CASE 3318: Application of PAN AM. for salt water disposal, San Juan County, New Mexico.

CASE NO.
3318

Application,
Transcripts,
Small Exhibits
ETC.

Mobil

Mobil Oil Company

A Division of Socony Mobil Oil Company, Inc.
10737 SOUTH SHOEMAKER AVENUE
SANTA FE SPRINGS, CALIFORNIA 90670

Cx 3318

September 21, 1965

New Mexico Oil & Gas
Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Attn: Mr. A. L. Porter, Jr.

WATER DISPOSAL APPLICATION FOR
TOCITO DOME PENN. "D" FIELD
SAN JUAN COUNTY, NEW MEXICO

Gentlemen:

Reference is made to the application of Pan American Petroleum Corporation dated September 15, 1965, for the injection of salt water into the Navajo Tribal "O" Well No. 6 in the subject field.

As an operator within a two mile radius of the proposed disposal well, Mobil has no objection to this application.

Very truly yours,

H. H. Carrick, Jr.
Producing Superintendent
Santa Fe Springs District

FMBurback/dv

cc: Pan American Petroleum Corp., Security Life Bldg., Denver, Colo. 80202
Texaco Inc., P. O. Box 810, Farmington, New Mexico
Sinclair Oil & Gas Co., 601 Denver Club Bldg., Denver, Colorado

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

October 13, 1965

Re: Case No. 3318
Order No. R-2984
Applicant:
PAN AMERICAN PETROLEUM CORP.

Mr. Louis C. Ross
Pan American Petroleum Corporation
Security Life Building
Denver, Colorado 80202

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x
OTHER

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. 3318
Order No. R-2984

APPLICATION OF PAN AMERICAN PETROLEUM
CORPORATION FOR SALT WATER DISPOSAL,
SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on October 6, 1965, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 13th day of October, 1965, 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, Pan American Petroleum Corporation, is the owner and operator of the Navajo Tribal "U" Well No. 6 located in Unit D of Section 22, Township 26 North, Range 18 West, NMPM, San Juan County, New Mexico.

(3) That the applicant proposes to utilize said well to dispose of produced salt water into the Pennsylvanian formation, with injection into perforations from 6238 to 6244 feet.

(4) That the injection should be accomplished through 2 3/8-inch internally plastic-coated tubing installed in a packer set not more than 200 feet above the casing shoe; that the casing-tubing annulus should be filled with an inert fluid; and that a

pressure gauge should be attached to the annulus in order to determine leakage in the tubing or packer.

(5) That approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Pan American Petroleum Corporation, is hereby authorized to utilize its Navajo Tribal "U" Well No. 6, located in Unit D of Section 22, Township 26 North, Range 18 West, NMPM, San Juan County, New Mexico, to dispose of produced salt water into the Pennsylvanian formation, injection to be accomplished through 2 3/8-inch tubing installed in a packer set not more than 200 feet above the casing shoe, with injection into the perforated interval from 6238 to 6244 feet;

PROVIDED HOWEVER, that the tubing shall be internally plastic-coated; that the casing-tubing annulus shall be filled with an inert fluid; and that a pressure gauge shall be attached to the annulus in order to determine leakage in the tubing or packer.

(2) That the applicant shall submit monthly reports of its disposal operations in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(3) 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
OIL CONSERVATION COMMISSION

JACK M. CAMPBELL, Chairman

GUYTON B. HAYS, Member

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

esr/

3318
Heard 10-6-65
Rec. 10-6-65

1. Grant Pan Am. as SWD well for the Navajo "U" #6, 660/N 510/W - 22 - 26N-18W.

2. Tubing shall be 2⅜ internally coated with permanent type packer set at immediately above the perforations at 6238-6244. Injection shall be at or near the water-oil contact of the pool. The tubing - 4½ casing annulus shall be filled with an inert fluid with a pressure gauge at surface.

[illegible signature]

Com. 3318

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		ADDRESS	
Pan American Petroleum Corporation		Security Life Building, Denver, Colo. 80202	
LEASE NAME	**WELL NO.**	**FIELD**	**COUNTY**
Navajo Tribal "U"	6	Tocito Dome Penn "D"	San Juan

LOCATION

UNIT LETTER O ; WELL IS LOCATED 660 FEET FROM THE North LINE AND 510 FEET FROM THE West LINE, SECTION 22 TOWNSHIP 26N RANGE 18W NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING	13-3/8	96	100	Surface	Circulation
INTERMEDIATE	8-5/8	1475	500	150	Estimate
LONG STRING	4-1/2	6386	1000	150	Calculation
TUBING	2-3/8	6200	NAME, MODEL AND DEPTH OF TUBING PACKER: Baker Model D		

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Pennsylvanian	5635	6386

IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?	PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
Injection Through Tubing	Perforations	6238 - 6244 w/4 SPF

IS THIS A NEW WELL DRILLED FOR DISPOSAL?	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED?	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE?
No	Oil Production	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	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA
Base De Chelly 4271	None Known	None Known

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
200	1000 est.	Open	Pressure	500

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)

Navajo Tribe of Indians - c/o U.S.G.S. - Farmington, New Mexico

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL

Texaco, Inc., P. O. Box 810, Farmington, New Mexico

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	Yes	Yes
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	**PLAT OF AREA**	**ELECTRICAL LOG**	**DIAGRAMMATIC SKETCH OF WELL**
	Yes	Yes	Yes

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

J. M. Curtis — District Superintendent — September 15, 1965

(Signature) *(Title)* *(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.

CASE 3316: In the matter of the hearing called by the Oil Conservation Commission on its own motion for the creation of a new oil pool for Yates and Seven Rivers production in Sections 12, 13, and 24, Township 26 South, Range 36 East, and Sections 7, 18, 19, 30, 31, 32, and 33, Township 26 South, Range 37 East, Lea County, New Mexico, said pool to be designated the Scarborough Yates-Seven Rivers Pool. Further, to consider the establishment of a procedure whereby a special allowable would be assigned to said pool which would permit equalized per-acre withdrawal rates from wells on 40-acre spacing in New Mexico to the per-acre withdrawal rates from 20-acre wells located immediately south in the Scarborough Pool, Winkler County, Texas.

CASE 3317: Application of Jake L. Hamon for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Owl Draw Unit Area comprising 8,916 acres, more or less, of Federal, State and Fee lands in Township 25 South, Range 27 East, Township 26 South, Range 26 East, Township 26 South, Range 27 East, Eddy County, New Mexico.

