STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Adams Exploration Company

Address: P.O. Box 10585 Midland, Texas 79702

Contact party: Steve A. Douglas Phone: 915-683-3303

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Steve A. Douglas Title Division Engineer

Signature: Steve A. Douglas Date: 11-24-81

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

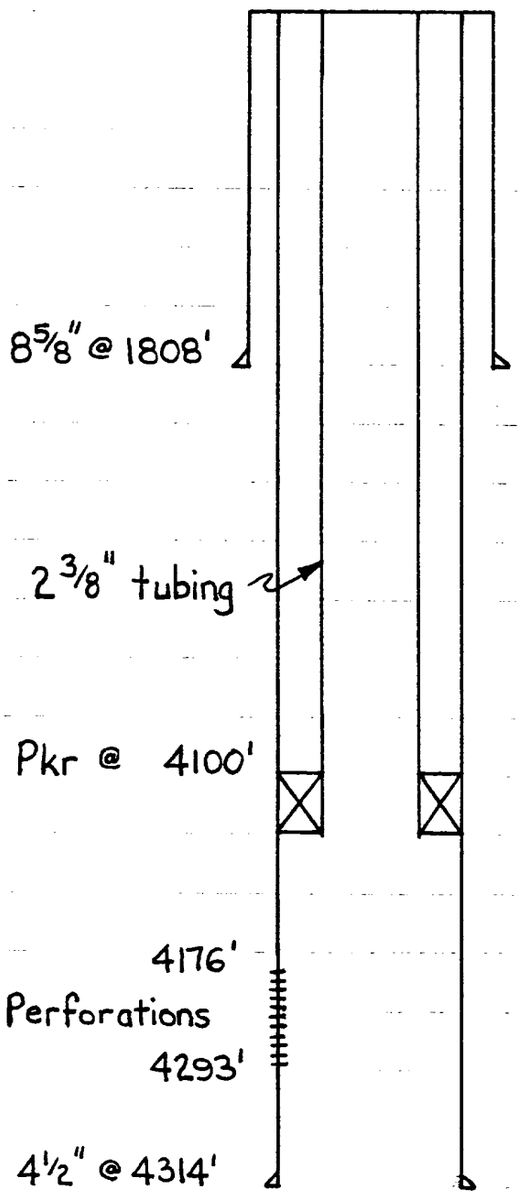
NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

III.

INJECTION WELL DATA SHEET

Adams Exploration Company Griffin Well No. 4
660' FNL & 660' FEL, Section 10, T-8-S, R-32-E
Chaves County, New Mexico

Schematic



Tubular Data

Surface Casing
8 5/8", 24 #, K-55, ST&C. Set at 1808'.
Cemented with 550 sx. Lightweight followed by 200 sx. Class "C".
Cement circulated to surface.
Hole size 12 1/4".

Long String
4 1/2", 10.5 #, K-55, ST&C. Set at 4314'.
Cemented with 300 sx. 50:50 Pozmix.
Top of cement is 2500' determined by calculation.
Hole size 7 7/8".
Total Depth 4315'.

