ARCO Oil and Gas Company
Central District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 688 5200

May 8, 1989

Mr. David Catanack
UIC Section
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

MAY 11 1989

OIL CONSERVATION DIV
SANTA FE

Dear Mr. Catanack:

Subject: Application for Class II UIC Permit
Conversion of Horseshoe Gallup #1 Well
San Juan County, New Mexico

Enclosed is a full application for a Class II permit under New Mexico's Underground Injection Control (UIC) regulations for ARCO's Horseshoe Gallup #1 Well. ARCO has already applied for the necessary approvals through the Navajo Nation, the U.S. EPA, Region VI and the BLM.

EPA accepted our proposed alternative mechanical integrity program in their draft permit. As you indicated in our telephone conversation on May 8, ARCO hopes your office will also approve of the proposed alternative method, since EPA has authority for testing on the well.

To satisfy NMOCD's proof of notice requirement, ARCO notified the Navajo and Ute Mountain Indian tribes. This letter is confirmation of your acceptance of our correspondence and permit with the tribe as proof of notice for the Navajos. A copy of the letter sent to the Ute Mountain tribe is enclosed, and the return receipt of the certified letter will be forwarded when received.

Please let me know (915-688-5651) if there are any questions regarding this permit application.

Sincerely,

C. T. Stilwell
Environmental Engineer

CTS:pjk

Attachment

ARCO Oil and Gas Company
Central District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 688 5200

May 8, 1989

Tribal Energy Department
Ute Mountain Indian Tribe
P.O. Box 54
Towaoc, Colorado 81334

Dear Gentlemen:

Subject: Notice of Application for Injection Well Permit
ARCO Horseshoe Gallup Field
San Juan County, New Mexico (Navajo Nation)

By this letter, ARCO Oil and Gas Company (ARCO) is hereby notifying the Ute Mountain Indian Tribe of our application to permit an injection well. The well, Horseshoe Gallup #1, is located on the Navajo Nation in New Mexico, but is within one-half mile of the boundary with the Ute Mountain land. Therefore, ARCO is required to notify you of this activity.

The well to be permitted is an existing producing well which is being converted to an injection well in the field's existing waterflood operation. We are obtaining the required permits from the Navajo Nation, U.S. Environmental Protection Agency, and U.S. Bureau of Land Management.

Sincerely,

C. T. Stilwell
Environmental Engineer

CTS:pjk

Attachment

cc: David Catanack
NMOCD - Sante Fe

ARCO Oil and Gas Company
Central District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 688 5200

February 3, 1989

Mr. Gus Chavarria
U.S.E.P.A. - Region VI
UIC Permits Enforcement Section
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Mr. Chavarria:

Subject: UIC Permit Application
ARCO Horseshoe Gallup #1 Well
Navajo Nation, New Mexico

Enclosed is a complete permit application, with required attachments. ARCO Oil and Gas Company (ARCO) is requesting issuance of a permit under the applicable federal regulations for injection wells on the Navajo Reservation in New Mexico.

Basically, the well to be permitted is an inactive producing well to be converted to an active injection well. The well is located in the Horseshoe Gallup oil field, within which ARCO is operating a mature waterflood. The purpose for converting the HSGU #1 Well is to enhance the recovery of oil from the Upper and Lower Gallup formations.

Because there are no underground sources of drinking water or flowing surface water nearby, the conversion and injection proposed in this application will not affect any water resources.

ARCO is interested in acquiring this permit as quickly as possible. Please call me (915-688-5651) if there is any more I can do to assist in the processing of the permit.

Sincerely,

C. T. Stilwell
Environmental Coordinator

CTS:pjk

Attachments

cc: B. Briscoe FAR
C. D. Muir MIO 945 (w/o attachments)
J. L. Morgan MIO 1125 (w/o attachments)

Well # HSGU #1
Permit #
Date Received :
*EPA Authorization #

Permit Application Checklist

	Attached	Not Attached	
1.	X		1. Budget Bureau Form # 1004 - 0135 (Sundrey Notices) or #1004 - 0136 (Application to Drill) (2 copies to EPA).
2.	X		2. Map using township-range-sections to show the location of wells within 1/2 mile (2640 ft.) of the proposed well.
3.	X		3. Tabulation of data on wells within 1/2 mile (2640 ft) including:
			depth
			location
			For wells that penetrate the injection interval, also show:
			date drilled
			record of plugging and/or completion
			corrective action plan for inadequately completed or plugged wells.
4.	X		4. Injection well schematic drawings of surface and subsurface details showing:
			(i) total depth plug-back depth,
			(ii) depth to top and bottom of injeciton interval,
			(iii) depth to top and bottom of casing and cemented interval, plus amount of cement,
			(iv) size of casing and tubing and depth of packer, and
			(v) hole diameter,
			(vi) other perforated intervals,
			(vii) daily drilling records, if available

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REGION VI

* Applicable to wells authorized by rule

	Attached	Not Attached	
5.	X		5. Operating data including: (i) maximum and average injection rate, (ii) maximum and average injection pressure, (iii) fracture pressure gradient of injection zone, See Attachment 6 (iv) whether operations is cyclic or continuous, and (v) source and analysis of injected fluids including TDS, chlorides, and additives.
6.	X		6. Geologic data on the injection and confining zones, including faults, geological name, thickness, porosity, permeability, depth, current reservoir pressure or fluid level, water quality, and lithologic description.
7.	No fresh water See Attachment #6		7. Depth to base of fresh water (10,000 mg/l)
8.	X		8. Verification of public notice, consisting of a list showing names, addressess, and date that notice of permit application was given or sent to each: (i) surface land owner, (ii) tenant, (iii) operator of a producing lease within one-half mile of the well location, and (iv) affected Tribal Government.
9.		(None Available)	9. All available logging and testing data on the well (for existing wells only).
10.	X		10. Proof of adequate financial responsibility.
11.	X		11. Certification form signed by well owner/operator or authorized representative (authorization must be in writing and copy attached).
12.	XXXXX	(No)	12. Has the applicant declared any part of his submission confidential? [147.2907]
13.	XXXXX	(No)	13. Is the injection well currently authorized by rule? If yes, EPA Inventory No. is _____.

