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Mobil Exploration & Producing U.S. Inc.

November 17, 1998

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P.O. BOX 633 MIDLAND, TEXAS 79702-0633

MIDLAND SITE ENVIRONMENTAL, REGULATORY & LOSS PREVENTION

Mr. Ben Stone Oil Conservation District 2040 S. Pacheco Street Santa Fe, New Mexico 87505

> RE: WATER DISPOSAL WELL STATE SEC. 27 LEASE – WELL #1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO.

Dear Mr. Stone.

Enclosed is a complete copy of the application sent October 16, 1998, I have re-signed the C-108 and dated it today. I have also enclosed a copy of the Publication Notice for your files.

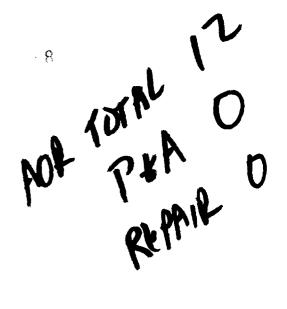
If any further information is needed concerning this application, please call Shirley Houchins at (915) 688-2585.

Yours truly.

seller Sue Moseley

Regulatory Technical Assistant

Mobil Exploration & Producing U.S. Inc. As agent for Mobil Producing TX & NM, Inc.





Mobil Exploration & Producing U.S. Inc.

October 16, 1998

P.O. BOX 633 MIDLAND, TEXAS 79702-0633

MIDLAND SITE ENVIRONMENTAL, REGULATORY & LOSS PREVENTION

Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico, 87501

Attention: Ben Stone

Re: WATER DISPOSAL WELL STATE SEC. 27 LEASE - WELL #1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

Dear Mr. Stone:

Mobil Exploration & Producing U.S. Inc., as agent for Mobil Producing Texas & New Mexico, Inc. (MPTM), is hereby requesting the OCD to reissue authority to dispose of produced water into the Devonian formation in the subject well. The original Permit was approved in April, 1991 and authorized by R-9474

Conversion of this well to be a water disposal well is necessary to economically dispose of lease and off lease water. The same water as permitted for disposal in the State Sec. 27 #2 will be disposed into the #1. The purpose for converting #1 is as back-up capacity to #2. Presently #1 is still Plugged and Abandoned and we wish to permit the well before Mobil spends money to reenter it.

The supporting information for this application is organized in accordance with Form C-108.

If any further information is needed concerning this application, please call Shirley Houchins at (915) 688-2585.

SUE 688. 1536 Mosce 7

Yours very truly,

Doug Fant Environmental, Regulatory, & Loss Prevention Supervisor

Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing TX & NM, Inc.

sm attachments

cc: w/attachments Offset Operators Surface Owner New Mexico State Land Office P. O. Box 1148, Santa Fe, NM 87501 District Director OCD - Hobbs



Surface Owners

New Mexico State Land Office P. O. Box 1148 Santa Fe, NM 87501

> Snyder Ranches, Inc. P. O. Box 2158 Hobbs, NM 88240

Offset Operators

Tamarack Petroleum Co. Inc. Attn: Judy Johnson 500 West Texas, Suite 1495 Midland, TX 79701

Capataz Operating Inc. Attn: Davis Scott P. O. Box 2083 Midland, Texas 79702-2083

Devon Energy Corp. Attn: Steve Cromwell 20 N. Boradway, Suite 1500 Oklahoma City, OK 73102

> Arco Attn: Peggy Kerr P. O. Box 1610 Midland, Tx 79702

Spirit Energy 76 P. O. Box 3100 Midland, TX 79702

Yates Petroleum Corp. Attn: Robert Bullock 105 South 4th Street Artesia, NM 88210

Paladin Energy Corporation 10290 Monroe Drive Dallas, TX 75229

Olsen Energy Incorporated 16414 San Pedro, Suite 470 San Antonio, TX 78232



STATE OF NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

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Oil Conservation Div. 2040 Pacheco St. Santa Fe, NM 87505

APPLICATION FOR AUTHORIZATION TO INJECT

I.	PURPOSE: Secondary Recovery Pressure Maintenance X Disposal Storage Application qualifies for administrative approval? Yes No
п.	OPERATOR: MOBIL PRODUCING TX & NM INC., MOBIL EXPLORATION & PRODUCING U.S. INC
	ADDRESS: P. O. BOX 633, NIDLAND, TEXAS 79702
	CONTACT PARTY:
m.	WELL DATA: Complete the data required on the reverse side of this form for each well processed 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
Ý.	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:
	 Proposed average and maximum daily rate and volume of fluids to be injected; Whether the system is open or closed; Proposed average and maximum injection pressure; Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and 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/1 or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
I X .	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.
хш.	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: SHIRLEY HOUCHINS	Jun	Losely, for	TITLE: ENV & REG T	ECHNICIAN
SIGNATURE: Kee	noselen	to	DATE:	-10=16-98 /1-17-98
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* If the information required under Sections VI, (VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstance of the earlier submittal. <u>APRIL</u>, 1991, R-9474

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, PO Box 2088, Santa Fe, NM 87504-2088 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.

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C-108

- I. Disposal
- II. Mobil
- III. A. 1. State Sec. 27 #1, 660' FNL & 1983' FEL, Sec. 27, T185, R3!
 - 2. 13 3/8" csg @ 360' cmt w/350 sks of cmt, circ to surface 9 5/8" csg @ 3800' cmt w/3500 sks of cmt, circ to surface 7 5/8" csg @ 11,800' cmt w/1165 sks of cmt, TOC by temp survey @ 1715' 7 5/8" csg cmt @ 1689'
 - 3. 3 1/2 or 4 1/2" Duolined tubing (fiberglass lining) set @ 11,750'
 - . 4. 7 5/8" permanent pkr + seal assembly set @ + 11,750'
 - B. 1. Devonian, South Vacuum
 - Proposed, 11,800 13,970', open hole Devonian Formation
 - 3. Originally drilled as Devonian producer
 - 4. Devonian perfs @ 11,650-668' squeezed w/150 sks
 - 5. Bone Springs, ± 8850'
 - IV. Yes, Division order # R-8645 dated 5-5-88
 - V. See attached map, Exhibit "A"
 - VI. Application filed March 2, 1988 for disposal permit for State Sec. 27 #2
- VII. 1. Average rate = 10,000 BWPD Maximum rate = 20,000 BWPD
 - 2. Closed system
 - 3. Average injection pressure = 0 (operate on gravity feed) Maximum injection pressure = 2390 psi
 - 4. See attached Exhibit "B", plus chemical analysis of source water, statement from previous Reservoir Engineer

