CASE 3378: Application of SOCONY-MOBIL OIL CO. for a waterflood project, Eddy County, N.M.

SE WO. 3378

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#### BEFORE THE OIL CONSERVATION COMMISSION OF

NEW MEXICO

IN THE MATTER OF THE APPLICATION OF SOCONY-MOBIL OIL COMPANY, INC. FOR AUTHORITY TO INSTITUTE A WATERFLOOD PROJECT WITHIN THE WEST HENSHAW PREMIER UNIT AREA, CONTAINING 2400 ACRES, MORE OR LESS, IN EDDY COUNTY, NEW MEXICO, SAID PROJECT TO BE OPERATED IN ACCORDANCE WITH RULE 701 OF THE COMMISSION.

Case No. 3378

#### APPLICATION

- 1. Socony-Mobil Oil Company, Inc. hereby makes application for authority for the injection of water into the Premier (basal Grayburg) Formation underlying an area designated as the West Henshaw Premier Unit Area in Eddy County, New Mexico. Attached to this Application as Exhibit 1 is a plat showing the location of proposed injection wells and the location of all other wells within a radius of two miles of the proposed injection wells. The plat also shows leasehold ownership within said two-mile radius. Exhibit 2 attached to this Application is a map of the proposed injection pattern.
- 2. There is attached as Exhibit 3 to this Application a typical log of proposed injection wells. Also attached as Exhibits 4, A through Z, are diagrammatic sketches of injection well completion data showing casing strings, cement programs and other pertinent information as required by Rule 701 of this Commission.
- 3. It is proposed that the interval to be affected by the proposed water injection is that found and defined as the continuous stratigraphic interval occurring between a point 100 feet above the top of the Premier Zone and the base of the Grayburg Formation, said interval having been penetrated between 2,733 feet and 2,860 feet and the top of the Premier Zone having been found

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Date 2-11-66

at 2,833 feet beneath the derrick floor in the Little Lucky Lake Unit, Shell Well No. 1, located in Lot Nine (9) of Section Three (3), Township 16 South, Range 30 East, N.M.P.M., Eddy County, New Mexico, as said interval is shown in the log of the last well named, which log is attached hereto and marked Exhibit 3.

- 4. Water for injection purposes will be obtained from a commercial water company operating in the area and, in addition, produced water will be injected as it is available and produced. Initial injection rate is proposed at a total of 6,500 barrels per day into the twenty-six (26) injection wells.
- 5. It is not now contemplated that additional wells in the Unit area will be converted to injection wells. However, if flood performance indicates the need for additional injection wells, it is requested that the Order sought herein make provision for the granting of administrative approval and authorization for such additional wells under the provisions of Rule 701e(5) of this Commission following application therefor.
- 6. A copy of this Application, complete with Exhibits, has been sent to the Office of the State Engineer, Santa Fe, New Mexico.

Applicant respectfully requests that the Commission issue its Order granting approval and authorizing institution of the waterflood project as proposed herein.

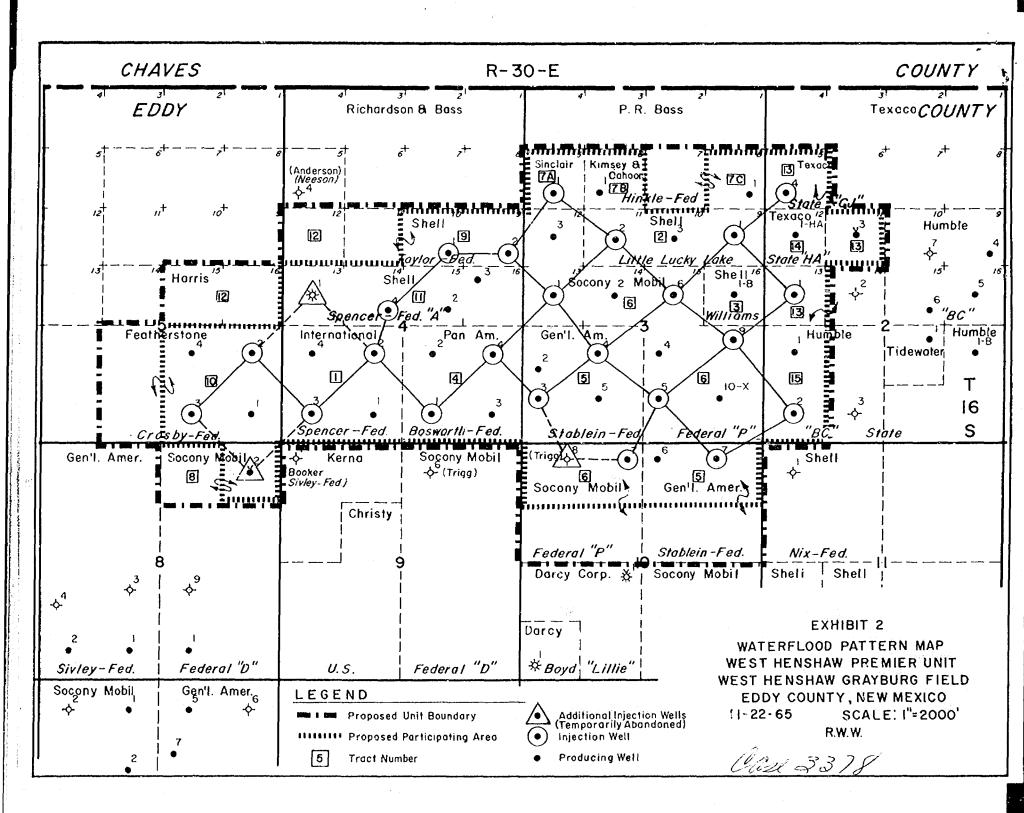
Respectfully submitted,

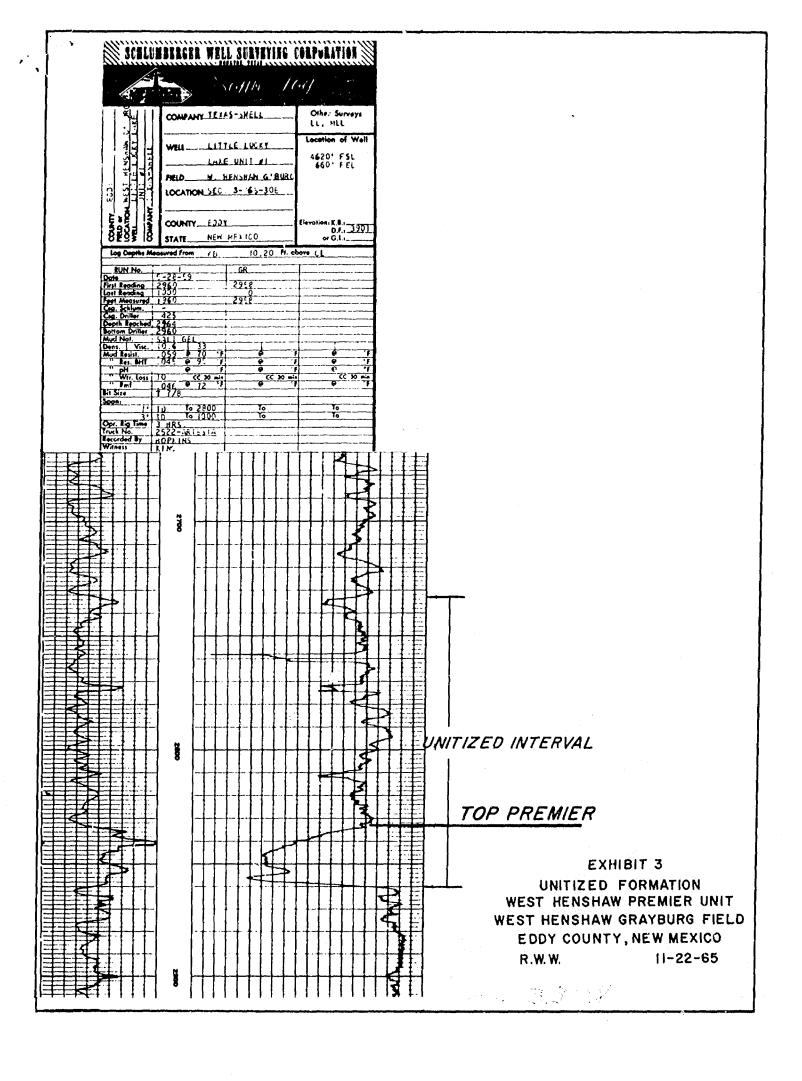
SOCONY-MOBIL OIL COMPANY, INC.

Modrall, Seymour, Sperling, Roahl & Harris

Its Attorneys
1200 Simms Building, Post Office Box 466
Albuquerque, New Mexico

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#### EXHIBIT 4-A INJECTION WELL COMPLETION DATA

FEATHERSTONE CROSBY FED
OPERATOR LEASE

WELL NO.

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#### EXHIBIT 4-B INJECTION WELL COMPLETION DATA

FEATHERSTONE CROSBY FED 3

OPERATOR LEASE WELL NO.

LOCATION W - SEC 3 - TIGS - R30E

WEST HENSHAW UNIT, EDDY CO., N.M.

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## EXHIBIT 4-C INJECTION WELL COMPLETION DATA

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OPERATOR LEASE WE

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OPERATOR LEASE WELL NO.

LOCATION U- SEC 3-TILS-R30E WEST HENSHAW UNIT, EDDY CO., N.M.

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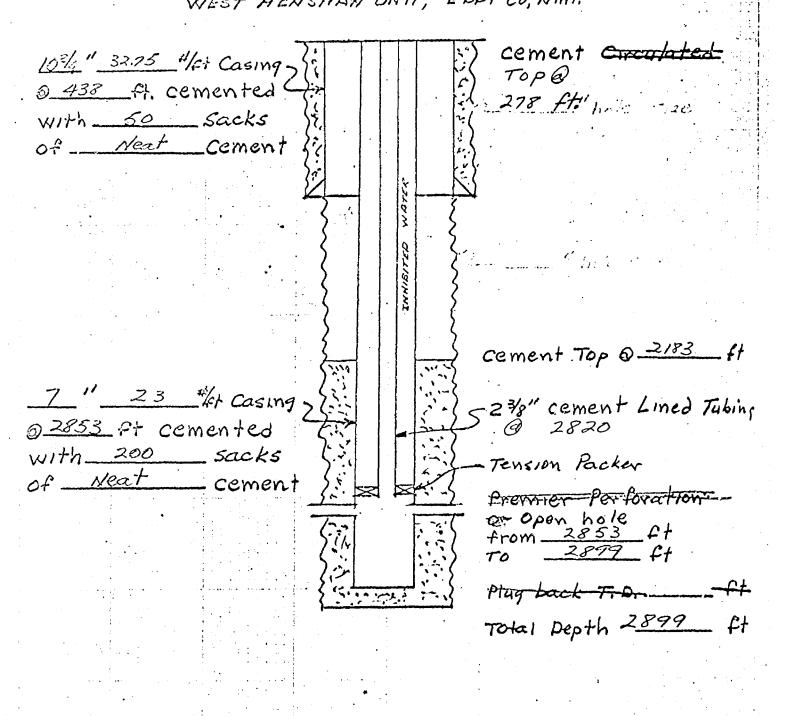
#### EXHIBIT 4-E INJECTION WELL COMPLETION DATA

GENERAL AMERICAN STABLEIN FED 4

OPERATOR LEASE WELL NO.