	Attached	Not Attached	
14.	(Yes)	~~(No)~~	14. Was applicant required by EPA to apply for a permit?
15.	(Yes)	~~(No)~~	15. The permit applicant is the owner/operator (circle one or both)
16.	~~(Yes)~~	(No)	16. Has the applicant requested emergency authorization to inject.
17.	X		17. Plugging and Abandonment Plan, and estimated cost of plan.

Administrative Reviewer
Signature/Date

Technical Reviewer
Signature/Date

Form 3160-5
(November 1983)
(Formerly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.	14-20-603-734
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	Navajo
7. UNIT AGREEMENT NAME	Horseshoe Gallup Unit
8. FARM OR LEASE NAME	Horseshoe Gallup
9. WELL NO.	1
10. FIELD AND POOL, OR WILDCAT	Horseshoe Gallup
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA	Sec. 32, T-31N, R-16W
12. COUNTY OR PARISH	San Juan
13. STATE	NM

1. OIL WELL ☒ GAS WELL ☐ OTHER

2. NAME OF OPERATOR
ARCO Oil & Gas Company, Division of Atlantic Richfield Company

3. ADDRESS OF OPERATOR
1816 E. Mojave Farmington, NM 87401

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
660' FSL & 417' FEL

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
5332'

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF ☐	PULL OR ALTER CASING ☐	WATER SHUT-OFF ☐	REPAIRING WELL ☐
FRACTURE TREAT ☐	MULTIPLE COMPLETE ☐	FRACTURE TREATMENT ☐	ALTERING CASING ☐
SHOOT OR ACIDIZE ☐	ABANDON* ☐	SHOOTING OR ACIDIZING ☐	ABANDONMENT* ☐
REPAIR WELL ☐	CHANGE PLANS ☐	(Other) ☐	
(Other) Convert producer to injector ☒		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

ARCO Oil & Gas Company respectfully request approval to convert the subject producer to an injector. Attached is the conversion procedure and the current and porposed wellbore configurations. ARCO will convert the subject well upon receiving an approved UIC EPA Permit.

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18. I hereby certify that the foregoing is true and correct

SIGNED [signature] TITLE Production Supervisor DATE 2/2/89

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

HORSESHOE GALLUP UNIT #1

CONVERSION PROCEDURE

1. MIRU pulling unit.
2. POH w/rods and pump. POH w/tbg.
3. RIH w/cone bit and csg scraper. Clean out to PBTD at 1252'. POH tbg, csg scraper and bit.
4. RIH w/2-3/8" tbg and Baker Mode "AD-1" tension pkr at 1060.
5. Hook up wellhead, flow meters, injection lines, and valves for reading injection pressures.

[redacted] GALLUP UNIT #1

EXISTING WELLBORE (BEFORE CONVERSION)

Spudded: 09/09/58
Completed: 09/24/58

Unit: P S:32 T:31N R:16W
660' F/SL 417' F/EL

Surface Casing: 8-5/8", 24#, J-55, 4 jts.)
Set @ 137.99'w/75 SX Common Cmt.

Casing: 39 jts: 5-1/2" 14# J-55 (1277.83')
Set at: 1285.15' w/150 SX Reg. Pozmix

12/13/65
Rods: 48 - 7/8" x 25' w/2-1/2" Huber Scraper
2 - 7/8" x 10' Pony
1 - 1-1/4" x 16' Polished Rod

12/24/65
Tubing: 1214.48'
39 jts. 3-1/2 Butt.,
9.2# J-55, Set at

Pump Plunger: 1-2 3/4" Bore Axite

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Tubing Pump: 18.60'
3-1/2" x 2-3/4"

Upper Gallup Perforations:
1091'-1094' } 12# jets
1099'-1128' }

PBTD: 1252'

TD: 1285'

Perfs: Lower Gallup: 1192--1233'
164 jets

HORSESHOE GALLUP UN[illegible]#1

PROPOSED WELLBORE CONFIGURATION

SPUDDED: 9/9/58

COMPLETED: 9/24/58

GL: 5332' KB: 5340'

UNIT: P SEC.: 32 T: 31N R: 16

LOCATION: 660' FSL & 617' FEL

TUBING: 1214.48'

12/24/66
39 jts.-2 7/8 Tbg.
9.2# J-55 Set @ 1239.08' RKB

SURFACE CASING:

4 jts.-8 5/8", 24# J-55. Set @ 137.99'
w/75 sx common cmt.

