Amoco Production Company
Post Office Box 68
Hobbs, New Mexico 88240

S. J. Okerson
District Superintendent
July 8, 1980

File: SJO-986.51 x WF-833

Re: Application for Salt Water Disposal
South Hobbs Unit Well No. 103
Hobbs Grayburg San Andres
Lea County, New Mexico

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

Gentlemen:

Amoco Production Company requests administrative approval to dispose of produced water from the Hobbs Grayburg San Andres field into the San Andres formation in our South Hobbs Unit Well No. 103, located 990' FNL & 2310' FEL, Section 15, T-19-S, R-38-E, Lea County, New Mexico. In accordance with Rule 701-C, we are attaching hereto our "Application to Dispose of Salt Water by Injection Into a Porous Formation". Also attached is a plat, a diagramatic sketch of the proposed injection well and a water analysis of the produced water to be injected. All acreage within a half mile radius of the proposed injection well is unitized into the South Hobbs Grayburg San Andres Unit.

South Hobbs Unit Well No. 103, the proposed injection well, was originally drilled as a producing well in the Hobbs Grayburg San Andres. Prior to conversion to a disposal well, the subject well will be deepened to a TD of 4822'. We will run a 4-1/2" flush joint liner from 3790' to TD and cement with 90 sx Class C cement. The interval to be perforated will be chosen after running logs. Approximately 100' will be perforated with 4 JSPF. Produced water from our South Hobbs Unit will be disposed of in the perforated San Andres interval through plastic coated tubing and packer set at approximately 4300'. Water will be injected at a maximum rate of 7500 bbl per day.

Yours very truly,

Original Signed by:
S. J. OKERSON

Attachments

cc: NMOCD
E. D. Newman
Dave Lenard

Form C-108
Revised 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR: Amoco Production Company		ADDRESS: P. O. Box 68, Hobbs, NM 88240	
LEASE NAME: South Hobbs Unit	WELL NO.: 103	FIELD: Grayburg San Andres	COUNTY: Lea

LOCATION: UNIT LETTER B ; WELL IS LOCATED 990 FEET FROM THE North LINE AND 2310 FEET FROM THE East LINE, SECTION 15 TOWNSHIP 19-S RANGE 38-E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING	12-1/2"	166'	100 sx	surface	circulated
INTERMEDIATE	8-1/4"	3186'	700 sx	btm 12-1/2"	calculated
LONG STRING	6-5/8"	3997'	50 sx	unknown	
TUBING: plastic coated	2-3/8"		NAME, MODEL AND DEPTH OF TUBING PACKER: Guiberson Unit VI - approx. 4300'		

NAME OF PROPOSED INJECTION FORMATION: San Andres	TOP OF FORMATION: 4000'	BOTTOM OF FORMATION: 5300'
IS INJECTION THROUGH TUBING, CASING, OR ANNULUS? Tubing	PERFORATIONS OR OPEN HOLE? Perforations	PROPOSED INTERVAL(S) OF INJECTION: Approx 100' between 4400'-4800'
IS THIS A NEW WELL DRILLED FOR DISPOSAL? No	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED? Producing Well	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE? No

LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH

DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA: 400'	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA: 3900'	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA: 5300'

ANTICIPATED DAILY INJECTION VOLUME (BBLS.)	MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	AP[illegible]OX. PRESSURE (PSI)
	4500	7500	closed	Pressure	850#

ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE —	WATER TO BE DISPOSED OF	NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
	Yes	Yes	Yes

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND): Dave Lenard, Box 27, Hobbs, NM 88240