5. See attached Exhibit "C"

- VIII. 1. Lithologic detail
 - a) Composition Devonian, white to tan, medium to course crystalline with vuggy to cavernous porosity
 - b) Type structure faulted anticline
 - c) Average porosity 13%
 - d) Average permeability 5 to 30 md
 - 2. Geologic name Devonian
 - 3. Thickness average, 500'
 - 4. Average top of pay 12,000'
 - Overlying fresh water zones, 10,000 ppm or less TDS:
 a) Ogalalla @ 300'
 - b) Santa Rosa @ 1400'
 - 6. There are no fresh water zones immediately underlying the injection zone.
 - IX. Acidize Devonian w/2,000 gal 15% HCL acid + 10,000 gal gelled 15% HCL acid + 6000 lbs graded rock salt. Maximum treating rate = 5 BPM, maximum treating pressure = 5000 psi. Flush treatment with 50 bbls biocide-treated fresh water.
 - X. Well will need to be deepened from present PBTD of 11,752' to proposed new TD of <u>13,970'</u>. At that time, open-hole logs will be run and filed with the OCD.
 - XI. See attached Exhibit "D"
 - XII. MPTM has examined the available geologic and engineering data and finds no evidence of open faults or other hydrological connection between the Devonian Formation and any underground source of drinking water.
 - XII. See attached Exhibits "E" and "F" for Proof of Notice

Also attached:

- Proposed sketch
 - Map (Exhibit A) with 1/2 mile radius drawn

DATE <u>4-23-90</u> WELL NO. / LEASE State Section 27 FIELD Vacuum Devonian South LOCATION 660' FNL \$ 1983' FEL Unit B Sec 27, TISS Lea Constr. New Mexico SIGNED DE Elwood 3887 GL DF KB (9'AGL) ZERO PROPOSED WELLBORE DIAGRAM - 31/2" or 41/2" N-SO/K-55 Duplined they, plur fluid on annulus -133/8" 48 blft H-40 cg set to 360 w/ 350 sks, cmt circ (17" hole) 75/8" csg cut @ 1689' Primary TOC (95/8-75/8) @ 1715' (temp survag) ____95/8" 36 16/44 J-55 csg set to 3800 ' w/ 3500 sks, cmt circ (124" hole) Devonian Perts 11,650 - 11,668 , squeezed w/150 sto ent 4 SPF 72 hold icomponent plu set @ ± 11,750 _7518 26.4, 29.7, \$ 33.7 "At N-80 Buttress + X-line csg set to 11,800' u/ 1165 sks Proposed Devenian Disposed Zone OH 11,500-13,970

Proposed TA: 13 970

Mobil Exploration & Producing U.S. Inc.

October 24, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

Qil Conservation Division P. O. Box 2088 Santa Fe, New Mexico, 87501 (3)

> WATER DISPOSAL WELL STATE SEC. 27 LEASE - WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

Gentlemen:

Mobil Exploration & Producing U.S. Inc., as agent for Mobil Producing Texas & New Mexico, Inc. (MPTM), respectfully requests authority to dispose of produced water into the Devonian formation in the subject well.

Conversion of this well to a water disposal well is necessary to economically dispose of lease and off lease water. The same water as permitted for disposal in the State Sec. 27 #2 will be disposed into the #1. The purpose for converting #1 is as back-up capacity to #2. Presently #1 is still P&A'd and we wish to permit the well before Mobil spends money to re-enter it.

The supporting information for this application is organized in accordance with Form C-108.

If any further information is needed concerning this application, please call J. W. Dixon at (915) 688-2452.

Xqurs very truly

G. N. ™iller Environmental, Regulatory, & Loss Prevention Supervisor

Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico, Inc.

JWD/fc attachments

cc: w/attachments Offset Operators Surface Owner New Mexico State Land Office P. O. Box 1148, Santa Fe, NM 87501 District Director OCD - Hobbs

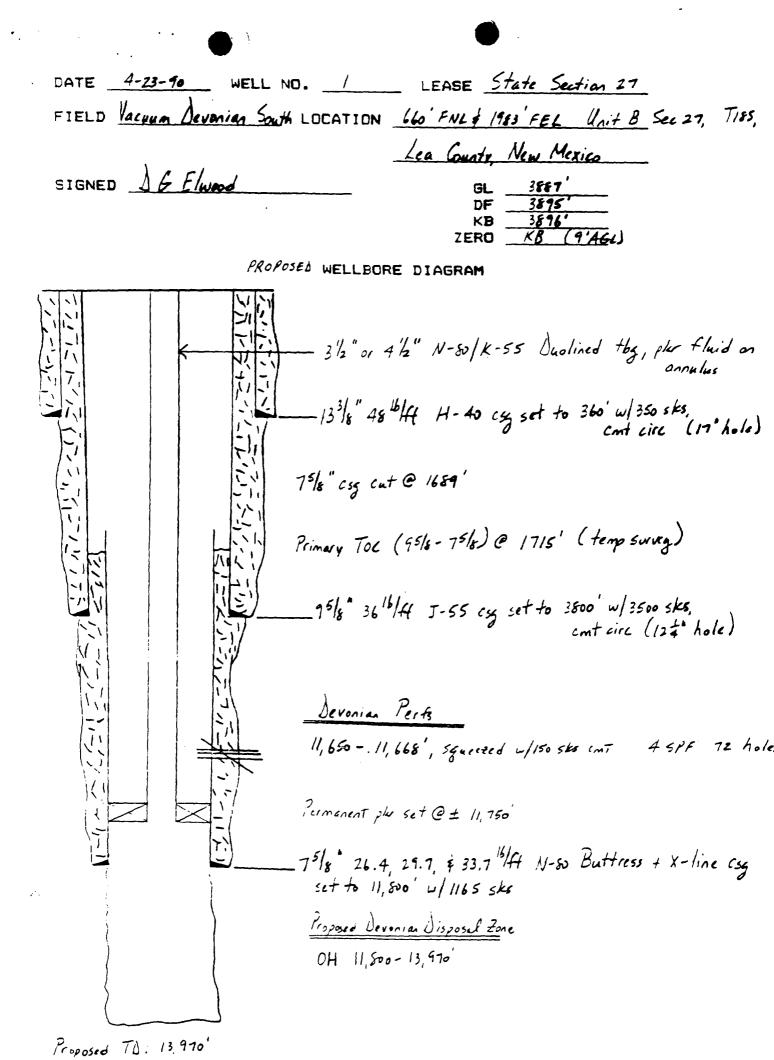
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	ATTON COR AN	THORIZATION TO INJEC	, U	
,	Purpose:	-	ry Pressure Maintenanc <u>e</u>	Disposal Storage
Ι.			dministrative approval?	es No
11.	Operator:		fexas & New Mexico, Inc.	
	Address:	c/o Mobil Explora	ation & Producing U.S. Inc.,	Box 633, Midland, TX 79702
	Contact par	rty:Judy W. Di	ixonPhone	(915) 688-2452
111.	Well data:		required on the reverse side o tion. Additional sheets may b	
JV.	Is this an If yes, giv	expansion of an exi ve the Division orde	sting project? yes r number authorizing the proje	x] no ct
۷.	injection a	well with a one-half	ll wells and leases within two mile radius circle drawn arou the well's area of review.	
• VI.	penetrate (well's type	the proposed injection, dat	all wells of public record wi on zone. Such data shall incl e drilled, location, depth, re l illustrating all plugging de	ude a description of each cord of completion, and
V11.	Attach data	a on the proposed op	eration, including:	
	2. Whi 3. Pro 4. Sou 5. If	ether the system is oposed average and m urces and an appropr the receiving format injection is for di at or within one mil- the disposal zone fo	aximum daily rate and volume or open or closed; aximum injection pressure; iate analysis of injection flu ion if other than reinjected p sposal purposes into a zone no e of the proposed well, attach rmation water (may be measured nearby wells, etc.).	id and compatibility with produced water; and of productive of oil or gas a chemical analysis of
•VIII.	detail, ged bottom of a total disso	ological name, thick all underground sour olved solids concent zone as well as any s	data on the injection zone inc ness, and depth. Give the geo ces of drinking water (aquifer rations of 10,000 mg/l or less such mource known to be immedi	s containing waters with) overlying the proposed
1x.	Describe th	he proposed stimulat	ion program, if any.	
• X.	Attach app with the Di	ropriate logging and ivision they need no	test data on the well. (If w t be resubmitted.)	ell logs have been filed
• XI.	available a	hemical analysis of and producing) within f wells and dates say	fresh water from two or more (n one mile of any injection of aples were taken.	fresh water wells (if disposal well showing
X11.	examined av	vailable geologic and	must make an affirmative state d engineering data and find no tion between the disposal zono	evidence of open faults
XIII.	Applicants	must complete the "!	Proof of Notice" section on th	e reverse side of this form.
XIV.	Certificati	ion		
	I hereby ce to the best	ertify that the info t of my knowledge and	rmation submitted with this ap	plication is true and correct
	Name:	Judy W. Dixon	,	v/Reg. Technician
	Signature:	Midly	BI NANANI	10/24/90
submi	he informatio itted, it nec he carlier su	on required under Sec ed not be duplicated	ctions VI, VIII, X, and XI abc and resubmitted. Please show	ve has been previously
Cas	e ∦9337, Ord	ler, #R-8645 dated	May 5, 1988 - State SEction	27 #2
01511	RIUUTIUN: Or	iginal and one conv	to Santa Fe with one copy to	the appropriate Division