PRODUCTION CASING:

39 jts.-5 1/2" 14# J-55 (1277.83')
Set @ 1285.15' w/150 sx reg pozmix

PERFORATIONS:

Upper Gallup:
1091'-1094' w/12S jets
1099'-1128' w/12S jets

Lower Gallup:
1192'-1233' w/164 jets

PACKER:

AD-1 Tension Packer
Set @ 1060'

PBD: 1252'

TD: 1285'

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EPA GW-S
REGION VI

11

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: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [X] yes [ ] no

II. Operator: ARCO Oil and Gas Company

Address: P.O. Box 1610, Midland, TX 79702

Contact party: Chuck Stilwell Phone: (915) 688-5651

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? [X] 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. N/A

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. N/A

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: C. T. Stilwell Title Environmental Engineer

Signature: Chuck Stilwell Date: 5/8/89

* 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. Surrounding well and geologic data should be available in NMOCD/Aztec office files

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

III. WELL DATA See BLM Sundry Notice and other attachments for 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.

ATTACHMENT 2

Explanation for Map of Project Area

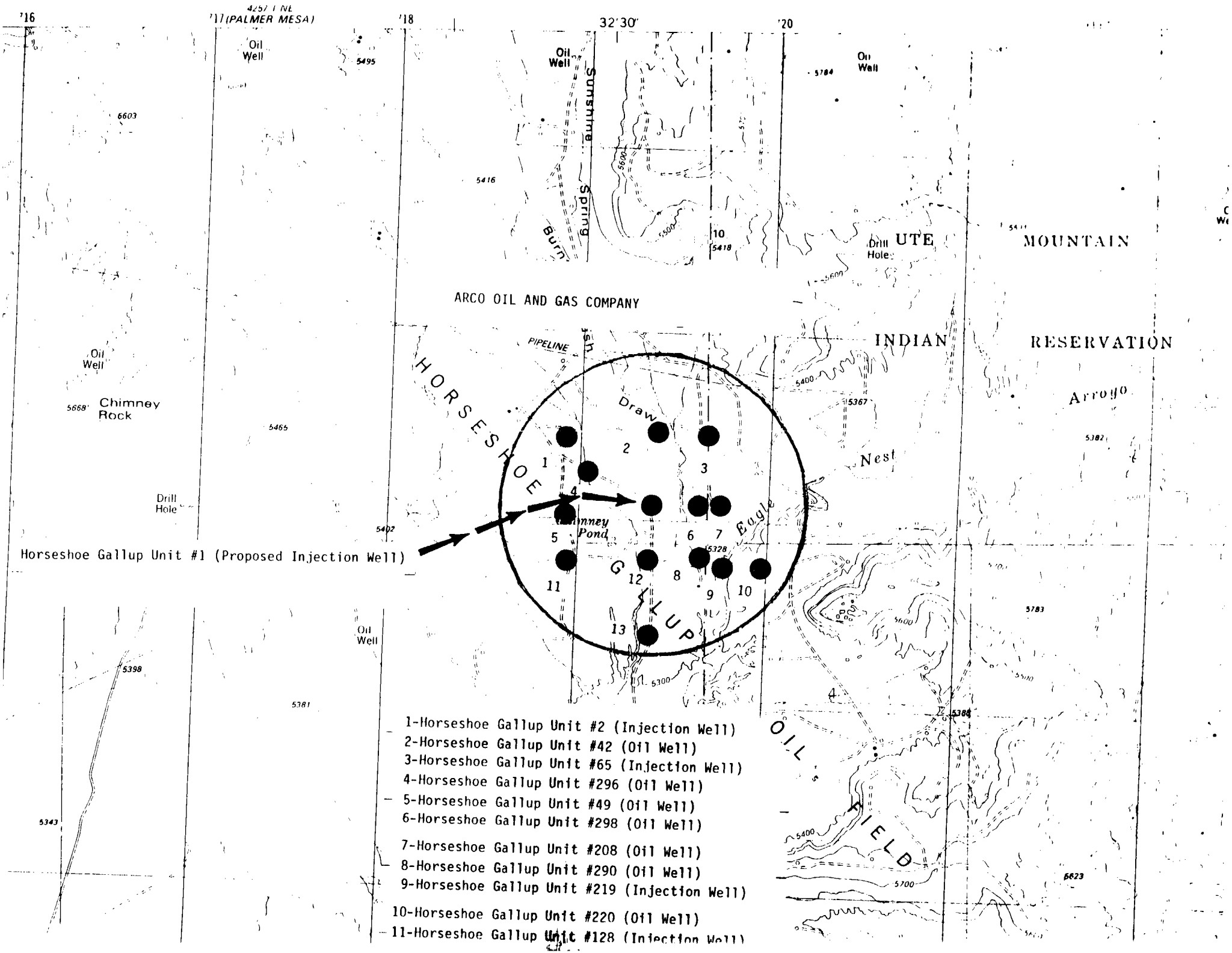
Horseshoe Gallup Unit

Required Information Existing on Map

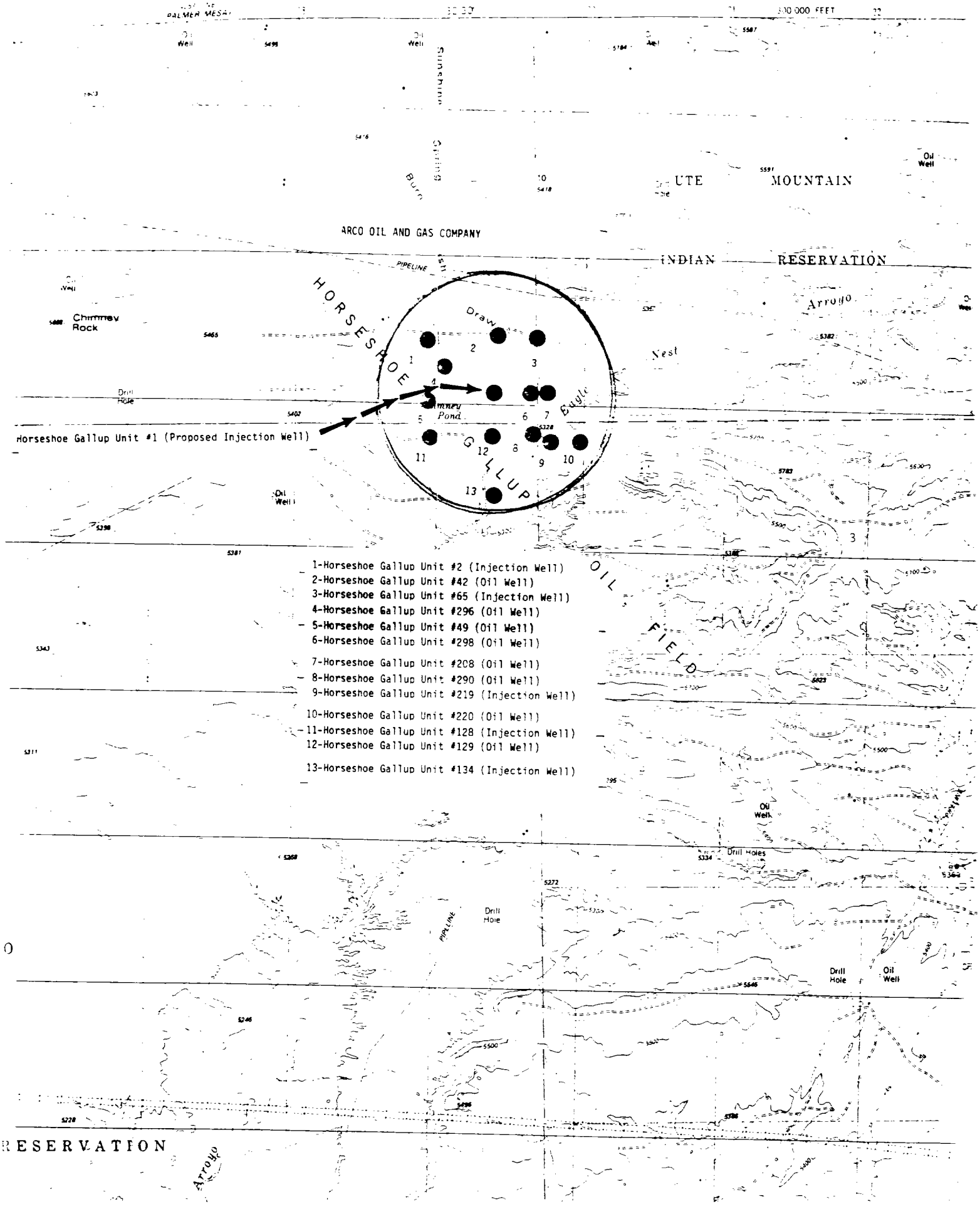
1. Surface bodies of water - consist of dry washes.
2. No springs, mines, quarries, or faults near project area.
3. No residences or public water supply facilities near project area.

Required Information Supplied by ARCO on Map

1. Area of Review - 1/2 mile radius, shown with red circle.
2. Identification of all wells in area of review.
   - See Radius of Endangering Influence forms and your department's well database for further information.


ARCO OIL AND GAS COMPANY
Horseshoe Gallup Unit #1 (Proposed Injection Well)
1-Horseshoe Gallup Unit #2 (Injection Well)
2-Horseshoe Gallup Unit #42 (Oil Well)
3-Horseshoe Gallup Unit #65 (Injection Well)
4-Horseshoe Gallup Unit #296 (Oil Well)
5-Horseshoe Gallup Unit #49 (Oil Well)
6-Horseshoe Gallup Unit #298 (Oil Well)
7-Horseshoe Gallup Unit #208 (Oil Well)
8-Horseshoe Gallup Unit #290 (Oil Well)
9-Horseshoe Gallup Unit #219 (Injection Well)
10-Horseshoe Gallup Unit #220 (Oil Well)
11-Horseshoe Gallup Unit #128 (Injection Well)
HORSESHOE GALLUP OIL FIELD
INDIAN RESERVATION
UTE MOUNTAIN
Chimney Rock
