



SWD-136
100 100 9

Amoco Production Company

Security Life Building
Denver, Colorado 80202

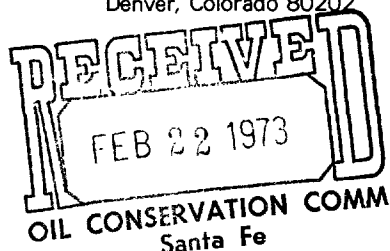
M. S. Kraemer
Division Production
Manager

H. T. Hunter
Assistant Division
Production Manager

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

February 15, 1973

File: KWB-151-986.511



SWD-136

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

Dear Mr. Porter:

Subject: Application to Dispose of Salt Water into Penn "D" Formation, Amoco's Navajo Tribal N-2 Well, Tocito Dome-Penn "D" Field, San Juan County, New Mexico

Amoco Production Company respectfully requests your approval of this application under the provisions of Order No. R-3558, dated November 18, 1968, to dispose of produced salt water from the Tocito Dome Field into the Pennsylvanian "D" formation in its Navajo Tribal "N" No. 2 Well located in Unit "G", Section 20-T26N-R18W, San Juan County, New Mexico. In connection with this application, attached are the following exhibits:

1. Three copies of New Mexico Oil Conservation Commission's Form C-108. A copy of this form is also being sent to the United States Geological Survey as representative of the Navajo Tribe of Indians, the surface and royalty owner, and to all operators within a 2 mile radius of the proposed disposal well.
2. A map of the field and surrounding area showing in detail the location of all wells and dry holes, the operators of various leases and the specific location of the present disposal well and the proposed disposal well.
3. A copy of the Induction-Electric log on the proposed disposal well.
4. A schematic diagram showing particulars of the casing and tubing program of the proposed well. Also shown are the Pennsylvanian "D" perforations 6237-6252' through which water will be disposed in this well. The proposed disposal well, Navajo Tribal N-2, was originally completed as an oil well on July 20, 1964, for an initial potential of 362 BOPD with no water.

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At the time the well was shut-in during January, 1971, due to high water production, the well was producing over 98% water and was shut-in due to being uneconomic. The last test before the well was shut-in was on December 3, 1970, when, during a 24-hour period, the well tested 7 BOPD, 463 BWPD and 29 MCFD. At the time of shut-in the well had produced 479,000 barrels of oil cumulative.

5. A copy of a typical water analysis obtained from one of the wells in the field - the water being unfit for domestic stock, irrigation or other general use.

New Mexico Oil Conservation Commission Order No. R-2984 issued October 13, 1965, granted Amoco permission to dispose of Tocito Dome Penn "D" Field produced water into Navajo Tribal "U" No. 6, located in Unit "D" of Section 22, T26N-R18W. Disposals into that well commenced November 22, 1965. During October, 1972 communication was detected between the tubing and casing in this well. Repair work was begun, however, it was determined that both the casing and tubing were parted and it would be impossible to successfully return the well to useful disposal service, and plans are being made to permanently abandon this well.

Under Order No. R-3558 issued November 18, 1968, Amoco began disposing of produced water into a second well, Nabajo Tribal U-1, located in Unit "L" of Section 21, T26N-R18W. Both Well No. U-6 and U-1 were used for disposal purposes until recently when Well No. U-6 failed. Since that time, all field produced water has been injected into Well No. U-1. Cumulative injections into Well U-1 have been 3,100,375 barrels through December 31, 1972. At the time of failure the cumulative volume disposed of into Well No. U-6 was 2,754,145 barrels.

Texaco, Inc., another operator in the field, recently obtained approval to dispose of their produced water into their Navajo Tribal No. 3, located in Unit "K", Section 28, T26N-R18W. Amoco will continue to dispose of its produced water into existing Well No. U-1. However, our system is operating at capacity and we have no standby disposal outlet, which creates a very serious production problem and potential pollution hazard. In order to relieve the situation, Amoco is therefore requesting herein approval to convert Navajo Tribal N-2 to disposal use. Both Well Nos. U-1 and N-2 would then be used for injection purposes. Amoco's lease water production is averaging 3000 BWPD and is expected to increase with continued drilling activity and increasing water cuts on existing producing wells. It is essential, therefore, that adequate disposal facilities be maintained to continue successful disposal of this produced water.