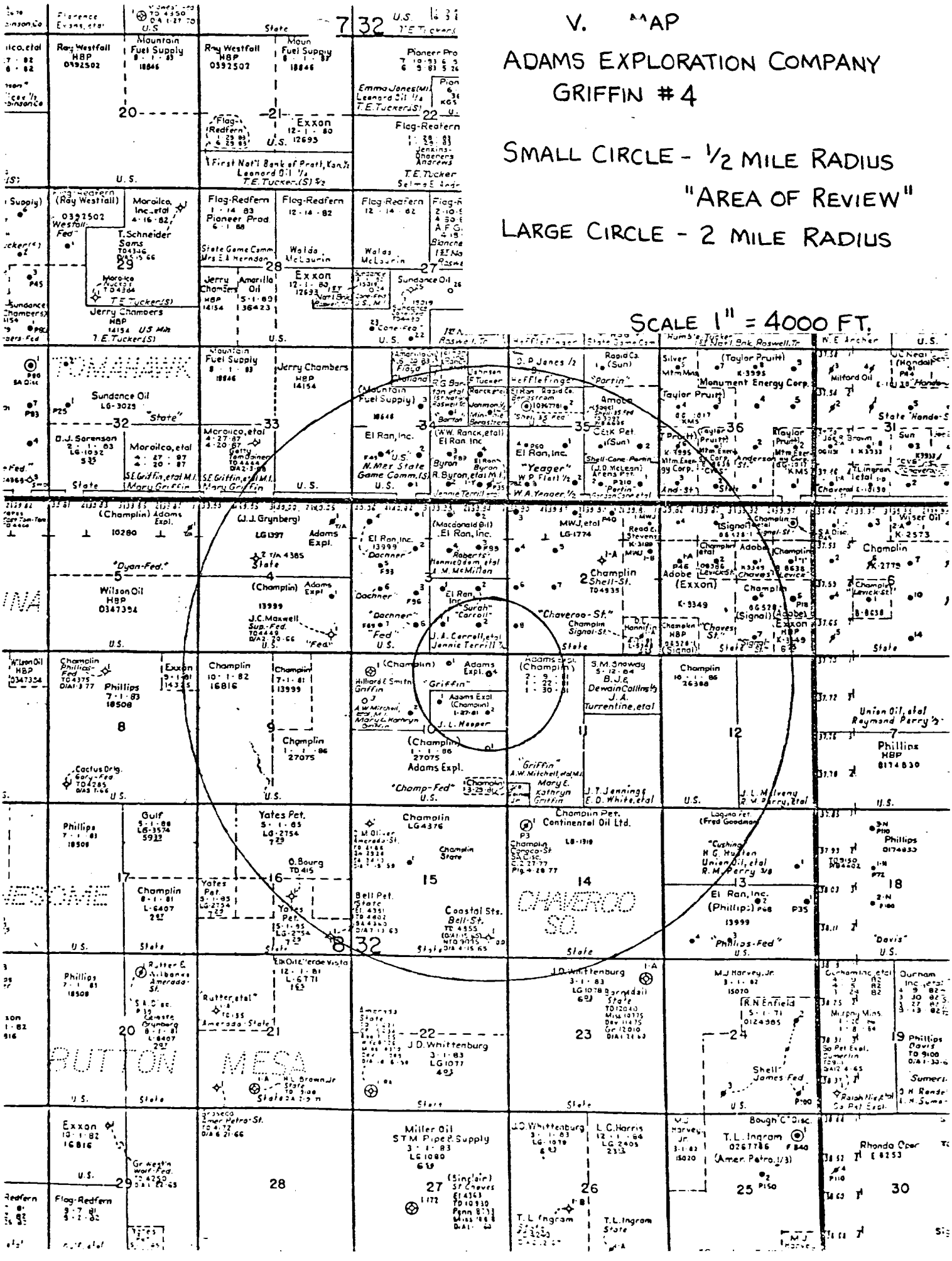
Injection interval through perforations 4176'-4293' (24 holes)

Tubing size is 2 3/8" which will be lined with a powered epoxy coating (Tuboscope TK-75 coating). Tubing will be set in a Baker AD-1 tension packer set at approximately 4100'.

INJECTION WELL DATA SHEET PAGE 2

1. The name of the injection formation is San Andres.
2. The name of the field is Chaveroo San Andres.
3. This is not a new well drilled for injection. This well was originally drilled as a San Andres oil well. The original permit to drill is dated 7-7-81.
4. This well has never been perforated in any zone other than the San Andres formation 4176' - 4293'.
5. The underlying oil or gas pools in this area are listed below. There are apparently no overlying pools in this area.

Pool	Average Producing Depth	Township	Range
Sqyers Penn	8380'	7S	32E
Flying M Abo	8603'	9S	33E
Bar U Penn	9210'	9S	32E
Tobac Penn	9061'	8S	33E


V. MAP
ADAMS EXPLORATION COMPANY
GRIFFIN #4
SMALL CIRCLE - 1/2 MILE RADIUS
"AREA OF REVIEW"
LARGE CIRCLE - 2 MILE RADIUS
SCALE 1" = 4000 FT.
PUTTON MESA
CHAVEROO SO.
JAL

VI.

WELLS WITHIN AREA OF REVIEW (½ MILE RADIUS)

OPERATOR: Adams Exploration Company

LEASE NAME: Griffin WELL NO.: 1

FIELD NAME: Chaveroo San Andres

LOCATION OF WELL: Unit Letter B, 330' FNL & 1980' FEL, Sec. 10, T-8-S, R-32-E, Chaves County, New Mexico

TYPE OF LEASE: Fee

WELL STATUS: Pumping oil well

PRODUCING FORMATION: San Andres

SPUD DATE: 11-9-80 COMPLETION DATE: 12-21-80

TOTAL DEPTH: 4400' PLUG BACK DEPTH: 4355'