Sunshine Spring
Eagle Nest
Arroyo
Oil Well
Drill Hole
PIPELINE

CHIMNEY ROCK QUADRANG
NEW MEXICO-SAN JUAN CO
7.5 MINUTE SERIES (TOPOGRAP
CHIMNEY ROCK SE QUADRANGLE



ATTACHMENT 3

HORSESHOE GALLUP #1 WELL

RADIUS OF ENDANGERING INFLUENCE FILE

Explanation of Well Information in Area of Review:

1. The following has descriptions of the wells within that Area of Review (1/2 mile) of the HSGU #1.

2. Information available on these wells can be found in UIC Section's database for the Horseshoe Gallup Field.

3. Information given here for the wells in the Area of Review is sufficient because:

   a. There is no Underground Source of Drinking Water in the area to contaminate.

   b. Routine well operation and monitoring performed on the active wells in the field will indicate if there is any communication between HSGU #1 and the surrounding wells.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		(X)OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME OTHER NO [HSGU # 2]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
( )OP OIL PRODUCTION		(X)OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
(X)ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE SW (NW)/NE (SE) SW NW [32] [T31N] [R16W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON N

LATITUDE[ ] LONGITUDE[ ]

UTM COORDINATES: X(east)[ ] Y(north)[ ] ZONE[ ]

DISTANCE FROM INJECTION WELL:

1120 Ft. (X)N ( )S 1200 Ft. ( )E (X)W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P O BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___ ___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

2. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

3. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

4. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

5. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED: **ILLEGIBLE**

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD

RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME OTHER NO [HSGU #42]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		(X)OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW (NE) SE SW NW NE (SE) SW NW — 10 acre — 40 acre — 160 acre

[32] SECT. [T31N] TOWNSHIP [R16W] RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON]

LATITUDE LONGITUDE

UTM COORDINATES: X(east) Y(north) ZONE

DISTANCE FROM INJECTION WELL:

1120 Ft. (X) N ( ) S Ft. ( ) E (X) W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P.O. BOX 1610

COMPLETED: __/__/__ TOTAL DEPTH: FT. FROM / S.