The existing perforations in Well No. N-2 are below the present oil-water contact as evidenced by several factors. First, as pointed out previously, Well No. N-2 was producing over 98% water at the time of shut-in two years ago. Second, the

February 15, 1973

nearest producer, Well No. N-9, located in Unit "D" Section 20, T26N-R18W is situated 41' structurally higher than Well No. N-2 and is producing 27 BOPD and 11 BWPD based on a test December 18, 1972. Finally, Well No. U-1 to the southeast of N-2 is located only 10' lower structurally and has disposed of more than 3,000,000 barrels of water since conversion to disposal use in 1968.

Approval of this application will prevent unnecessary wells, otherwise prevent waste, protect correlative rights and eliminate a potential pollution hazard. Amoco Production Company, therefore, respectfully requests administrative approval of this application under the provisions of Order No. R-3558. If objections are raised or if you believe this application should only be considered for approval after a public hearing, please set the matter for hearing on the next scheduled docket.

Yours very truly,

R. B. Giles

CJB:im

Attachments

cc: Texaco, Inc.
Box 2100
Denver, Colorado 80201

Southern Gulf Prod. Co.
840 Houston National Gas Bldg.
Houston, Texas

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

Mobil Oil Corporation
Box 633
Midland, Texas 79701

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

562 559, 562, 563

NEW MEXICO OIL CONSERVATION COMMISSION
APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR AMOCO PRODUCTION COMPANY		ADDRESS 501 Airport Drive, Farmington, New Mexico	
LEASE NAME Navajo Tribal "N"	WELL NO. 2	FIELD Tocito Dome Penn. "D"	COUNTY San Juan
LOCATION UNIT LETTER G ; WELL IS LOCATED 1850 FEET FROM THE North LINE AND 1850 FEET FROM THE East LINE, SECTION 20 TOWNSHIP 26-N RANGE 18-W NMPM.			
CASING AND TUBING DATA			
NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT
SURFACE CASING	13-3/8"	95'	100
INTERMEDIATE	8-5/8"	1520'	400
LONG STRING	4-1/2"	6417'	1100
TUBING	To be run	2-7/8"	6150'
NAME OF PROPOSED INJECTION FORMATION Pennsylvanian "D"		TOP OF FORMATION 6229'	
IS INJECTION THROUGH TUBING, CASING, OR ANNULUS? Tubing		PROPOSED INTERVAL(S) OF INJECTION 6237-6252'	
IS THIS A NEW WELL DRILLED FOR DISPOSAL? No		IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED? Oil Producer	
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 Est. 1300'		DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA None Known	
ANTICIPATED DAILY INJECTION VOLUME (BBLs.) 500		OPEN OR CLOSED TYPE SYSTEM Closed	
IS INJECTION TO BE BY GRAVITY OR PRESSURE? As Necessary		APPROX. PRESSURE (PSI) 200 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 — Yes		WATER TO BE DISPOSED OF Yes	
NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND) U.S.G.S. for the Navajo Tribe of Indians		NATURAL WATER IN DISPOSAL ZONE Yes	
LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF MILE OF THIS INJECTION WELL Texaco, Inc. Box 2100, Denver, Colorado 80201		ARE WATER ANALYSES ATTACHED? Previously Submitted	
Mobil Oil Corporation, Box 633, Midland, Texas 79701			
Southern Gulf Production Co., 840 Houston Nat'l Gas Bldg., Houston, Texas 77002			
HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?			
SURFACE OWNER Yes		EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL Yes	
PLAT OF AREA Yes		ELECTRICAL LOG Yes	
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)		THE NEW MEXICO STATE ENGINEER No	
		DIAGRAMMATIC SKETCH OF WELL Yes	

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

(Signature)