.

district office.

Submit to Appropriate District Office Suite Lease - 6 copies Fas Lease - 5 copies		State of New Me: Minerals and Natural Re	sources Department		
D <u>ISTRICT I</u> F.O. Box 1980, Hobbs, NI		CONSERVATIO P.O. Box 208		API NO. (assigned by OCE 30-025-0314	
DISTRICT II P.O. Drawer DD, Artesia,		ants Fe, New Mexico	87504-2088	5. Indicate Type of Lease	
DISTRICT III	114 00210			5T 6. State Oil & Gas Lease	ATE X FEE
1000 Rio Brazos Rd., Aza	·			NM-587	
APPLICA 1a. Type of Work:	TION FOR PERMIT T	O DRILL, DEEPEN, C	R PLUG BACK	7. Lease Name or Unit Ag	
DRIL	L 🗍 RE-ENTER	X DEEPEN	PLUG BACK		
b. Type of Well: OL GAS	Disp	osal snul			27
WELL WELL		20NE	2018	State Section	
•	icing Tx. & N.M.	Inc.		8. Well No. 1	
Address of Operator P. 0. BOX	Exploration & Pr	oducing U.S.Inc.		9. Pool same or Wildcat	
P'OBox (33, Midland, Te			Vacuum Devonia	
Unit Lotter	3:660 Foot F	rom The North	Line and 1983	Feet From The	East Line
Section 27	Towa	hip 18S Ra	35E	NMPM	County
		10. Proposed Depth		//////////////////////////////////////	12. Rotary or C.T.
			13,970 De	vonian	Rotary
13. Elevations (Show when	· · ·	4. Kind & Sumas Plug. Bond	15. Drilling Contractor		Date Work will start
388	7'GL	Blanket on File	Unknow		n as possible
SIZE OF HOLE	SIZE OF CASING	OPOSED CASING AN	ND CEMENT PROG	RAM SACKS OF CEMENT	EST. TOP
17"	13-3/8"	48#	360'	350	Circ to surfac
12-1/4"	9-5/8"	36#	3800'	3500	Circ to surfac
	7-5/8" 7-5/8" csg (26.4, 29.7,33.7	11,800	1165	Temp survey
 RIH, dre DD into Run OH 1 RIH w/te Acidize 15% HCL 	acid + 6000# gra posal rate/press est tbg, RIH w/D	<pre>@ 1689. f ±-13,970. @ ±11,750'. ion 11,800-13,970 ded rock salt. sure into Devonias buolined tubing (</pre>	n. 3-1/2 or 4-1/2"		
8. POOH w/t Set pkr	@ ±11,750'. Loa on prod. water	disposal.		``	
 POOH w/t Set pkr Put well PABOVE SPACE DE ZONE GIVE BLOWOUT PRE 	on prod. water SCRIBE PROPOSED PROG	disposal. RAM: FPROPOSAL IS TO DE2PH to the best of my knowledge and	belief. Mobil Producing	echnician Texas & New Mexico	10/11/90

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\$ 4	11711	1 and	
N - 1	919	onn	
1 \	• • •		



. Submit to Appropriate District Office State Lease - 4 copies Fee Lease - 3 copies

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

DISTRICT JI P.O. Drawer DD, Anesia, NM 88210

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

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

bil Produci		יחו ויו	•	State	Sec. 27			Well No.	
	tice	Township		Range			County		
i Letter So B	27	•	8–S	R-35-	Е		т т	ea	
nal Footage Location				1	<u> </u>	NMPN			
1002	from the	East	line and	66 0		feet from	Nor	th line	
und level Elev.		ing Formation		Pool				Dedicated A	reage;
38 87'	Devo	nian		South	Vacuum			80	Acres
2. If more that	n one lease is d	ed to the subject v edicated to the we lifferent ownership	ll, culline each an	d identify the ow	pennip thereof	(both as to work	-	• ••	
unitization, Yi If answer is " this form if n No allowable	force-pooling, s [ho" list the own ccessary will be assigned	eic.?	answer is "yes" ty iptions which have all interests have t	pe of consolidate e actually been c	one oneolidated. (U	se reverse side (.f)
			4111111	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	//////////////////////////////////////		I hereby conjoined her	ein in true and wiedeg and beli	the information is complete to the
							Position Mobil Prod Company	ucing Texa	& Regulator & & New Mexic h its agent Producing U.S
			27		 		I hereby cerr on this plat actual surve supervison, d	was plotted fr ys made by i and that the s	IFICATION II location shown om field notes of ne or under my ame is true and y knowledge and
<u> </u>					 		Date Surveye Signature & Professional	Seal of	
		T-18-S	R-3	35-E	 		Certificate N	۵.	