WORKOVERS: __/__/__ : __ __ __ PLUGGED: __ __ __

1. CASING PERFORATED FROM FT TO FT OPENING TYPE
2. CASING PERFORATED FROM FT TO FT OPENING TYPE
3. CASING PERFORATED FROM FT TO FT OPENING TYPE
4. CASING PERFORATED FROM FT TO FT OPENING TYPE
5. CASING PERFORATED FROM FT TO FT OPENING TYPE

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:

See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME OTHER NO [HSGU #65]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
( )OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
(X)ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE	SE	SW	NW/NE	SE	SW	NW/NE	SE	SW	NW	SECT.	TOWNSHIP	RANGE
10 acre		40 acre			160 acre					[31]	[T 31 N]	[R 16 W]

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON

LATITUDE[ ] LONGITUDE[ ]

UTM COORDINATES: X(east)[ ] Y(north)[ ] ZONE[ ]

DISTANCE FROM INJECTION WELL:

1200 Ft. (X)N ( )S 960 Ft. (X)E ( )W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P O BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
2. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
3. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
4. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
5. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:

See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [ ] [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #296]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW NE (SE) SW NW NE (SE) SW NW [32] [T 31N] [R 16W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON]

LATITUDE _____ LONGITUDE _____

UTM COORDINATES: X(east) _____ Y(north) _____ ZONE ____

DISTANCE FROM INJECTION WELL:

5560 Ft. (X)N ( )S 1120 Ft. ( )E (X)W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P O BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: _____ FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE ____

2. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE ____

3. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE ____

4. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE ____

5. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE ____

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [ ))2)6)4)0)] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [H)O)R)S)E)S)H)O)E))G)A)L)L)U)P))U)N)I)T))#)1)]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [H)S)G)U))=)4)9)]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE (SW) NW/NE (SE) SW NW [3)2] [T)3)1)N] [R)1)6)W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [2)0))M)I)L)E)S))W)E)S)T))O)F))F)A)R)M)I)N)G)T)O)N

[ ] LATITUDE[ ] LONGITUDE[ ]

UTM COORDINATES: X(east)[ ] Y(north)[ ] ZONE[ ]

DISTANCE FROM INJECTION WELL:

2 4 0 Ft. ( )N (X)S 1 5 2 0 Ft. ( )E (X)W

LEGAL CONTACT: NAME (A)R C O) O I L & G A S C O M P A N Y

ADDRESS P O) B O X 6 1 O)

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
2. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
3. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
4. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
5. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

ILLEGIBLE

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [ ))2)6)4)0)] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [H)O)R)S)E)S)H)O)E))G)A)L)L)U)P))U)N)I)T))#1)]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [H)S)G)U))#)2)9)8]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE (SW) NW/NE SE (SW) NW [3)3] [T)3)1)N] [R)1)6)W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [2)0))M)I)L)E)S))W)E)S)T))O)F))F)A)R)M)I)N)G)T)O)N

LATITUDE[ ] LONGITUDE[ ]

UTM COORDINATES: X(east)[ ] Y(north)[ ] ZONE[ ]

DISTANCE FROM INJECTION WELL:

[ ] Ft. ( )N ( )S [8000] Ft. (X)E ( )W

LEGAL CONTACT: NAME [ARCO & GAS COMPANY]

ADDRESS [P O BOX 1610]

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
2. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
3. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
4. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]
5. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED: **ILLEGIBLE**

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #208]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE (SW) NW/NE SE (SW) NW [33] [T 31 N] [R 16 W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON

LATITUDE LONGITUDE

UTM COORDINATES: X(east) Y(north) ZONE

DISTANCE FROM INJECTION WELL:

Ft. ( )N ( )S 1200 Ft. (X)E ( )W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P O BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM FT TO FT OPENING TYPE
2. CASING PERFORATED FROM FT TO FT OPENING TYPE
3. CASING PERFORATED FROM FT TO FT OPENING TYPE
4. CASING PERFORATED FROM FT TO FT OPENING TYPE
5. CASING PERFORATED FROM FT TO FT OPENING TYPE

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:

See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #2900]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE SW (NW)/NE SE SW (NW) [4] [T 30N] [R 16W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON N

LATITUDE [ ] LONGITUDE [ ]

UTM COORDINATES: X(east) [ ] Y(north) [ ] ZONE [ ]

DISTANCE FROM INJECTION WELL:

1000 Ft. ( )N (X)S 880 Ft. (X)E ( )W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P O BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
2. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
3. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
4. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
5. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

( ) NR NO REMEDIAL ACTION PROPOSED **ILLEGIBLE**
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:

See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #219]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
( )OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
(X)ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE SW (NW)/NE SE SW (NW) [14] [T 30 N] [R 16 W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON N]

LATITUDE _____ LONGITUDE _____

UTM COORDINATES: X(east) _____ Y(north) _____ ZONE _____

DISTANCE FROM INJECTION WELL:

1000 Ft. ( )N (X)S 1280 Ft. (X)E ( )W

LEGAL CONTACT: NAME ARCO OIL & GAS COMPANY

ADDRESS P O BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: _____ FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___ ___ ___