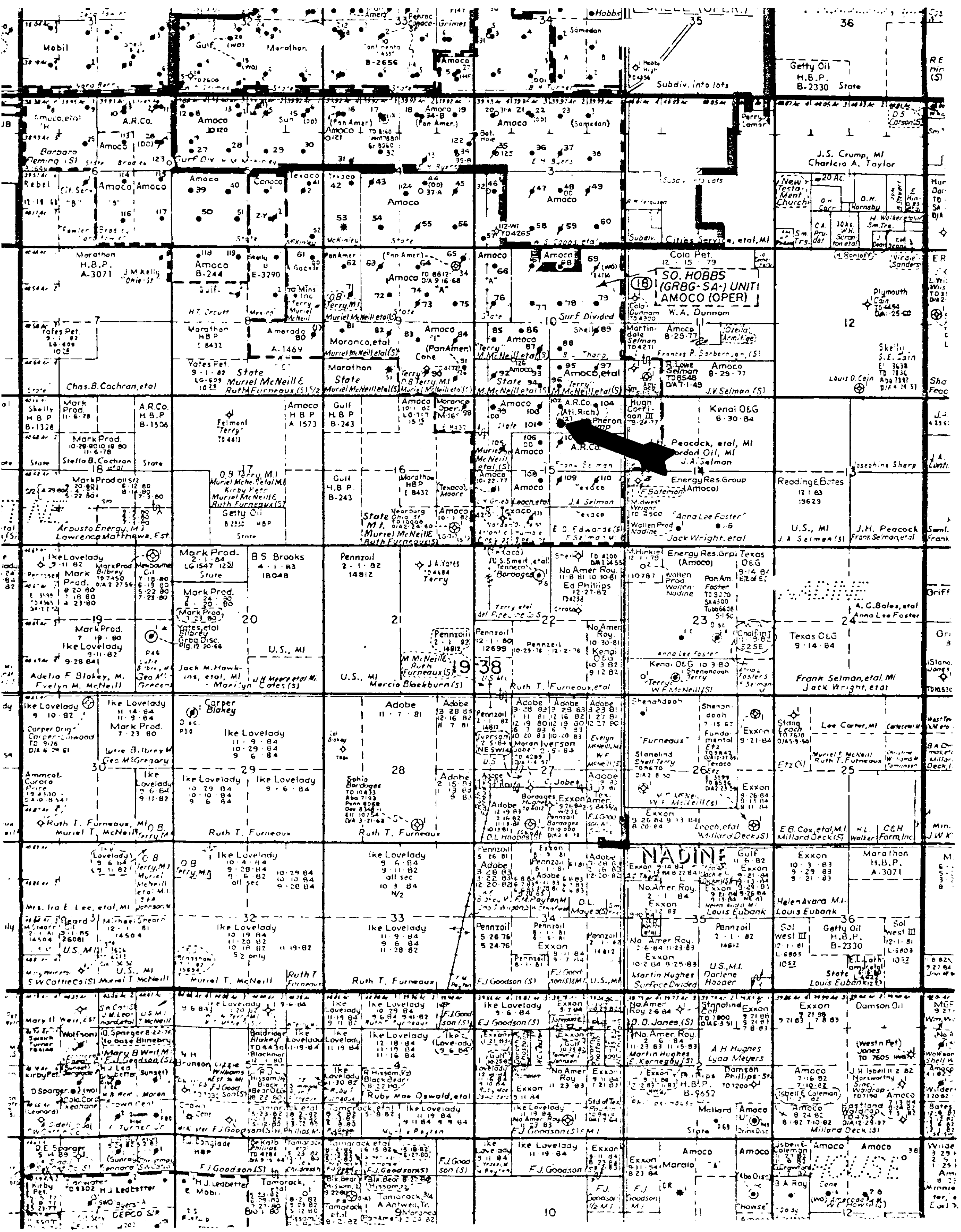
LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL: All acreage within 1/2 mile is unitized in the South Hobbs Grayburg San Andres Unit.

HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER	EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL	THE NEW MEXICO STATE ENGINEER
	Yes	NA	Yes
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	**PLAT OF AREA**	**ELECTRICAL LOG**	**DIAGRAMMATIC SKETCH OF WELL**
	Yes	No	Yes

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

Bob Davis (Signature) — Admin Analyst (Title) — 7/9/80 (Date)

NOTE: Should waivers from the State Engineer, the surface owner, and all operators within one-half mile of the proposed injection well not accompany this application, the New Mexico Oil Conservation Commission will hold the application for a period of 15 days from the date of receipt by the Commission's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.