LOCATION S-SEC 3-TILS-R-30E

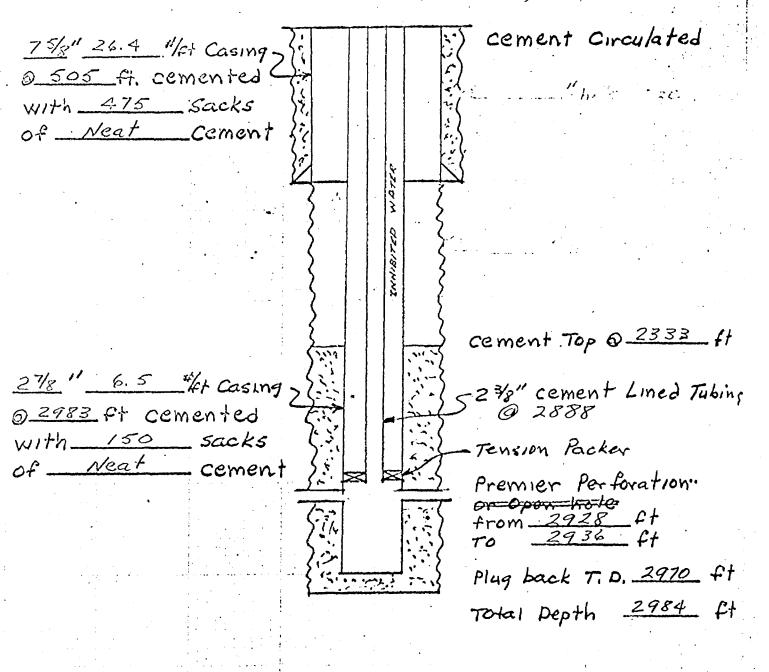
WEST HENSILAW UNIT, EDPY CO, N.M.



#### EXHIBIT 4-F INJECTION WELL COMPLETION DATA

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LOCATION U-Sec Z-T 165-R 30E

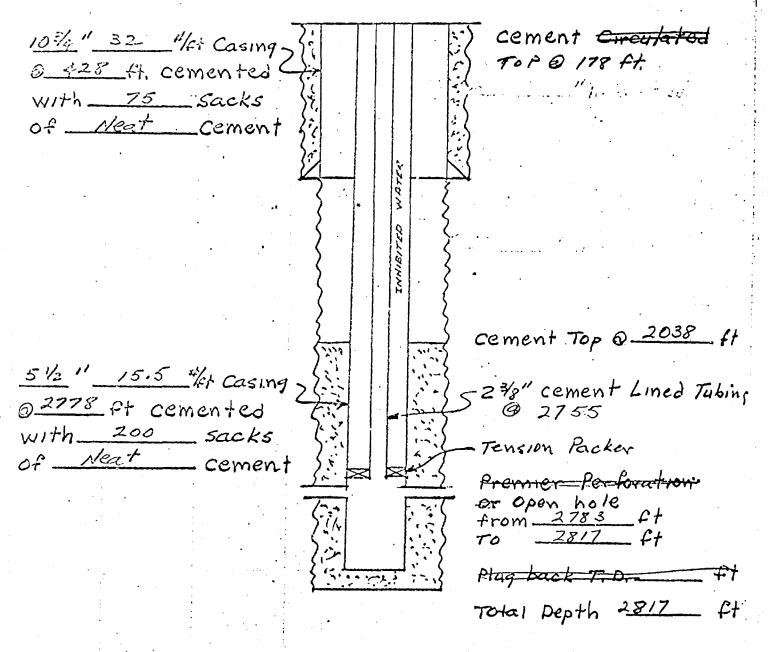
WEST HENSHAW UNIT, EDDY CO., N.M.



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WEST HENSHAW UNIT, EADY CO, N.M.



#### EXHIBIT 4 - H INJECTION WELL COMPLETION DATA

OPERATOR LEASE WELL NO.

LOCATION U-SEC 4-TIGS-RSOE

WEST HENSHAW UNIT, EPDY CO, N.M.

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OPERATOR LEASE WELL NO.

LOCATION Q - SEC 8 - TILS - R30E

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OPERATOR LEASE WELL NO.

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WEST HENSHAW UNIT, EDDY CO, N.M.

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## EXHIBIT 4-K INJECTION WELL COMPLETION DATA

OPERATOR LEASE WELL NO.

LOCATION W-SEC 3-T165-R30E

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## EXHIBIT 4-L INJECTION WELL COMPLETION DATA

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OPERATOR LEASE WELL NO.
LOCATION O SEC 3-TIGS-R30E
WEST HENSHAW UNIT, EPPY CO., N.M.

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EXHIBIT 4-M
INJECTION WELL COMPLETION DATA

MOBIL FED P

OPERATOR LEASE WELL NO.
LOCATION & SEC 3-TILS-R30E

WEST HENSHAW UNIT, EDDY CO, N.M.

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	STA STATE OF THE S		from 2879 ft  To 2906 ft  Play back T.D ++
	•		Total Depth 2906 ft

## EXHIBIT 4-1/ INJECTION WELL COMPLETION DATA

MOBIL Fed P 7
OPERATOR LEASE WELL NO.
LOCATION C- SEC 10 - T165 - R 30 E
WEST HEN SHAW UNIT, EDDY CO, N.M.

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#### EXHIBIT 4-0 INJECTION WELL COMPLETION DATA

MOBIL FEDERAL D 8

OPERATOR LEASE WELL NO.

LOCATION d-SEC 10-T165-R30E

WEST HENSHAW UNIT, EDDY CO, N.M.

1034" 32 "/ct Casing 3456 A. cemented With 75 Sacks  of Neat Cement	- C - X - V - C - C - X - V - C - C - X - V - C - C - C - C - C - C - C - C - C		Cement enculated Top@ 256 ft  /2
		TWINGITTED WAY	Cement Top @ 2523 ft
5½" 14 %+ Casing 2 0 2913 st cemented with 100 sacks of Neat cement			- Z= 28" cement Lined Tubing  - Tension Packer  Premier Parloyation:
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		from

#### EXHIBIT 4-P INJECTION WELL COMPLETION DATA

PAN AMERICAN BOSWORTH FED 1

OPERATOR LEASE WELL NO.

LOCATION W- SEC 4-TILS-R30E

WEST HENSHAW UNIT, EDDY CO, N.M.

cement Circulated 8 5/8" 22.7 1/ct Casing 0 56/ A. cemented With 300 Sacks Neat cement cement Top @ 2/49 ft # Casing > -238" cement Lined Tubing @ 2786 @ 2875 ft cemented with 125 \_\_\_sacks Tension Packer Neat cement Premier Perforation. from 2815 2850 ft Plug back T.D. 2864 ft Total Depth 2875 ft

### EXHIBIT 4-Q INJECTION WELL COMPLETION DATA

PAN AMERICAN BOSWORTH FED 4

OPERATOR LEASE WELL NO.

LOCATION 9-SEC4-TIGS-R'30E

WEST HENSHAW UNIT, EDPY CO, N.M.

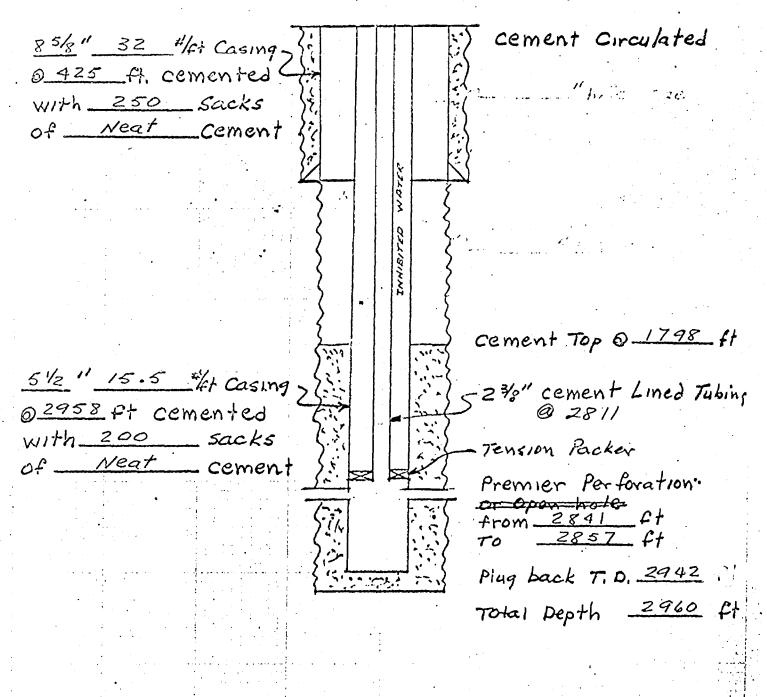
85/8" 22.7 #/st Casing ]		) cement Circulated
@ 547 ft. cemented	4	
with 500 sacks st. of Neat Cement si		hale tree
};		
	Liam S	
	Zwill Bi	
		cement Top @ 2177 ft
51/2" 14 # Casing 2 ?		52 % cement Lined Tubing @ 2809
with 125 sacks		- Tension Packer
of <u>Neat</u> cement		Premier Perforation:
<u> </u>	7/1	from 2842 ft
<b>}</b> ,		To 2887 ft  Plug back T.D. 2892 ft
	5,72 kb/t 12.1	Total Depth 2902 ft

#### EXHIBIT 4-R INJECTION WELL COMPLETION DATA

OPERATOR LEASE WELL NO.

LOCATION 1 - Sec 3 - T165 - R30 E

WEST HENSHAW UNIT EDDY CO, N.M.



### EXHIBIT 4 - 5 INJECTION WELL COMPLETION DATA

SHELL LITTLE LUCKY LAKE UNIT Z

OPERATOR LEASE WELL NO.

LOCATION K-SEC Z-T165-R 30E

WEST HENSHAW UNIT, EDDY CO, N.M.

				•		÷
85/8" 3Z	#/ft Casing	3:		() cemen	t Circulat	<sup>L</sup> ed
0 433 A. C	• /	<del>\</del>		$\langle c \rangle$		
with _ 300	Sacks	\{\{\}_{\}}		4.	"he 12 1 20	
of <u>Neat</u>	Cement	3.		; ) s: .		•
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		}	3			
		5 0	3	) }**>		•
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51/2 115.5¢ 17	_# Casing	3	1.1.	)		
2870 ft Co	emented	25	المنظ	5278" cei	ment Lined 2790	Tubing
with 600		7:37		•		
	_ cement	};'\	المرتبة	- TENSION	tacker	
			*****		Perforation	n.
		Sin	7 (	from 2	19 ft	
				TO _2	8 27 ft	•
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Plug back	T.D. 284	6 ft
		}		• ,	th 287	
			•	Total Dep	7h <u></u>	<u> </u>
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		t. Ha		•	•	
	The state of the s		· · · · · ·	•	***	4.5

# EXHIBIT 4 -T INJECTION WELL COMPLETION DATA

SHELL SPENCER FED A DELL NO.