CASE 3318: Application of Pan American Petroleum Corporation for salt water disposal, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Pennsylvanian formation in its Navajo Tribal "U" Well No. 6 located in Unit O of Section 22, Township 26 North, Range 18 West, San Juan County, New Mexico.

CASE 3107 (Reopened): In the matter of Case No. 3107 being reopened pursuant to the provisions of Order No. R-2779, which order established 80-acre spacing units for the North Bagley-Middle Pennsylvanian Pool, Lea 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.

Docket No. 28-65

DOCKET: EXAMINER HEARING - WEDNESDAY - OCTOBER 6, 1965

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

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

CASE 3307: (Continued from September 22, 1965 Examiner Hearing)
Application of Arwood Stowe & Company for the creation of a pool, special pool rules, and a waterflood project, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks the creation of an oil pool for Mesaverde production in Section 33, Township 18 North, Range 3 West, Sandoval County, New Mexico, and the establishment of special pool rules governing well spacing of less than 40 acres and special well locations; or in the alternative, for the extension of the San Luis-Mesaverde Pool to include portions of said Section 33. Applicant further seeks authority to institute a waterflood project in said Section 33 by the injection of water into the Mesaverde formation through four wells.

CASE 3310: (Continued from September 22, 1965 Examiner Hearing)
Application of Cima Capitan, Inc., Ryder-Scott Management Company, and Stallworth Oil and Gas Company for a waterflood project, Eddy County, New Mexico. Applicants, in the above-styled cause, seek authority to conduct a copperative waterflood project by the injection of water into the Grayburg-San Andres formations through 16 injection wells to be drilled at unorthodox locations in Sections 25 and 36, Township 16 South, Range 30 East, and Sections 30, 31 and 32, Township 16 South, Range 31 East, Square Lake Pool, Eddy County, New Mexico.

CASE 3313: Application of Tenneco Oil Company for a non-standard location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to produce its Omler "A" Well No. 2 at a non-standard undesignated Gallup oil well location 1525 feet from the North line and 1650 feet from the East line of Section 35, Township 28 North, Range 10 West, San Juan County, New Mexico.

CASE 3314: Application of Sinclair Oil & Gas Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an amendment to Order No. R-2040, which created a non-standard gas proration unit comprising the SW/4 of Section 14 and the SE/4 of Section 15, Township 23 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, said unit to be dedicated to its Matkins Well No. 1 located in Unit P of said Section 15. Applicant proposes to dedicate said unit to its Matkins Well No. 4 located in Unit K of Section 14 in addition to said Well No. 1.

CASE 3315: Application of Sun Oil Company for a unit agreement, Catron and Socorro Counties, New Mexico. Applicant, in the above-styled cause, seeks approval of the San Augustin Plains Unit Area comprising 404,293 acres, more or less, of Federal, State and Fee lands in Townships 1, 2, 3, 4, and 5 South, Ranges 7, 8, 9, 10, 11, and 12 West, Socorro and Catron Counties, New Mexico.

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

Case 3318

S. E. REYNOLDS
STATE ENGINEER

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

October 1, 1965

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

Reference is made to the application of Pan American Petroleum Corporation which seeks authority to dispose of salt water by injection into a porous formation through their Navajo Tribal "U" No. 6 well, located in the NW¼ of Sec. 22, T. 26 N., R. 18 W.

This office offers no objection to the granting of the application provided:

1. The 2 3/8 inch tubing is internally coated.

2. The annulus between the tubing and the 4½ inch casing is filled with inhibited fluid, with provision for a gage on the annulus at the surface, and

3. The packer at the lower end of the tubing is not more than 200 feet above the casing shoe.

Yours truly,

S. E. Reynolds
State Engineer

By: Frank E. Irby
Frank E. Irby
Chief
Water Rights Div.

FEI/ma
cc-Mr. R. B. Giles

FORM 523 6-65

PAN AMERICAN PETROLEUM CORPORATION

SECURITY LIFE BUILDING
DENVER, COLORADO 80202

S. B. RICHARDS
DIVISION ENGINEER

UNITIZATION
R. B. GILES

'65 SEP 22 AM 1 18

Case 3318

September 21, 1965

File: SBR-1603-986.511

Re: Water Disposal Application
for Tocito Dome Penn "D" Field
San Juan County, New Mexico

Mr. A. L. Porter, Jr.
Oil and Gas Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico

Dear Sir:

Please refer to our letter of September 15, 1965, on the above subject. Attached hereto is a copy of the certified mail receipt as evidence that a copy of the subject application was sent to the State Engineer's office.

Yours very truly,

R. B. Giles

Attachment

FORM 523 6-65

PAN AMERICAN PETROLEUM CORPORATION

S. B. RICHARDS
DIVISION ENGINEER

SECURITY LIFE BUILDING
DENVER, COLORADO 80202

'65 SEP 16

UNITIZATION
R. B. GILES

September 15, 1965

File: SBR-1564-986.511

Re: Water Disposal Application
for Tocito Dome Penn. "D" Field
San Juan County, New Mexico

Mr. A. L. Porter, Jr.
Oil and Gas Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico

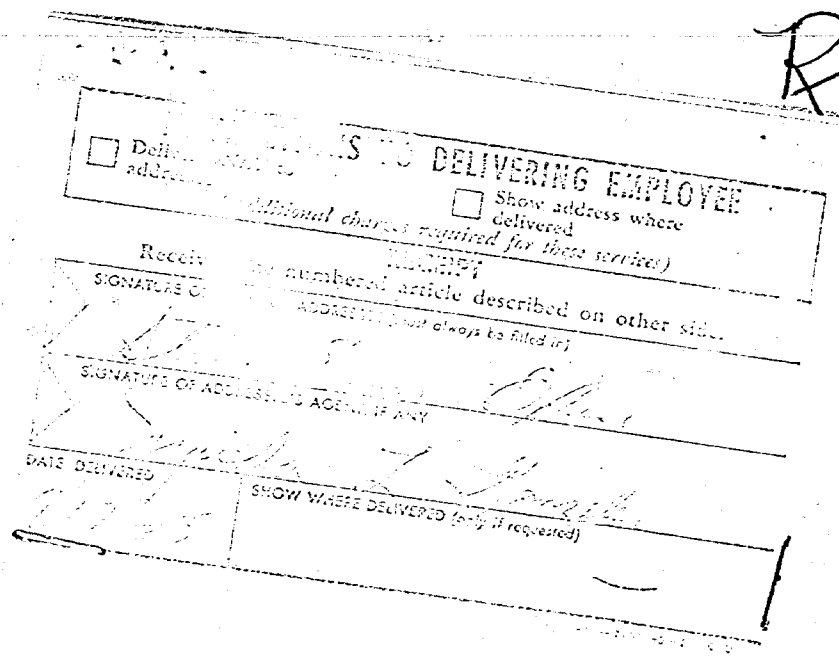
Dear Mr. Porter:

Attached hereto are three copies of Pan American's "Application to Dispose of Salt Water by Injection into a Porous Formation" for the Navajo Tribal "U" Well No. 6, Tocito Dome Penn. "D" Field, San Juan County, New Mexico. It is requested that you advertise this matter as required by law and set it for public hearing on the October 6, 1965, Examiner Hearing Docket.