1. CASING PERFORATED FROM _____ FT TO _____ FT OPENING TYPE _____
2. CASING PERFORATED FROM _____ FT TO _____ FT OPENING TYPE _____
3. CASING PERFORATED FROM _____ FT TO _____ FT OPENING TYPE _____
4. CASING PERFORATED FROM _____ FT TO _____ FT OPENING TYPE _____
5. CASING PERFORATED FROM _____ FT TO _____ FT OPENING TYPE _____

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, preus, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

ILLEGIBLE

COMMENTS:

See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #220]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE SW (NW)/NE SE SW (NW) [4] [T 30N] [R 16 W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON]

LATITUDE _____ LONGITUDE _____

UTM COORDINATES: X(east) _____ Y(north) _____ ZONE _____

DISTANCE FROM INJECTION WELL:

1000 Ft. ( )N (X)S 1920 Ft. (X)E ( )W

LEGAL CONTACT: NAME (A)R(C)O (O)I L (&) G A S C O M P A N Y

ADDRESS P O B O X 6 1 O

COMPLETED: ___/___/___ TOTAL DEPTH: _____ FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE _____

2. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE _____

3. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE _____

4. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE _____

5. CASING PERFORATED FROM _____FT TO_____FT OPENING TYPE _____

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #28]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
( )OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
(X)ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE SE SW (NW) (NE) SE SW NW [5] [T 30N] [R 16W]

10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON

LATITUDE[ ] LONGITUDE[ ]

UTM COORDINATES: X(east)[ ] Y(north)[ ] ZONE[ ]

DISTANCE FROM INJECTION WELL:

1000 Ft. ( )N (X)S 1440 Ft. ( )E (X)W

LEGAL CONTACT: NAME (ARCO OIL & GAS COMPANY)

ADDRESS PO BOX 1610

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

2. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

3. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

4. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

5. CASING PERFORATED FROM [ ]FT TO[ ]FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/OTHER NO [HSGU #129]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	(X)ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	( )INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW (NE) SE SW NW (NE) SE SW NW — 10 acre — 40 acre — 160 acre

[15] SECT. [T30N] TOWNSHIP [R16W] RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON]

[ ] LATITUDE [ ] LONGITUDE [ ]

UTM COORDINATES: X(east) [ ] Y(north) [ ] ZONE [ ]

DISTANCE FROM INJECTION WELL:

[1000] Ft. ( )N (X)S [ ] Ft. ( )E ( )W

LEGAL CONTACT: NAME [ARCO OIL & GAS COMPANY]

ADDRESS [P O BOX 1610]

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
2. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
3. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
4. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
5. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

ILLEGIBLE

COMMENTS:

See department well database for further information. Available information for this well was submitted to your department in 1987.

TRIBAL INJECTION WELL RECORD
RADIUS OF ENDANGERING INFLUENCE FILE

WUPS # [ ]

NAME OF USGS TOPO MAP ATTACHED WITH SURFACE FEATURES [Chimney Rock]

RADIUS OF INFLUENCE: [2640] FT.

ALL WELLS IN PROJECT AREA: See USGS Map

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME/WUPS NO [HORSESHOE GALLUP UNIT #1]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
(X)OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
( )IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

ILLEGIBLE

ALL WELLS PENETRATING INJECTION ZONE WITHIN RADIUS OF INFLUENCE:

TRIBAL WELL NO [ ] PWSID [ ]

WELL NAME OTHER NO [HSGU #134]

WELL TYPE (MARK ONE ONLY)	WELL STATUS (MARK ONE ONLY)	WELL USE (MARK ONE ONLY)
( )WW WATER WELL	( )ACT ACTIVE	( )DOM DOMESTIC
( )WA ARTESIAN WELL	(X)INA INACTIVE	( )AGR AGRICULT. LIVESTOCK
( )WS SPRING	( )ABA ABANDONED	( )IND INDUSTRIAL MINING
( )OW OBSERVATION WELL		( )REC RECREATION
( )GS GAS WELL		( )MUN MUNICIPAL
( )OP OIL PRODUCTION		( )OTH OTHER
( )MW MINERAL WELL		
(X)IN INJECTION		
( )ER ENHANCED RECOVERY		
( )DH DRY HOLE		

QUAD NO [ ] MILES WEST [ ] MILES SOUTH [ ]

NE SE SW NW/NE (SE) SW NW/NE SE (SW) NW [15] [T 30N] [R 16W]
10 acre 40 acre 160 acre SECT. TOWNSHIP RANGE

APPROXIMATE LOCATION [20 MILES WEST OF FARMINGTON N

--

[ ] LATITUDE [ ] LONGITUDE [ ]

UTM COORDINATES: X(east) [ ] Y(north) [ ] ZONE [ ]

DISTANCE FROM INJECTION WELL:

[ ] Ft. ( )N ( )S [ ] Ft. ( )E ( )W

LEGAL CONTACT: NAME (ARCO OIL & GAS COMPANY)

ADDRESS P.O. BOX 6110

COMPLETED: ___/___/___ TOTAL DEPTH: [ ] FT. FROM / S.

WORKOVERS: ___/___/___ ; ___/___/___ PLUGGED: ___/___/___

1. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
2. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
3. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
4. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]
5. CASING PERFORATED FROM [ ] FT TO [ ] FT OPENING TYPE [ ]

opening codes: f=fractured rock, l=louvered or shutter-type screen, m=mesh screen, p=perforated, prous, slotted casing, r=wire-wound screen, s=screen, type unknown, t=sand point, w=walled or shored, x=open hole, z=other

REMEDIAL ACTION PROPOSED:

ILLEGIBLE

( ) NR NO REMEDIAL ACTION PROPOSED
( ) PP PROPER PLUGGING
( ) OP OTHER PROPOSAL - SEE COMMENTS

COMMENTS:
See department well database for further information. Available information for this well was submitted to your department in 1987.