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State of New Mexico gy, Minerals and Natural Resources Departm

OIL CONSERVATION	DIVISION
P.O. Box 2088	

Santa Fe, New Mexico 87504-2088

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- Ti Anni Coron	Big 6 mint Man			EXHIBIT "A" STATE SEC. 27 #1	1
		1 10103 Happ'us at		VACUUM DEVONIAN	SOUTH FIELD
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<u>C-108</u>

- I. Disposal
- II. Mobil
- III. A. 1. State Sec. 27 #1, 660' FNL & 1983' FEL, Sec. 27, T185, R35
 - 2. 13 3/8" csg @ 360' cmt w/350 sks of cmt, circ to surface 9 5/8" csg @ 3800' cmt w/3500 sks of cmt, circ to surface 7 5/8" csg @ 11,800' cmt w/1165 sks of cmt, TOC by temp survey @ 1715' 7 5/8" csg cmt @ 1689'
 - 3. 3 1/2 or 4 1/2" Duolined tubing (fiberglass lining) set @ 11,750'
 - 4. 7 5/8" permanent pkr + seal assembly set @ + 11,750'
 - B. 1. Devonian, South Vacuum
 - Proposed, 11,800 13,970', open hole Devonian Formation
 - 3. Originally drilled as Devonian producer
 - 4. Devonian perfs @ 11,650-668' squeezed w/150 sks
 - 5. Bone Springs, ± 8850'
 - IV. Yes, Division order # R-8645 dated 5-5-88
 - V. See attached map, Exhibit "A"
 - VI. Application filed March 2, 1988 for disposal permit for State Sec. 27 #2
- VII. 1. Average rate = 10,000 BWPD Maximum rate = 20,000 BWPD
 - 2. Closed system
 - 3. Average injection pressure = 0 (operate on gravity feed) Maximum injection pressure = 2390 psi
 - 4. See attached Exhibit "B", plus chemical analysis of source water, statement from previous Reservoir Engineer
 - 5. See attached Exhibit "C"

- VIII. 1. Lithologic detail
 - a) Composition Devonian, white to tan, medium to course crystalline with vuggy to cavernous porosity
 - b) Type structure faulted anticline
 - c) Average porosity 13%
 - d) Average permeability 5 to 30 md
 - 2. Geologic name Devonian
 - 3. Thickness average, 500'
 - 4. Average top of pay 12,000'
 - 5. Overlying fresh water zones, 10,000 ppm or less TDS:
 a) Ogalalla @ 300'
 b) Santa Rosa @ 1400'
 - 6. There are no fresh water zones immediately underlying the injection zone.
 - IX. Acidize Devonian w/2,000 gal 15% HCL acid + 10,000 gal gelled 15% HCL acid + 6000 lbs graded rock salt. Maximum treating rate = 5 BPM, maximum treating pressure = 5000 psi. Flush treatment with 50 bbls biocide-treated fresh water.
 - X. Well will need to be deepened from present PBTD of 11,752' to proposed new TD of <u>13,970'</u>. At that time, open-hole logs will be run and filed with the OCD.
 - XI. See attached Exhibit "D"
 - XII. MPTM has examined the available geologic and engineering data and finds no evidence of open faults or other hydrological connection between the Devonian Formation and any underground source of drinking water.
 - XII. See attached Exhibits "E" and "F" for Proof of Notice
 - Also attached:

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- Proposed sketch
- Map (Exhibit A) with 1/2 mile radius drawn

Exhibit "5"

INTEROFFICE CORRESPONDENCE

DATE: Feb. 15, 1933

TO: Ann Moore

CC:

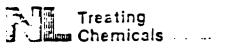
With regards to the water capatability test conducted on fluids to be injected into the State 27 well #2 SWDW, the following statement can be made :

A composite of produced water which represents the typical injection fluid consists of Abo (46%), San Andres (48%), Glorieta (2%), Pennsylvania (3%), and Blinebry (1%). This water was combined with Devonian produced water in varying amounts. In summary, the Devonian water alone, and mixtures of Devonian from 0 to 50% with the proposed injection fluid formed carbonate scale. Calcium sulfate becomes evident in the high percent composite range of 80 - 100%. Thus a scale prevention program is needed and chemical treatment of the well will be done as required to control both types of scale.

Ann, attached is a copy of the analysis performed by NL Treating Chemic If you have any questions, please give me a call at ext. 2076.

Thanks

Jack Hamner RM - 240 Project Reservoir Engineer



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NL Treating Chemicals/NL industries, Inc. P.O. Ecx 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLOS UI

Water Analysis R

				SHEET NUMBER
ICMFANY	Truce & New Mentes			DATE
MODII Procucing	Texes & New Mexico			
Vacuum	•	Lea	Y CR FARISH	STATE
	A CHUM ALO SAMPLE SCURCE	I Lee	IWATER SOURC	New Mexico
	eses Unit #235		Abo	
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DATE SAMPLED	TYPE OF WATER: D PRODUCI		FLOOD D SALT WATER CISPOSAL	
12-16-87	TYPE OF PRODUCTION: E PR	IMARY D WATERFLOOD	C CO2 FLOOD C POLYMER FLOO	OD E STEAMFLOOD
	W/ (NUMEER EESID	ATER ANALYSIS PATT	TERN	
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Mg ⁺ +i <u>i i i i</u>	$\left\{ \begin{array}{c} \cdot \cdot$	╞┼┼┾┼┼┼	; 	<u> </u>
Fe ⁺ + +			<u>, , , , , , , , ,</u>	<u> </u>
DISSOLVED SOLIDS		[DISSOLVED GASES	
CATIONS Total Hardness Calcium, Ca + + Hagnesium, Mg + +	128 50 78	(Hydrogen Sulfide, H2S Caroon Dioxice, CO2 Dxyçen, O2	mg/i mg/i mg/i
ron (Total) Fe + + + ;arium, Ba + + oc:um, Na + (Calc.)	75.1	1,727	PHYSICAL PROPERTIES DH (Field) En (Redox Potential) Specific Gravity	<u>7.2</u>
NIONS Intoride, CI $\overline{}$ ultate, SO4 $\overline{}$ arbonate, CO3 $\overline{}$	<u>169.0</u> <u>30.7</u>	<u>6,000</u> <u>1,475</u>	Turbidity, FTU Units Total Dissolved Solids (Calc.) Stability Index @ <u>80</u> °F @100_°F	11.361 mg/l +0.81 +0.30
scarbonate, HCO3 ydrozyt, OH	3.4	<u>207</u> c	© <u>120</u> •F CaSO ₄ Solubility @•F	+0, 5 m 9/
Jilide, S =	الل ى الي من الي	h	e°F Aax, CaSO4 Possible (Calc.)	mg/l

.ISPENDED SOLIDS (QUALITATIVE)

In Sulfide D Iron Oxice D Calcium Carbonate D Calcium Sulfate D Acid Inscluble D EMARKS AND RECOMMENDATIONS:

TO ENGINEER	DIST. NO.	ADDRESS	OFFICE PHONE	(HOME PHONE
Dickerson/Siyker	821		1	1
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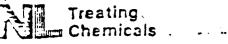
Max. EaSO4 Possible (Calc.)