SO. HOBBS
(GRBG-SA-) UNIT
AMOCO (OPER)
NADINE
Subdiv. into lots
Getty Oil
H.B.P.
B-2330
State
J.S. Crump, MI
Charlcia A. Taylor
Cola Pet.
W.A. Dunnam
Surf Divided
Kenai O&G
J. A. Selman
Energy Res. Group
(Amoco)
Reading & Bates
U.S., MI
J.H. Peacock
Mark Prod.
B S Brooks
Pennzoil
Ed Phillips
Texas O&G
A. G. Bales, etal
Anna Lee Foster
Frank Selman, etal, MI
Jack Wright, etal
Ike Lovelady
Adobe
Ruth T. Furneaux
Marcia Blackburn (S)
Lee Carter, MI
Exxon
Marathon
H.B.P.
A-3071
Helen Avara MI.
Louis Eubank
Muriel T. McNeill
Martin Hughes
Surface Divided
Damson Oil
Amoco
Ruby Mae Oswald, etal
F.J. Goodson (S)
Tamarack, etal
H J Leabetter
Mobil
Chas. B. Cochran, etal
Yates Pet.
Moranco, etal
Stella B. Cochran
Getty Oil
Lawrence Matthews, Est.
Adelia F. Blakey, M.
Evelyn M. McNeill
Jack Wright, etal

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
Amoco Production Company	South Hobbs GSA Unit	103

Unit Letter	Section	Township	Range	County
B	15	19-S	38-E	Lea

Actual Footage Location of Well:
990 feet from the North line and 2310 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

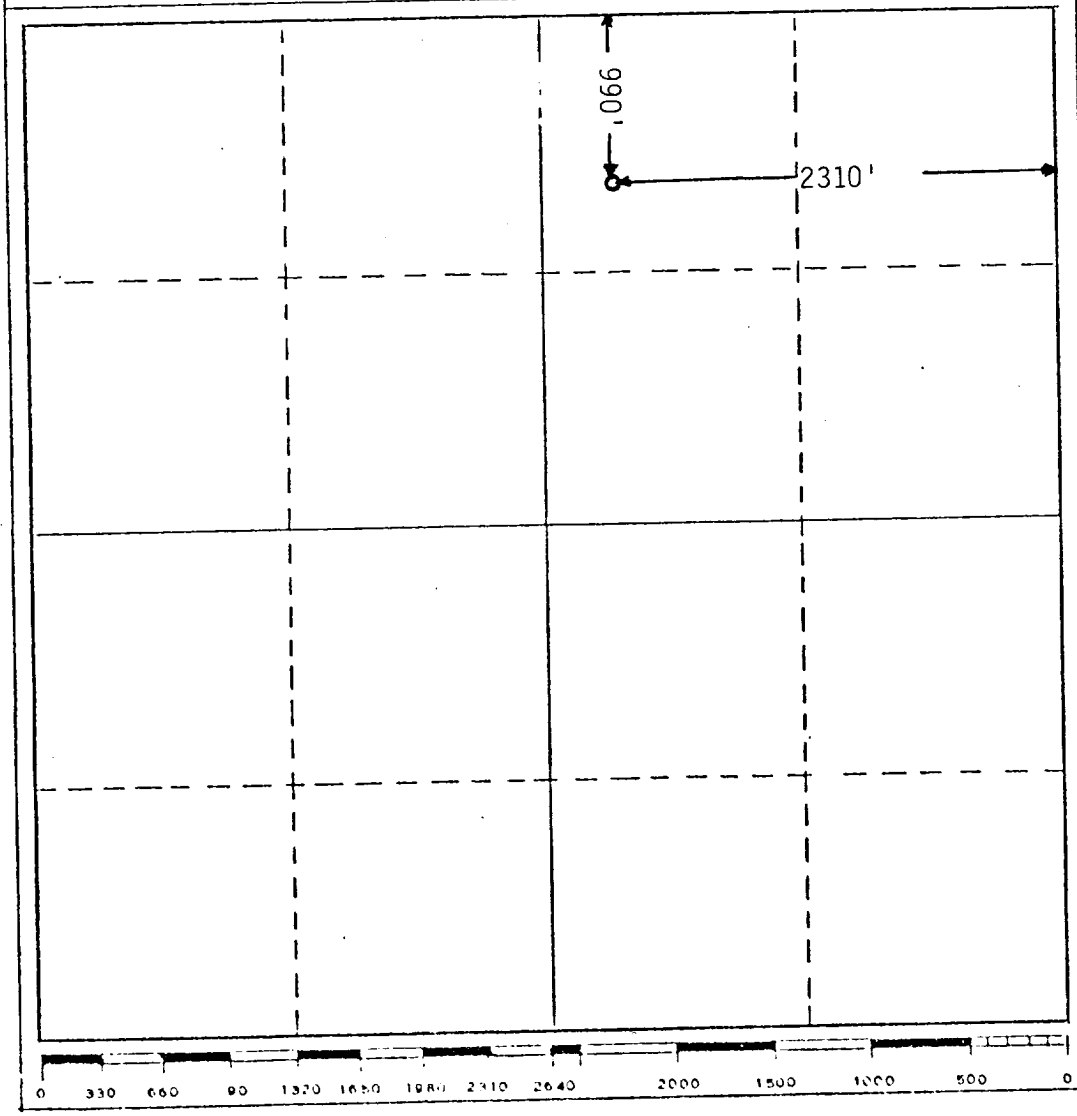
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