WELL SCHEMATIC

ATTACHMENT 4

Operator ARCO Oil and Gas Company

Completion Date: 9/24/58

Well Name: Horseshoe Gallup Well # 1

660 Ft. F S L & 417 Ft. F E L

SE ¼ Section 32 Twp. 31N Rg. 16W

Surface Elevation 5500'

Formation(s) Top/Bottom from PBTD to surface:

Mancos Shale	0' / 1087'
Upper Gallup	1090' / 1128'
Mancos Shale	1129' / 1189'
Lower Gallup	1190' / 1233'
Mancos Shale	1234' /
	/
	/

Tubing Size: 2-3/8 In.

Weight: 4.7 lb./Ft.

Length: 1060 Ft.

Packer Type: AD-1 Tension Pkr

Set at: ±1060 Ft.

Formation(s) perforated above packer:

None ' to '

' to '

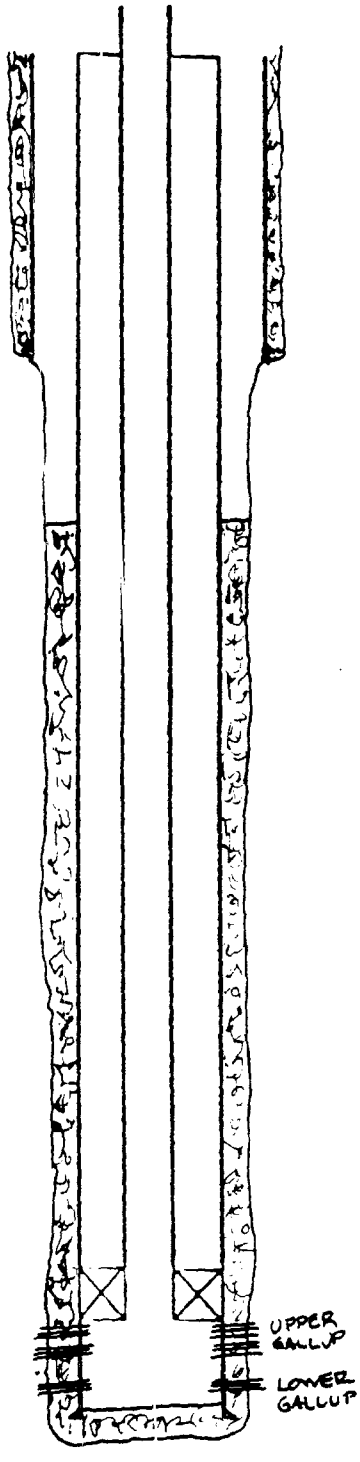
Formation(s) perforated below packer:

Upper Gallup	1091 '	to	1094 '
Upper Gallup	1099 '	to	1128 '
Lower Gallup	1192 '	to	1233 '

Open hole below production casing from N/A ' to '

Formation(s) present in open hole:

N/A



SURFACE CASING DATA

Hole Size: 12-1/4 In.

Casing Size: 8-5/8 In.

Weight: 24 lb/

Length: 137.99 Ft.

Cement Type: Class Common

Amount: 75 Sx.

Additives:

Casing set at: 137.99 Ft.

Top of Cement: 0 Ft.

Method of Determination: Circulated

PRODUCTION CASING DATA

Hole Size: In.

Casing Size: 5-1/2 In.

Weight: 14 lb/

Length: 1285.15 Ft.

Cement Type: Class reg. pozmix

Amount: 150 Sx.

Additives:

Casing Set at: 1285.15 Ft.

Top of Cement: 450 Ft.

Method of Determination: Calculation

PBTD: 1252'

TD: 1285'

NOTE: All depths are to be from ground level. If KB depths are used make notations on diagram & give height of KB above ground level.

ATTACHMENT 4A

Cementing Records for Surface Casing

THE ATLANTIC REFINING COMPANY

LOG: DRILLING WELL ☒ WORKOVER ☐

(Place "X" in proper space above. After TD is reached, if well is plugged back carry TD and Plugged Back Depth, each tour)

UNIT or LEASE: Navajo (Name to be same as shown in permit to drill) TRACT: ____ (Designation) WELL NO. 1 DATE 9-9-58

FIELD: Horseshoe CONTRACTOR: Banner Drlg Co

SIZE HOLE: 12 1/4 REDUCED AT: ____ KIND OF TOOLS: Power Rotary

KIND OF FUEL: Butane FURNISHED BY: Contractor FROM: ____ NO. OF HOURS: ____

WATER FURNISHED BY: Contractor FROM: ____ NO. OF HOURS: ____

TOUR NO.	DEPTH FROM	DEPTH TO	FORMATION OR CORE (CORE INTERPRETATION MUST BE SIGNED)
			Finished rigging up
2			& spudded @ 10:30 AM 9-9-58
	0	107	SHALE + SAND
	107	143	
			Drld 12 1/4" hole to 143' SLM
			R.U. + ran 8 5/8" O.D. casing
			as follows btm to top.
			1 - Larkin 8 5/8" Guide Shoe - 1.41
			1 Jt 8 5/8" O.D. 24# J-55 casing - 31.90
			1 - Larkin 8 5/8" Float Collar - 1.56
			3 - Jts 8 5/8" O.D. 24# J-55 Casing 95.27
			4 Jts + Equip 130.14
			RKB to 8 5/8" Collar 7.85
			Casing set @ 137.99
			R.U. + cond. hole. R.U. Howco
			+ cemented casing w/ 75 sacks common
			cement plus 2% calcium chloride
			Plug down @ 6:30 PM 9-9-58. w/500#
			Cement did not circulate. Top
			of plug 103'. W.O.C. - 4 hours. Checked
			& found top of cement 12' below ground level.
			Washed mud out + placed 7 SKS Common
			Cement around top of surface casing
			D.F. - GL. - 5.29
			Unit Floor - GL. - 6.05
			R.T. + RKB - GL - 7.32
			GL - 5332