Residual Hydrocarbons

_ m**q/I** _ ppm(Voi/Vo

B-





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NL Treating Chemicals:NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 957-5400 Telex: 4620243 NLOS UI

Water Analysis R

·····									SHEET NUN	ALLA
CMPANY									DATE	
Mobil Produ	icina Texa	S & No	w Mexico)						
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CATIONS			me/1 282		nigi		Carbon Dioxid	-		ng/l
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Aagnesium, Mg + +						<u> </u>	FHYSICAL PF			
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:zrium, Ea + +			974.7		22.4	1.8	Eh (Recox Po			мv
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.arbonate, CO2 =						44		¢100 • F		
carbonate, HCO3			12.2			1.4		e <u>120</u> •F	+0.52	
ydroxyl, OH			1. •			. r		ility C*F		m g/i
_:::ce.S≍		<u> </u>	4.1		(55		@•F		mg/l .
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								Possible (Calc.)		т дЛ
							Residual Hyd	rocarbons	1	ppm(VolV

LOPENDED SOLIDS (QUALITATIVE)

🕫 Sulfide 🗖 – Iron Oxide 🗖 – Calcium Carbonate 🗖 – Calcium Sulfate 🗖 – Acid Insoluble 🗖

EMARKS AND RECOMMENDATIONS:



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NL Treating Chemicals/NL incustries, inc. F.O. Ecx 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLCS UI

Water Analysis Re

		· · · ·		SHEET NUMBER
COMPANY				DATE
Mobil Producing Te	xas & New Mexico			
FIELD		[C	COUNTY CE FARISH	STATE
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Bridges-State Lea			Glorieta	
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DATE SAMPLED	TYPE OF WATER E PRODU		WATERFLOOD D SALT WATER DISPOSA	l
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		••••		
Mg++		-+-+-+-+-		
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Magnesium, Mg + +	88	107		
ron (Total) Fe + + +				6 15
Earium, Ba + +	3,698,9	85.075	pH (Field)	MV
Bocium, Na + (Calc.)			Eh (Redox Potential)	MIV
			Specific Gravity Turbidity, FTU Units	
	3 915 5	130 000	Total Dissolved Solids (Calc.)	231,712 mg/
Chloride, Cl	47.6	2 275	Stability Index CS	+0.77
Sullate, SO4 =			<u>c_100</u> •F	+0.96
Carbonate, COg=	7.5	458	<u>e 120</u> +F	+1,21
Eicarbonate, HCO3			CESO4 Solubility C	mg/i
∃yoroxyl, OHT Julide, S™	4.5	72	CF	mg/l
.01.107.0			Max. CaSO4 Possitile (Calc.)	mg/l
			Max. BaSO4 Possible (Calc.)	mg/i
			Residual Hydrocarbons	pr

USPENDED SOLIDS (OUALITATIVE)

or. Sullide D Iron Oxide D Calcium Carbonate D Calcium Sulfate D Acid Insoluble D EMARKS AND RECOMMENDATIONS:

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Dickerson/Slyker	821	1		1
-LYID BY	I CATE	10:642-21-71-01		



NL Treating Chemicals/NL Industries. Inc. P.O. Eox 60020, Houston, Texas 77205 Tel. (713) 967-5400 Telex: 4620243 NLOS UI

__ mgA __ mgA __ mgA __ mgA __ pcm(Vol/Vol)

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ISSOLVED SC	LIDS				DIS	SOLVED GAS	ES	
ATIONS			men	mçA		rogen Sullide, H	-	
al Hardness			132	2,640		on Dioxide, CC	2	mg/l
alcium, Ca + +			114	1,391	Ory	çan, O2		mg/l
agnesium, Mg+	·				 DUV	SICAL PROPER	~~, # A	
on (Total) Fe + + srium, Ba + +	•			**************************************		(Field)		6.16
dium, Na + (Cal	ie.)		2,197	50.531		Redox Potential	8	MV
0.011, 114 (00							•	

sn (Total) Fe f srium, Ba + + dium, Na + (Calc.)	2,197	50.531	pH (Field) Eh (Redox Potential) Specific Gravity	<u>6.16</u> MV
lions loride, Cl ⁻ liate, SO ₄ =	2.366.2 46.4	84.000	Turbidity, FTU Units Total Dissolved Solics (Calc.) Stability Index <u>C. P.O</u> °F	<u>161,81</u> 3mg/ <u>+0_13</u>
rbonale, CO3 = carbonale, HCO3 = droxyl, OH =	12	732	G_100°F G_120°F CaSO4 Solubility G°F	<u></u>
	16_4	204	CaSO4 Consulty & P Caso4 Possible (Calc.)	mg/ mg/
			Max. BaSC4 Possible (Calc.) Residual Hydrocarbons	mgå ppm(V

SPENDED SOLIDS (OUALITATIVE)

- Sulfide 🔲 Iron Oxide 🗆 Calcium Carbonate 🔲 Calcium Sulfate 🗇 Acid Inscluble 🗇

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MARKS AND RECOMMENDATIONS:

ENGINEER	DIST. NO. ADI	DRESS	CFFICE PHONE	HOME PHONE
ickerson/Slyker	821 ·			
-YZED BY	DATE DIS	TRIEUTION C CUSTOMER	C REGION	E DISTRICT
17	112/17/57	- 4		



NL Treating Chemicals/NL Industries, Inc. P.O. Eox 60020, Houston, Texas 77205 Tel. (713) 587-5400 Telex: 4620243 NLOS UI

				SHEET NUMEER
MFANY				
Mobil Producing Te.	xas & New Mexico			
LD		lc	OUNTY OR PARISH	STATE
Vacuum		! !	Lea	New Mexico
ASE OR UNIT	SAMPLE SOURCE			EFORMATION
Bridges-State Leas			Hiddle P	
ат н. ат. Вит. ° я	SAMPLE SOURCE		VATER, EPLIDAY CIL BELICAY	GAS. MINCERCAY
TE SAMPLED	TYPE OF WATER: C PRODI	JCED C SUPPLY D	WATERFLOOD C SALT WATER DISPOSAL	
12-16-87	TYPE OF PRODUCTION:	PRIMARY C WATERFLO	OOD E CO2FLOOD E POLYMERFLOO	DO C STEAMFLOOD
•		WATER ANALYSIS		_
+ 20 15		SIDE ION SYMEOL INDI	ICATES men SCALE UNIT) 5 10	- 15 20 ~-
-Na+ 20 15			and the second secon	$\frac{15}{1}$, $\frac{20}{1}$ a
_ Ca ⁺ +				
			<u> </u>	
	-			
_Mg ⁺ +	<u></u>			so
				• • • • •]
Fe ⁺⁺⁺ , , , , ,			, , , , , , , , , , , , , , , , , , , ,	
	<u></u>			
SSOLVED SOLIDS			DISSOLVED GASES	
110NS	meß	mg/l	Hydrogen Sulfide, H2S	mg/l
al Hardness	172		Carbon Dioxide, CO2	mg/i
cium, Ca + +	100	2.000	Oxycen, O2	mg/l
gnesium, Mg ⁺ +	72	878		
(Total) Fe + + +			- PHYSICAL PROPERTIES	
ium. Ba + +			pH (Lab)	7.7
ium, Na + (Calc.)			Eh (Redox Potential)	MV
			Specific Gravity	
IONS	•		Turbidity, FTU Units	
oride, Cl	647.9	23,000	Total Dissolved Solids (Calc.)	mg/i
fale, SO4 =	33,9	1,625	Stability Index*F	<u> </u>
bonate, CO3 =			*F	
arbonate, HCO3			*F	
srozyl, OH	<u></u>		CaSO: Solubility C*F	mg/i
lide, S=			*F	mgA
		••••••••••••••••••••••••••••••••••••••	Max. CaSO4 Possible (Calc.)	
			Max. BaSO4 Possible (Calc.)	mg/
			MAA. DASUA PUSSIDIE (CAIC.)	

LICPENDED SOLIDS (QUALITATIVE)

on Sulfide D. Iron Oxide D. Calcium Carbonate D. Calcium Sulfate D. Acid Insoluble D. *EMARKS AND RECOMMENDATIONS:*

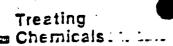
Note: Small sample of water obtained.