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

Name: Bob Davis

Position: Admin. Analyst

Company: Amoco Production Company

Date: 7-8-80

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

Date Surveyed

Registered Professional Engineer and/or Land Surveyor

Certificate No.

Amoco Production Compa

ENGINEERING CHART

FILE ______

APPN ______

DATE 7-02-80

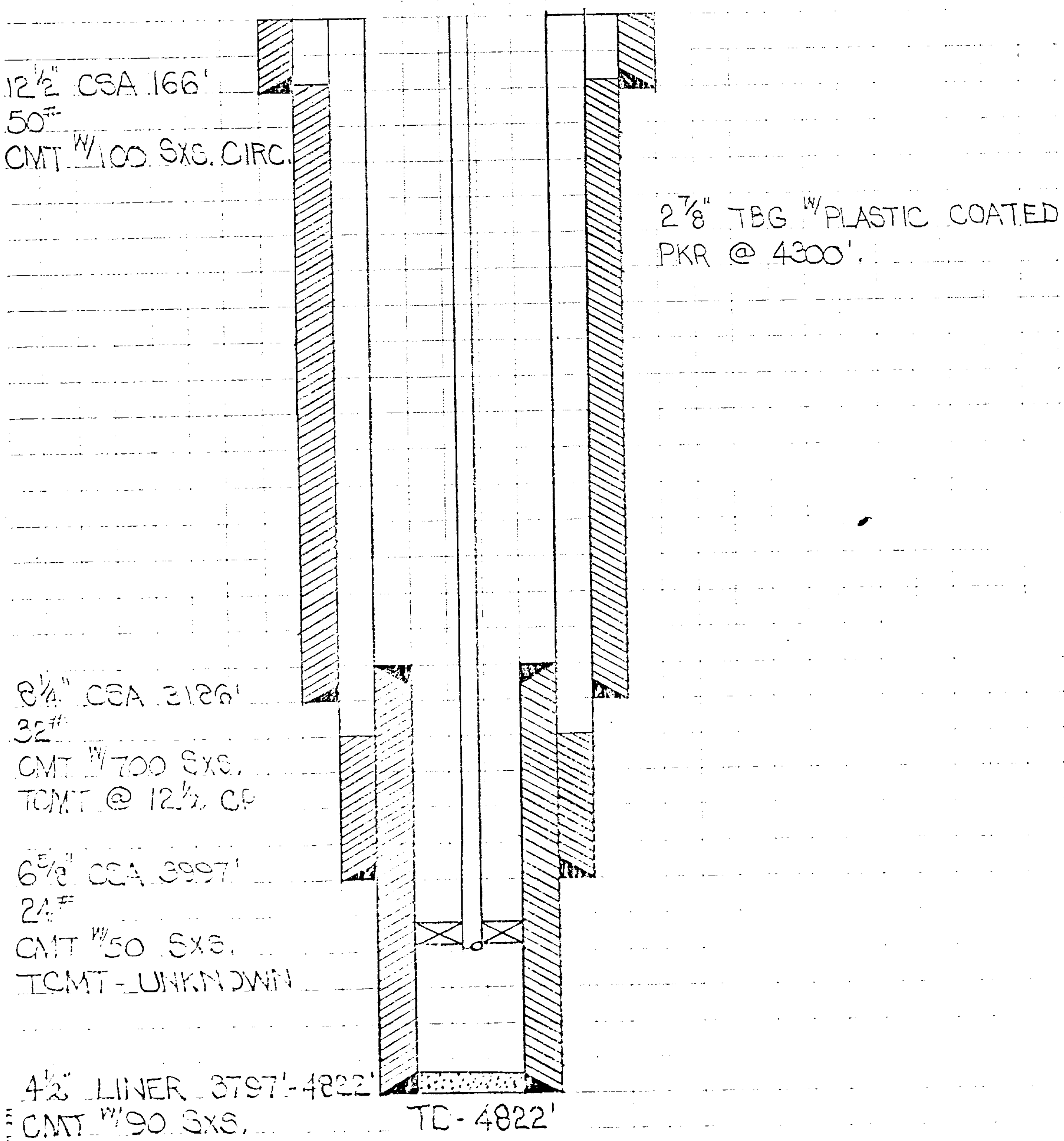
BY R.W.