CASING RECORD:

SIZE	WEIGHT	DEPTH	CEMENTING RECORD & TOP OF CEMENT
8 5/8"	24 #	1842'	450 sx. "LW" + 200 sx. Class "C" Top of cement at surface
4½"	10.5 #	4400'	300 sx. Class "C" Top of cement at 2660'

TUBING RECORD:

SIZE	DEPTH	PACKER DEPTH
2 3/8"	4180'	None

PERFORATIONS AND TREATMENT:

INTERVAL	TREATMENT
4176' - 4199' (4 holes)	Acidized w/ 250 gals. 20% HCl
4242' - 4313' (7 holes)	Acidized w/ 1250 gals. 20% HCl

POTENTIAL TEST:

DATE	PRODUCTION
12-23-80	Pumped 55 BBLS. OIL + 10 BBLS. WATER in 24 hours

VI.
WELLS WITHIN AREA OF REVIEW (½ MILE RADIUS)

OPERATOR: Adams Exploration Company

LEASE NAME: Hooper WELL NO.: 1

FIELD NAME: Chaveroo San Andres

LOCATION OF WELL: Unit Letter G, 1650' FNL & 2310' FEL, Sec. 10, T-8-S, R-32-E, Chaves County, New Mexico

TYPE OF LEASE: Fee

WELL STATUS: Pumping oil well

PRODUCING FORMATION: San Andres

SPUD DATE: 3-27-81 COMPLETION DATE: 5-14-81

TOTAL DEPTH: 4338' PLUG BACK DEPTH: 4330'

CASING RECORD:

SIZE	WEIGHT	DEPTH	CEMENTING RECORD & TOP OF CEMENT
8 5/8"	24#	1810'	600 sx. "LW" + 200 sx. Class "C" Top of cement at surface
4½"	10.5#	4338'	400 sx. 50:50 Pozmix Top of cement at 2500'

TUBING RECORD:

SIZE	DEPTH	PACKER DEPTH
2 3/8"	4283'	None

PERFORATIONS AND TREATMENT:

INTERVAL	TREATMENT
4175'-4195' (8 holes)	Acidized w/ 4300 gals. 15% HCl
4234'-4248' (10 holes)	Acidized w/ 4300 gals. 15% HCl

POTENTIAL TEST:

DATE	PRODUCTION
8-24-81	Pumped 8 BBLS. OIL + 30 BBLS. WATER + 2.6 MCF in 24 hours

VI.

WELLS WITHIN AREA OF REVIEW (½ MILE RADIUS)

OPERATOR: Adams Exploration Company

LEASE NAME: Hooper WELL NO.: 2

FIELD NAME: Chaveroo San Andres

LOCATION OF WELL: Unit Letter H, 1980' FNL + 660' FEL, Sec. 10, T-8-S, R-32-E, Chaves County, New Mexico

TYPE OF LEASE: Fee

WELL STATUS: Pumping oil well

PRODUCING FORMATION: San Andres

SPUD DATE: 7-26-81 COMPLETION DATE: 9-2-81

TOTAL DEPTH: 4294' PLUG BACK DEPTH: 4290'

CASING RECORD:

SIZE	WEIGHT	DEPTH	CEMENTING RECORD & TOP OF CEMENT
8 5/8"	24#	1861'	500 sx. "LW" + 200 sx. Class "C" Top of cement at surface
4 1/2"	10.5#	4294'	300 sx. Class "H" Top of cement at 2700'

TUBING RECORD:

SIZE	DEPTH	PACKER DEPTH
2 3/8"	4239'	None

PERFORATIONS AND TREATMENT:

INTERVAL	TREATMENT
4180' - 4206' (10 holes)	Acidized w/ 300 gals. 15% HCl
4232' - 4278' (18 holes)	Acidized w/ 500 gals. 15% HCl

POTENTIAL TEST:

DATE	PRODUCTION
9-27-81	Pumped 5 BBLS. OIL + 70 BBLS. WATER + 1.2 MCF in 24 hours

VI.

WELLS WITHIN AREA OF REVIEW (½ MILE RADIUS)

OPERATOR: El Ran, Inc.