All offset operators within a two mile radius of the proposed disposal well and the surface landowner of the land upon which the disposal well is located have been sent copies of this Application. A copy of the Application complete with all attachments has also been sent to the State Engineer's office by certified mail. A copy of the certified mail receipt will be forwarded to your office when received.

Yours very truly

R B Giles



DOCKET MAILED

Date 9-24-65

ATWOOD & MALONE
LAWYERS

P. O. DRAWER 700
TELEPHONE 505 622-6221
SECURITY NATIONAL BANK BUILDING
ROSWELL, NEW MEXICO
88201

CLIFF D. ATWOOD (1883-1960)
ROSS L. MALONE
CHARLES F. MALONE
RUSSELL D. MANN
PAUL A. COOTER
BOB F. TURNER

ROBERT A. JOHNSON
JOHN W. BASSETT, JR.

SEP 24 1 1

SEPTEMBER
23rd
1965

Mr. A. L. Porter, Jr., Secretary
New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Case No. 3318 - Oil Conservation Commission

Dear Mr. Porter:

We enclose herewith our Entry of Appearance in the above captioned case for Pan American Petroleum Corporation, with the request that you please file same.

Thank you.

Sincerely yours,

L. D. Mann

for ATWOOD & MALONE

R
D
M

*

v

Encls.

Cc: Mr. Louis C. Ross
Mr. T. J. Files

'65 SEP 24 PM 1 2

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF PAN AMERICAN PETROLEUM CORPORATION FOR SALT WATER DISPOSAL, SAN JUAN COUNTY, NEW MEXICO.	)	No. 3318

ENTRY OF APPEARANCE

The undersigned, Atwood & Malone of Roswell, New Mexico, a firm of attorneys, all of whose members are duly licensed to practice in the State of New Mexico, hereby enters its appearance as local counsel with Louis C. Ross, Esquire, of the Texas Bar, for Pan American Petroleum Corporation in the above entitled cause.

DATED at Roswell, New Mexico, this 23rd day of September, 1965.

ATWOOD & MALONE

By _____

Attorneys for Pan American
Petroleum Corporation
Post Office Drawer 700
Roswell, New Mexico

SINCLAIR OIL & GAS COMPANY
501 LINCOLN TOWER BUILDING
DENVER, COLORADO 80203

WESTERN REGION

September 28, 1965

Mr. A. L. Porter, Jr.
Oil & Gas Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico

Re: Water Disposal Application
for Tocito Dome Penn "D"
Field, San Juan County,
New Mexico

Dear Sir:

Reference is made to Pan American Petroleum Corporation's Application dated September 15, 1965, for the injection of salt water into the above captioned field. Sinclair Oil & Gas Company has no objections to this application.

Very truly yours,

W. A. Walther, Jr.
Western Region Production Mgr.

WAW:bjs

cc: Pan American Petroleum Corp.,
Securtiy Life Building
Denver, Colorado - 80202

Texaco Inc.
P. O. Box 810
Farmington, New Mexico

TEXACO
INC.
PETROLEUM PRODUCTS

DOMESTIC PRODUCING DEPARTMENT
DENVER DIVISION

J. F. NEILL, ASSISTANT DIVISION MANAGER

P. O. BOX 2100
DENVER COLO. 80201

Cool 3318

MAIL RO

'65 SEP 27 AM

September 23, 1965

WATER DISPOSAL
TOCITO DOME PENN. "D" FIELD

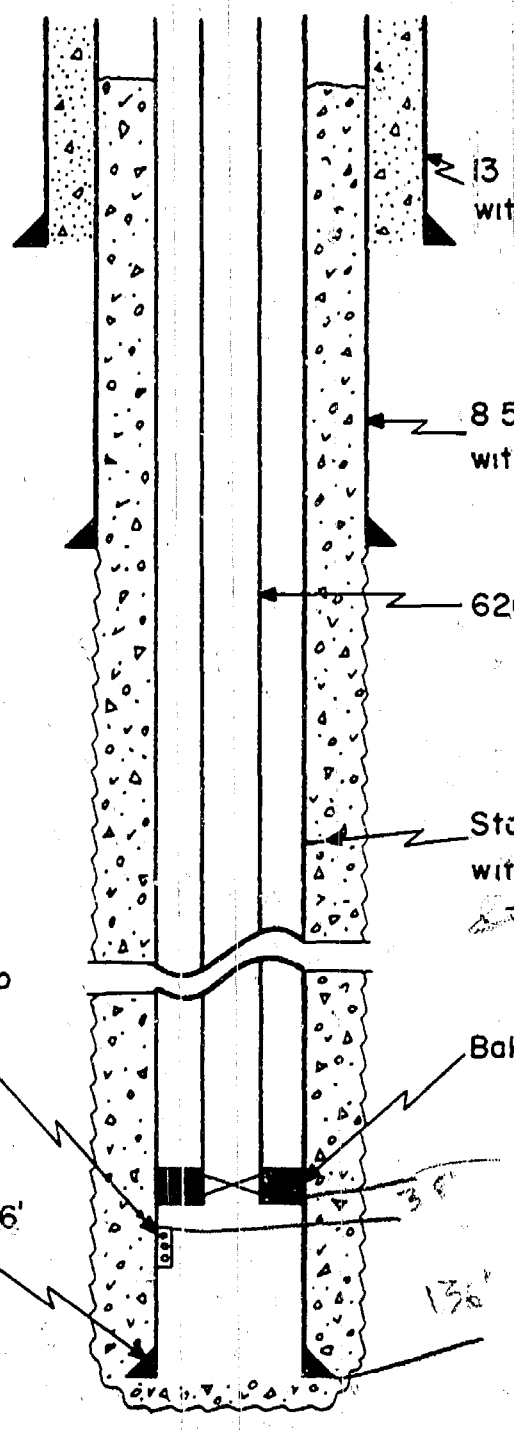
Mr. A. L. Porter, Jr.
Oil and Gas Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico

Dear Mr. Porter:

Texaco Inc. has been notified of the intention of Pan American Petroleum Corporation to dispose of produced water in the Pennsylvanian formation in its Navajo Tribal "U" No. 6 of San Juan County, New Mexico. Texaco Inc., as leasehold owner and operator in the Tocito Dome Penn. "D" Field supports the application of Pan American Petroleum Corporation.