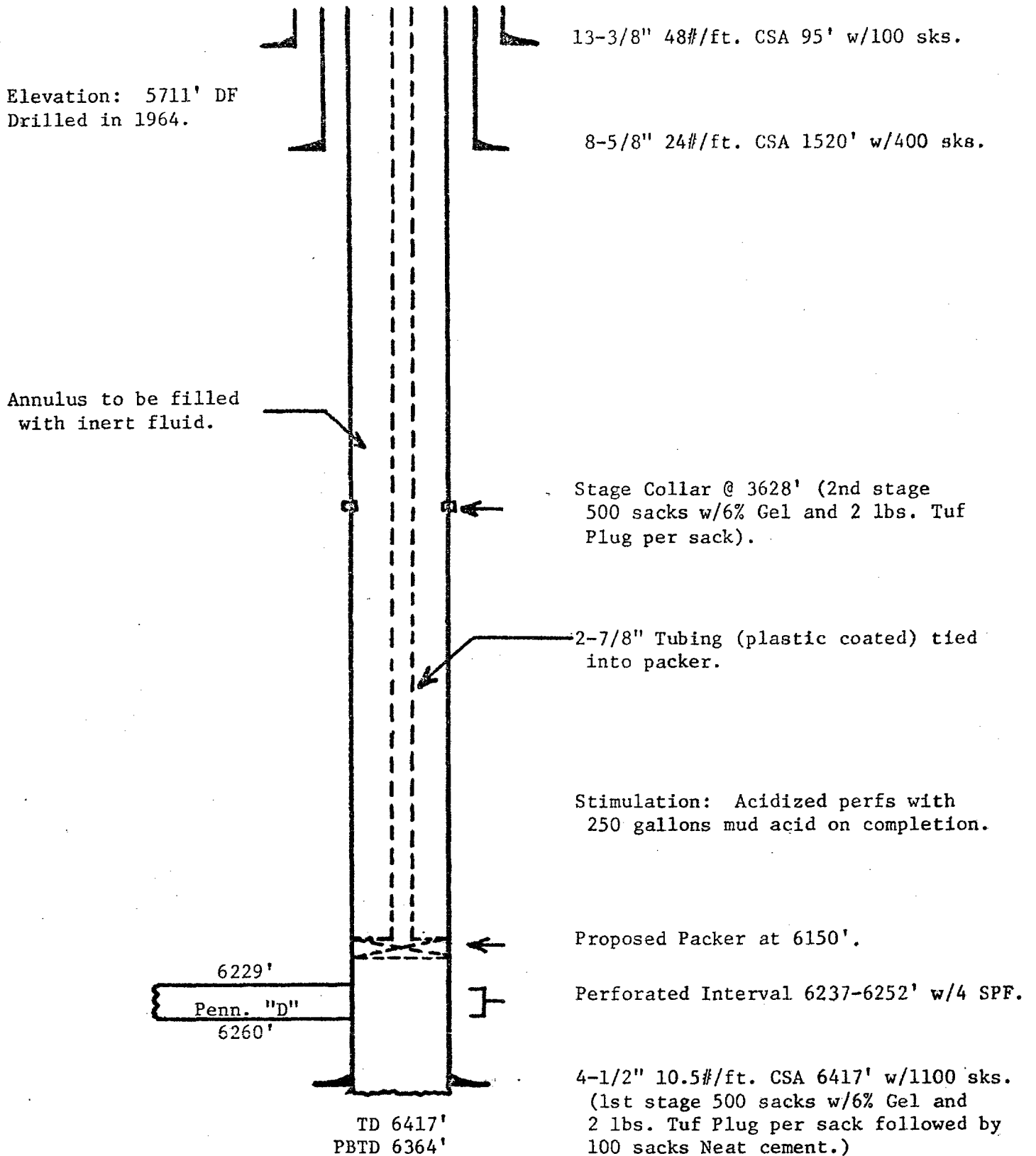
(Title)

(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.

NAVAJO TRIBAL "N" WELL NO. 2
TOCITO DOME PENN. "D" FIELD

Elevation: 5711' DF
Drilled in 1964.





CHEM LAB

WATER ANALYSIS EXCHANGE REPORT

ILLEGIBLE

MEMBER Pan American Petroleum Corp.
 OPERATOR Pan American Petroleum Corp.
 WELL NO. Navajo Tribal U-1
 FIELD Tocito Dome
 COUNTY San Juan
 STATE New Mexico

LAB NO. 24896 REPORT NO. OCT 15 1968
 LOCATION NW SW 21-26N-18W
 FORMATION Pennsylvanian "D"
 INTERVAL 6383-6386
 SAMPLE FROM Production (5-9-68)
 DATE October 10, 1968

REMARKS & CONCLUSIONS: Clear water.