DERATOR LEASE WELL NO.

LOCATION M- SEC 4-TIGS-R30 E

WEST HENSHAW UNIT, EDDY CO, N.M.

35/4 3Z #/fi Casing	cement Circulated
0509 ft. cemented (); With 500 sacks (); Of Neat Cement ();	1/h /2 20
	la suita management de la suita della suit
	ZWHISITE C
51/2 " 15.5 "If Casing 2 City	cement Top & Surface #
with 1000 sacks of Neat Cement	Tension Packer
	Premier Perforation:  or open hole  from 2769 ft  To 2773 ft
NOTE: THIS WELL IS  PRESENTLY COMPLETED IN  THE QUEEN SAND AS A  WATER SOURCE WELL, IT  WILL BE RECOMPLETED IN	Total Depth 2844 ft
THE PREMIER.	

la in ven s

#### EXHIBIT 4-U INJECTION WELL COMPLETION DATA

SHELL SPENCER FEDA 4

OPERATOR LEASE WELL NO.

LOCATION M- SEC 4-TIGS-R30E

WEST HENSHAW UNIT, EPOY CO., N.M.

85/8" 32 "/ct Casing-	3:1	5	cement c	irculated
0 509 ft. cemented	<u>}</u>		1/10	to 1.20
with <u>250</u> Sacks of <u>Neat</u> Cement	}\[\frac{7}{2}\]	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
	30	8		
	3	wan.	e e e e e e e e e e e e e e e e e e e	
	}			
	}	181HNS		
	}			4.00
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1	cement.Top	6-680 ft
51/2" 15.5 # Casing	2	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	-23/8" cement	
02860 ft cemented with 600 sacks	5:3		@ 2760 0 1	t and the second of the second
of <u>Neat</u> cement		The state of the s	-Tension Pack Premier Per	
	777	1 3	or open how	3
			from 2790 To 2812	ft
	3,5,5,5		Plug back T.	
		•	Total Depth	2860 ft
	· · · · · · · · · · · · · · · · · · ·	•		
			•	
	•			

## EXHIBIT 4-V INJECTION WELL COMPLETION DATA

SHELL TAYLOR FED /
OPERATOR LEASE WELL NO.
LOCATION j- SEC 4- TIGS-R 30E
WEST HENSHAW UNIT, EDDY CO, N.M.

85/8" 37 #/ct Cash	ng - 3:		cement c	irculated
<u>∂ 5/2</u> A. cemente	, , , , , ,		,,	
with 250 Sacks	7 '(1 ' 1	4	he and the	A Tac
of <u>Neat</u> Cemer	nt 3?	4:.		
	7.			
		Works.	e de la companya de La companya de la co	
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	. }	7.18	e in the second	
	}			
	<b>\</b>	1  }		u.
:	200	1	Tement .Top	0 693 ft
51/2" 15.5 %+ Cas	1 1	1	7/ //	
0 2873 ft cemented	25	1 5	278" cemen @ 2762	+ Lined Tubing
with 600 sack	. 7 4 ( )	1 155.	•	•
of <u>Neat</u> ceme	ent s	العربيا	Tension Pack	
	7-		Premier Per	
	SIA		from 2792	-ct
	13	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ro <u>2802</u>	•
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u>现于</u>	Plug back T.	D. <u>2845</u> ft
		7	rotal Depth	2873 Ft
			•	•
			:	
**************************************	santa sa marana 1721	1	· · · · · · · · · · · · · · · · · · ·	ROSS 200

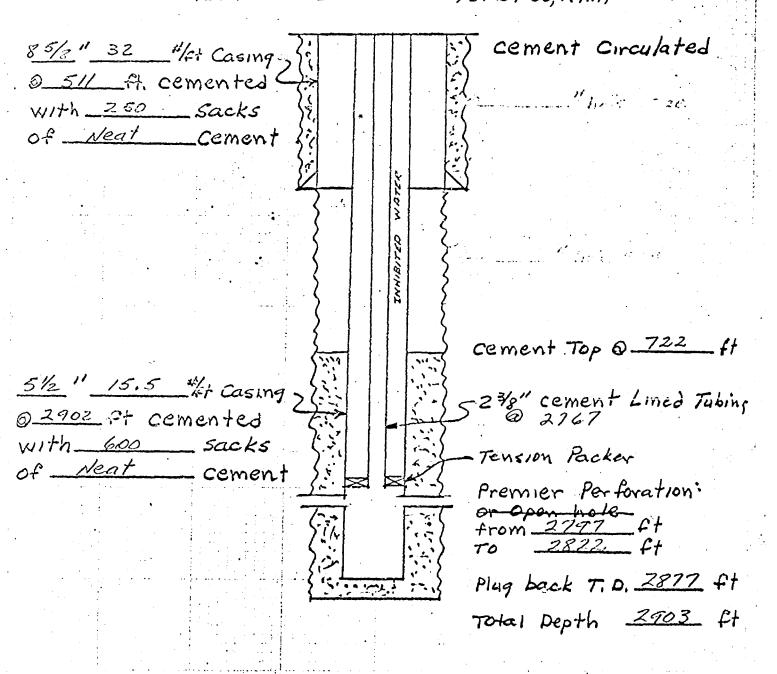
#### EXHIBIT 4-W INJECTION WELL COMPLETION DATA

SHELL TAYLOR-FED 2

OPERATOR LEASE WELL NO.

LOCATION L- SEC 4 - TIGS-R30E

WEST HENSHAW UNIT, EPDY CO, N.M.



## EXHIBIT 4-X INJECTION WELL COMPLETION DATA

SINCLAIR BASS FED P

OPERATOR LEASE WELL NO.

LOCATION & SEC3-TIGS-R30 R

WEST HENSHAW UNIT, EDDY CO., N.M.

•	
85/2" 24/32 #/ct Casing 3:	cement Circulated
5 392 A. cemented	$(\epsilon)$
With 225 Sacks }	hole te
of 6% gel cement ?	
	3
	3
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	}
£2029	cement Top 0 2/69 ft
51/2" 14 #/ Casing	
	( ) > 523/8" cement Lined Tubing
92839 ft cemented Fire	@ 2759
of Nect Cement	Tension Packer
of Nect Cement	Premier Perforation
77	or open hale ct
	from 2789 ft
	Total Depth 2840 ft

## EXHIBIT 4 - Y INJECTION WELL COMPLETION DATA

TEXACO STATE CJ

OPERATOR LEASE WELL NO.

LOCATION M - Sec 2 - TIGS - R 3 O E

WEST HENSHAW UNIT, ERRY CO., N.M.

·		<u>.</u>
85/8" 24 "/fi Casing };  0 450 ft. cemented ;  With 40 Sacks  of Neat Cement	4	Cement Circulated TOP @ 340 ft,
		INVISITED WOTER
41/2" 11.6 #th Casing > 0 2965 ft cemented with 300 sacks of Neat cement		cement Top @ 1055 ft  2 3/8" cement Lined Tubing @ 2882  Tension Packer  Premier Perforation:  or open-hode
		from 29/2 ft  To 2921 ft  Plug back T.D. 2949 ft  Total Depth 2965 ft

## EXHIBIT 4-Z INJECTION WELL COMPLETION DATA

TEXACO STATE CJ 4

OPERATOR LEASE WELL NO.

LOCATION E- SEC 2-TIGS-R30E

WEST HENSHAW UNIT, EDDY CD, N.M.

113/4" 23.72 #/	t Casing -	: : :		cement C	irculated
0 5/5 . Ct. cer	' / (		( a ( c )	<i>,,</i>	
With 500				Land of the state	150 (1.5 <b>26</b> €) (4.5 (1.5 (1.5 (1.5 (1.5 (1.5 (1.5 (1.5 (1
of <u>Neat</u>	_cement }				
	}				
		3/5	2,5		
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	8		
	•	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	LIBIT CONTRACTOR		
		}		Campant Ton	Surface #
		河		cement top	
85/8" 24				-238" cemen	+ Lined Tubing
02871 Pt Cem		5:5	-	@ 2820	
of <u>Neat</u>		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Tension Paci	ker
	- Comerci	\(\frac{1}{2}\)		Premier Per	
		STA	7.50	from 2850	<u>c</u> t
		50		To 2855	
		15/200	<u> </u>	Plug back T.	D. 2870 ft
				Total Depth	10,100 Ft
•					
			•		
to the property of the state	10 B7-13				Respiration of the co.

GOVERNOR
EDWIN L. MECHAM
CHAIRMAN

# State of New Mexico Oil Conservation Commission

LAND COMMISSIONER

D. S. JOHNNY WALKER

NEMBER



STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

Attorneys at Law
P. O. BOX 2008

SANTA FE

8750!

Authorized water injection wells, which with a parker and with the casing - heading answer and the casing - heading answer and the casing - heading answer.

Mr. James E. Sperling

Modrall, Seymour, Sperling, Roehl & Carrier on the present and the prese

Gentlemen:

Researce is muse to see the second order No. R- 3045, entered in Case No. 33 8, approving the Socond Mobil Nost Heuskam Premier Water Flood Project.

According to our calculations, when soil of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 1974 barrels per day. The maximum 7B should be active to 2016 be the Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate District per lay.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behoves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

Mr. Frank Irby cc: OCC - Artesia Booker Kelly

A. L. PORTER, Jr. Secretary-Director

#### OIL CONSERVATION COMMISSION

P. O. BOX 2088

#### SANTA FE, NEW MEXICO

March 7, 1966

Mr. James E. Sperling Modrall, Seymour, Sperling, Roehl & Harris Attorneys at Law Post Office Box 466 Albuquerque, New Mexico

Dear Mr. Sparling:

Reference is made to Commission Order No. R-3045, recently entered in Case No. 3378, approving the Socony Mobil West Henshaw Premier Water-flood Project.

Injection is to be through the 26 authorized water injection wells, each of which shall be equipped with a packer and with tubing, with the casing-tubing annulus filled with inhibited water to prevent corrosion.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 1974 barrels per day. If Tract 78, Lot 6 of Section 3, should be committed to the unit later, this maximum allowable would be increased to 2016 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behoves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a pesponse to water injection, etc.