Very truly yours,

AGW: WH



13 3/8" Casing set at 96' (+5603) with 100 sacks cement. Circulated.

8 5/8" Casing set at 1475' (+4224) with 500 sacks cement.

6200' - 2 3/8" Tbg.

Stage tool set at 3716' (+1983) with 600 sacks cement.

Perf. 6238-6244 (-539 to -545. Acidized w/250 gal. 15% HCL. Flowed 233 Bbls. SWPD

Baker Model "D" Packer

4 1/2" Casing set at 6386' (-687) with 400 sacks cement.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 3318

PAN AMERICAN PETROLEUM CORP.
NAVAJO TRIBAL "U" NO. 6
660' FNL and 510' FWL Sec. 23-T26N-R18W
SAN JUAN COUNTY, NEW MEXICO

CASE 3318 OCTOBER 6, 1965
EXHIBIT #4

FORM 66 7-62

N AMERICAN [illegible] ON

RES[illegible]MENT

W[illegible]NALYSIS

File

Lease Navajo Tribal "U" Well No. 5 Lab. No. T-17,220

Field Cocito Dome Penn. D County [illegible]an State New Mexico

Quarter or Survey Blk. Section 22 T. 28N R. 18W

Exact Location 660' FNL X 510' FWL Sample Series No. HC-65

Producing Stratum PBTD 6343 Total Depth 6386

Stratum Yielding Sample Lower Hermosa From 6238 To 44

Condition of Well

Sample Collected From Flow Line Method Used Direct

Collected by D. R. Hogan Date Collected 6-2-65 Date Received 6-8-65

Transmittal Letter by L. O. Speer, Jr. Date 6-2-65 File N-1063-535.11

Radicle	Per Cent by Analysis	(a) P. P. M.	(b)	(a) X (b)	Per Cent Reacting Value	Calculated Compound	P. P. M.
Na	29.12	26,207	.0435	1,139.97	36.26	Na_2SO_4	
Ca	5.93	6,240	.0499	311.38	9.90	NaCl	66,271
Mg	1.63	1,470	.0822	120.83	3.84	Na_2CO_3	
Fe						$NaHCO_3$	521
						$CaSO_4$	1,020
						$CaCl_2$	16,450
SO_4	.80	720	.0208	14.98	.48	$CaCO_3$	
Cl	61.10	55,000	.0282	1,551.00	49.32	$Ca(HCO_3)_2$	
CO_3	0	0	.0333	0	0	$MgSO_4$	
HCO_3	.42	378	.0164	6.20	.20	$MgCl_2$	5,753
H_2S						$MgCO_3$	
						$Mg(HCO_3)_2$	

Total solids as a summation of radicles 90,015 P.P.M.

Total solids by evaporation and ignition of residue at low red heat 93,480 P.P.M.

Sample as received: Resistivity: ohms/M'M .083 at 77°F. | pH Value 6.2 | Specific Gravity 60°/60°F. 1.008

PROPERTIES OF REACTION IN PER CENT

PRIMARY SALINITY: $SO_4 + Cl$ = ... with equal value Na (K) ..... = 72.52 %

SECONDARY SALINITY: If $SO_4 + Cl$ is greater than Na (K) ..... = ... %

Then $SO_4 + Cl$ = ... with equal value of Ca + Mg ..... = 27.08 %

PRIMARY ALKALINITY: Excess Na (K) over $SO_4 + Cl$ = ... with equal value of $CO_3 + S$ ..... = 0 %

SECONDARY ALKALINITY: Excess Ca + Mg over $SO_4 + Cl$ = ... with equal value of $CO_3 +$ ..... = .40 %

CHLORIDE SALINITY: $Cl \div (SO_4 + Cl)$ = ... X 100% ..... = 99.04

SULPHATE SALINITY: $SO_4 \div (SO_4 + Cl$ = ... X 100% ..... = .96

NOTE: Multiply Parts per Million by .0583 to obtain Grains per Gallon.

REMARKS:

J. L. Hoyt, Jr.
W. T. Smith
L. O. Speer, Jr.
G. W. Schmidt

CASE 3318 OCTOBER 6, 1965
EXHIBIT #5

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 3318

RECEIVED
23
PROD. DEPT.
FORT WORTH

Analyst James D Elliott Date 6-17-65

FORM 66 7-62

AMERICAN PETROLEUM CORPO N
RESEARCH DEPARTMENT
WATER ANALYSIS

Lease Navajo Tribal "P" Well No. 2 Lab. No. T-17,020
Field Tocito Dome-Perm "D" County [illegible] State New Mexico
Quarter or Survey Blk. Section T. R.
Exact Location PBTD 6417 Sample Series No.
Producing Stratum Total Depth 6423
Stratum Yielding Sample Lower Hermosa (Penn) From To
Condition of Well Method Used
Sample Collected From Treater discharge line Date Collected 2-5-65 Date Received 2-12-65
Collected by W. T. Holland Date 2-10-65 File N-1016-535.11
Transmittal Letter by L. O. Speer, Jr.