TCENGINEER Fickérson/Slyker	DIST. NO. 821	ADDRESS	······································	GFFICE PHONE	HOME PHONE
-LYZED BY	10ATE	10:57515-17101	·		



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NL Treating Chemicals/NL Incustries, Inc. P.O. Ecx 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLCS UI

Water Analysis

					SHEET NUMEER
COMPANY Mobil Pre	oducing Texa	is & New Mexico			DATE
FIELD Vacuum				TY OF PARISH	STATE New Mexic
LEASE OR LINIT Bridges-	State Leases	SAMPLE SOURCE		WATER SO Bline	URCE (FORMATION)
SEPTH.FT.	внт, * F	sample source	TEMP. "F WATE	F. EGUCAY OIL BELIDAY	GAS, MMCFIDAY
DATE SAMPLED 12-16-87			MARY D WATERFLOOD	ERFLOOD E SALT WATER DISPO E CO2 FLOCD E POLYMER	
		(NUMEER EESID	ATER ANALYSIS PAT E ION SYMEOL INDICAT		
Na ⁺ 20					
Ca ⁺⁺					
Mg ⁺ +	+ + + + + + + + + + + + + + + + + + + +	┼┼┼┼┼┼┼┼	╘┼┼┼┼┼		
Fe ⁺⁺⁺	<u></u>	<u>,,,,,,,,</u>		<u> </u>	<u> </u>
DISSOLVED S	OLIES			DISSOLVED GASES	
CATIONS Total Hardness Calcium, Ca + +	+ +		mg/l 10.920 2.294	Hydrogen Sulfide, H2S Carbon Dicxide, CO2 Oxyçên, O2	mgA mgA mgA
=e+ + 	+ + =1c.)	2.665.7	61.311	PHYSICAL PROPERTIES pH (Field) Eh (Redox Potential) Specific Gravity	<u>7.05</u>
-NIONS Chioride, CI Julfate, SO4 =	=	<u> </u>		Turbidity, FTU Units Total Dissolved Solids (Calc.) Stability Index <u>@80</u> °F <u>@100</u> °F	<u>105 885</u> mg/ <u>+1 55</u> +1 74
Jardonate, CO3 Sicardonate, HC -ydroxyt, OH Uliide, S =		<u>5.9</u>	360	CaSO4 Sclubility CF CaSO4 Sclubility CF CF Max. CaSO4 Possible (Calc.)	<u>+1 07</u> mg/i mg/i
				Max. BaSO4 Possible (Calc.) Residual Hydrocarbons	mg/l

USFENDED SOLIDS (QUALITATIVE)

-> Suffice D from Oxide D Calcium Carbonate D Calcium Sulfate D Acid Insoluble D

EMARKS AND RECOMMENDATIONS:

ICENGINEER	CIST. NO.	ADDRESS	CEFICE PHONE	HOME PHONE
Dickerson/Slyker	<u>821</u>	1	1	
ALYZEDEY	DATE	DISTRIBUTION C CUSTOMER	- DIGION	
* *	3	· •		

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Exhibit "C"



January 20, 1988

Mr. David Howell Mobil Producing Texas & New Mexico P. O. Box 1800 Hobbs, New Mexico 88240

Subject: Vacuum Area Waters - Compatibility Study with Devonian Brine

Dear Mr. Howell:

Appended are individual produced water analyses pertaining to those Mr. Dickerson and I took with you on December 16, 1987. Also included is the Union's Devonian water analysis.

A mixture of your produced water was made as follows:

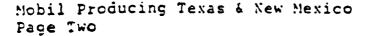
Abo46%San Andres48%Glorieta2%Pennsylvania3%Blinebry1%

That mixture was blended with Devonian water in 10% increments. Samples were placed in an oven for 5 days at 100°.

The "Compatibility" appendage describes how samples reacted. Brief general summary comments are these:

- No major initial incompatibility was seen at the time of mixing.
- 2. Moderate calcium carbonate deposition was found in the Devonian by itself (100%).
- 3. Mixtures were stable and stayed clear in the 90%-60% Devonian range.
- 4. Calcium carbonate deposition was seen in all samples from 50% Devonian to 0% (or 100% composite produced water mixture).
- 5. Calcium sulfate deposition was observed in the 80%-100% composite produced water ratios.

200 N. Loraine, Suite 250, Midland, TX 79701 Tel (915) 684-7269 - FAX: (915) 699 70-7



In summary, the Devonian alone, and mixtures of Devonian from 50% to 0% formed carbonate scale. Calcium sulfate becomes a known in the high percent composite mixture range.

In other words, scale prevention treatment is advisable throughout most of the mixing range. One treatment can handle both kinds of scale.

. We would be pleased to discuss this report with you at a mutually agreeable time.

Very truly yours,

John U. Wayne Dickerson John V. Slyker

Sales Engineer Sales Representative

/cg

cc: W. Reeves D. Seale



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NL Treating Chemicals/NL Industries, Inc. P. O. Box 4305 Houston, Texas 77210

				SHET MANDER
COMPANY		_		CATE
	ucina Texes & New	Mexico		12-16-57
HELD OF PLANT	•			TY DA PARISM STATE
Vacuum Area	e Lesses	WELLIS MANE & NO.	lea	
LEASE OR UNIT		TELLIS) FARE & HU.	1	I SOURCE
			1 See	Below
TYPE SAMPLE				
REASON FOR TEST		******	1 (07	npatibility of Devonian with Mix
		-1		·
	Salt Water Dispos	81		
RESULTS:	۰.			
Compatil	bility Mixture 4	Observations	(100	0°F)
	Composite	Initial		۶ ۵ .
Devonian	Produced Waters	Appearance		<u>5 days</u>
100 .	0	Clear		Moderate calcium carbonate Depos
90	10	Clear		No deposition
80	20	Clear		No deposition
70	30	Clear		No deposition
60	40	Slightly hazy		No deposition
50	50	Slightly hazy		Moderate calcium carbonate depos
40	60	Slightly hazy; sl	ight	Slight calcium carbonate deposit
	••	gray cast		
30	70	Slightly hazy, sl	ight	Slight calcium carbonate deposit
	0	gray cast		
20	80	Slightly hazy, sl	ight	
		gray cast		calcium carbonate depositions; s
				iron compounds precipitated.
10	90	Slightly hazy; sl	ight	
		gray cast		moderate calcium carbonate forme
•	100	tichtly have at	. .	+ moderate iron compounds deposi
0		Slightly hazy, sl	ignt	
		gray cast		moderate calcium carbonate preci moderate amount of insoluble irc compounds formed

REMARKS & RECOMMENDATIONS:

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Source	<u>Hixture</u>	2		•	
Abo	46				
San Andres	48				
Clorieta	2				
Pennsylvania	3				
Blinebry	1	ŕ .			
		CIST NO	ACOAFER		······································

