

OIL CONSERVATION COMMISSION
3 DISTRICT

OIL CONSERVATION COMMISSION
BOX 2088
SANTA FE, NEW MEXICO

DATE 1-10-73

Re: Proposed NSP _____

Proposed NWI _____

Proposed NSL _____

Proposed NFO _____

Proposed MC _____

Proposed Snd X

Gentlemen:

I have examined the application dated 12-29-72
for the Texaco Inc Navajo Tribe AC #3 K-28-260-18W
Operator Lease and Well No. S-T-R

and my recommendations are as follows:

approve

Yours very truly,

Ernest C. Lewis



PETROLEUM PRODUCTS

PRODUCING DEPARTMENT
ROCKY MOUNTAINS-U.S.
DENVER DIVISION

J. C. WHITE
ASSISTANT DIVISION MANAGER

December 29, 1972

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

**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

Mr. A. L. Porter, Jr.

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December 29, 1972

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,

Signed: J. C. White

LEA:WH

Attach.

NEW MEXICO OIL CONSERVATION COMMISSION

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

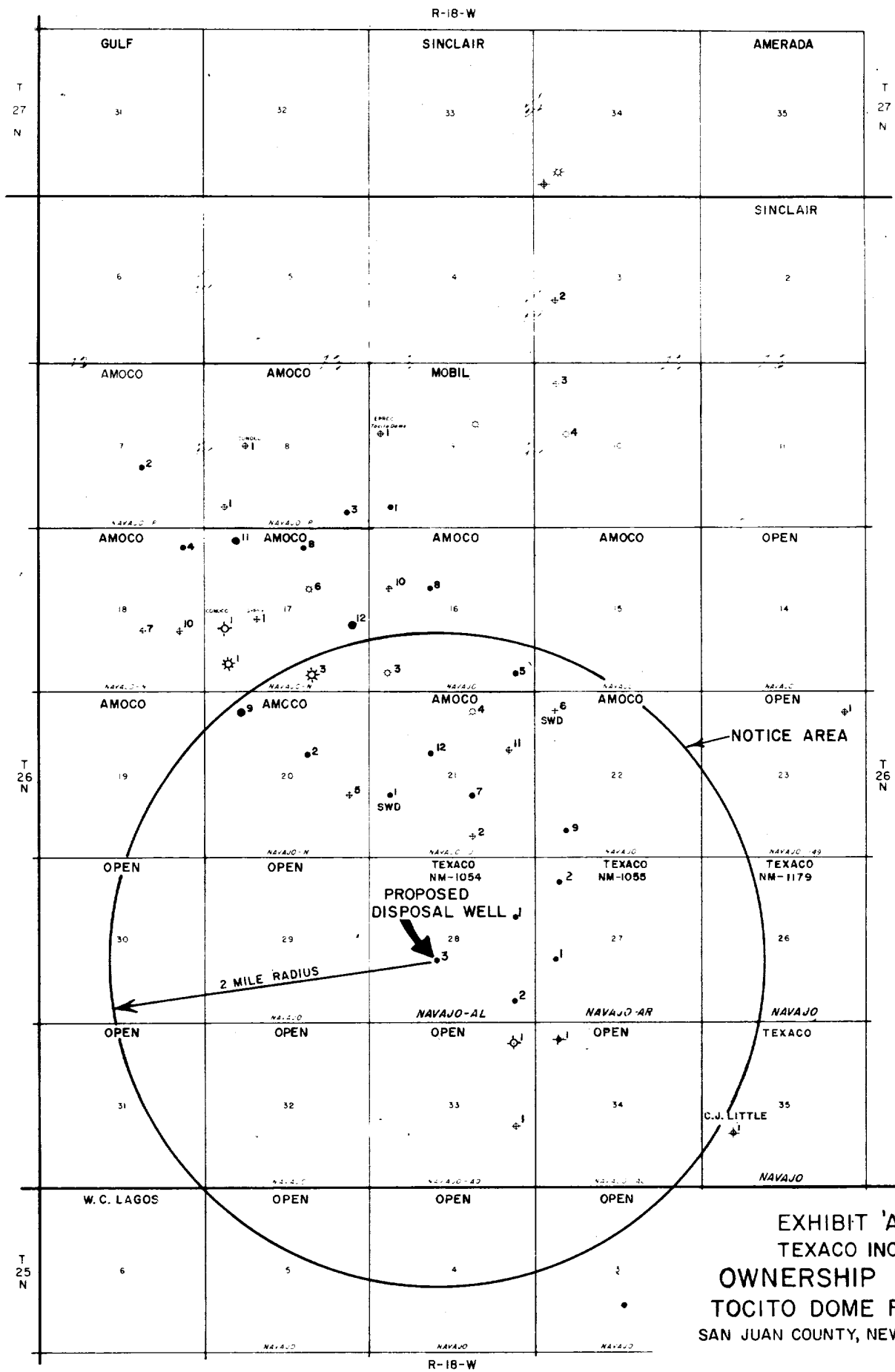
OPERATOR Texaco Inc.		ADDRESS Box 2100, Denver, Colorado 80201	
FIRST NAME Havajo Tribe AL		WELL NO. 3	COUNTY Tocito Dome Pennsylvania D San Juan
LOCATION UNIT LETTER K WELL IS LOCATED 1930 FEET FROM THE South LINE AND 2130 FEET FROM THE West LINE, SECTION 28 TOWNSHIP 26N RANGE 18W NE 1/4			

CASING AND TUBING DATA					
NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP TERMINATED 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 Baker Lok-Set to be set at approx. 6200			
NAME OF PROPOSED INJECTION FORMATION Barker Creek			TOP OF FORMATION 6278		BOTTOM OF FORMATION 6393
IS INJECTION THROUGH TUBING, CASING, OR ANNULUS? Tubing		PERFORATIONS OR OPEN BOLL? Perforations		PROPOSED INTERVALS OF INJECTION 6313-6316; 6334-6345	
IS THIS WELL DRILLED FOR DISPOSE OF? No		IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED? Oil well		HAS WELL EVER BEEN PERFORATED IN ALL ZONES AND TESTED FOR PROPOSED INJECTION? YES	
LIST ALL SPOUTS, INTEGRATED INTERVALS AND PACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH 6322-6329 Squeezed with 100 sacks					
DEPT. OF NEXT CASE CEMENT FROM WATER ZONE IN THIS AREA Dep. 1300		LENGTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA None		DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA Not known	
APPROX. VOLUME OF INJECTION (GALLONS) 100	MAXIMUM 1500	OPEN OR CLOSED TYPE SYSTEM Closed	IS INJECTION TO BE BY GRAVITY OR PUMP? As necessary		APPROX. PRESSURE (PSI) 1000 psi
ARE THERE ANY OTHER WELLS IN THE FOLLOWING WATERS ARE MINERAL WATERS, OR ARE THEY TO BE USED FOR DOMESTIC, IRRIGATION, OR OTHER GENERAL USES?		WATER TO BE DISPOSED OF Yes		WATER TO BE DISPOSED OF Yes (Source)	
NAME AND ADDRESS OF WELL OWNER (OR LEASEE, IF STATE OR FEDERAL LAND) Havajo Tribe c/o U. S. Geological Survey, P.O. Box 959, Farmington, N.M. 87401		DRAWER 1857, ROSWELL, N.M. 88201			
LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE 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 Yes	EACH OPERATOR WITHIN ONE MILE OF THIS WELL Yes	THE NEW MEXICO STATE ENGINEER Yes		
IS THIS WELL TO BE INJECTED TO THIS APPLICATION (SEE RULE 70-10)?	DEPT. OF AREA Yes	TELEMETRICIAN Yes	DIAGRAMS AND SKETCH OF WELL Yes		

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

[Signature] Assistant Division Manager *December 29, 1965*
(Signature) (Date) (Date)

NOTE: Should notices 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 1 year from the date of receipt by the Commission's Santa Fe office. If at the end of the 1-year 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. S.B. 10-1-701.