Radicle	Per Cent by Analysis	(a) P. P. M.	(b)	(a) X (b)	Per Cent Reacting Value	Calculated Compound	P. P. M.
						Na_2SO_4	
Na	28.86	22,444	.0435	976.32	35.93	NaCl	56,834
Ca	6.99	5,440	.0499	271.46	9.99	Na_2CO_3	
Mg	1.73	1,350	.0822	110.97	4.08	$NaHCO_3$	336
Fe						$CaSO_4$	1,614
						$CaCl_2$	13,750
					.87	$CaCO_3$	
SO_4	1.46	1,140	.0208	[illegible]	48.98	$Ca(HCO_3)_2$	
Cl	60.65	47,200	.0282	1,330.8	0	$MgSO_4$	
CO_3	0	0	.0333	0	.15	$MgCl_2$	5,284
HCO_3	.31	244	.0164	4.03		$MgCO_3$	
H_2S						$Mg(HCO_3)_2$	

Total solids as a summation of radicles 77,818 P.P.M.
Total solids by evaporation and ignition of residue at low red heat 83,980 P.P.M.
Sample as received: Resistivity: ohms/M'M .091 at 77°F. | pH Value 6.1 | Specific Gravity 60°/60°F. 1.058

PROPERTIES OF REACTION IN PER CENT

PRIMARY SALINITY: $SO_4 + Cl$ = ... with equal value Na (K) ..... = 71.86 %
SECONDARY SALINITY: If $SO_4 + Cl$ is greater than Na (K) ..... = %
Then $SO_4 + Cl$ = ... with equal value of Ca + Mg ..... = 27.84 %
PRIMARY ALKALINITY: Excess Na (K) over $SO_4 + Cl$ = ... with equal value of $CO_3 + S$ ..... = %
SECONDARY ALKALINITY: Excess Ca + Mg over $SO_4 + Cl$ = ... with equal value of $CO_3 +$ ..... = .30 %
CHLORIDE SALINITY: $Cl + (SO_4 + Cl)$ = ... X 100% ..... = 98.25
SULPHATE SALINITY: $SO_4 + (SO_4 + Cl$ = ... X 100% ..... = 1.75

NOTE: Multiply Parts per Million by .0583 to obtain Grains per Gallon.

REMARKS:

J. L. Hoyt, Jr.
W. T. Smith
T. M. Curtis
L. O. Speer, Jr.
G. W. Schmidt

CASE 3318 OCTOBER 6, 1965
EXHIBIT #6

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. [illegible]

Analyst James J. Elliott Date 2-17-65

DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

FIELD LABORATORY REPORT

WATER ANALYSIS

June 17, 1964

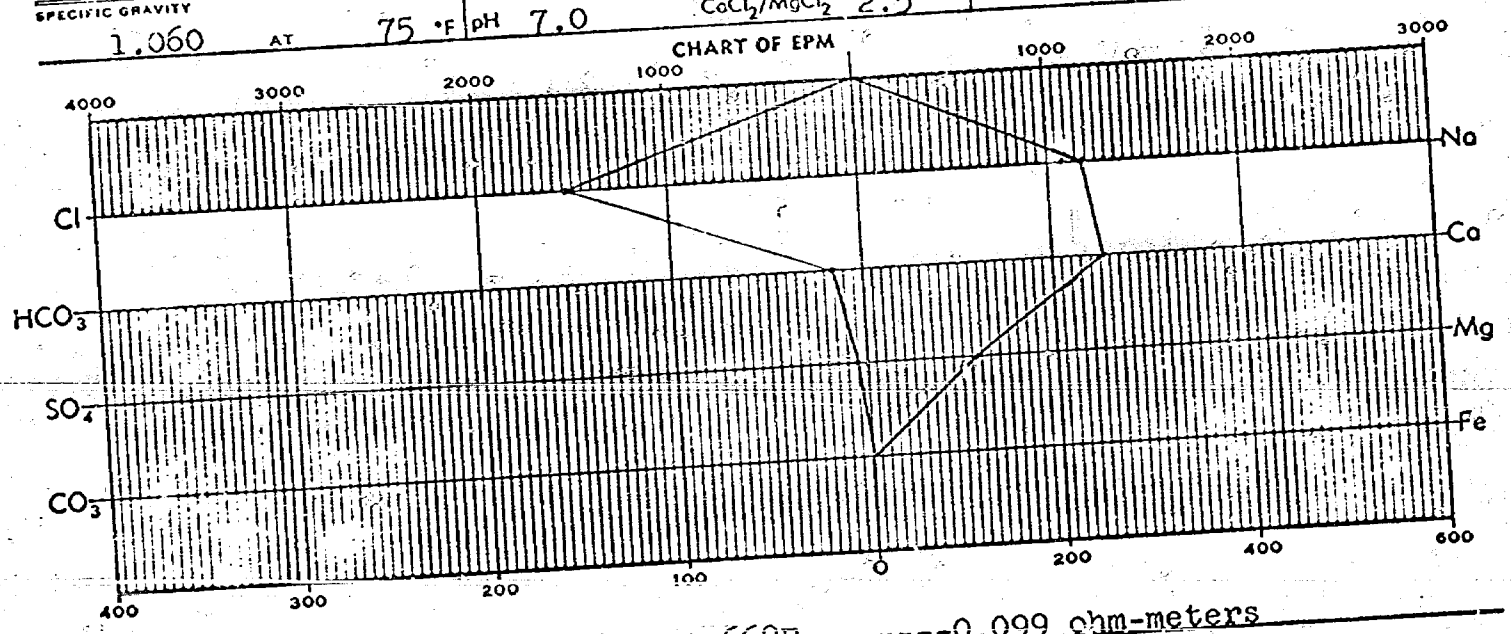
TO: C. E. Gustafson
Farmington

CASE 3318 OCTOBER 6, 1965
EXHIBIT #7

LABORATORY LOCATION: Denver	REPORT NUMBER: RML #48
COMPANY: Texaco	WELL: AL #2
FOOTAGE:	LOCATION:
COUNTY: San Juan	STATE: New Mexico
FORMATION: Paradox	DEPTH:
DATE SAMPLE SUBMITTED: June 16, 1964	SUBMITTED BY: C. E. Gustafson
SAMPLE SOURCE: Flow Line	TESTS DESIRED: Water Anelysis

	PPM	EPM		PPM	EPM
CALCIUM	5080		CHLORIDE	54100	
MAGNESIUM	1440		SULFATE	726	
SODIUM	27000		BICARBONATE	311	
IRON	not determined		CARBONATE		
HYDROGEN SULFIDE	none detected		HYDROXIDE		

SPECIFIC GRAVITY: 1.060 AT 75 °F pH 7.0 $CaCl_2/MgCl_2$ 2.5 % SALT SATURATION



Calculated Resistivity at 66°F--------0.099 ohm-meters

REMARKS:

cc
Tulsa - Lab File
Denver - Lab File, E. W. Moore, K. W. Buckles, J. D. Woodward
E. H. Nielsen

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 3318

CHEMIST J. M. Stull DATE

JMS/rk

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

RECEIVED
OCT 1 1965

1 WGS W/s

September 30, 1965

Rbg 4

Mr. R. B. Giles
Pan American Petroleum Corporation
Security Life Bldg.
Denver, Colorado 80202

CASE 3318 OCTOBER 6, 1965
EXHIBIT #8

Dear Mr. Giles:

In reply to your letter of September 29, 1965 concerning your file SBR-1656-986.511, please be advised that your application to dispose of salt water by injection into a porous formation was received during my absence on September 17th and all of your listed attachments are intact. The application has been reviewed and I will forward a letter to the Oil Conservation Commission today or tomorrow with a copy to you.

FEI/ma

Yours truly,

S. E. Reynolds
State Engineer

By: Frank E. Irby
Frank E. Irby
Chief
Water Rights Div.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXPL. EXHIBIT NO. 8
CASE NO. 3318

6 3 79.

INSTRUCTIONS TO DELIVERING EMPLOYEE
☐ Deliver ONLY to addressee ☐ Show address where delivered
(Additional charges required for these services)

RECEIPT
Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE (must always be filled in)
State Engr. Office

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY
Imelda L. Gonzales

DATE DELIVERED
9/17/65

SHOW WHERE DELIVERED (only if requested)
—

C35—16—71548-5—F GPO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 6, 1965

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for salt water disposal, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Pennsylvanian formation in its Navajo Tribal "U" Well No. 6 located in Unit O of Section 22, Township 26 North, Range 18 West, San Juan County, New Mexico.

Case No. 3318

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3318.

MR. DURRETT: Application of Pan American Petroleum Corporation for salt water disposal, San Juan County, New Mexico.

MR. ROSS: My name is Louis C. Ross. I am an attorney for Pan American Petroleum Corporation, and I would like for the record to show that Atwood and Malone, attorneys of Roswell, have entered their appearance along with me in this cause. I have one witness which I would like to have sworn now.

(Witness sworn.)

MR. ROSS: I want to thank the Commission for allowing us to set this up.

MR. UTZ: Are there any other appearances? You may proceed.

DENNIS K. MILLER

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

DIRECT EXAMINATION

BY MR. ROSS:

Q Please state your name, your profession, and your educational status.

A I am Dennis K. Miller, I am a Petroleum Engineer. In 1958 I earned a Bachelor of Science Degree in General Engineering with the Petroleum option from the University of Wyoming.

Q Have you ever testified before the Oil Conservation Commission before?

A I have not.

Q All right.

MR. ROSS: If it please the Commission, I will proceed to qualify this gentleman.

Q (By Mr. Ross) By whom are you employed?

A Pan American Petroleum Corporation.

Q How long have you been with this company?

A Since June of 1958, seven years and three months.

MR. ROSS: May I ask the examining Commissioner if he's satisfied with the qualifications of this witness?

MR. UTZ: Yes, sir, he is qualified to testify in this case. He's familiar with the San Juan Basin Area, is he not?

MR. ROSS: Yes, sir, I will get to that point.

Q (By Mr. Ross) Are you familiar with this particular salt water problem in the San Juan River Basin, and if so, where is the location of this field?

A I have been directly responsible for all reservoir engineering matters in the Tocito Dome Field since July of this year. The Tocito Dome Field is located in the northwest corner of New Mexico in San Juan County. It's fourteen miles directly south of the well-known geological feature, Shiprock.

Q Are there any special rules or Oil Conservation Commission rules or regulations with reference to the Tocito Dome Field?

A There are three Commission orders familiar to the Tocito Dome Field. The first order is a special field rules and regulations; the second order which establishes a 4.77 proportional factor for the field; and the third order establishes permanent 160-acre spacing for oil wells, 320-acre spacing for gas wells.

Q May I ask if you have a plat of this field showing the producing well locations and the site of the proposed injection well?

A Yes, sir.

MR. ROSS: If it please the Examiner, I would like to introduce a plat of this field and ask that it be marked.

MR. UTZ: Do you have other exhibits?

MR. ROSS: Yes. The next exhibit that I want to introduce, I have a sonic log of Navajo Tribal "U" No. 6 as Exhibit No. 2. Exhibit No. 3 is an induction-electrical log of Navajo Tribal "U" No. 6. I have a diagram of the injection well and various features concerning it as Exhibit No. 4. Exhibit No. 5 is a water analysis from Navajo Tribal "U" No. 6, and Exhibit No. 6 is a water analysis from Navajo Tribal "P" No. 2. Exhibit No. 7 is also a water analysis report. Exhibit

No. 8 is a copy of a letter from the State Engineer's Office to Pan American Petroleum Corporation.

(Whereupon, Applicant's Exhibits Nos. 1 through 8, both inclusive, marked for identification.)

Q (BY Mr. Ross) Now, Dennis, the plat of the field is identical to Exhibit No. 1, is it not, that you are showing us now?

A The slide that I am showing on the screen is identical to Exhibit 1, with the exception that on Exhibit 1 I have inter-imposed the structure contours and a diagrammatic layout of the proposed injection system.

Q Will you please indicate the locations of Pan American's present producing wells and the ownership of their wells within a two-mile radius of the injection well, and show also the location of the injection well?

A The Pan American currently operates seven producing oil wells shown in green on Exhibit 1, located between the gas-oil contact and the water-oil contact around the rim of the structure. These wells are producing 2100 barrels of oil per day, and 270 barrels of water per day. There are five wells completed in the gascap area of the field. Four of these have been active producers. However, they are now shut-in to conserve reservoir energy.

The proposed injection well, Navajo Tribal "U" 6, is

located in the Northwest Quarter Northwest Quarter of Section 22, Township 26 North, Range 18 West. Texaco operates five producing wells in the south portion of the field right in this area. Their current production is 835 barrels of oil per day and 115 barrels of water per day.

All production from this field is from the Penn. D interval of the Lower Hermosa. The circle inscribed on the map is a two-mile radius from the proposed injection well.

The lessees in the area include Mobil, Sinclair, Texaco, and Pan American. In all cases the lessor is the Navajo Indian Tribe.

As can be seen by the layout of the injection system, this is a joint venture with Pan American and Texaco.

Q Now do you have a graphic reproduction showing copies of the logs of the proposed injection well which have been introduced here as Exhibits 2 and 3. If so, would you please explain how the well has been completed, or rather, would you please explain the exhibits?

A We have two logs on this well, the induction-electrical log and the sonic log. This slide shows only the portion of the log that we're interested in. The Lower Hermosa is located at a minus 535 subsea datum. The pay interval is the interval shown in red on the sonic log.

This well was perforated from 6238 to 6244, and after

being acidized with 250 gallons of fifteen percent hydrochloride acid, it flowed 233 barrels of salt water per day. The reason the well was not completed as a commercial producer was due to the fact the water-oil was at minus 550 or midway into the pay interval.