SUBJECT SOUTH HOBBS UNIT # 103

HOBBS GSA

UNIT B, 990' FNL & 2310 FEL, SEC 15, T-19-S, R-38-E
LEA COUNTY, NEW MEXICO

ELEVATION: 3588' GL



Amoco Production Company

RESEARCH CENTER WATER ANALYSIS

101 File 535.11

T.S. or File No. _____
Lab. No. T25439
Field No. _____
API Well No. _____

LOCATION SAMPLED: Region Houston Division _____ District Hobbs
Operator (Plant) Amoco Well No. 102 Lease South Hobbs Unit
State (Province) New Mexico County (Parish) Lea
Twp. 19S Rng. 38E Sec. _____ Quarter (Lsd.) _____ Other (Meridian) _____
Wildcat ( ) Field Well ( ) Field name _____
Sample collected from Wellhead Date 5-13-79 Sample collected by _____
Interval sampled _____ to _____ Interval name San Andres
Recovery _____

Form 97 transmitted by V. E. Staley Date 6-6-79 Authorized by _____

ORGANIC CONSTITUENTS in mg/l

	BOTTOM	MIDDLE	TOP	MUD	
Benzene					
Toluene					
HC Gases					

DESCRIPTION OF SAMPLE

Sample used for detailed analyses _____
Date received _____
Condition as received _____
Color _____
Odor _____
Suspended solids _____
Bottom sediment _____
Oil or fluorescence _____

QUALITY OF SAMPLE

	BOTTOM	MIDDLE	TOP
Chloride ion mg/l:			

COMMENTS:

CONVENTIONAL MAJOR ION ANALYSIS

			Major Ions mg/l	% of Total Major Ions	Reaction Value meq/l	% of Total Reaction Value
CATIONS	Sodium	Na^+	1,002	21.71	43.58	29.52
	Calcium	Ca^{++}	248	5.38	12.38	8.39
	Magnesium	Mg^{++}	217	4.71	17.84	12.09
	Potassium	K^+				
ANIONS	Chloride	Cl^-	1,870	40.55	52.73	35.73
	Bicarbonate	HCO_3^-	1,240	26.89	20.34	13.78
	Sulfate	SO_4^{--}	35	.76	.73	.49
	Carbonate	CO_3^{--}	0	0	0	0
	TOTAL		4,612			

Total solids by evaporation 4,180 mg/l
NaCl resistivity equivalent (Dunlap) 3,894 mg/l
Resistivity 1.31 ohm-meters at 77 °F
pH 7.4 Specific gravity 1.003 at 73 °F
Ryznar stability index (2pHs-pH) _____ at _____ °F

OTHER IONS AND DISSOLVED SOLIDS

CATIONS	mg/l	ANIONS	mg/l	OTHERS	mg/l

REMARKS AND CONCLUSIONS:

CC: A. R. Reed
V. E. Staley
G. W. Schmidt

Analyst Bruce Barnes Date 6-22-79

Water charts on back ( )

Form 66 Feb 79

Amoco Production Company

RESEARCH CENTER WATER ANALYSIS

-10- File 535.11

T.S. or File No. _____
Lab. No. T25452
Field No. _____
API Well No. _____

LOCATION SAMPLED: Region Houston Division _____ District Hobbs
Operator (Plant) Amoco Well No. 126 Lease South Hobbs Unit
State (Province) New Mexico County (Parish) Lea
Twp. 19S Rng. 38E Sec. _____ Quarter (Lsd.) _____ Other (Meridian) _____
Wildcat (---) Field Well ( ) Field name _____
Sample collected from Wellhead Date 5-7-79 Sample collected by _____
Interval sampled _____ to _____ Interval name San Andres
Recovery _____

Form 97 transmitted by V. E. Staley Date 6-6-79 Authorized by _____

ORGANIC CONSTITUENTS in mg/l

	BOTTOM	MIDDLE	TOP	MUD	
Benzene					
Toluene					
HC Gases					

DESCRIPTION OF SAMPLE

Sample used for detailed analyses _____
Date received _____
Condition as received _____
Color _____
Odor _____
Suspended solids _____
Bottom sediment _____
Oil or fluorescence _____