Cations	mg/l	meq/l
Sodium	26036	1132.49
Potassium	165	4.22
Lithium	-	-
Calcium	4336	216.37
Magnesium	1353	111.22
Iron	Absent	-
Total Cations	-	1464.30

Anions	mg/l	meq/l
Sulfate	1181	22.00
Chloride	50700	1420.74
Carbonate	-	-
Bicarbonate	610	10.00
Hydroxide	-	-
Hydrogen sulfide	Absent	-
Total Anions	-	1464.30

Total dissolved solids, mg/l 84071
 NaCl equivalent, mg/l 84481
 Observed pH 7.3

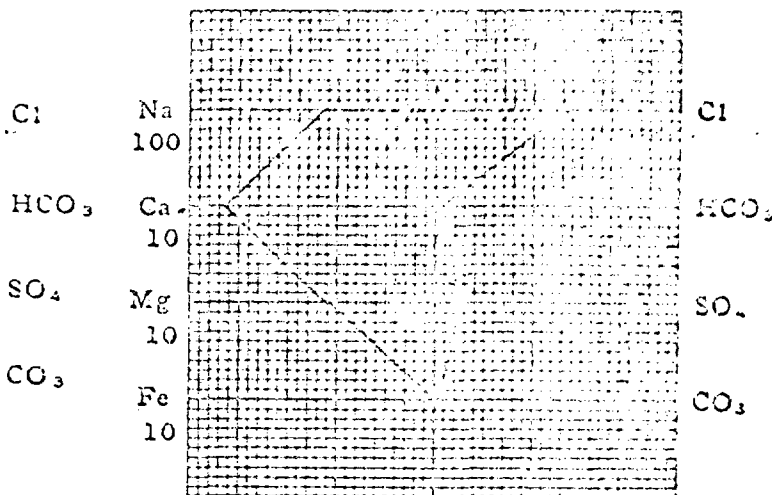
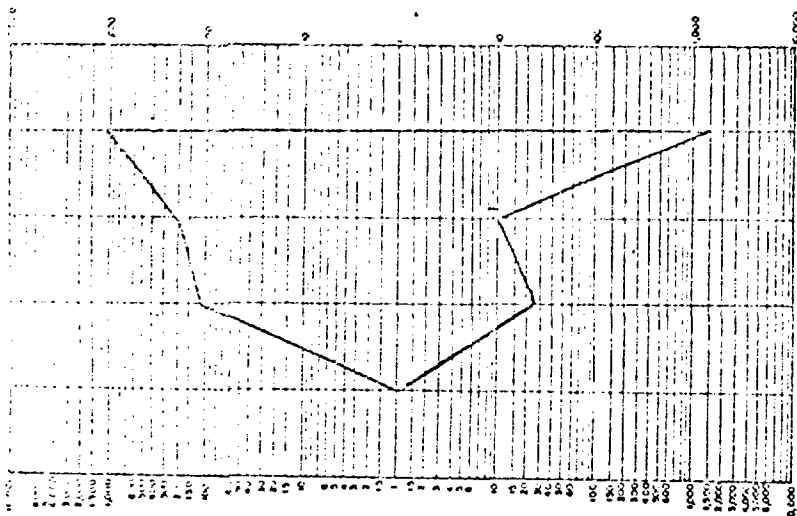
Specific resistance @ 68° F.:
 Observed 0.110 ohm-meters
 Calculated 0.029 ohm-meters

WATER ANALYSIS PATTERNS

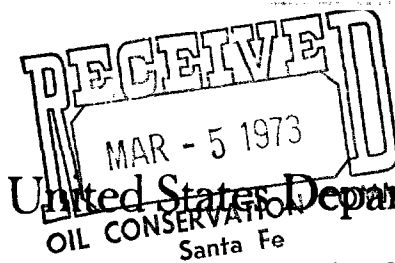
MEQ per unit

LOGARITHMIC

STANDARD



(Na value in above graphs includes Na, K, and Li)
 NOTE: Mg/l = Milligrams per liter. Meq/l = Milliequivalent per liter.



File: 986.511 N.M.O.C.
Tocito Dome

United States Department of the Interior
OIL CONSERVATION
Santa Fe
GEOLOGICAL SURVEY

P. O. Box 959
Farmington, New Mexico 87401

February 27, 1973

Amoco Production Company
Security Life Bldg.
Denver, Colorado 80202

Re: Navajo tribal lease
14-20-603-5035
water disposal

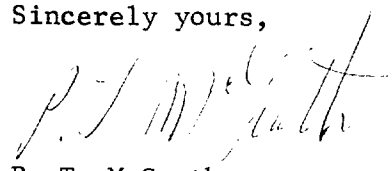
Attn: H. T. Hunter

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. 2 Navajo Tribal "N", SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 26 N., R. 18 W., on Navajo tribal lease 14-20-603-5035.