Q Now do you have a diagrammatic sketch showing the completion program of the proposed injection well? I think this is the same as our Exhibit 4 already introduced, is it not?

A Yes, sir.

Q All right.

A The proposed injection well, Navajo Tribal "U" 6, was completed with three casing strings. Surface pipe consists of 13-3/8ths inch casing set at 96 feet with 100 sacks of cement which circulated to surface. An intermediate string of 8-5/8ths inch casing is set at 1475 feet with 500 sacks of cement. Cement did not circulate to the surface; however, 500 sacks of cement is 200 percent of the theoretical fill from the casing shoe to surface.

The production string consists of 4-1/2 inch casing set at 6386 feet with 1,000 sacks of cement. This was a two-stage cement job with a stage collar set at 3716 feet. The first stage consisted of 400 sacks of cement, or 105 percent of the theoretical fill from the casing shoe to the stage collar. The second stage consisted of 600 sacks of cement or 125 percent

of a theoretical fill from the stage collar to the surface. We are confident we have an adequate cement job on this well, because 600 sacks of cement is comparable to 200 percent of a theoretical fill from the stage collar to the base of the casing shoe on the intermediate string.

To insure that injections will be confined to the Penn D horizon, we are taking several precautions. The first consists of conducting injections down plastic lined tubing through a packer set at 6200 feet. This is 38 feet above the perforations, or 136 feet above the casing shoe.

As additional precaution, the annular space between the 2-3/8ths tubing and the casing will be filled with sweet crude which is produced from the field, and this crude will contain a corrosion inhibitor. A pressure gauge will be installed on the casinghead at the surface so we will be able to detect any communication between the tube and the annular space.

Q About the water, do you have any chemical analysis, can you present for us the chemical analyses of the water that are evidenced by Exhibits 5, 6, and 7? Would you please explain the wells they are from and so forth?

A Exhibits 5, 6, and 7 are water analyses from two producing wells. One is Navajo Tribal "P" 2 and the second is from Texaco AL No. 2. The third is from the Navajo Tribal "U" 6, or the formation from which we propose to conduct

injections. This slide summarizes the water analyses, and in all cases the adverse quality of the water is the high total solids content which ranges from eighty to ninety thousand parts. The high total solids results from the high chloride concentration, ranging from forty-seven to fifty-five thousand. The chlorides are present as salts of sodium and calcium. The waters are very similar in chemical composition. Therefore, they are compatible and should not result in any formation damage.

Q May I ask you, in your opinion is there any possibility of this water which is to be injected into the injection well, can it in any way adversely affect any offsetting producing well?

A Due to the complexity of your question, I am going to answer it in two ways. The first slide I am projecting on the screen shows the rate versus time performance for two wells in the field. Navajo Tribal "P" 2 was completed in January of '65, January, 1965, and produced water upon completion. It is presently producing 230 barrels of water per day.

Navajo Tribal "U" 1 was completed in August of 1964 and this well produced clean oil up until September, 1965, when we observed the first water production of 23 barrels of water per day. I'm presenting this slide to illustrate that by

returning the produced water into the producing horizon, we are doing nothing more than supplementing one of the natural drive mechanisms of this reservoir.

MR. UTZ: Where is the "U" 1 located? Oh, here it is.

A This slide shows the location of Navajo Tribal "U" 6 and he nearest producing well, which is Navajo Tribal "U" 5. It is located 1800 feet from the proposed injection well. At current water producing rates of 385 barrels of water per day, it will require eight years for water injected at "U" 6 to show up at "U" 5. If at any time we should see premature water breakthrough or an adverse effect upon the producing horizon, we could discontinue injections and would not cause any irreparable damage to the producing well.

MR. ROSS: May I state, I don't intend to introduce the slides in evidence, because I think the testimony has covered it. They're purely to illustrate and make the situation graphic.

Q (By Mr. Ross) Will you please tell these gentlemen what benefits the company, our company, Pan American, the lessors, the other lessees, and the reservoir will obtain if this program is instituted?

A At the present time Pan American must dispose of 270 barrels of produced salt water per day. Approximate cost for hauling approaches $800.00 per month. As we've seen on this

slide showing the performance of these two wells, we have seen a rapid water increase in the last month with active water drive, and the increased water production hauling will not be an economically feasible or practical method of water disposal. Open pit disposal is not practical due to the possible contamination of shallow fresh waters in the area, and due to the presence of livestock in the area.

The slide showing the logs, the Lower Hermosa interval indicated that the water-oil contact was in the pay interval. The interval from the water-oil contact to the top of the porosity contains oil and there is an excellent possibility that we will displace this oil upstructure to some of the nearest producing wells by injecting water.

Q In other words, you are going to have a water drive in time, you are going to increase the natural water drive in the field?

A We are supplementing the natural water drive.

MR. ROSS: I believe that concludes the presentation of our case.

CROSS EXAMINATION

BY MR. UTZ:

Q I would like you to put the log slide back on there for just a minute. You say from the water-oil contact, from 6249 up to the top of your pay zone is oil?

A Yes, sir. There's oil saturation.

Q It follows that oil or water will be below that. What is your injection interval that you propose in this well?

A 6238 to 6244, which is this interval shown right here on the log.

Q So that will be up into your oil zone, actually?

A Yes, sir.

Q Why are you injecting in the oil zone rather than down in the water zone?

A Simply because we hope to sweep some of this oil in this area upstructure to some of the producing wells. We have no producing wells on that flank of the reservoir.

MR. ROSS: By that flank, you mean the east flank?

A The east flank of the reservoir.

Q (By Mr. Utz) Did this well actually produce some oil out of this zone?

A No, sir, it did not produce any oil at all.

Q Well, actually, the red area above your water-oil contact does not contain oil, then, in this oil bore?

A Yes, sir, it contains oil but due to the higher water saturation and the relative permeability characteristics, we did not see any oil production. In other words, the water was so much more mobile in the formation than was the oil that we did not produce any oil. We have two wells in the field with

the same identical histories as far as completion goes.

Q You tested these perforations that you intend to inject through?

A Yes, sir.

Q This is a water drive field, is it not?

A Right now it is producing primarily from solution gas, but we have seen evidence of water just recently, as I tried to illustrate with this slide here.

Q Yes.

A This is all the evidence we have of an active water drive at the present time.

MR. ROSS: In other words, your evidence of the active water drive is the sudden increase in water production from this well, the Navajo "P" 2 --

A And the first production from Navajo "U" 1.