#### OIL CONSERVATION COMMISSION

P. O. BOX 2088

#### SANTA FE, NEW MEXICO

- 2 -

March 7, 1966

Mr. James E. Sperling Albuquerque, New Mexico

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr. Secretary-Director

#### ALP: DSN: sg

cc: Mr. Frank Irby State Engineer Office Capitol Building Santa Fe, New Mexico

> Mr. Booker Kelly Lincoln Building Santa Fe, New Mexico

Oil Conservation Commission Drawer D D Artesia, New Mexico



DRAFT JMD/esr

### BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

	CF Subj.
IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION	
COMMISSION OF NEW MEXICO FOR	
THE PURPOSE OF CONSIDERING:	
	CASE No. 3378
A STATE OF THE STA	Order No. R-3045

APPLICATION OF SOCONYMOBIL OIL COMPANY, INC., FOR A WATERFLOOD PROJECT, EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

#### BY THE COMMISSION:

This cause came on for hearing at 9 of the a.m. on February 23, 1966, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter

NOW, on this day of February, 1966, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

#### FINDS:

- (1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.
- (2) That the applicant, Socony Mobil Oil Company, Inc., seeks permission to institute a waterflood project in the West Henshaw Premier Unit Area, West Henshaw-Grayburg Pool, by the injection of water into the Premier formation through twenty-six wells in Sections 2, 3, 4, 5, 8, and 10, Township 16 South, Range 30 East, NMPM, Eddy County, New Mexico.
- (3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.
- (4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

### IT IS THEREFORE ORDERED:

(1) That the applicant, Socony#Mobil Oil Company, Inc., is hereby authorized to institute a waterflood project in the West Henshaw Premier Unit Area, West Henshaw-Grayburg Pool, by the injection of water into the Premier formation through the following-described wells in Township 16 South, Range 30 East, NMPM, Eddy County, New Mexico:

Operator and Lease	Well No.	Unit	Section
Texaco State CJ	4 ·	E	2
Texaco State CJ	1	M	2
Humble State BC	2	U.	2
Sinclair Bass Federal	1	E ·	3
Shell Little Lucky Lake Unit	2	K	3
Shell Little Lucky Lake Unit	1	I.	3
Mobil Federal P	1	M.	3
Mobil Federal P	6	O.	3
General American Stablein Federal	4	S.	3
Mobil Federal P	9	Β. Q	3
General American Stablein Federal	3	U-	3 <sup></sup>
Mobil Federal P	5 5	₩	3
Shell Taylor-Federal	1	νι∽ . J	4 ·
<del>-</del>	2	I	4
Shell Taylor-Federal	1	M M	4
Shell Spencer-Federal A	4	M N	_
Shell Spencer-Federal A	-		4
International Spencer-Federal	2	S	4
Pan American Bosworth-Federal	4	Ω	4
International Spencer-Federal	3	Ŭ	4
Pan American Bosworth-Federal	1	W	4
Featherstone Crosby Foderal	2	Ω	5
Featherstone Crosby-Federal	3	W	5
Mobil Federal P D	2	Α-	8
Mobil Federal P	8	D	10
Mobil Federal P	7	С	10
General American Stablein-Federal	7	A	10

- (2) That the subject waterflood project is hereby designated the Materflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.
- (3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.
- (4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

LAW OFFICES OF

JOHN F. SIMMS (1885-1954)

J. R. MODRALL
AUGUSTUS T. SEYMOUR
JAMES E. SPERLING
JOSEPH E. ROEHL
GEORGE T. HARRIS, JR.
DANIEL A. SISK
LELAND S. SEDBERRY, JR.
ALLEN C. DEWEY, JR.
FRANK H. ALLEN, JR.
JAMES P. SAUNDERS, JR.

JAMES A. PARKER HENRY G.COORS JOHN R. COONEY
KENNETH L. HARRIGAN

#### MODRALL, SEYMOUR, SPERLING, ROEHL & HARRIS

SIMMS BUILDING

P. O. BOX 466

ALBUQUERQUE, NEW MEXICO 87103

TELEPHONE (43-45) AREA CODE 505

January 26, 1966

('aa 3378

Mr. A. L. Porter, Jr., Director Oil Conservation Commission State Land Office Building Santa Fe, New Mexico

Dear Sir:

We submit herewith Application of Socony-Mobil Oil Company, Inc. for authority to institute a waterflood project within the area to be designated as the West Henshaw Premier Unit, Eddy County, New Mexico, containing 2,400 acres, more or less, said waterflood project to be operated in accordance with Rule 701 of the Commission; a copy of this Application has been forwarded to the Office of the State Engineer.

We also submit herewith Application of Socony-Mobil Oil Company, Inc. for approval of Unit Agreement for the area to be designated as the West Henshaw Premier Unit, Eddy County, New Mexico, with copy of Unit Agreement attached thereto.

Ì

Very truly yours,

James E. Sperling

JES:fm

Enclosures

cc: Office of State Engineer Attention: Mr. Frank Irby

DOCKET MAILED

Date 2-11-66

JR

#### DOCKET: EXAMINER HEARING - WEDNESDAY - FEBRUARY 23, 1966

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM, STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

- CASE 3377: Application of Socony-Mobil Oil Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the of the West Henshaw Premier Unit Area comprising 2,400 acres of State and Federal lands in Township 16 South, Range 30 East, Eddy County, New Mexico.
- CASE 3378: Application of Socony-Mobil Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, authority to institute a waterflood project in its West Henshaw Premier Unit Area by the injection of water into the Premier formation through twenty-six wells in Sections 2, 3, 4, 5, 8, and 10, Township 16 South, Range 30 East, West Henshaw Grayburg Pool, Eddy County, New Mexico.
- CASE 3379: Application of Texaco Inc. for force-pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Justis-Paddock Gas Pool underlying the S/2 of Section 35, Township 24 South, Range 37 East, Lea County, New Mexico.
- CASE 3380: Application of Texaco Inc. for force-pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Justis-Paddock Gas Pool underlying the N/2 of Section 35, Township 24 South, Range 37 East, Lea County, New Mexico.

#### CASE 3187 (Reopened):

In the matter of Case No. 3187 being reopened pursuant to the provisions of Order No. R-2861, which order established 80-acre spacing units for the North Sawyer-Devonian Pool, Roosevelt County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

### BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

> CASE No. 3378 Order No. R-3045

APPLICATION OF SOCONY MOBIL OIL COMPANY, INC., FOR A WATERFLOOD PROJECT, EDDY COUNTY, NEW MEXICO.

#### ORDER OF THE COMMISSION

#### BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 23, 1966, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 1st day of March, 1966, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

### PINDS:

- (1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.
- (2) That the applicant, Socony Mobil Oil Company, Inc., seeks permission to institute a waterflood project in the West Henshaw Premier Unit Area, West Henshaw-Grayburg Pool, by the injection of water into the Premier formation through twenty-six wells in Sections 2, 3, 4, 5, 8, and 10, Township 16 South, Range 30 East, NMPM, Eddy County, New Mexico.
- (3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.
- (4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

-2-CASE No. 3378 Order No. R-3045

(5) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

#### IT IS THEREFORE ORDERED:

(1) That the applicant, Socony Mobil Oil Company, Inc., is hereby authorized to institute a waterflood project in the West Henshaw Premier Unit Area, West Henshaw-Grayburg Pool, by the injection of water into the Premier formation through the following-described wells in Township 16 South, Range 30 East, NMPM, Eddy County, New Mexico:

Operator and Lease	Well	No. Unit	Section
Texaco State CJ	4	E	2
Texaco State CJ	1	M	2
Humble State BC	2	ប	2
Sinclair Bass Federal	1	E	3
Shell Little Lucky Lake Unit	2	K	3
Shell Little Lucky Lake Unit	1	<b>I</b>	3
Mobil Federal P	1	, : M	3
Mobil Federal P	6	Mark o	3
General American Stablein-Federal	4	<i>\$</i>	3
Mobil Federal P	9	Q	3
General American Stablein-Federal	3	ប	3
Mobil Federal P	5	W	3
Shell Taylor-Federal	ì.	J	4
Shell Taylor Federal	2	1	4
Shell Spencer-Federal A	1	M	4
Shell Spencer-Federal A	4	N	4
International Spancer-Federal	2	S	4
Pan American Bosworth-Federal	4	Q	4
International Spencer-Federal	3	U	4
Pan American Bosworth-Federal	1	W	4
Featherstone Crosby-Federal	2	Q	5
Featherstone Crosby-Federal	3	W	5
icbil Federal D	2	Ł.	8
fobil Federal P	8	D	10
iobil Federal P	7 .	c	10
Seneral American Stablein-Pederal	7	A	10

(2) That the subject waterflood project is hereby designated the West Henshaw Premier Waterflood Project and shall be governed

-3+ CASE No. 3378 Order No. R-3045

by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

- (3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.
- (4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

> STATE OF NEW MEXICO QIL CONSERVATION COMMISSION

TACK M CAMPBRILL Chairman

GUYTON B. HAYS, Member

4. f. Chin. h

A. L. PORTER, Jr., Member & Secretary

016576 01 016576 01 016576 01 016576131 0167761	Votes Bres 7: 17: 07814975 R-2	9-E 26 12 12 2	(5) (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	7 30 17 10 17 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	29	28 R-30-E 27 0- F. Minkleric
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her land	HBP 185	t d Harris	Sel XX	Sacon Mosti	25. C	the state of the second st
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13 - 13 - 13 - 13 - 13 - 13 - 13 - 13 -	ting + 18	• 17 • 10 ;	16	Secon, Mobil	5hr Oce   257512	18   18   18   18   18   18   18   18
(Cosson Vabilities) J McCiellan	Transfer of terrore	Gen'l Amer Socony Mobil	31010	Estimated Sociony Mobil for Long Map 1-55 1-55 1-55 1-55 1-55 1-55 1-55 1-5	(5. 74972)  (5. 74972)  (6. 74972)  (7. 74	EXHIBIT I LEASE MAP
24 Sim	ار <sub>اد ما</sub> ا احد ا	LEGEND Proposed Unit B Proposed Inject Producing Well	Boundary 21	Shell   Shell   Shell   Shell	HENSHAW DEER UNIT.	WEST HENSHAW PREMIER UNIT WEST HENSHAW GRAYBURG FIELD EDDY COUNTY, NEW MEXICO 2-11-66

## EXHIBIT 4 - Y INJECTION WELL COMPLETION DATA

TEXACO STATE CJ WELL NO.

DERATOR LEASE WELL NO.

LOCATION M - Sec 2 - TIGS - R 30E

WEST HENSHAW UNIT, EPDY CO., N.M.

85/8" 24 #/ct Casing 0 450 ft. cemented with 40 Sacks of Neat Cement	Cement Condition  TOP @  340 ft,  (est by Volumetric fitt up cale)  12/2" hole  24/4" hole
41/2" 11.6 #th Casing 2 0 2965 ft cemented with 300 sacks of Neat cement	cement Top @ 1055 ft  (est by Volumetric Fill up calculation)  2 78" cement Lined Tubing  @ 2882  Tension Packer  Premier Perforation.
	from 29/2 ft  from 29/2 ft  To 2921 ft  Plug back T. D. 2949 ft  Total Depth 2965 ft
	R.w. white 2-11-66

## EXHIBIT 4 - F INJECTION WELL COMPLETION DATA

HUMBLE STATE BC 2

OPERATOR LEASE WELL NO.

LOCATION U - Sec Z - T 165 - R 30 E

WEST HENSHAW UNIT, EDDY CO., N.M.

75/8" 26.4 #/c+ Casingcement Circulated 0 505 ft. cemented -11" hole, Rotary With 475 Sacks of <u>Neat</u> Cement . 634" hole, Rotary Cement Top 0 2333 ft 27/8 " 6.5 # Casing > 1238" cement Lined Tubing
0 2888 @ 2983 ft cemented with 150 sacks - Tension Packer -cement Premier Perforation. from 2928 ft to 2936 ft Plug back T.D. 2970 ft Total Depth 2984 ft

. R.w. white 2- 11-66

### EXHIBIT 4 -Z INJECTION WELL COMPLETION DATA

TEXACO STATE CJ 4

OPERATOR LEASE WELL NO.