REPORT OF TES



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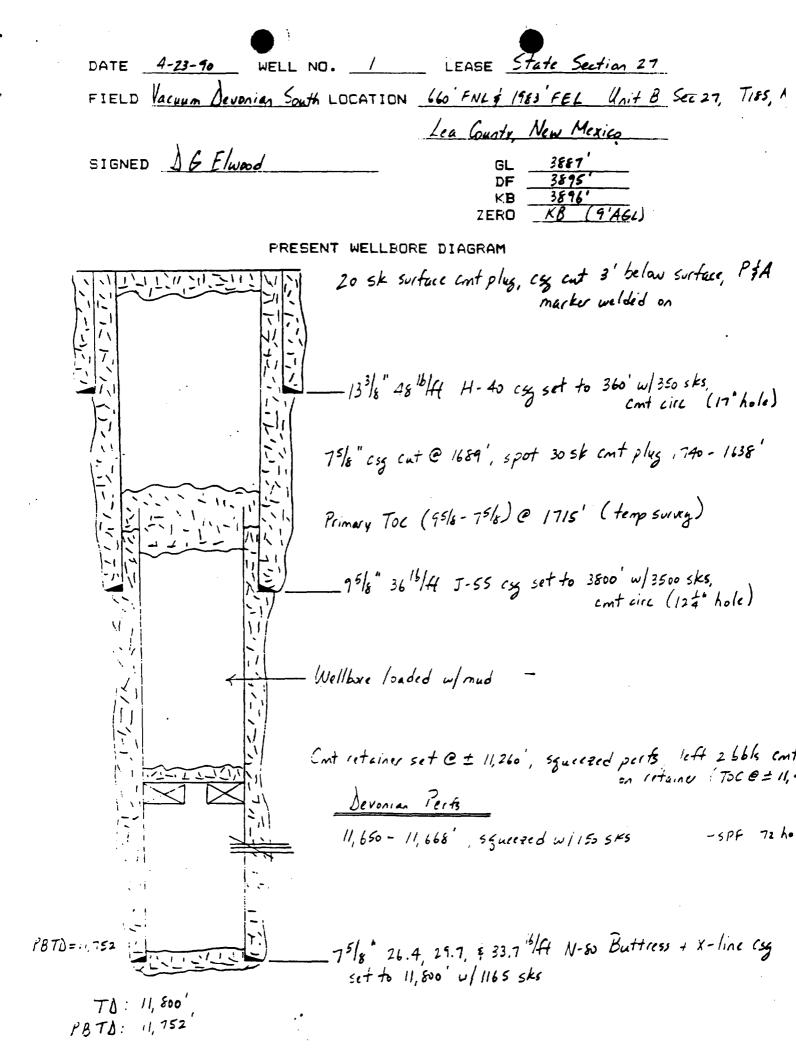
P.O.BOX 2187 HOBBS, N.M. 88240

WATER ANALYSIS REPORT

.

Report for:	Date sampled: 5-8-90
cc: DONNA ELWOOD-JR. GARCIA	Date reported: 5-9-90
cc:	Lease or well # : SNYDER WINDMILL
cc:	County: State:
Company: MOBIL	Formation:
Address:	Depth:
Service Engineer: OWEN POBEPTS	Submitted has CHEN PORFRES
Service Engineer: OWEN ROBERTS	Submitted by: OWEN ROBER

CHEMICAL COMPOSITION : Chloride (Cl)	mg/L 50	meg/L l	
Iron (Fe) (total)	3.0		
Total hardness	230	•	
Calcium (Ca)	48	2 2	
Magnesium (Mg)	26	2	
Bicarbonates (HCC3)	146	2	
Carbonates (CO3) Sulfates (SO4)	n/a 39	1	
Hydrogen sulfide (H2S)	15	Ŧ	
Carbon dioxide (CC2)	39		
Sodium (Na)	2	0	
Total dissolved solids	312	0	
Barium (Ba)	n/a		
Strontium (Sr)	n/a		
Deroneral (Dr)	17 a		
Specific Gravity	1.000		
Density (#/gal.)	8.334		
pH	6.350		
IONIC STRENGTH	0.01		
	(CaCC3) Stability Inde	× :	
	H - pCa - pAlk - K	· · ·	
	i pou pui n		
SI	0.86 F = -0.74		
	104 F = -0.53		
	122 F = -0.30		
	140 F = -0.06		
	158 F = +0.19		
This water is $2389 \text{ mg/l} (\$-100.00\$)$ under ITS CALCULATED CaSO4 saturation value at 82 F.			
SATURATION=	2389 mg/L PF	ESENT= 0 ma/L	
	-	ESENT= 0 mg/L	
	1		
	Jan	down WCart	
	REPORTED BY RANDOLF	H SCOTT	
	CHEMI	বেদ	



DATE 4-23-90 WELL NO. 1 LEASE State Section 27 FIELD Vacuum Devonian South LOCATION 660' FNL \$ 1983' FEL Unit B Sec 27, TISS, Lea County New Mexico SIGNED 16 Elwood 3887 GL DF KB PROPOSED WELLBORE DIAGRAM - 31/2" or 41/2" N-80/K-55 Duclined they, plur fluid on annulus -133/8" 48 16/ff H-40 cy set to 360' w/ 350 sks. cmt circ (17° hole) 75/8" csg cut @ 1689' Primary Toc (95/8-75/8) @ 1715' (temp survey) _95/8° 36 16/49 J-55 cy set to 3800' w/ 3500 sks. cmt circ (124° hole) Devonian Perts 11,650 - 11,668', squeezed w/150 sta cmi 4 5PF 72 hole icimenent plu set @ ± 11,750 .75/8° 26.4, 29.7, \$ 33.7 16/4 N-50 Buttress + X-line Csg set to 11, 800' u/ 1165 sks Proposed Devenian Disposed Zone OH 11,500 - 13,970'

Proposed TD: 13,970'

[•] 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 of Adv. Director 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

Legal Notice

and mumbered box they
Country XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
entire issue of THE LOVINGTON DAILY LEADER and
not in any supplement thereof, on sector week was the
same aday a skathe a seek, forone (1) day
consecutive wasks, beginning with the issue of
and ending with the issue of
October 21

which sum has been (Be id) (Assessed) as Court Costs
Subscribed and sworn to before me this
day ofOctober, 1998 Debug Notary Public, Lea County New Mexico

My Commission Expires June 22, 13, 2002

LEGAL NOTICE

1. Mobil Producing TX & NM Inc., Attention: Shirley Houchins, P.O. Box 633, Midland, Texas 79702, (915) 688-2585 will apply for permission to inject produced water into the following well/wells for the purpose of Disposal. 2. Well Name and Number: State Sec. 27, No. 1, Location: 660' FNL & 1983' FEL, Sec. 27, Section: 27, T18S, R35E, County, Lea 3. Formation Name: Devonian Injection Interval: 11,800-13,900 Maximum Injection Rate: 20,000 BWPD Maximum Pressure: 2390 PSI

4. Interested parties, who can show that they are adversely affected by this application, must file objections or requests for hearing with the Energy and Minerals Department, Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days after this publication.

Published in the Lovington Daily Leader October 21, 1998.

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 10233 Order No. R-9474

APPLICATION OF MOBIL EXPLORATION & PRODUCING U.S. INC., AS AGENT FOR MOBIL PRODUCING TEXAS & NEW MEXICO INC., FOR APPROVAL OF SALT WATER DISPOSAL, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on March 7 and March 21, 1991, at Santa Fe, New Mexico, before Examiners Jim Morrow and Michael E. Stogner, respectively.