LEASE NAME: Sarah WELL NO.: 1

FIELD NAME: Chaveroo

LOCATION OF WELL: Unit Letter O, 990' FSL & 2200' FEL, Sec. 3, T8S, R32E, Chaves County, New Mexico

TYPE OF LEASE: Fee

WELL STATUS: Pumping oil well

PRODUCING FORMATION: San Andres

SPUD DATE: 4-8-80 COMPLETION DATE: 4-23-80

TOTAL DEPTH: 4390' PLUG BACK DEPTH: 4387'

CASING RECORD:

SIZE	WEIGHT	DEPTH	CEMENTING RECORD & TOP OF CEMENT
8 5/8"		1682'	550 sx.
4 1/2"		4389'	175 sx.

TUBING RECORD:

SIZE	DEPTH	PACKER DEPTH
2 3/8"	4285'	

PERFORATIONS AND TREATMENT:

INTERVAL	TREATMENT
4172'-4284'	Acidize w/ 6000 gals. 20% HCl

POTENTIAL TEST:

DATE PRODUCTION

Pumped 82 BBLS. OIL + 10 BBLS. WATER in 24 hours. GOR TSTM

VI.

WELLS WITHIN AREA OF REVIEW (½ MILE RADIUS)

OPERATOR: El Ran, Inc.

LEASE NAME: Carroll WELL NO.: 2

FIELD NAME: Chaveroo

LOCATION OF WELL: Unit Letter P, 990' FSL & 990' FEL, Sec. 3, T8S, R32E, Chaves County, New Mexico

TYPE OF LEASE: Fee

WELL STATUS: Flowing oil well

PRODUCING FORMATION: San Andres

SPUD DATE: 10-17-80 COMPLETION DATE: 10-31-80

TOTAL DEPTH: 4313' PLUG BACK DEPTH: 4312'

CASING RECORD:

SIZE	WEIGHT	DEPTH	CEMENTING RECORD & TOP OF CEMENT
8 5/8"		1665'	575 sx.
4 ½"		4312'	175 sx.

TUBING RECORD:

SIZE	DEPTH	PACKER DEPTH
2 3/8"	4263'	None

PERFORATIONS AND TREATMENT:

INTERVAL	TREATMENT
4193'-4281'	Acidize w/ 6000 gals. 20% HCl

POTENTIAL TEST:

DATE

PRODUCTION

Flowed 45 BBLS. OIL + 0 BBLS. WATER + 28.8 MCF in 24 hours through 1" choke. Tubing press. 135 psi. Casing press. 385 psi.

VI.

WELLS WITHIN AREA OF REVIEW (½ MILE RADIUS)

OPERATOR: MWJ Producing Co.

LEASE NAME: Chaveroo State WELL NO.: 8

FIELD NAME: Chaveroo

LOCATION OF WELL: Unit Letter M, 990' FSL & 330' FWL, Sec. 2, T8S, R 32E, Chaves County, New Mexico

TYPE OF LEASE: State

WELL STATUS: Pumping oil well

PRODUCING FORMATION: San Andres

SPUD DATE: 4-2-81 COMPLETION DATE: 7-23-81

TOTAL DEPTH: 4330' PLUG BACK DEPTH: 4322'

CASING RECORD:

SIZE	WEIGHT	DEPTH	CEMENTING RECORD & TOP OF CEMENT
8 5/8"		1785'	625 sx.
4 1/2"		4330'	325 sx.

TUBING RECORD:

SIZE	DEPTH	PACKER DEPTH
2 3/8"	4219'	None

PERFORATIONS AND TREATMENT:

INTERVAL	TREATMENT
4202'-4318'	Acidize w/ 1500 gals.

POTENTIAL TEST:

DATE	PRODUCTION
	Pumped 31 BBLS. OIL + 55 BBLS. WATER + 41 MCF in 24 hours

VII.

Proposed Operation

Adams Exploration Company proposes to utilize this injection well to dispose of water produced from our Hooper Lease Well Nos. 1 and 2 and our Griffin Lease Well Nos. 1 and 2. Present water production from the Hooper Lease is 70 bbls. per day and from the Griffin Lease is 90 bbls. per day. The proposed average volume of water to be injected is 160 bbls. per day. Maximum anticipated volume of water to be injected is 200 bbls. per day. The average anticipated injection rate is ½ bbl. per minute at an average pressure of 50 psi. Maximum anticipated rate is 1 bbl. per minute at a maximum pressure of 200 psi. This proposal is to reinject water produced from the San Andres formation back into the San Andres formation.

VIII.
Geological Data

The injection zone in this proposed well is the San Andres formation which is composed of dolomite. The gross thickness of the injection zone is 117 feet with perforations from 4176' to 4293'. The top of the San Andres formation in the proposed injection well is 3449' and the well was still in the San Andres at 4315' total depth.