LOCATION C- SEC 2 - TIGS - R 30E

WEST HENSHAW UNIT, EDDY CO, N.M.

cement Circulated 1134" 23.72 #/c+ Casing-0 5/5 A. cemented 15" hole, With 500 Sacks .Cement -10 % " hole, Rotary cement Top & Surface # #th Casing > -23/8" cement Lined Tubing @ 2871 ft cemented @ 2820 with 900 sacks. - Tension Packer cement Premier Perforation. or open hole from 2850 2855 ft Plug back T.D. 2870 ft Total Depth 10,100 ft . R.w. white 2-11-66

### EXHIBIT 4-X INJECTION WELL COMPLETION DATA

SINCLAIR BASS FED 1

OPERATOR LEASE WELL NO.

LOCATION & - SEC 3 - TIGS - R 30 E

WEST HENSHAW UNIT, EDDY CO., N.M.

cement Circulated 85/8" 24 1 32 #/c+ Casing 0 392 ft. cemented -11 hole = 20 With 275 Sacks of 6 % ge/ Cement cement Top @ 2169 ft (est by Volumetric fill up calculation) 51/2 " 14 # Casing > 52 % cement Lined Tubing @ 2759 @ 2839 ft cemented with\_110\_sacks Tension Packer .cement Premier Perforation.

or open hole from 2789 ft

To 2793 ft Plug back T. D. 28/3 ft Total Depth 2840 ft

. R.w. white 2-11-66

### EXHIBIT 4-5 INJECTION WELL COMPLETION DATA

LITTLE LUCKY LAKE UNIT 2 OPERATOR LEASE

. R.w. white 2-11-66

LOCATION K- SEC 3 - T165 - R 30E

WEST HENSHAW UNIT, EDDY CO. N.M.

cement Circulated 85/8" 32 #/ft Casing 0 133 ft. cemented 2 11 "hole 20 With 300 Sacks of <u>Neat</u> Cement 7 1/2 11 hole cement Top 0 690 ft (Est by Volumetric fill up Calculation) 51/2 "15.5\$ 17 # Casing > 5238" cement Lined Tubing @ 2790 @ 2870 ft cemented with 600 sacks - Tension Packer - cement Premier Perforation. or open hote from 2819 ft To 2827 ft Plug back T.D. 2846 ft Total Depth 2870 ft

## EXHIBIT 4-R INJECTION WELL COMPLETION DATA

SHELL LITTLE LUCKY LAKE UNIT |

OPERATOR LEASE WELL NO.

LOCATION 1 - Sec 3 - T165 - R 30 E

WEST HENSHAW UNIT EXXY CO, N.M.

cement Circulated 8 5/8" 32 #/c+ Casing-0 425 ft, cemented 2\_11 ... "hole - 20. With 250 Sacks of <u>Neat</u> \_\_Cement (est by Volumetric fill up calculation) 51/2" 15.5 # Casing > -2 1/8" cement Lined Tubing 02958 ft cemented @ 2811 with 200 \_\_ Sacks - Tension Packer of Neat -cement Premier Perforation. from 2841 ft To 2857 ft Plug back T.D. 2942 ft Total Depth 2960 ft.

R.w. white 2-11-66

### EXHIBIT 4-J INJECTION WELL COMPLETION DATA

MOBIL Fed P

OPERATOR LEASE WELL NO.

LOCATION M-SEC 3-TIGS-R30E

WEST HENSHAW UNIT, EDOY CO, N.M.

cement - Circulated 103/4" 32 #/F+ Casing-Top @ 53 Feet (XI) 0 425 ft. cemented (est by volumetric fill up) With 75 Sacks Cement 121/2" cable tool hole . 10" cable tool hole +0. 21:55 fut. -8" cable tool hole 2155 to T, D, cement Top @ 2435 (est by Volumetric fill up) 51/2 " 15.5 # Casing > ~23/8" cement Lined Tubing @ 2825 ft cemented @ 2796 with 100 \_ sacks Tension Packer .cement Premoter Portoration. from 2825 2865 -ft Plug back Ti Di 2869 Ft Total Depth 41 - For capse hole and No cement loss.

#2 - For Goque hote and No cement loss coment Top would be 2227 feet,

Contraction of the second of t

R.W. White 2-11-66

## EXHIBIT 4-L INJECTION WELL COMPLETION DATA

MOBIL FED P.

OPERATOR LEASE WELL NO.

LOCATION O SEC 3 - TIGS - R30E

WEST HENSHAW UNIT, EPPY CO., N.M.

cement and tel Top @ 180 Ft. (x1) 103/4" 32 #/c+ Casing-(est by Volumetric fill up 0432 ft. cemented calculation } With \_\_\_\_\_\_\_ Sacks of Nest Cement 2 1242" cable tool hole cement Top 0 2243 ft (est by Volumetric fill up calculation) 523/8" cement Lined Tubing \_#h Casing > @ 2802 0 2833 ft cemented - Tension Packer \_sacks with\_ Premier Perforation. .cement from 2833 Plug back T.D. Total Depth 2861 ft

\* 1 For Gauge hole and No coment 1055 Top of cement would be 60 feet

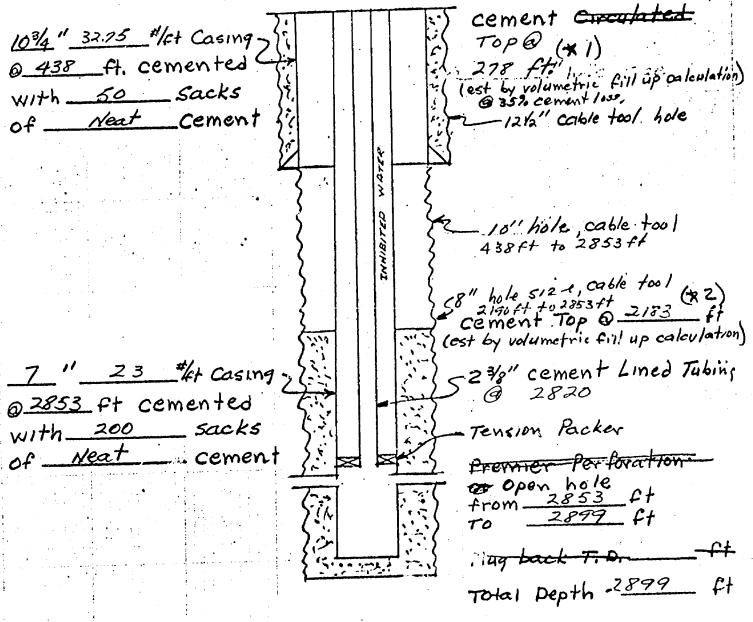
R.w. white 2-11-66

## EXHIBIT 4-E INJECTION WELL COMPLETION DATA

GENERAL AMERICAN STABLEIN FED 4

OPERATOR LEASE WELL NO

LOCATION S-SEC 3- TIGS-R30E WEST HENSHAW UNIT, EDDY CO, N.M.



(X1) For a gause hole and No cement loss, estimated top would be 192 feet

(92) For a gauge hole and no cement loss, estimated coment top would be 1598 feet,

10 85 (3)

R.w. White 2-11-66

EXHIBIT 4-M
INJECTION WELL COMPLETION DATA

MOBIL FED P 9
OPERATOR LEASE WELL NO

LOCATION & SEC 3 - TILS - R30E WEST HENSHAW UNIT, EDDY CO, N.M.

183/4" 32 #/ct Casing Dept Casing Stacks  With 75 Sacks  of Next Cement	· · · · · · · · · · · · · · · · · · ·	reo waree	Cement Guest Top @ 200 + lest by Volumetric calculations:  12/2"cable tool  7/8" hole  from 2245 to 7	et (* 1) Gilup I hole
51/2" 14 # Casing  02879 ft cemented  with 90 sacks  of Neat cement			Cement Top 6  it by Volumetric fill  2 3/8" cement  2 852  Tension Packet  Premier Pert  or Open hole  from 2879  To 2906  Play back T. E  Total Depth	Lined Tubing  Foration:  _ft _ft -ft

\* 1 For Gause hole and No cement loss Top of Coment Would be 77 feet.

R.w. White 2-11-66

## EXHIBIT 4-D INJECTION WELL COMPLETION DATA

GENERAL AMERICAN STABLEIN FED

3

RETORES :

OPERATOR T

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LEASE

WELL NO.

LOCATION U- SEC 3-TILS - R30E

WEST HENSHAW UNIT, EDDY CO., N.M.

cement circulated 103/4" 32.75 #/ct Casing-Top & #1 (below). 0 430 ft. cemented (est by volumetric cabulations and 35% coment 1055) 50 Sacks WITH \_ Cement s 12 12" cable tool hole -10" hole, calle tool 430 ft to 2175 fl. 8" hole, calle tool 2175' to 2848' cement Top @ 2228 ft (est by volumetric fill up calculation) # Casing > -23/8" cement Lined Tubing @ 2848 ft cemented 100 sacks Tension Packer cement Previor Perforation. from 2848 Plug back T.D. \_\_\_ ft Total Depth 2899 ft

(\*) Conservative Estimate - For a gause hole and No cement loss estimated Top would be 184 feet.

(\$2) Conservative Estimate - For a gause hole and No coment loss estimated Top would be 1978 feet

R.W. White 2-11-66

## EXHIBIT 4-K INJECTION WELL COMPLETION DATA

MOBIL FED P

OPERATOR LEASE WELL NO.

LOCATION W-SEC 3 - TIGS - R30E

WEST HENSHAW UNIT, EDDY CO, N.M.

•			
1034" 32 #/st Casing.  0 485 ft. cemented with 75 Sacks  of Neat Cement	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Cement Exculpted  Top @ 235 ft (* 1)  (Est by Volumetric fill up Calculation)
		BITED WB	2 10" hole to 2230 2 10" hole to 2230 2 8" cable fool hole 2250 to T.D.
5½" 14 #t Casing @ 2867 ft cemented with 100 sacks of Neat cemen	5:3		cement Top @ 2277 ft (Est by Volumetric fill up Calculation) 523/8" cement Lined Tubing @ 2839 Tension Packer
			or Open hole from 2867 ft To 2909 ft  Plug back T.D ft  Total Depth 2909 ft

\*1 For Gague hole and No cement loss.
Top of cement would be 1/3 feet.

R.w. white 2-11-66

# EXHIBIT 4-V INJECTION WELL COMPLETION DATA

SHELL TAYLOR FED WELL NO.

OPERATOR LEASE WELL NO.

LOCATION J-SEC 4-TIGS-R 30E

WEST HENSHAW UNIT, EDDY CO, N.M.