QUALITY OF SAMPLE

	BOTTOM	MIDDLE	TOP
Chloride ion mg/l			

COMMENTS:

CONVENTIONAL MAJOR ION ANALYSIS

		Major Ions mg/l	% of Total Major Ions	Reaction Value meq/l	% of Total Reaction Value
CATIONS	Sodium Na^+	1,134	23.16	49.32	32.74
	Calcium Ca^{++}	292	5.97	14.57	9.67
	Magnesium Mg^{++}	139	2.84	11.43	7.59
	Potassium K^+				
ANIONS	Chloride Cl^-	1,740	35.55	49.07	32.58
	Bicarbonate HCO_3^-	1,550	31.66	25.42	16.87
	Sulfate SO_4^{--}	40	.82	.83	.55
	Carbonate CO_3^{--}	0	0	0	0
	TOTAL	4,895			

Total solids by evaporation 4,440 mg/l
NaCl resistivity equivalent (Dunlap) 3,868 mg/l
Resistivity 1.30 ohm-meters at 77 °F
pH 7.2 Specific gravity 1.004 at 71 °F
Ryznar stability index (2pHs-pH) _____ at _____ °F

OTHER IONS AND DISSOLVED SOLIDS

CATIONS	mg/l	ANIONS	mg/l	OTHERS	mg/l

REMARKS AND CONCLUSIONS:

CC: A. R. Reed
V. E. Staley
G. W. Schmidt

Analyst Bruce Barnes Date 6-22-79

Water charts on back ( )

Form 66 Feb 79

Amoco Production Company

RESEARCH CENTER WATER ANALYSIS

T.S. or File No. ____
Lab. No. T25436
Field No. ____
API Well No. ____

LOCATION SAMPLED: Region Houston Division ____ District Hobbs
Operator (Plant) Amoco Well No. 52 Lease South Hobbs Unit
State (Province) New Mexico County (Parish) Lea
Twp. 19S Rng. 38E Sec. ____ Quarter (Lsd.) ____ Other (Meridian) ____
Wildcat ( ) Field Well ( ) Field name ____
Sample collected from Wellhead Date 6-4-79 Sample collected by ____
Interval sampled ____ to ____ Interval name San Andres
Recovery ____

Form 97 transmitted by V. E. Staley Date 6-6-79 Authorized by ____

ORGANIC CONSTITUENTS in mg/l

	BOTTOM	MIDDLE	TOP	MUD	
Benzene					
Toluene					
HC Gases					

DESCRIPTION OF SAMPLE

Sample used for detailed analyses ____
Date received ____
Condition as received ____
Color ____
Odor ____
Suspended solids ____
Bottom sediment ____
Oil or fluorescence ____

QUALITY OF SAMPLE

	BOTTOM	MIDDLE	TOP
Chloride ion mg/l:			

COMMENTS:

CONVENTIONAL MAJOR ION ANALYSIS

		Major Ions mg/l	% of Total Major Ions	Reaction Value meq/l	% of Total Reaction Value
CATIONS	Sodium Na^+	2,774	29.66	120.68	41.54
	Calcium Ca^{++}	260	2.78	12.97	4.47
	Magnesium Mg^{++}	141	1.51	11.59	3.99
	Potassium K^+				
ANIONS	Chloride Cl^-	3,690	39.47	104.06	35.83
	Bicarbonate HCO_3^-	2,390	25.56	39.20	13.49
	Sulfate SO_4^{--}	95	1.02	1.98	.68
	Carbonate CO_3^{--}	0	0	0	0
	TOTAL	9,350			

Total solids by evaporation 8,100 mg/l
NaCl resistivity equivalent (Dunlap) 7,686 mg/l
Resistivity .700 ohm-meters at 77 °F
pH 7.4 Specific gravity 1.007 at 73 °F
Ryznar stability index (2pHs-pH) ____ at ____ °F

OTHER IONS AND DISSOLVED SOLIDS

CATIONS	mg/l	ANIONS	mg/l	OTHERS	mg/l

REMARKS AND CONCLUSIONS:

CC: A. R. Reed
V. E. Staley
G. W. Schmidt

Analyst Bruce Barnes Date 6-22-79

Water charts on back ( )

Form 66 Fet 79