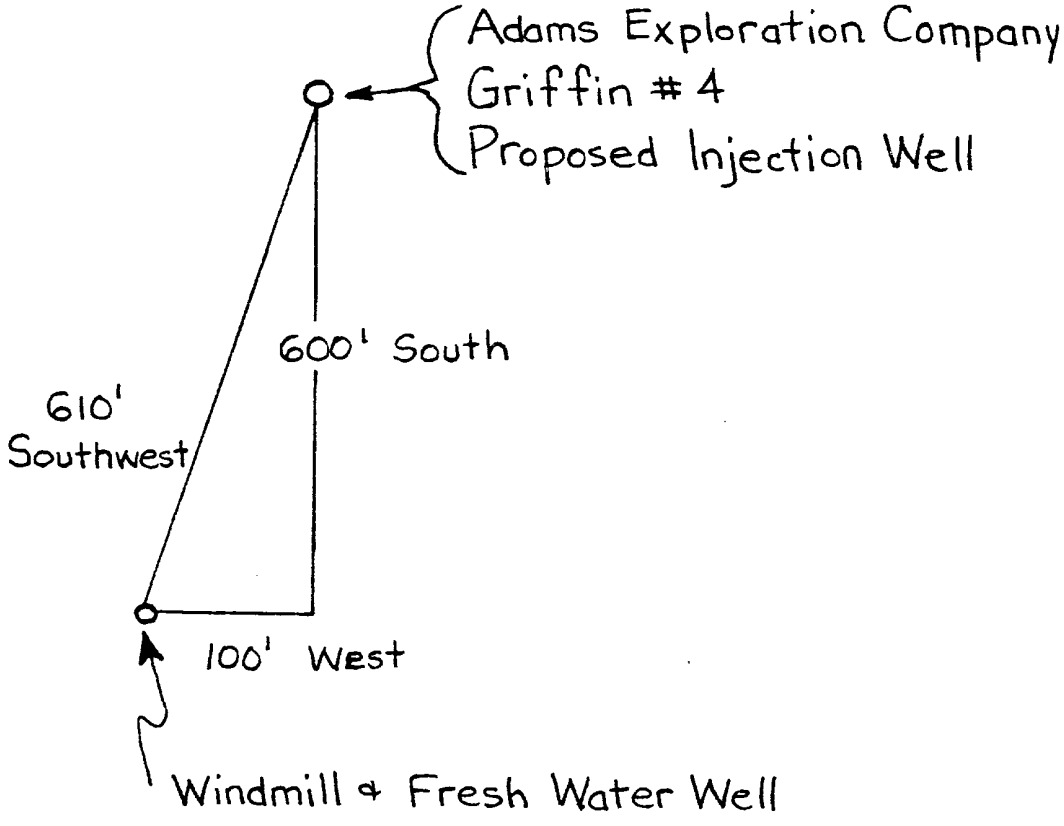
The depth to the bottom of the underground source of drinking water would be 380', which is the base of the Tertiary formations in this well. There is only one water well within a one mile radius of the proposed injection well. The water well is located approximately 610 feet southwest from the proposed injection well. It is pumped by a windmill and used for livestock water only.

IX.
Proposed Stimulation

The San Andres perforations (4176'-4293') in the Griffin #4 have been stimulated with 5500 gals. of acid. The well has produced an average of 140 bbls. of water per day with no oil during production testing. The only additional stimulation anticipated would be an occassional acid job after the well has been utilized for injection.

XI.

There is only one fresh water well within a one mile radius of this proposed injection well. The location of the well is shown below. The water well is pumped by a windmill and the water is used for livestock consumption.



1342-A

HALLIBURTON DIVISION LABORATORY

XI. CHEMICAL ANALYSIS OF FRESH WATER FROM WATER WELL

HALLIBURTON SERVICES
MIDLAND DIVISION
HOBBS, NEW MEXICO 88240

LABORATORY WATER ANALYSIS

No. W81-966

To Adams Exploration

P.O. Box 10585

Midland ,Tx 79702

Date 11-2-81

Submitted by Danny Sooter Date Rec. 10-27-81

Well No. Water Well Depth --- Formation ---

County Chaves Field --- Source ---

Resistivity	14 @ 72°F			
Specific Gravity	1.000			
pH	8.3			
Calcium (Ca)	Nil			*MPL
Magnesium (Mg)	Nil			
Chlorides (Cl)	Nil			
Sulfates (SO_4)	Nil			
Bicarbonates (HCO_3)	Nil			
Soluble Iron (Fe)	Nil			

Sample appeared to be fresh water

Remarks:

*Milligrams per liter

Respectfully submitted,

Analyst: R. K. Grimes

HALLIBURTON COMPANY

By _____ CHEMIST

cc:

NOTICE

THIS REPORT IS LIMITED TO THE DESCRIBED SAMPLE TESTED. ANY USER OF THIS REPORT AGREES THAT HALLIBURTON SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, WHETHER IT BE TO ACT OR OMISSION, RESULTING FROM SUCH REPORT OR ITS USE.