ELEV. 5720' GR.
5732' KB

PROPOSED WORK

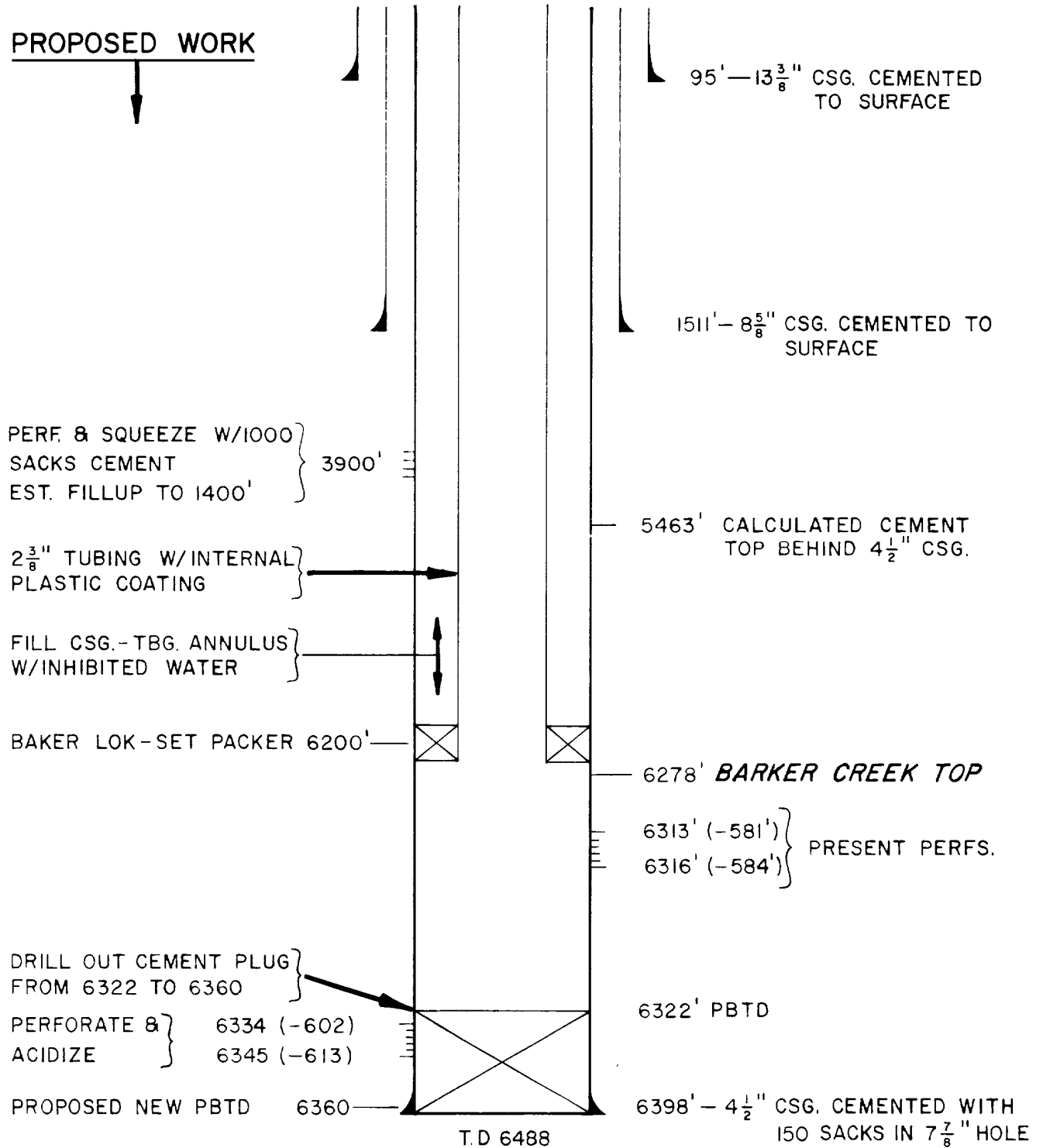


EXHIBIT 'B'

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 (PBSD) 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 casingtubing annulus at the surface.
13. Hook up well for salt water disposal service.

1911

My dear Mr. [Name]
I have just received your letter of the 10th inst.

and am glad to hear from you.

I am sorry to hear that you are ill.

I hope you will get better soon.

Very truly yours,
[Signature]

I am sure you will be well again soon.

Yours sincerely,
[Signature]

I am sure you will be well again soon.

I am sure you will be well again soon.

I am sure you will be well again soon.

I am sure you will be well again soon.

I am sure you will be well again soon.

I am sure you will be well again soon.

I am sure you will be well again soon.

LABORATORY LOCATION: _____ ANALYST: _____ ANALYSIS REPORT NUMBER: _____

DATE: 11/20/79

PAGE: 1

Company: _____				
Field: _____		Legal Description: _____		
Lease or Unit: _____	Well: _____	Depth: _____	Formation: _____	Water, B/D: _____
Type of Water (Produced, Seep, etc.): _____		Sampling Point: _____		Submitted By: _____
C. Schuchman, U.S. Geological Survey				

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sulfate, SO_4 (calc.)	26,919	1,173
Chloride, Cl	3,208	260
Magnesium, Mg	2,040	180
Sodium, Na	0	0
_____	_____	_____
_____	_____	_____

OTHER PROPERTIES

pH	7.2
Specific Gravity, 60/60 F.	1.020
Resistivity (ohm-meters) 76 F.	_____
_____	_____
_____	_____

ANIONS

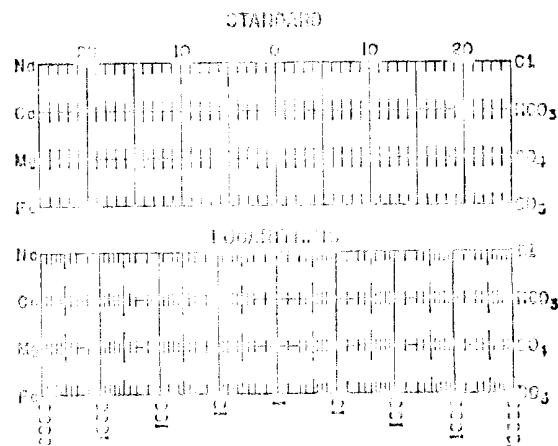
Chloride, Cl	55,000	1,570
Sulfate, SO_4	1,100	37
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	450	7
_____	_____	_____
_____	_____	_____

Total Dissolved Solids (calc.)

Iron, Fe (total)

Sulfide, as H_2S

WATER PATTERNS — me/l



REMARKS & RECOMMENDATIONS:

EXHIBIT D