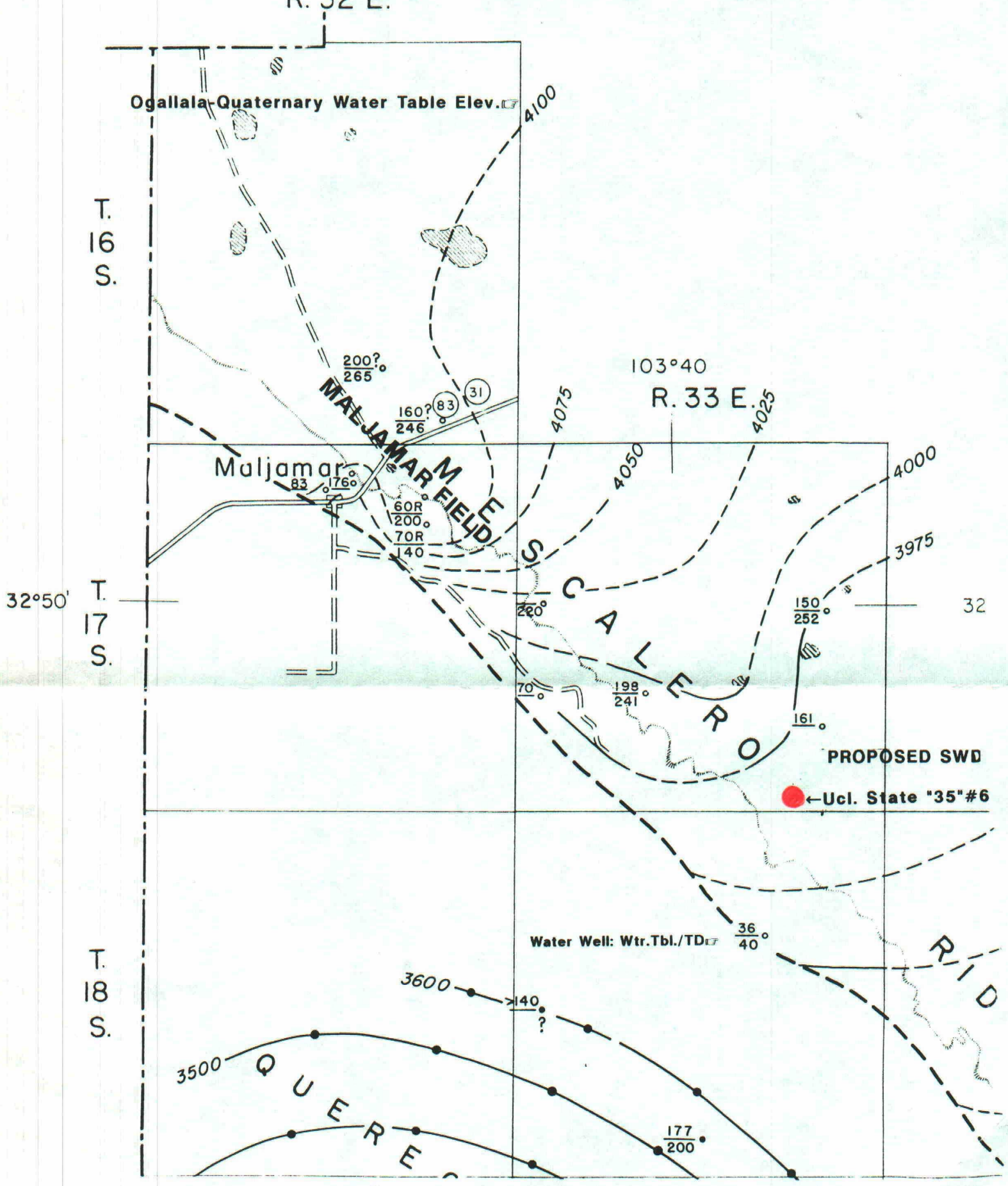
MIDLAND DISTRICT
Union Oil & Gas Division: Central Region

MALJAMAR FIELD
LEA COUNTY, NEW MEXICO

"PERMIAN"
SAN ANDRES STRUCTURE

Unocal SWD Request : MALJAMAR

Figure 1: Ground-Water Overview



from Nicholson, A., Jr., and Clebsch, A., Jr.,

"Geology and Ground-Water Conditions in Southern Lea County, New Mexico";

N.M. Inst. of Mining and Tech., St. Bur. Mines & Min. Res. Div., and N.M. St. Engr., 1961