XII.

Adams Exploration Company geologic and engineering personell have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

Steve A. Douglas
Division Engineer

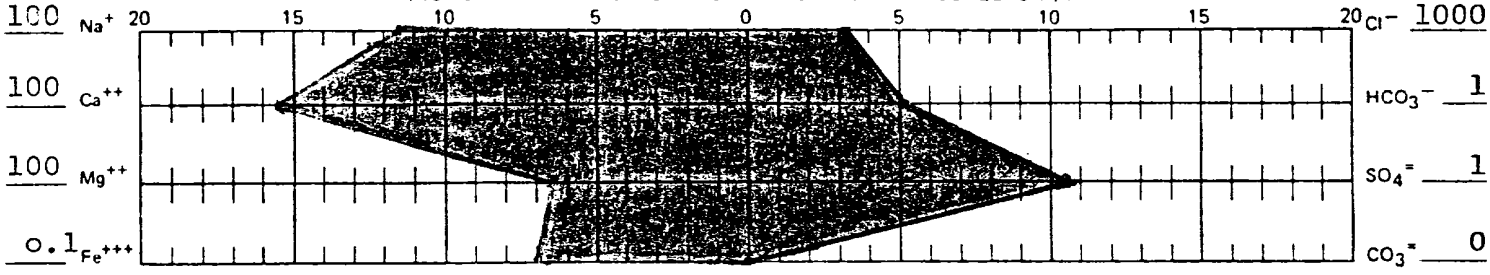
Mark Schweinfurth
Exploration Manager

BAKER OIL TREATING
A Baker Oil Tools Company

WATER ANALYSIS REPORT

COMPANY				ANALYSIS NUMBER
Adams Exploration				1017
COMPANY ADDRESS				DATE
Midland, Texas				8/27/81
FIELD		COUNTY OR PARISH		STATE
Chaveroo		Roosevelt		N.M.
LEASE OR UNIT	WELL(S) NAME OR NO.	WATER SOURCE (FORMATION)		
Hooper	#1	S.A.		
DEPTH FT. / BHT. °F	SAMPLE SOURCE / TEMP. °F	WATER BBL/DAY	OIL BBL DAY	GAS MMCF/DAY
DATE SAMPLED	TYPE OF WATER			
8/20/81	☒ PRODUCED ☐ SUPPLY ☐ WATERFLOOD ☐ SALT WATER DISPOSAL			

WATER ANALYSIS PATTERN
(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	2220	
Calcium, Ca^{++}	1560	31200
Magnesium, Mg^{++}	660	8052
Iron (Total) Fe^{+++}	0.7	13
Barium, Ba^{++}	--	--
Sodium, Na^{+}(calc.)	1147.5	26392.5
ANIONS		
Chloride, Cl^{-}	3352.1	119,000
Sulfate, $SO_4^{=}$	10.9	525
Carbonate, $CO_3^{=}$	0	0
Bicarbonate, HCO_3^{-}	5.2	317.2
Hydroxyl, OH^{-}	0	0
Sulfide, $S^{=}$	--	--

TOTAL SOLIDS (QUANTITATIVE) 185499.7

DISSOLVED GASES

Hydrogen Sulfide, H_2S	-- mg/l*
Carbon Dioxide, CO_2	-- mg/l*
Oxygen, O_2	--- mg/l*

PHYSICAL PROPERTIES

pH	5.55
Specific Gravity	
Total Dissolved Solids (calc.)	185500 mg/l*
Stability Index @ °C	
@ 20 °C	+0.67
$CaSO_4$ Solubility @ °C	me/l*
@ 20 °C	6.42 me/l*
Max. $CaSO_4$ Possible (calc.)	me/l*
Max. $CaSO_4$ Possible (calc.)	10.9 me/l*
Residual Hydrocarbons	ppm(Vol/Vol)
Residual Hydrocarbons	ppm(Vol/Vol)

REMARKS AND RECOMMENDATIONS

@ 20 C Carbonate scaling is indicated.
Sulfate scaling is indicated.

*NOTE: me/l and mg/l are commonly used interchangeably for epm and ppm respectively. Where epm and ppm are used, corrections should be made for specific gravity.

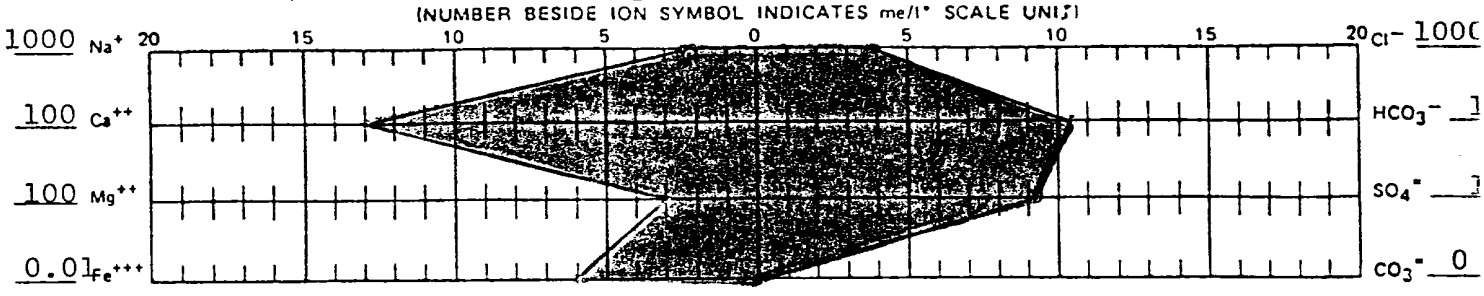
MAGNA REPRESENTATIVE	ADDRESS	TELEPHONE
W.H. Fort		OFF RES
ANALYZED BY	DATE	DISTRIBUTION

BAKER OIL TREATING
A Baker Oil Tools Company

WATER ANALYSIS REPORT

COMPANY				ANALYSIS NUMBER
Adams Exploration				1019
COMPANY ADDRESS				DATE
Midland, Texas				8/28/81
FIELD		COUNTY OR PARISH		STATE
Chaveroo		Roosevelt		N.M.
LEASE OR UNIT	WELL(S) NAME OR NO	WATER SOURCE (FORMATION)		
Griffin	#2	San Andres		
DEPTH, FT. / BHT, °F	SAMPLE SOURCE	TEMP, °F	WATER, BBL/DAY / OIL BBL DAY	GAS, MMCF/DAY
DATE SAMPLED	TYPE OF WATER			
8/20/81	☒ PRODUCED ☐ SUPPLY ☐ WATERFLOOD ☐ SALT WATER DISPOSAL			

WATER ANALYSIS PATTERN
(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	1600	
Calcium, Ca^{++}	1300	26000
Magnesium, Mg^{++}	300	3660
Iron (Total) Fe^{+++}	0.06	1.2
Barium, Ba^{++}	--	--
Sodium, Na^{+}(calc.)	2419.5	55648.5
ANIONS		
Chloride, Cl^{-}	4000	142000
Sulfate, $SO_4^{=}$	9.17	440
Carbonate, $CO_3^{=}$	0	0
Bicarbonate, HCO_3^{-}	10.4	634.4
Hydroxyl, OH^{-}	0	0
Sulfide, $S^{=}$	--	--

TOTAL SOLIDS (QUANTITATIVE) 228384.1

DISSOLVED GASES

Hydrogen Sulfide, H_2S	--	mg/l*
Carbon Dioxide, CO_2	--	mg/l*
Oxygen, O_2	--	mg/l*

PHYSICAL PROPERTIES

pH	5.95	
Specific Gravity		
Total Dissolved Solids (calc.)	228384	mg/l*
Stability Index @ °C		
@ 20 °C	+1.54	
$CaSO_4$ Solubility @ °C		me/l*
@ 20 °C	7.64	me/l*
Max. $CaSO_4$ Possible (calc.)		me/l*
Max. $CaSO_4$ Possible (calc.)	9.17	me/l*
Residual Hydrocarbons		ppm(Vol/Vo
Residual Hydrocarbons		ppm(Vol/Vo

REMARKS AND RECOMMENDATIONS:

@ 20 C Carbonate scaling is indicated.
Sulfate scaling is likely.

*NOTE: me/l and mg/l are commor used interchangeably for epm and pp respectively. Where epm and ppm a used, corrections should be made f specific gravity.

MAGNA REPRESENTATIVE	ADDRESS	TELEPHONE
W.H. Fort		OFF RES
ANALYZED BY	DATE	DISTRIBUTION

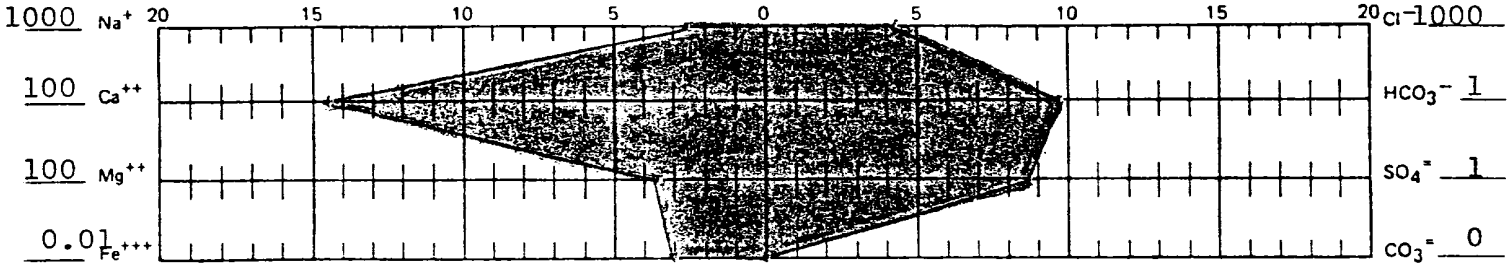
BAKER OIL TREATING
A Baker Oil Tools Company

RECEIVED
SEP 18 1981
ADAMS EXPLORATION COMPANY

WATER ANALYSIS REPORT

COMPANY					ANALYSIS NUMBER
Adams Exploration					1018
COMPANY ADDRESS					DATE
Midland, Texas					8/27/81
FIELD			COUNTY OR PARISH		STATE
Chaveroo			Roosevelt		N.M.
LEASE OR UNIT	WELL(S) NAME OR NO.		WATER SOURCE (FORMATION)		
Griffin	#1		San Andres		
DEPTH FT	BHT °F	SAMPLE SOURCE	TEMP. °F	WATER BBL/DAY	OIL BBL DAY	GAS MMCF/DAY
DATE SAMPLED	TYPE OF WATER				
8/20/81	☒ PRODUCED	☐ SUPPLY	☐ WATERFLOOD	☐ SALT WATER DISPOSAL	

WATER ANALYSIS PATTERN
(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	1780	
Calcium, Ca^{++}	1440	28800
Magnesium, Mg^{++}	340	4148
Iron (Total) Fe^{+++}	0.03	0.6
Barium, Ba^{++}	--	--
Sodium, Na^{+}(calc.)	2548.42	58613.7
ANIONS		
Chloride, Cl^{-}	4309.9	153000
Sulfate, $SO_4^{=}$	8.75	420
Carbonate, $CO_3^{=}$	0	0
Bicarbonate, HCO_3^{-}	9.8	597.8
Hydroxyl, OH^{-}	0	0
Sulfide, $S^{=}$	--	--

TOTAL SOLIDS (QUANTITATIVE) 245580.1

DISSOLVED GASES

Hydrogen Sulfide, H_2S	— mg/l*
Carbon Dioxide, CO_2	— mg/l*
Oxygen, O_2	— mg/l*

PHYSICAL PROPERTIES

pH	6.1
Specific Gravity	
Total Dissolved Solids (calc.)	245580 mg/l*
Stability Index @ °C	
@ 20 °C	+2.11
$CaSO_4$ Solubility @ °C	me/l*
@ 20 °C	6.29 me/l*
Max. $CaSO_4$ Possible (calc.)	me/l*
Max. $CaSO_4$ Possible (calc.)	8.75 me/l*
Residual Hydrocarbons	ppm(Vol/Vol)
Residual Hydrocarbons	ppm(Vol/Vol)

REMARKS AND RECOMMENDATIONS

@ 20 C Carbonate scaling is indicated.
Sulfate scaling is likely.

*NOTE: me/l and mg/l are commonly used interchangeably for epm and ppm respectively. Where epm and ppm are used, corrections should be made for specific gravity.

MAGNA REPRESENTATIVE	ADDRESS	TELEPHONE
W.H. Fort		OFF RES
ANALYZED BY	DATE	DISTRIBUTION