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 6237 to 6252 ft. It is understood that the well will be conditioned for disposal by setting a packer at 6150', running plastic coated tubing to the perforated zone, and isolating the annular space by filling the 4 $\frac{1}{2}$ " casing - 2-7/8" tubing annulus with inhibited or inert fluid. Like approval must be given 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

RECEIVED	
PROD. & INJECT.	
MAR 2 1973	
DATE	
TIME	
BY	
FILE	

Handwritten: 14-20-603-5035

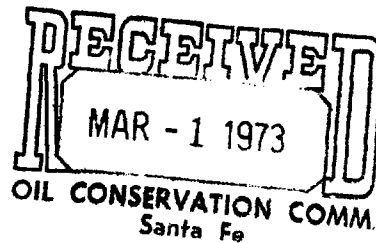
Send copy to
NMOCC

SOUTHERN GULF PRODUCTION COMPANY

840 HOUSTON NATURAL GAS BLDG.

HOUSTON, TEXAS 77002

713-225-2055



February 26, 1973


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

Re: Application to Dispose of Salt Water
Navajo Tribal "N" Well No. 2
Tocito Dome Field
San Juan County, New Mexico

Dear Mr. Porter:

This is to advise that Southern Gulf Production Company does not have any objection to Amoco's proposal to dispose of salt water into the Navajo Tribal "N" Well No. 2, Tocito Dome Field, San Juan County, New Mexico.

Yours very truly,


Gordon B. Puckett
Vice President

GBP:mad

cc: Mr. H. T. Hunter
Amoco Production Company
Security Life Building
Denver, Colorado 80202

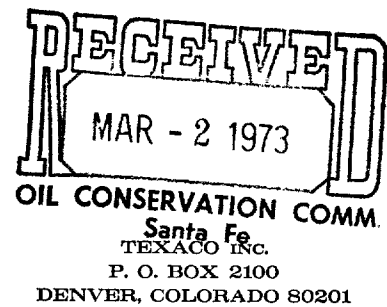


PETROLEUM PRODUCTS

PRODUCING DEPARTMENT
ROCKY MOUNTAINS-U.S.
DENVER DIVISION

J. C. WHITE
ASSISTANT DIVISION MANAGER

February 27, 1973



AMOCO APPLICATION
FOR SALT WATER DISPOSAL
TOCITO DOME FIELD, NEW MEXICO
6.02-1

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

Dear Mr. Porter:

On February 15, 1973, Amoco Production Company filed with the New Mexico Oil Conservation Commission an application to dispose of salt water into the Pennsylvanian "D" formation in Navajo Tribal "N" Well No. 2, Tocito Dome Field, San Juan County, New Mexico. Texaco has oil producing leases within two miles of the proposed disposal well and has received a copy of Amoco's application, in accordance with Rule 701-C.

Please be advised that Texaco waives objection to Amoco's subject application.

Very truly yours,

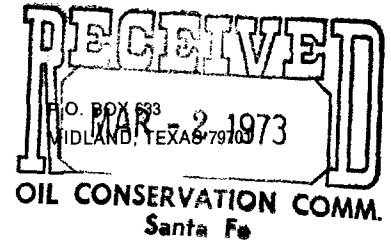
LEA:BKM

cc: Mr. H. T. Hunter
Amoco Production Company
Security Life Building
Denver, Colorado 80202

cc: U. S. Geological Survey
P. O. Drawer 1857
Roswell, New Mexico 88201

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

Mobil Oil Corporation



February 28, 1973

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

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

AMOCO PRODUCTION COMPANY APPLICATION
TO DISPOSE OF SALT WATER INTO THE
NAVAJO TRIBAL "N" WELL NO. 2,
TOCITO DOME FIELD, SAN JUAN COUNTY,
NEW MEXICO

Gentlemen:

Mobil Oil Corporation has been informed of the Amoco proposal to dispose of salt water into the Navajo Tribal "N" Well NO. 2, Unit G, Section 20, T26N, R18W, San Juan County, New Mexico. It is our understanding that the produced salt water from the Tocito Dome Field will be injected through tubing, below a packer, into the Pennsylvanian "D" formation.

Mobil Oil Corporation, as an operator in the Tocito Dome Field, hereby waives objection to this application.

Yours very truly,

A handwritten signature in cursive script that reads "J. A. Morris".

J. A. Morris
Production Engineering Supervisor

JHSeerey/cs

cc: Amoco, Denver

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE