SWD - 133

Due Jan 15

PRODUCING DEPARTMENT
ROCKY MOUNTAINS-U. S.
DENVER DIVISION

J. C. WHITE
ASSISTANT DIVISION MANAGER

TEXACO
PETROLEUM PRODUCTS

TEXACO INC.
P. O. BOX 2100
DENVER, COLORADO 80201

December 29, 1972

APPLICATION TO DISPOSE OF SALT WATER
IN TEXACO INC. NAVAJO TRIBE "AL" WELL
NO. 3--TOCITO DOME PENNSYLVANIAN "D"
SAN JUAN COUNTY, NEW MEXICO
6.02-1

Mr. A. L. Porter, Jr. (3)
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

Texaco Inc. respectfully requests administrative approval of the attached Application to dispose of salt water by injection into a porous formation (Form C-108) in Navajo Tribe "AL" Well No. 3, Tocito Dome Pennsylvanian "D" Field, San Juan County, New Mexico. Also attached, in support of the application, are:

1. A notarized affidavit, showing the names and addresses of lease owners and surface owners to whom copies of the Application have been mailed.

2. Exhibit "A", a map, showing lease ownership within a two-mile radius of the proposed salt water disposal well.

3. Exhibit "B", a schematic diagram of the proposed salt water disposal well, showing present completion data and the proposed work.

4. Exhibit "C", showing the procedure that will be used to convert Navajo Tribe "AL" Well No. 3 to a salt water disposal well.

5. Exhibit "D", a copy of an analysis of the produced water for which approval is requested for disposal facilities.

6. Exhibit "E", an induction-electrical log from the proposed salt water disposal well.

On September 15, 1965, Pan American Petroleum Corporation (now Amoco Production Company) submitted to the New Mexico Oil Conservation Commission an application to dispose of salt water by injection into a porous formation (Form C-108) in Navajo Tribe "U" Well No. 6, Tocito Dome Pennsylvanian "D" Field, San Juan County, New Mexico. Following approval of this application, Texaco Inc. and Pan American Petroleum Corporation entered into a joint agreement for the installation, operation, and maintenance of a salt water disposal system, including Navajo Tribe "U" Well No. 6 as the disposal well, with Pan American Petroleum Corporation as operator. This arrangement was satisfactory until the last week in October, 1972, when communication was detected between the tubing and casing in the Texaco-Amoco jointly owned disposal well. Remedial work was started, but was stopped when it was learned that the casing and tubing were parted. Because of the high cost to repair the well, Amoco has recommended that it be permanently abandoned.

Since the failure of Navajo Tribe "U" Well No. 6, Amoco has been disposing of Texaco's produced salt water in their Navajo Tribe "U" Well No. 1 on an emergency basis. However, their system is overloaded and they have no standby disposal outlet, which creates a potential pollution hazard. In order to relieve this situation, Texaco requests approval to convert Navajo Tribe "AL" Well No. 3 to a salt water disposal well in the Pennsylvanian "D" formation.

Case No. 3913, Order No. R-3558, dated November 18, 1968, granted to Pan American Petroleum Corporation authorization to utilize Navajo Tribe "U" Well No. 1 as a produced salt water disposal well, in the Pennsylvanian "D" formation, Tocito Dome Field. As an exception to Rule 701 of the Commission Rules and Regulations, this same order authorized the Secretary-Director to approve additional salt water disposal wells in the Tocito Dome-Pennsylvanian "D" Pool, provided the application to dispose of salt water and the disposal well completion meet certain requirements. These requirements are summarized below:

1. An application requesting administrative approval of a proposed salt water disposal well shall be filed in accordance with Rules 701-B and 701-C.

2. Any additional salt water disposal well shall be completed in a manner similar to that specified in Order No. R-3558 for Pan American Petroleum Corporation's Navajo Tribe "U" Well No. 1, viz:

   (a) The tubing shall be plastic lined.

   (b) The casing-tubing annulus shall be filled with an inert fluid.

   (c) A pressure gauge shall be attached to the casing-tubing annulus at the surface.

   (d) Disposal shall be into the Pennsylvanian "D" formation below the oil-water contact.

In compliance with the above requirements, and in support of its application, Texaco Inc. presents the following:

Texaco's Navajo Tribe "AL" Well No. 3 was completed January 19, 1965, with an IP of 11 BOPD, 6 BWPD, and a gas volume too small to measure. Production was from the Barker Creek, with perforations from 6,313 feet to 6,316 feet. The well was shut in in September, 1970 because it stopped producing. Cumulative production is 17,121 barrels of oil. Immediately before learning of the seriousness of the problems with the jointly-owned Texaco-Amoco salt water disposal system, Texaco was preparing to plug and abandon Navajo Tribe "AL" Well No. 3.

Exhibit "A" is a map showing lease ownership within a two-mile radius of Texaco's Navajo Tribe "AL" Well No. 3. Note that there are two other lease owners, in addition to Texaco. The Navajo Tribe is the owner of the surface lands on which Well No. 3 is located. Copies of this application have been mailed (certified, return receipt requested) to these lease owners and to the Navajo Tribe (through the U.S.G.S.) as indicated on the attached affidavit.

Exhibit "B" is a schematic diagram of Navajo Tribe "AL" Well No. 3, showing present completion data and the work proposed for converting it for water disposal service. Exhibit "C" is a step-by-step outline of the procedure that will be followed in making the conversion. Note that the injection string will be internally plastic-lined tubing, the casing-tubing annulus will be filled with inert fluid, a pressure gauge will be attached to the casing-tubing annulus at the surface, and disposal will be into the Pennsylvanian "D" formation below the oil-water contact (-556 feet elevation).

Exhibit "D" is a copy of an analysis of water produced in association with the oil from the Pennsylvanian "D" formation. This water is unfit for domestic, stock, irrigation, or other general use and would create a pollution problem if discharged upon the surface of the ground. Therefore, it will be injected back into the Pennsylvanian "D" formation.

Exhibit "E" is a copy of the induction-electrical log run in Navajo Tribe "AL" Well No. 3 when it was drilled. Note that the proposed cement squeeze will cover the interval from the base of the main development in the DeChelly at 3,900 feet to approximately 100 feet inside the 8-5/8 inch surface pipe. The interval from 6,322 feet (-590 feet elevation) to 6,329 feet (-597 feet elevation) was perforated on completion and then cement squeezed after swab testing all water. The interval proposed for water disposal is from 6,334 feet (-602 feet elevation) to 6,345 feet (-613 feet elevation), well below the water-oil contact at 6,288 feet (-556 feet elevation). The zone that was oil productive in this well is a thin stringer from 6,313 Feet (-581 feet, elevation) to 6,316 feet (-584 feet elevation). The producing history of this zone indicates that it is in a small, tight reservoir. Since this zone will take an insignificant amount of water, it will be left open to avoid the expense of unnecessary cement squeezing.

Approval of this application will prevent drilling unnecessary wells, otherwise prevent waste, protect correlative rights, and eliminate a potential pollution hazard. Texaco Inc. therefore, respectfully requests administrative approval of this Application within 15 days of its filing, if no objections are raised; or sooner, if the Commission receives waivers of objection from the offset operators and the surface owner. If a protest is

received, please enter this matter on the docket for the next regularly scheduled hearing.

When the proposed salt water disposal system is put into operation, Texaco Inc. will report monthly to the Commission the volumes of fluid injected and the injection pressures on Form C-120-A, in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

Very truly yours,

J. C. White

LEA:WH

Attach.

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	
Texaco Inc.		Box 2100, Denver, Colorado 80201	
LEASE NAME	**WELL NO.**	**FIELD**	**COUNTY**
Navajo Tribe AL	3	Tocito Dome Pennsylvania D	San Juan

LOCATION

UNIT LETTER K ; WELL IS LOCATED 1980 FEET FROM THE South LINE AND 2130 FEET FROM THE West LINE, SECTION 28 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	95	100	Surface	Circulated
INTERMEDIATE	8-5/8	1511	400	Surface	Circulated
LONG STRING	4-1/2	6398	150	5463	Calculated
TUBING	2-3/8	To be set approx. 6200	NAME, MODEL AND DEPTH OF TUBING PACKER: Baker Lok-Set to be set at approx. 6200		

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Barker Creek	6278	6393

IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?	PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
Tubing	Perforations	6313-6316; 6334-6345

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 well	Yes

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

6322-6329 Squeezed with 100 sacks

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
Est. 1300	None	Not known

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
100	1500	Closed	As necessary	1000 psi

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 (Source)	Yes

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND)

Drawer 1857, Roswell, N.M. 88201
Navajo Tribe c/o U. S. Geological Survey, P.O. Box 959, Farmington, N.M. 87401

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ~~XXXXXXXX~~ MILE OF THIS INJECTION WELL

Two (2)

American Oil Company, Security Life Building, Denver, Colorado 80202

Mr. Wm. C. Lagos, 1010 Denver Center Building, Denver, Colorado 80203

two (2)

HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER	EACH OPERATOR WITHIN ~~XXXXXX~~ MILES OF THIS WELL	THE NEW MEXICO STATE ENGINEER
	Yes	Yes	NA

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. C. Lutz — (Signature)

Assistant Division Manager — (Title)

December 29, 1972 — (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.

AFFIDAVIT OF MAILING

Mr. J. C. White, being duly sworn, deposes and says:

That he is over the age of twenty-one (21) years;

That on the 29th day of December, 1972, he deposited in the United States mail at Denver, Colorado, certified mail, return receipt requested, postage thereon fully prepaid, a sealed envelope containing a copy of the application of Texaco Inc., requesting administrative approval by the Secretary-Director of the New Mexico Oil Conservation Commission, for the disposal of produced salt water in Texaco Inc. Navajo Tribe "AL" Well No. 3, Tocito Dome Pennsylvanian "D" Field, San Juan County, New Mexico, dated December 29, 1972, to which this affidavit is attached, addressed and directed to each of the following:

Amoco Production Company
Security Life Building
Denver, Colorado 80202

Mr. William C. Lagos
1010 Denver Center Building
Denver, Colorado 80203

Navajo Tribe c/o United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico 88201

P. O. Box 959 (2 copies)
Farmington, New Mexico 87401

Further affiant saith not.

J. C. White

STATE OF COLORADO)
CITY AND) ss.
COUNTY OF DENVER)

Subscribed and sworn to before me this 29 day of December, 1972.

Witness my hand and official seal.

Virginia Sickels
Notary Public

My commission expires 4-8-76

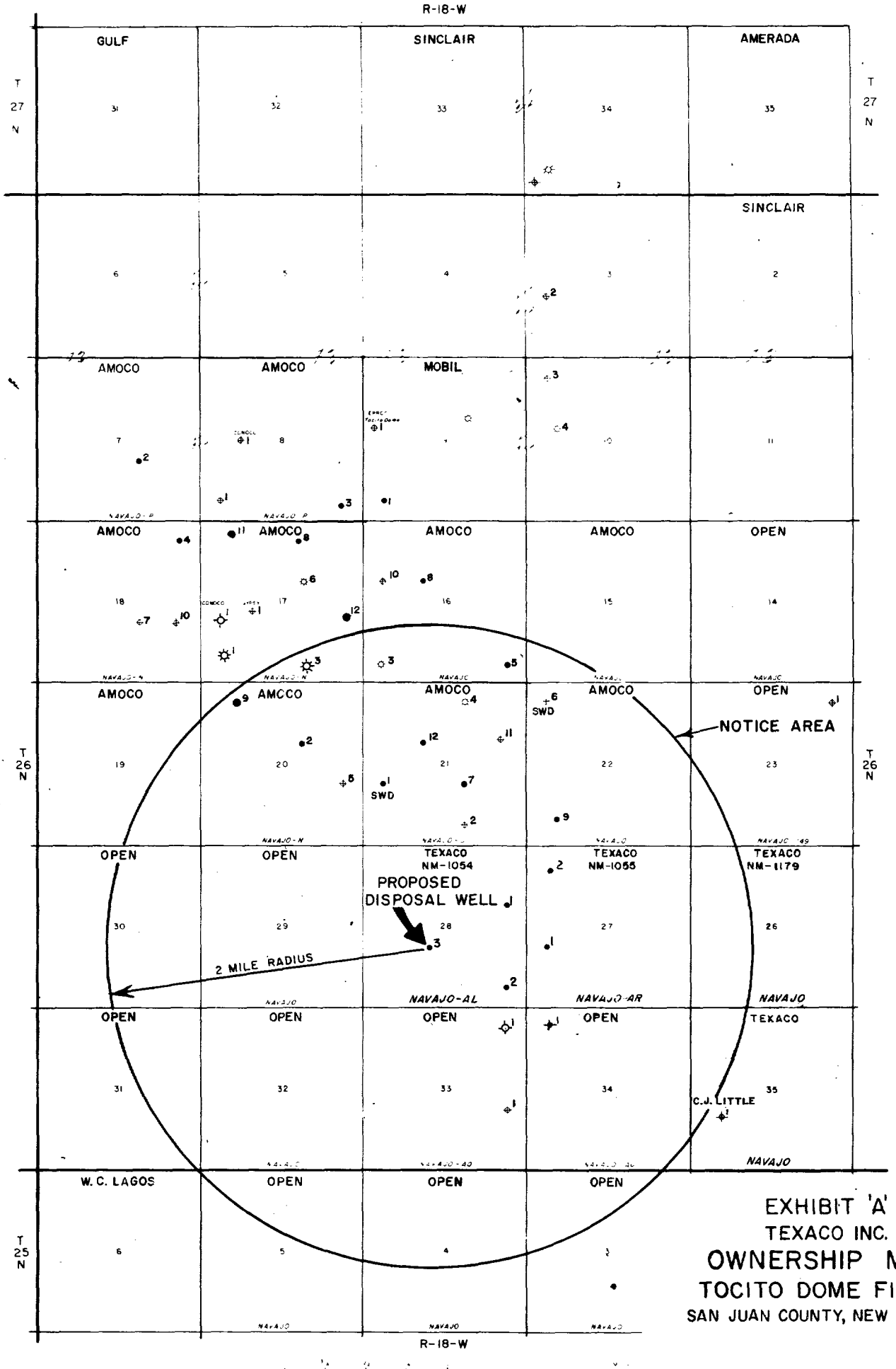


EXHIBIT 'A'
TEXACO INC.
OWNERSHIP MAP
TOCITO DOME FIELD
SAN JUAN COUNTY, NEW MEXICO

12-26-72 T2.016

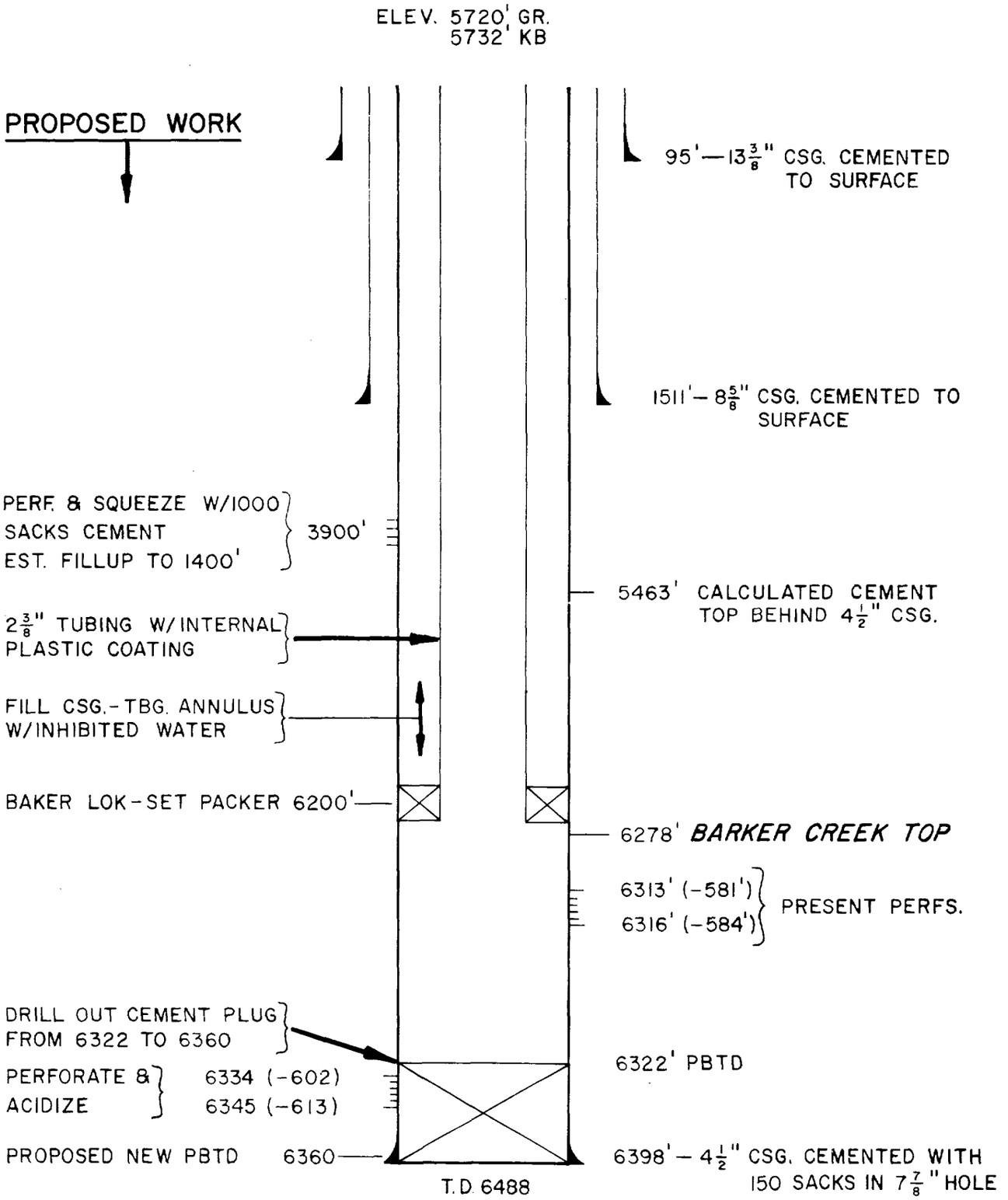


EXHIBIT 'B'

TEXACO INC.

NAVAJO TRIBE "AL" WELL NO. 3

TOCITO DOME PENNSYLVANIAN "D" FIELD

SAN JUAN COUNTY, NEW MEXICO

EXHIBIT "C"

PROCEDURE FOR CONVERTING TEXACO
NAVAJO TRIBE "AL" WELL NO. 3 TO
SALT WATER DISPOSAL SERVICE

1. Pull rods and tubing.

2. Set drillable bridge plug at 5900 feet.

3. Perforate 4-1/2 inch casing with four holes at 3900 feet.

4. Establish communications to surface through 4-1/2 inch - 8-5/8 inch annulus.

5. Set drillable cement retainer at 3800 feet and cement through perforations at 3900 feet with 1000 sacks.

6. Wait on cement 16 hours.

7. Drill retainer, cement, bridge plug, and present cement plug from 6322 feet (PBTD) to 6360 feet.

8. Perforate Barker Creek from 6334 feet to 6345 feet with four jet shots per foot.

9. Acidize with 3000 gallons 28% hydrochloric acid.