WEST	e ·
3.1	Cement Circulated
85/8" 32 #/et Casing > []	
0 5/2 ft. cemented	11 "hole - 20
with 250 sacks	
With Sament [i]	
of Neat Cement 30	
	3
	8 32 77/8 " hole
	1 3 2 10 More
<b>}</b>	[*] {
}	cement Top @ 693 ft
\(\sigma_{\sigma}\)	(est by Volumetric fill up Calculation)
	- and coment Lined Tubing
51/2" 15.5 # Casing 2	(est by Volumetric Fill up carculations)  523/0" cement Lined Tubing  2762
2873 of cemented (%)	1 1 1 40 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
the 600 sacks	Tension Packer
of Neat _ cement }	Premier Perforation.
0+	from 2792 Ct
Six .	from ft
	2845 ft
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Plug back T. D. 2845 ft
	Total Depth 2873 ft
	10101 194
	2 11-66
	R.w. whita 2-11-66
A DAN DE S COPE UNE	

### EXHIBIT 4 -W INJECTION WELL COMPLETION DATA

SHELL TAYLOR-FED

OPERATOR "

LEASE

WELL NO.

LOCATION L'- SEC 4 - TIGS-R 30E WEST HENSHAW UNIT, EPDY CO, N.M.

cement Circulated 85/8" 32 #/c+ Casing 0\_51/\_ft. cemented -11- "hole = 20. with 250 Sacks of Neat \_Cement cement Top @ 722 ft (est by volumetric fill up calculation) 51/2 " 15.5 # Casing > 52 % cement Lined Tubing @ 2902 ft cemented with 600 sacks - Tension Packer - cement Premier Perforation. from 2797 ft Plug back T.D. 2877 ft Total Depth 2903 ft

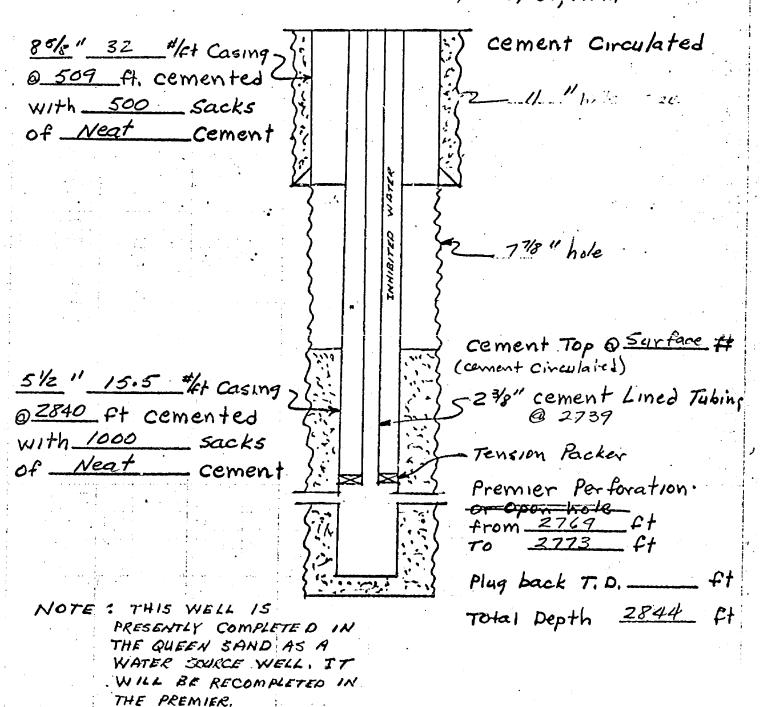
P.w. white 2-11-66

### EXHIBIT 4 -T INJECTION WELL COMPLETION DATA

SHELL SPENCER FED A OPERATOR LEASE

R.W. white 2-11-66

LOCATION M- SEC 4-TIGS-R30E WEST HENSHAW UKIT, EDDY CO, N.M.



# EXHIBIT 4-U INJECTION WELL COMPLETION DATA

SHELL SPENCER FEDA WELL NO.

OPERATOR LEASE WELL NO.

LOCATION M- SEC 4 - TIGS-R 30 E

WEST HENSHAW UNIT, EDDY CO., N.M.

	cement Circulated
7.1	Cement Car
85/8" 32 #/c+ Casing 7 (i)	
or comented ()	thole = 16
0 509 ft. cemented	14
with 250 sacks	
of <u>Neat</u> cement }	
Of	
	8
	8 72 71/8" hole
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
· · · · · · · · · · · · · · · · · · ·	TOO 6 680 FT
}	cement Top 6 680 ft
5200	1 1 7" 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
531	Cest by volument Lined Tubing
51/2 " 15.5 # Casing 2	@ 2760
02860 pt cemented	
02860 P1 COMO 100 KS	Tension Packer
with 600 cacks	premier Perforation.
of <u>Neat</u> cement	premier retto
01	Fall or open hote ft
	from 2790 ft
	Plug back T. D. 2837 ft
- \\ \frac{\lambda}{\sqrt{\sq}\ext{\sqrt{\sq}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}	Total Depth 2860 ft
	Total Depth
	•
	1 
	R.w. white 2-11-66
	Rw. white 2 -11-00
	Remores the
The state of the s	
A WHAP INT WOUND LILE. 10 BO 43	

### EXHIBIT4-6 INJECTION WELL COMPLETION DATA

INTERNATIONAL

SPENCER FED

WELL NO.

OPERATOR

LOCATION 5-SEC 4-TIGS-R30E WEST HENSHAW UNIT, ERRY CO, N.M.

1034" 32 #/st Casing ?!  0 428 ft. cemented ?!  With75 _ Sacks  ofNeatCement ?!  0 2778 ft cemented  With200sacks  ofNeatCement  ofNeatCement	The second secon	Cement Energy of Person Packer open hole from 2783  Plug back T.	from 2135 to TO.  2038 (#2)  ill up calculation)  Lined Tubins  or  ft  ft
		 Total Depth	2817 ft
•	•		

\*1 For a cause hole and no cement loss . top of cement would be@ 56 feet.

\*2 For a Gauge hote and no coment loss top of coment would be @ 1856 ft.

The Commence of the Commence o

R.W. white 2-11-66

## EXHIBIT 4-Q INJECTION WELL COMPLETION DATA

PAN AMERICAN BOSWORTH FED OPERATOR LEASE

LOCATION 9-SECA-TILS-R'30E WEST HENSHAW UNIT, EDDY CO, N.M.

85/8" 22.7 #/st Casing 0_547 ft, cemented With _500 sacks of _Neat _Cement	Cement Circulated  11. "hale  2. 77/3" hole
51/2" 14 #t Casing 2 02902 ft cemented with 125 sacks of Neat cement	Cement Top 6 2177 ft  (lest by Volumetric fill up cakulation)  523/8" cement Lined Tubing  2809  Tension Packer  Premier Perforation  60 2812 ft  To 2887 ft  Plug back T.D. 2892 ft
	Total Depth 2902 ft
A PONEST CHIEF THE TOTAL TO SECTION AND A SE	R.w. white 2-11-66

### EXHIBIT 4 - H INJECTION WELL COMPLETION DATA

INTERNATIONAL

10 85%

SPENCER FED

OPERATOR 1

LEASE

WELL NO.

LOCATION U- SEC 4 - TI65- R30E

WEST HENSHAW UNIT , EPPY CO, N.M.

85/8" 24 #/ 0 449 ft. ce  With _75  of _Neat  0 2770 ft cer  With _125  of _Neat	mented - Sacks -Cement : Mented - sacks		SINVE SINVE	Cement C Top @ 200 2 10." Eab 2 10." Eab 2 10." Eab 2 10." Cable food 2110' to TD Cement Top lest by Volumetric for 2 3/9" Cement 2 734 Tension Pack Prevner for 4 0pen hold from 2720 To 2801	the tool hole  hole  2/30 ft  illup calculation)  Lined Tubing  er  foration  e  ft  ft  ft
		.•	·	Total Depth	2801 Ft

- \* 1 Volumetric fill up Calculations for Gague hote.
  and 20% cement loss indicate coment would circulate
- #2 Conservative Estimate For gauge hold and No cement loss Top of sement would be 1453 feet.

R.W. White 2-11-66

## EXHIBIT 4-P INJECTION WELL COMPLETION DATA

PAN AMERICAN BOSWORTH FED /
OPERATOR LEASE WELL NO
LOCATION W- SEC 4-TILS-R30E

LOCATION W- SEC 4-THS-R30E WEST HENSHAW UNIT, EDDY CO, N.M.

8 5/8 " 22.7 #/c+ Casing-	3:	5)	cement Ci	rculated
With 300 Sacks	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	2. 11" hole	# 7° <b>26</b> €
of <u>Neat</u> Cement				
		istree w	-7 78" hole	
		EWA	cement Top &	0 <u>2/49</u> #
51/2 11 14 #/ Casing	2	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	t by Volumetric fi -2 3/8" cement	11 up calculation)
02875 ft comented with 125 sacks of Neat cement			@ 2786 Tension Packi	
	\$7.7h		Premier Per- or Open hotel from 2815 To 2850	<u>-</u> c+
	{\(\frac{1}{2}\)\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u> </u>	Plug back T. 1 Total Depth	
	• • • • • • • • • • • • • • • • • • • •		R.w. white	2-11-66

INJECTION WELL COMPLETION DATA FEATHERSTONE CROSBY FED LEASE OPERATOR LOCATION 9-SEC 5-TIGS-R30E WEST HENSHAW UNIT, EDDY CO, N.M. 24 #/ft Casingcement Circulated (estimated from volumetric fill up calculations) 495 ft. cemented 10" cable tool hole 75 Sacks Cement "cable tool holento to 2140 63/4" cable tool hole from 2740 10 TD Cement Top @ 2200 ft (Estimated from volumetric fill up calculation) \_#H Casing > -238" cement Lined Tubing @ 2815 ft cemented with 100 sacks Tension Packer cement Premier Perforation. ox open to le from 2760 2800 ft Plug back T.D. ft Total Depth 2815 ft BEFORE EXAMINER NUTTER CIL CONSERVATION COMMISSION Cyspel EXHIBIT NO. 4 a CASE No. 3378.

Product of

For the Attendance of Corne Chair .

## EXHIBIT 4-B INJECTION WELL COMPLETION DATA

FEATHERSTONE

CROSBY FED

· 3

OPERATOR

LEASE

WELL NO.

LOCATION W- SEC 5-T165- R30E WEST HENSHAW UNIT, EDDY CO., N.M

85/8" 24 #/Ft Casing Signature of the Casing Size of Neat Cement S	Cement Circulated (estimate from volumetric fill up calculations)  2 78" cable tool hole  Cement Top Q 2172 ft (estimated from volumetric fill up calculations) 238" cement Lined Tubing Q 2726  Tension Packer  Prevnier Perforation or Open hole from 2734 ft To 2752 ft  Plug back T.D. ft
	Total Depth 2800 ft
	· •

## EXHIBIT 4-II

MOBIL FED D 2

OPERATOR LEASE WELL NO.

LOCATION Q - SEC 8 - TILS - R30E

WEST HENSHAW UNIT, EDDY CO., N.M.

103/4" 42 */Ft Casing   1	Cement Greculated  Top@ 220 #+ (#1)  Lest by Volumetric fill up Cole)  2 1212" Coble tool hoke  2 77/8" hole
51/2" 15 #t Casing 2 19 15	Cement Top 6 2456 ft  (est by Volumetric fill up calculation)  270" cement Lined Tubing  2718  Tension Packer  Premier Perforation  propen hole from 2250 ft  To 2770 ft  Plug back T.D. 2770 ft  Total Depth 2804 ft

#1 For Gague hole and No cement loss
Coment Top would be 98 ft.