NOW, on this 27th day of March, 1991, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) The applicant, Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico Inc., (Mobil), seeks authority to dispose of produced salt water into the South Vacuum-Devonian Pool, in the open hole interval from approximately 11,800 feet to 13,970 feet in its State Section 27 Well No. 1 (proposed well) located 660 feet from the North line and 1983 feet from the East line (Unit B) of Section 27, Township 18 South, Range 35 East, NMPM, Lea County, New Mexico.

(3) Mobil plans to use the proposed well for disposal of lease and offlease water. The well is needed as a back-up for the State Section 27 Well No. 2 which was approved by Oil Conservation Commission Order No. R-8645 on May 5, 1988.

(4) At the hearing Mobil submitted exhibits and testimony containing the following information and plans concerning the proposed well.

(a) It is plugged and abandoned with cement plugs at the surface, 1638 feet, and 11260 feet. 13 3/8-inch casing is set at 360 feet and 9 5/8-inch casing is set at 3,800 feet with cement circulated behind both strings. 7 5/8-inch casing set at 11,800 feet has been cut and pulled from 1,689 feet. Cement behind the 7 5/8-inch casing is from 11,800 feet to 1,715 feet. If approved, the proposed well would be cleaned out and deepened to 13,970 feet, pressure tested to ensure casing integrity, and 3 1/2-inch or 4 1/2-inch fiberglass lined tubing would be run and set in a packer at 11,750 feet. The tubing-casing annulus would be loaded with packer fluid.

- (b) From a closed system, water would be injected down the tubing into the open-hole Devonian-Fusselman interval between 11,800 feet and 13,970 feet. The Devonian portion of the injection interval is below the abandoned Devonian production section, 11,650 to 11,668 feet which has been cement squeezed with 150 sacks. Average and maximum injection rates would be 10,000 and 20,000 barrels per day. The proposed well is expected to take water on a vacuum. A maximum injection pressure of 2390 psi is being requested.
- (c) Based on compatibility test of Devonian water and produced waters which indicate probable scale formation, Mobil plans a scale prevention program.

(5) The following information concerning the area surrounding the proposed disposal well was submitted by Mobil through its exhibits and the testimony of its witnesses:

- (a) Structure maps of the South Vacuum-Devonian Pool show a major Northwest-Southeast trending fault with an upthrown Southwest block which has been and continues to be oil productive.
- (b) Devonian production from the pool has been from 14 wells located in Sections 21, 22, 26, and 27, Township 18
 South, Range 35 East. Currently there are four productive wells in the Southcast part of the Pool; all are operated by Unocal. Average daily per well production

> from the four wells is 20 bbls. of oil and 1,876 barrels of water. Currently there are also two former Devonian producers which are used as disposal wells. The Fusselman, non-productive in this pool, is included in the disposal interval in Mobil's State Section 27 Well No. 2 and the proposed well.

- (c) The Mobil State Section 27 Well No. 2 located 1869 feet Southeast of the proposed well has been a very successful disposal well. Water injection into the 27 Well No. 2 since June 1990 has averaged approximately 6,000 barrels per day at O psi (Vacuum) surface injection pressure. Tracer surveys run in March 1988 and January 1991 show that most of the injected water is entering a lower Devonian interval from approximately 12,040 feet to 12,100 feet.
- (d) The Mobil State Section 27 Well No. 2 is the only well within one-half mile of the proposed well which penetrates the proposed injection interval. It is properly constructed to prevent the migration of injected fluids from the disposal interval.
- (e) Fresh water is present in the Ogalalla formation at 300 feet and the Santa Rosa at 1,400 feet. There is no evidence of open faults or other hydrological connection between the Devonian Formation and any underground source of drinking water. A water sample from a well in the area identified as the "Snyder Windmill" indicated a chloride concentration of 50 mg/liter.

(6) Snyder Ranches, Inc. protested this application and through its witness, Mr. Larry C. Squires, submitted the following testimony:

- (a) Snyder Ranches lands have been damaged in the past by potash operations and oil field operations.
- (b) The "Snyder Windmill" water sample came from some location other than the approximate location identified by Mobil's witness.
- (c) Snyder Ranches is not protesting the granting of Mobil's application in this case, but is requesting that OCD require additional tests to ensure that fresh water in the area is being protected.

> (d) Snyder Ranches is concerned that a recent water blowout in the area may have been caused by injection operations.

(7) Additional tests and procedures to ensure fresh water protection were discussed at the hearing by Mobil and Snyder Ranches as follows:

- (a) Require more frequent mechanical integrity pressure tests.
- (b) Maintain pressure on the tubing-casing annulus.
- (c) Periodic sampling of Snyder Ranches water well located approximately one-half mile East of Mobil's proposed well.

(8) Following the hearing, correspondence was received from Mobil requesting that the tests and procedures set out in Findings (7)(b) and (7)(c) above not be required, but recommending annual pressure testing as an additional permit requirement. Mobil also submitted a written request that the record in Case No. 9337 be included as a part of the record in this case.

(9) Snyder Ranches Inc. submitted a letter following the hearing suggesting that Mobil hire an independent water laboratory to sample the Snyder Ranches water well on a quarterly basis.

(10) The subject application indicates that Mobil would comply with OCD rules and requirements in operating the proposed well as a disposal well and that fresh water resources and oil and gas accumulations would not be adversely affected. Approval of the application is in the interest of conservation, and would prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico Inc., is hereby authorized to dispose of produced salt water into the South Vacuum-Devonian Pool, in the open hole interval from approximately 11,800 feet to 13,970 feet in its State Section 27 Well No. 1 located 660 feet from the North line and 1983 feet from the East line (Unit B) of Section 27, Township 18 South, Range 35 East, NMPM, Lea County, New Mexico.

PROVIDED HOWEVER THAT, injection shall be through 3 1/2-inch or

4 1/2-inch fiberglass lined tubing set in a packer at approximately 11,750 feet, the tubing-casing annulus shall be filled with an inert packer fluid, and a pressure gauge shall be attached to the annulus or the annulus shall be equipped with an approved leak detection device in order to determine leakage in the casing, tubing, or packer.

<u>PROVIDED FURTHER THAT</u>, prior to commencing injection operations and <u>annually thereafter</u>, the casing in the subject well shall be pressure tested to assure the integrity of such casing in a manner and at a time that is satisfactory to the supervisor of the Division's district office at Hobbs, New Mexico.

(2) The injection well or system shall be equipped with a pressure limiting switch or other acceptable device which will limit the wellhead pressure on the injection well to no more than 2360 psi (0.2 psi per foot).

(3) The Director of the Division may authorize an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected waters from the San Andres formation.

(4) The operator shall notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity pressure tests in order that the same may be witnessed.

(5) The operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing or packer in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

(6) The applicant shall conduct disposal operations and submit monthly reports in accordance with Rules 702, 703, 704, 705, 706, 708 and 1120 of the Division Rules and Regulations.

(7) Personnel from the Division's Hobbs district office shall contact Snyder Ranches Inc. personnel on or about April 1 and October 1, 1991 and 1992 and arrange to collect a water sample from the Snyder Ranch Inc. water well in Section 26 approximately one-half mile East of Mobil's proposed well. Chloride analysis of the samples shall be kept on file at the Hobbs office. After 1992, the Supervisor of the Hobbs office shall determine whether additional sampling is needed.

(8) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION

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WILLIAM J. LEMAY, DIRECTOR

dr/