MR. ROSS: It has been a rapid increase in salt water production, hasn't it?

A It has increased by 120 barrels of water in the last month.

MR. ROSS: I'm sorry to interrupt you, Mr. Examiner.

Q (By Mr. Utz) This business of injecting water into an oil well is a bit unusual. Is this common practice with Pan American in disposal wells?

A In some cases. In this case where we have such a

poor water, or with the high total solids content, there's essentially no place to put it other than back into the formation where it came from.

Q Would it not be possible to inject it below the water-oil contact?

A Yes, it would. We definitely could do that.

Q Would that have the same effect as repressuring or waterflooding, so to speak, your oil zone?

A It could possibly result in some additional recovery, but it would not be as effective as injecting it into the oil zone.

Q You don't think that you will bypass any oil by injecting into the oil zone?

A No, sir. We will increase the recovery by sweeping areas that will not be swept in any other way, because we have no drainage in this portion of the reservoir. That oil will stay there until we find some mechanism to move it. We have nothing at the present time.

Probably, as to your question about injecting into the oil zone, due to the higher water saturation, what will happen shortly after we begin injection is the water will end up down below the water-oil contact or in the zone of the higher water saturation, because the permeability to water is much higher than it is above the water-oil contact.

Q It's your testimony that you don't feel by injecting into the oil zone that you will bypass any oil?

A I'll state it this way. We won't leave any more unrecovered oil in this portion of the reservoir than we will by the present means of operation. The acreage is all dedicated in that area. We have -- well, this is a dry hole, it may not be dedicated. I'm not familiar with the regulations.

Q I don't believe you could dedicate a dry hole.

A In order to get an effective drainage of this area, we would have to drill an oil producing well to the west of the proposed injection well. If we would do this, we would be going over into Section 21 where the acreage is dedicated.

Q I'm not questioning the location of the well. I am questioning the injection into the producing horizon.

MR. ROSS: May I ask, Mr. Examiner, are you satisfied with his response? I think you were asked to, as to the history, have we ever done this before, injected into the interval, the producing interval in this dry hole, or what would have been a producing interval in this dry hole.

A We have not done it, as far as I know, we have not done it as a method of water disposal. However, it is standard practice to do it as a water drive.

Q (By Mr. Utz) Yes, but not as a means of pressure maintenance, is that correct?

A I misunderstood your question.

Q I say, do you do this as a means of pressure maintenance rather than water drive?

A Yes, sir, we are doing it in the State of New Mexico in the Cha Cha-Gallup.

Q This is not a water drive field.

A I am not that familiar with that field that I could state.

MR. ROSS: Whichever injection zone you use, whether this or down into the water itself, you don't expect to recover all of the oil in this area anyway, do you?

A No, sir. My comment here was, we will probably increase ultimate recovery in this area, as I showed on one of my other slides. It's going to take something on the order of eight years to see any response at the nearest producing well. This is assuming that the water sweeps the entire pay section.

Q (By Mr. Utz) Yes, but this is the oil zone in this well you feel is connected with your No. 4 and No. 5 wells?

A Yes, sir, it is.

Q And that oil will move in that direction by producing those two wells?

A Part of it will, yes, sir.

Q Refer to your Exhibit No. 4, which is your casing and

cementing program. Did you run any temperature logs or any means of detecting the top of the cement?

A No, sir, we have not.

Q So your only evidence as to where the cement is, is by the volume method?

A Yes, it's by volumetric calculations and by providing sufficient excess to be reasonably sure of an adequate cement job.

Q In other words, you feel that you have an adequate cement job, then, from the casing shoe on the 4-1/2 inch back up into the 8-5/8ths?

A Definitely.

Q About how far do you estimate?

A I had anticipated it was 150 feet from surface. There is no way of knowing for sure where it is.

Q But you feel sure it goes adequately back up behind the 8-5/8ths?

A Yes, sir.

MR. ROSS: When this well was filled in as a dry hole, no completion was attempted, it hadn't been hydro-fracked, had it?

A No, sir. It was acidized with 250 gallons of acid, so we are confident that the cement sheath is in as good a shape as you can possibly get with conventional oil well cementing.

MR. ROSS: Is that very much acid to put in a well?

A No, sir, it's a very minimal amount.

Q (By Mr. Utz) And you used 500 sacks or 200 percent by volume?

A Behind the 8-5/8ths.

Q And it did not circulate?

A No, sir.

Q And 200 percent should have circulated?

A Yes, it should have. There's some shallow formation in there that is breaking down with the hydrostatic pressure of the cement.

Q But your surface pipe from 96 feet up did circulate?

A Yes, sir.

Q And if I recall your testimony, you filled the annulus with sweet oil with a pressure gauge at the top; your tubing is going to be internally coated?

A Yes, sir.

MR. UTZ: Are there any other questions of the witness?

MR. IRBY: Yes.

BY MR. IRBY:

Q You have your stage tool set there at 3716 on this exhibit, and cement up there with 600 sacks. When you started out with this stage tool to bring this cement on up,did you find

any evidence of where your 400 sacks was?

A No, we did not.

Q Then it was below your ports?

A It was below the ports in the staging tool.

Q So we can't say definitely anything concerning tops of cement on the 4-1/2?

A That is right.

Q Tell me once again, then, how far above the shoe the end of the tubing and the packer will be.

A The packer will be 38 feet above the top of the perforations and 186 feet above the shoe.

MR. IRBY: Thank you.

BY MR. UTZ:

Q Do you anticipate any surface pressure will be needed to inject water into this zone, or will it inject by gravity?

A We anticipate it will take 250 pounds to inject the water that's available at this time, 385 barrels of water per day.

MR. UTZ: Are there other questions of the witness? The witness may be excused.

(Witness excused.)

MR. UTZ: Are there any statements in this case? Did you introduce your exhibits -- how many did you have?

MR. ROSS: I had eight altogether.

MR. UTZ: Did you formally introduce those?

MR. ROSS: I would like to formally introduce them. I think they were formally introduced.

MR. UTZ: Exhibits 1 through 8 will be entered into the record in this case.

(Whereupon, Applicant's Exhibits Nos. 1 through 8, both inclusive, were offered and admitted in evidence.)

MR. UTZ: Are there other statements in this case? The case will be taken under advisement.

* * * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter - Notary Public, 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 8th day of November, 1965.

Ada Dearnley
Court Reporter - Notary Public

My Commission Expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3376, heard by me on 10-6 1965.

..... Examiner
New Mexico Oil Conservation Commission