10. Run 2-3/8 inch tubing, internally coated with plastic, with a Baker Lok-Set packer and set packer at 6200 feet.

11. Fill casing-tubing annulus with inhibited water.

12. Connect pressure gauge to casing-tubing annulus at the surface.

13. Hook up well for salt water disposal service.

DWL-451-2-A

DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

LABORATORY LOCATION Tulsa API WATER ANALYSIS REPORT FORM DATE 11/20/70

Company Texaco (Sample 2)				Date Sampled
Field	Legal Description		County or Parish	State
Lease or Unit	Well	Depth	Formation	Water, B/D
Type of Water (Produced, Supply, etc.) Combined Produced	Sampling Point			Sampled By

DISSOLVED SOLIDS

CATIONS	*mg/l*	*me/l*
Sodium, Na (calc.)	26,979	1,173
Calcium, Ca	5,208	260
Magnesium, Mg	2,160	180
Barium, Ba	0	0

ANIONS		
Chloride, Cl	55,000	1,570
Sulfate, SO_4	1,800	37
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	430	7

Total Dissolved Solids (calc.)

Iron, Fe (total)

Sulfide, as H_2S

REMARKS & RECOMMENDATIONS:

OTHER PROPERTIES

pH	7.2
Specific Gravity, 60/60 F.	1.070
Resistivity (ohm-meters) 76 F.	