R.w. white 2-11-66

### EXHIBIT 4 - O INJECTION WELL COMPLETION DATA

MOBIL FEDERAL P

OPERATOR

LEASE

WELL NO

LOCATION d- SEC 10-T165-R30E

WEST HENSHAW UNIT, EDDY CO, N.M.

103/4" 32 #/c+ Casing };  3 456 ft. cemented ;  With 75 sacks  of Neat Cement {;	Cement excupated  Top 0 25% ft (XI)  (est by Volumetric fill up calculation)  12½ hole 512e  Cable tool
	Cement Top @ 2523 ft
5/2" 14 #t Casing 2 2913 of cemented sacks of Neat cement	Tension Packer  Premier Perforation
	from

\*I - For Gause hole and No coment loss
Top of cement would be 84 feet

\*Z - For Gause hole and No cement loss
Top of cement would be 2315 feet.

R.W. white 2-11-66

## EXHIBIT 4-1/ INJECTION WELL COMPLETION DATA

MOBIL FED 7

OPERATOR LEASE WELL NO.

LOCATION C - SEC 10 - T165 - R30 E

WEST HEN SHAW UNIT, EDDY CO, N.M.

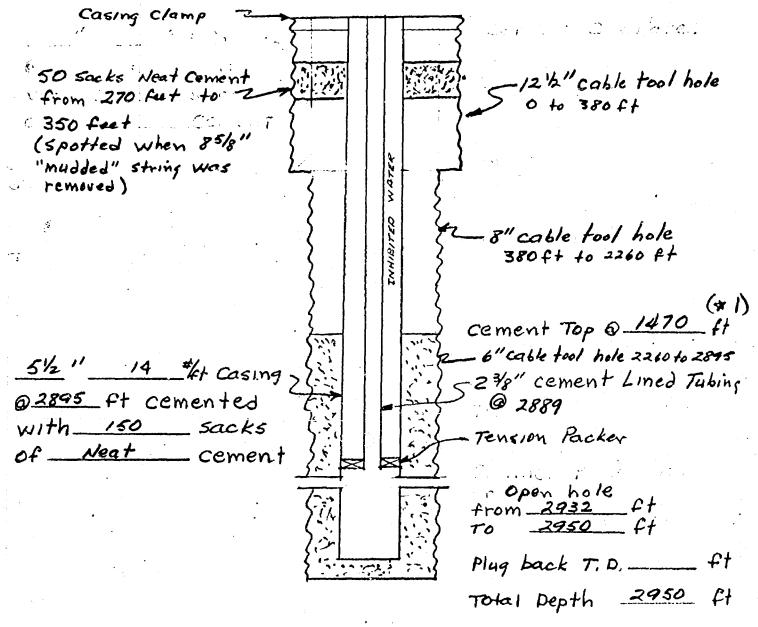
10 3/4" 32 #/ft Casing 32 #/ft Casin	Cement Circulated  To P  (2) @ 242 ft (*1)  (est-from Volumetrie fill up  calculation)	
	2 12 12 12 10 cable tool hole	
51/2" 14 #H Casing 2	Cement Top @ 2450 for cement Lined Tubil @ 2810	in
withloosacks ofweatcement	Prevnier Perforations  Prom 2847 ft  To 2908 ft	
	Play back 7: D. Play back 7: D. Total Depth 2910 F	<b>F</b>
Top of Coment was	nd No cement loss uld be 111 foet  R.W. White 2-11-66	

### EXHIBIT 4-C INJECTION WELL COMPLETION DATA

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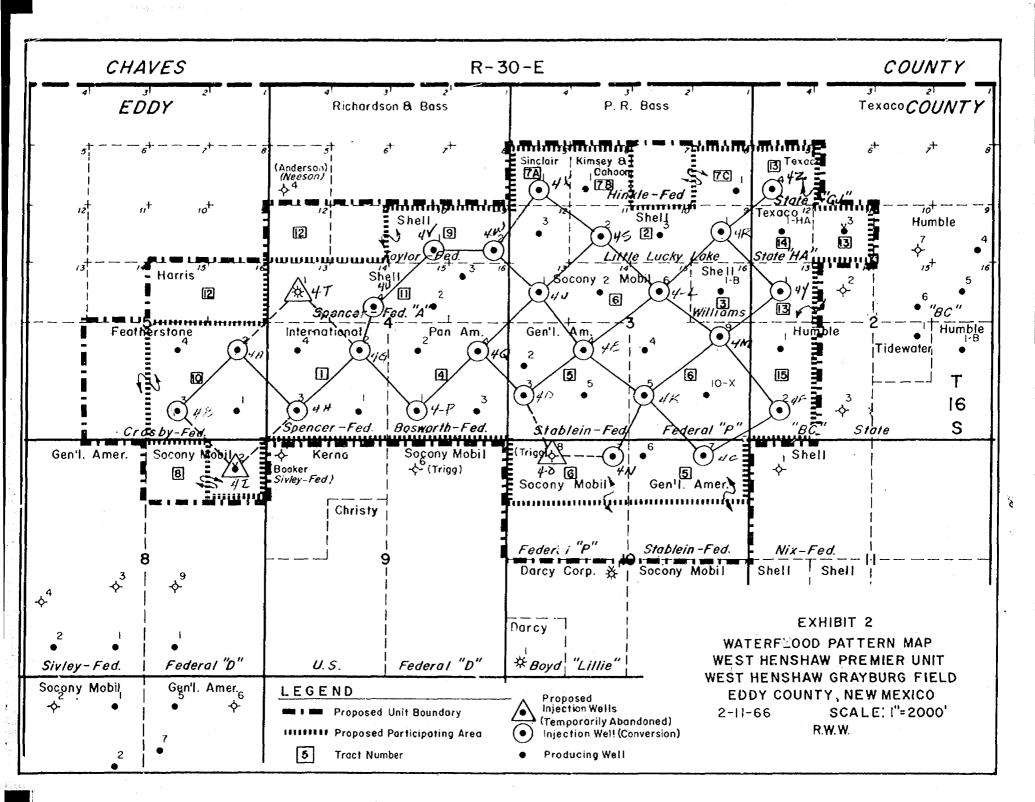
WELL NO.

LOCATION a - SEC 10 - TIGS - R 30E WEST HENSHAW UNIT, EDDY CO., N.M.



(\*1) volumetric fill up calculation for gauge hole and No cement 1055.

R.w. white 2-11-66



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## BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION Santa Fe, New Mexico February 23, 1966

EXAMINER HEARING

IN THE MATTER OF:

Application of Socony-Mobil Oil Company for a unit agreement, Eddy County, New Mexico.

Application of Socony-Mobil Oil Company for a waterflood project, Eddy County, New Mexico. Case No. 3377

Case No. 3378

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING



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## NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

, NEW MEXICO SANTA FE

## REGISTER

9 A.M. HEARING DATE FEBRUARY 23, 1966 TIME: NAME: REPRESENTING: LOCATION: Hornous on allet 6 MIDENNO, TEX HARLEY REAVIS TEXAGO INS · J. T. JOHNADELUS

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MR. NUTTER: The hearing will come to order. The first case this morning will be Case 3377.

MR. DURRETT: Application of Socony-Mobil Oil Company for a unit agreement, Eddy County, New Mexico.

MR. SPERLING: J. E. Sperling and John Cooney of Modrall, Seymour, Sperling, Roehl and Harris, Albuquerque, appearing for the applicant. We would like to ask that for the purposes of the testimony that Case 3377 be combined with Case 3378.

MR. NUTTER: We will call next Case 3378.

MR. DURRETT: Application of Socony-Mobil Oil Company for a waterflood project, Eddy County, New Mexico.

MR. NUTTER: Cases 3377 and 3378 will be consolidated for the purposes of testimony. Would you proceed, please?

MR. SPERLING: We have one witness, Mr. White, if he may be sworn.

MR. NUTTER: Stand and be sworn, please.

(Witness sworn.)

## ROBERT W. WHITE

called as a witness, having been first duly sworn, was examined and testified as follows:

## DIRECT EXAMINATION

## BY MR. SPERLING:

Q Would you state your name, please?



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Mr. White, are you familiar with the application which has been filed on behalf of Socony-Mobil Oil Company in Case No. 3377, which is for approval of a unit agreement?

Yes, I am.

(Whereupon, Exhibit No. 1 in Case 3377 was marked for identification.)

Now, submitted with the application as originally filed with the Commission was a copy of the unit agreement. We have had marked as Exhibit 1 in Case 3377 a unit agreement which has been designated as the unit agreement for the West Henshaw Premier Unit, Eddy County, New Mexico. In what respects, if any, did this unit agreement vary from the unit agreement which was submitted with the application?

- It is the same.
- It's content is the same? Q

The exhibits have been added to this agreement that may have not been submitted with the original, the exhibits A, B and C in the attachment.

- Q What do those exhibits consist of?
- They consist of a map of the unit area, which is Exhibit A, and Exhibit B to the unit agreement is the description of the tract and ownership, and Exhibit C is the tract participation.
  - Can you tell us whether or not the unit agreement Q



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has been submitted to the United States Geological Survey and to the Commissioner of Public Lands for the State of New Mexico and what the status of approval is?

A Yes. We have submitted and received tentative approval from the United States Geological Survey and from the State Land Commissioner.

- Q I assume that the unit agreement has been circulated among the operators which are shown on the exhibits to the unit agreement as interest owners in the unit area?
  - A Yes, it has.
- Q Can you tell us what the status of signup is insofar as royalty interest is concerned, overrides and working interest?
- A The royalty interest is all state and federal lands. The working interest, we have received or have indicated seventy-two percent approval on the unit agreement.
- Q Do you anticipate total approval by all of the interest owners in the unit area?
- A There is a one-well tract shown on Exhibit A as Tract 7-B, Kemsee and Cahoun Hinkle Federal No. 1 that has indicated that they will not joint the unit.
  - Q Is that a 40-acre tract?
  - A Yes, it is.
  - Q Is this unit agreement of the usual form required



by the United States Geological Survey in connection with proposed unit operations as contemplated by the agreement?

Yes, it is. It has been circulated in the local office and in Washington and in conference between the United States Geological Survey and the State Land Commission the unit agreement was discussed and received tentative approval from both agencies.

- This was a joint conference between Mobil as the proposed operator, the Commissioner of Public Lands' representative and the United States Geological Survey?
  - Yes.
- As a result of that conference were certain changes made in the form as originally proposed?
- Some modifications to the agreement were made. They have been encompassed in this unit agreement as presented.
- What is the purpose of the unit agreement? What does it contemplate?
- The unit agreement is to provide for the most efficient waterflood secondary operation in the West Henshaw reservoir.
- And the West Henshaw reservoir is made up of approximately what area acreagewise?
- It's made up of approximately 2400 acres that is included in the unit boundary located in Sections 2, 3, 4, 5, 8,



9 and 10, Township 16 South, Range 30 East.