WATER PATTERNS — *me/l*

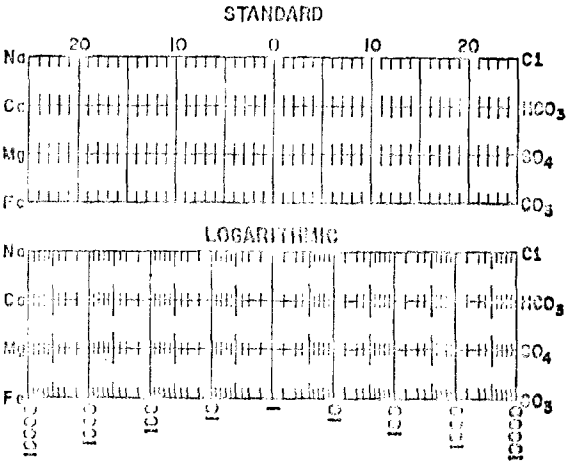


EXHIBIT D

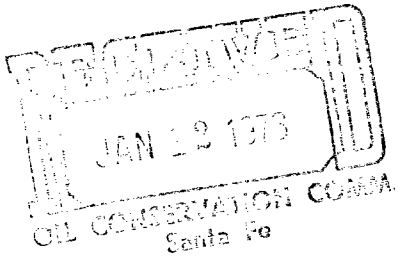
ANALYSIS BASED ON API RECOMMENDED PROCEDURE

OIL CONSERVATION COMMISSION
3 DISTRICT

OIL CONSERVATION COMMISSION
BOX 2088
SANTA FE, NEW MEXICO

DATE 1-10-73

Re: Proposed NSP
Proposed NWU
Proposed NSL
Proposed NFO
Proposed MC
Proposed SWD X



Gentlemen:

I have examined the application dated 12-29-72

for the Teraco Inc Navajo Tribal AL #3 K-28-26N-8W
Operator Lease and Well No. S-T-R

and my recommendations are as follows:

Approve

Yours very truly,

Emery C Arnold

United States Department of the Interior

GEOLOGICAL SURVEY

P. O. Box 959
Farmington, New Mexico 87401

January 8, 1973

Texaco Inc.
P. O. Box 2100
Denver, Colorado 80201

Re: Navajo tribal lease
I4-20-0603-8104

LEA - 1-12-73
FSld. 1-12-73

Attention: J. C. White

Gentlemen:

Your application to the New Mexico Oil Conservation Commission requests approval to dispose of produced salt water from the Tocito Dome field, San Juan County, New Mexico, into an existing well No. 3, NE¼SW¼ sec. 28, T. 26 N., R. 18 W., on the above-referenced lease.

This office has no objection to the disposal of salt water as outlined in your request whereby produced water is injected into the Pennsylvanian "D" formation at a perforated interval from 6313-6316 ft. and 6334 to 6345 ft. It is understood that the well will be conditioned by perforating the 4½" casing at 3900 ft. and squeezing with 1000 sacks of cement, setting a Baker lok-set packer at 6200 ft. and filling the 4½" casing tubing annulus with inhibited water. Like approval must be made by the N. M. O. C. C. and any change in the method outlined must be approved by this office.

Sincerely yours,

P. T. McGrath
District Engineer

Amoco Production Company
Security Life Building
Denver, Colorado 80202

M. S. Kraemer
Division Production Manager

H. T. Hunter
Assistant Division Production Manager

K. W. Bolt
T. M. Curtis
District Superintendents

January 11, 1973

File: KWB-37-986.511

Mr. A. L. Porter, Jr.
Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

Subject: Texaco Incorporated Salt Water Disposal Application, Tocito Dome Field, San Juan County, New Mexico

Amoco Production Company, as an operator in the Tocito Dome Field, has no objection to Texaco Incorporated's application to dispose of produced salt water in the their Navajo Tribe "AL" Well No. 3, Tocito Dome Pennsylvanian "D" Field, San Juan County, New Mexico.

Yours very truly,

R. B. Giles

CJB:im

cc: Texaco Incorporated
P. O. Box 2100
Denver, Colorado 80201

United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico 88201

United States Geological Survey
P. O. Box 959
Farmington, New Mexico 87401

671 345