Q And the unit area is, of course, described as well as depicted on the map of the unit area which is contained as an exhibit to the agreement?

A Yes, it is. It's described in the body and shown in Exhibit A.

Q What is the unitized substance?

A The unitized interval is the Premier interval. The unitized formation is defined as that portion of the Grayburg formation underlying the unit area, which includes the continuous stratigraphic interval, occurring between a point one hundred feet above the top of the Premier zone and the base of the Grayburg formation, said interval having been penetrated between 2733 feet and 2860 feet, and the top of the Premier zone having been found at 2833 feet beneath the derrick floor in the Little Lucky Lake Unit Shell Well No. 1, located in Lot 9 of Section 3, Township 16 South, Range 30 East, NMPM, Eddy County, New Mexico, as recorded on the sonic log and Laterolog, said well dated May 28, 1959.

Q Mr. White, in your opinion would the approval of the unit agreement by the Commission be in the best interest of the prevention of waste and protection of correlative rights?

A Yes, it would.



MR. SPERLING: I think that's all I have.

MR. NUTTER: Does anyone have any questions of this witness? The same witness is going to appear in the waterflood case?

MR. NUTTER: Go ahead with your waterflood case then. MR. SPERLING: Yes. (Whereupon, Exhibits No. 1 through 3 and 4a through 4z were marked for identification)

(By Mr. Sperling) Now, Mr. White, would you refer to what has been marked as Exhibit 1 in Case 3378 and tell us

what that shows and what it is? Exhibit 1 is the lease map of the West Henshaw Premier area showing all the wells and leases within a twomile radius of the proposed injection. The unit boundary is outlined and the proposed injection wells are shown on Exhibit 1. Exhibit 2 is an enlargement of Exhibit 1, showing more detail of the pattern. The proposed pattern is a five-spot with certain modifications because of irregular spacing on 40 acres.

Well, then, the Exhibit 2 is simply a larger scale indication of the unit area with the injection wells indicated as shown by the legend to the exhibit?

Yes, it is. There will be twenty-six injection wells in the proposed area.

Now, I believe you stated in connection with the Q



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unit agreement the unitized interval which is proposed to this waterflood, I assume that Exhibit 3 is a representative log of the typical injection well as proposed for the project?

A Yes. It's a representative log which shows the unitized interval and the top of the Premier zone, which will be the flooded interval.

Q Would you point out what well the log represents?

A Yes. The log represents the Shell Little Lucky Lake
Unit No. 1 well located in Lot 9 of Section 3, Township 16
South, Range 30 East. That will become Tract 2, Well 1.

Q And that is shown on Exhibit 2?

A Yes, it is.

Q Now, would you please refer to Exhibit 4 and tell us what those in combination represent? I believe they're identified as Exhibits 4a through z, is that correct?

A Yes. Exhibits 4a through z are schematic diagrams of the proposed injection well. There's one diagram for each well. In general the wells show the casing size and depth, the number of sacks of cement used, the cement tops, the perforated interval of the Premier or the open hole interval and the tubing string set just to the top of the injection formation set with tension packers. It is proposed that 2-3/8ths inches of cement-lined tubing will be used as the injection string in the annulus between the injection



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string and the casing will be filled with inhibited water.

All of the sketches are similar or identical with the exception of Exhibit 4c.

- Q In what respect does it differ from the others?
- A Exhibit 4c represents the completion technique that was used with the cable tool drilling operation with this well at this particular time and it's significant difference is in effect that 8-5/8ths surface string was mudded during the drilling operations and then pulled from the well and fifty sacks of cement were dumped around the top of the 5-1/2 inch casing string. The annulus was then packed off at the surface and a cement sill was placed and the casing was swung from a casing clamp on the cement sill at the surface.
- Q Well, within this interval are there any fresh water zones encountered or any water of any kind?
- A There is some local water at some sites at about 250 feet to 300 feet above an anhydrite section that indicates to be of minor aerial extent.
- Q Is any use being made of this water that you think is present on a rather local restricted area?
  - A Not to my knowledge.
- Q What do you propose to use as a source of water for injection?
  - A It is proposed to buy fresh water from commercial



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water companies operating in the area and likely will be the Double Eagle Corporation of New Mexico for whom we will purchase makeup water for the initial fillup period of the waterflood and as soon as produced water becomes available it will be included and used in the waterflood operation.

Q Would you give us some of the history of this particular reservoir? Is it in an advanced stage of depletion?

A Yes, it is. The field was discovered in 1957. The unit area of production for September 1965 was 3,475 barrels of oil from 39 wells, which is an average daily oil production of about three barrels per well per day. In addition to the 39 wells there are seven wells which are shut in and two temporarily abandoned.

Now the unit area has reached the advanced stage of depletion. Now the original bottom hole pressure has declined from an original of a thousand and thirty pounds to less than two hundred pounds at the present. The cumulative production from the unit area was 1,717,000 barrels of oil as of January 1, 1966, which represents 99 percent of the estimated unit area ultimate primary of 1,730,000 barrels.

Q I don't believe we covered the proposed tract participation which is set forth, I believe, in Exhibit 1 in Case 3377. What was the basis used for tract participation?

A Tract participation will be on two-phase formula,



phase 1 will be 100 percent current production based on the current production interval from September 1962 to February 29, 1964 which is an eighteen-month period. Phase 2 will be on the basis of 100 percent ultimate primary. Phase 1 will be in effect until a total ultimate primary of 1,750,000 barrels has been produced from the unit area.

- Q What is your estimate of the primary recovery which has been recovered?
- A To date there has been 1,717,000 barrels produced and the ultimate primary based on a reasonable economic limit is 1,730,000 barrels. It is estimated that the proposed waterflood will recover an additional two million barrels of oil over the remaining primary.
- Q At what rate do you propose to inject water initially?
- A It is proposed to initiate injection at a total rate of 6,500 barrels of water per day into 26 injection wells, which is at the rate of 250 barrels per well. The well head pressure after 50 percent fillup is anticipated to be approximately 1800 pounds. Injection equipment will be designated for a well-head working pressure of 2,000 pounds. All the injection facilities will be internally coated.
- Q What is the drive mechanism as far as this reservoir is concerned?





A The reservoir produced primarily from solution gas drive with some slight gas cap of minor importance being present. There is no indication of any active water influx. There is no water production from any wells within the unit area.

- Q I believe you mentioned that there had been a substantial decline in bottom hole pressure in this reservoir. Did you give the figures on that?
  - A Yes, I did.
- Q Have you made an analysis of the properties of the reservoir?
- A The rock and fluid properties of the reservoir from a volumetric standpoint might be summarized as follows: The average depth of Premier production is 2900 feet. The estimated oil-productive area is 1880 acres. The estimated average pay thickness is 11 feet. The estimated average porosity is fifteen and a half percent; the connate water saturation is estimated at 35 percent. The original formation volume factor of the crude is estimated to have been 1.176 barrels per barrel.
- Q What completion methods were used in this field in its primary development?
- A Some of the wells were drilled by cable tool and the Premier section was open hole completed, others were

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completed by the techniques of setting the oil string through and perforating the Premier interval. The individual completions are shown on Exhibit 4a through z.

- Q Is there anything further you would like to add, Mr. White?
  - A No.
- Q Do you feel that the approval of this application in 3378 would be in the best interest of prevention of waste and the protection of correlative rights?
  - A Yes, I do.
    - MR. SPERLING: I believe that's all.
    - MR. NUTTER: Are there any questions of Mr. White?
  - MR. IRBY: I would like to ask a couple of

questions.

MR. NUTTER: Okay.

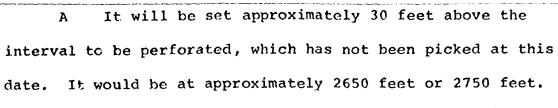
MR. IRBY: Frank Irby, State Engineer's Office.

## CROSS EXAMINATION

## BY MR. IRBY:

- Q Mr. White, referring to your Exhibit 4 nought which is your Mobil Federal "P" No. 8 well --
  - A Yes.
- Q -- where will the packer on the end of the tubing be set with respect to the cement top surrounding the 5-1/2 inch casing?





Q Then you'd say it would be better than 200 feet below the top of the cement that I asked you about?

A Yes, sir.

Q Now, referring to your Exhibit 4f, which is your Humble State "BC" No. 2, is the casing in that hole actually 2-7/8ths inch?

A Yes, it is.

Q And you intend to put 2-3/8ths inch tubing inside that?

A No, sir, we'll have to use a smaller diameter tubing. That 2-3/8ths inch is incorrect as shown on this sketch and should be corrected to 1-1/2 inch.

MR. IRBY: That's all the questions I have. Thank you.

## BY MR. NUTTER:

Q Now, you stated, Mr. White, that there was some water in the range from 250 to 300 feet. I haven't had a chance to look at all of these exhibits, but in each case, with the exception of that one well, is there surface pipe set and cemented below that water?

A Yes, there is.



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- Q Also in each case you have your production string down there near the pay, either at the top of the pay or through the pay, and perforations and cement on that. Now, what is the minimum height that that cement comes on these wells above the shoe of the casing?
  - A Minimum would be 250 to 300 feet.
- Q And in each one of these cases you are going to run a string of tubing in these injection wells and you are going to set a packer down, within what interval from the casing shoe?
  - A Within 30 feet of the casing shoe within one joint.
  - Q Or the perforation?
  - A Yes, sir.
- Q Within 30 feet. That would be on the bottom joint of casing you might say?
  - A Yes, sir.
- Q In each case you will also have inhibited water behind the tubing?
  - A Yes, sir, we will.
- Q I missed the figure that you gave. You said in September of 1965 you produced 3,475 barrels and that was from how many wells?
  - A That was from 39 wells.
  - Q For an average of three barrels per well per day?



A Yes.

Q And you've recovered 1,717,000 barrels out of an estimated ultimate primary of 1,730,000?

A Yes.

Q And you estimate two million barrels on secondary?

A Yes, sir.

MR. NUTTER: Are there any other questions of Mr. White? He may be excused.

(Witness excused.)

MR. SPERLING: Mr. Examiner, I would like to offer Exhibit 1 in Case 3377 and Exhibits 1 through 4 in Case 3378.

MR. NUTTER: Exhibit 1 in Case 3377 will be admitted, Exhibits 1 through 3 and 4a through 4z in Case 3378 will be admitted in evidence.

(Whereupon, Exhibit 1 in Case 3377 and Exhibits 1 through 3 and 4a through 4z were offered and admitted in evidence.)

MR. NUTTER: Do you have anything further in either case, Mr. Sperling?

MR. SPERLING: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in either of these cases?

MR. KELLY: Texaco is a working interest owner and they would like to concur in the cases.



MR. NUTTER: Thank you, Mr. Kelly. Anything further? We will take the cases under advisement.

STATE OF NEW MEXICO )
) ss
COUNTY OF BERNALILLO )

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 24th day of February, 1966.

NOTARY PUBLIC

My Commission Expires: June 19, 1967.



I do hereby dertify that the foregoing is a complete record of the productings in the Examiner hearing of Case No. 3377 \$378 hourd by see on 2/23 , 13 kg6.

New Mexico Oil Conservation Commission

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Case 3378

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