DATA AT END OF TOUR	TOUR 1	TOUR 2	TOUR 3
DRILL PIPE IN USE: SIZE		4 1/2	4 1/2
LENGTH DRILL COLLARS		62	65.20
LENGTH DRILL PIPE		30.15	59.52
KELLY DOWN		15	18.00
TOTAL IN HOLE		107	142.72
DRILL BIT: SERIAL NO.		RT 12 1/4	RT 12 1/4
DRILL BIT: NUMBER		1	1
MAKE		HTC	HTC
TYPE		OSC	OSC
CORE BARREL: KIND			
SIZE			
CORE BIT: SERIAL NO.			
CORE BIT: NUMBER			
KIND			
SIZE			
STRAIGHT HOLE TEST AT			143
DEGREES OFF			1/4
MUD MATERIAL: KIND	AMOUNT	AMOUNT	AMOUNT
1.			
2.			
3.			
CHEMICAL: KIND	AMOUNT	AMOUNT	AMOUNT
1.			
2.			
3.			
4.			
MUD TYPE			
MUD WEIGHT			
VISCOSITY: 1500 cc IN 1 quart OUT			
PH			
WATER LOSS: cc			
FILTER CAKE	/32"	/32"	/32"

FOR COMPANY REPRESENTATIVE ONLY — TIME ANALYSIS CO. TIME

DRILLING			
CORING			
DST. OPEN HOLE			
LOGGING			
CASING & WOC			
DOWNTIME			
COMPLETING			
LOSS CIRCULATION			
FISHING			
CO. TIME w/DP			
CO. TIME w/o /DP			

Concise explanation of all delays and reasons therefor SHALL be indicated by each driller and verified by Company representative. Time chargeable to Company on day rate basis SHALL be fully explained.

TOUR No. 1 FROM 7:00 AM TO 7:00 PM DRILLING ____ HRS. TRIPPING ____ HRS. REPAIRS ____ HRS. OTHER: ____

7:00 To 7:00 Rigging Up

SIGNED ____ DRILLER

TOUR No. 2 FROM 7:00 AM TO 3:00 PM DRILLING ____ HRS. TRIPPING ____ HRS. REPAIRS ____ HRS. OTHER: ____

7:00 To 10:30 Rigging up & Drlg. Rat Hole. Spudded @ 10:30 A.M. 10:30 To 3:00 Drlg. 12 1/4 Surface Hole

SIGNED Jewell Copeland DRILLER

TOUR No. 3 FROM 3:00 M TO 11:00 M DRILLING 2 HRS. TRIPPING 1/2 HRS. REPAIRS ____ HRS. OTHER: 5 1/2

DRLG 2 HRS. Pulled out of Hole Run (4-JTS-8RD Th) 8 5/8-Csg SET @ 137.99 : K.B. CEMENTED W/ 75 SK - plus 2% Calsum, Plug Down @ 6:30 - W.O.C. 7:00 To 11:00

SIGNED E.H. Cleland DRILLER

COMPANY REPRESENTATIVE: Accuracy and Completeness are your responsibility. SIGNED L.D. Kelly

Tabulate drilling time, when taken, on Form 3B-744 and mail with this form. Note depth each time bit pulled and reason for pulling and depth sharp bit ran.
INDICATE DATE AND HOUR RIG RELEASED AND MARK LAST REPORT "FINAL".
IMPORTANT: ALL APPLICABLE SPACES MUST BE FILLED BEFORE MAILING. REPORT TO BE MAILED EACH DAY

SIZE: 8 5/8 (TOP TO BOTTOM)

JTS	FEET	WEIGHT	GRADE	TH.	CL
4	127 17	24	J-55	8R	1

CMTD. W/SLURRY CONSISTING OF 82 SX Common

CMT. PLUS 2% Calcium chloride

SCRATCHERS:

CENTRALIZERS:

TIME PLUG DOWN: [illegible] 4-4-38 TOP CMT. PLUG: 103

CSG. HD.: OCT C-18 - 8 5/8" w/8" Series 600 top Fl. 2-2" LP outlets, 2" Bull Plug, 2x2 [illegible] nipple & 2" valve.

TBG. HD.: [illegible] 3044 [illegible] valve

XMAS TREE:

SETTING DATA

SHOE: Larkin Guide	1	41
SET JT. 8 5/8 24# J-55	31	90
COLLAR	1	56
3 JTS PIPE	95	27
TOTAL	130	14
RKS TO 8 5/8" Collar	7	85
DEPTH SET	137	99

PICKUP JT.:

PACKER:

PIPE TALLY

FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	SUB TOTALS
31 90													127 17
31 62													
31 65													
32 00													
127 17													

ILLEGIBLE

ATTACHMENT 4B
Cementing Records for Long String Casing

THE ATLANTIC REFINING COMPANY
LOG: DRILLING WELL [X] WORKOVER [ ]

(Place "X" in proper space above. After TD is reached, if well is plugged back carry TD and Plugged Back Depth, each tour)

UNIT or LEASE Navajo (Name to be same as shown in permit to drill) TRACT ____ (Designation) WELL NO. 1 DATE 9-15-58

FIELD Horse Shoe Gallup CONTRACTOR Bannon Bros & Co

SIZE HOLE 7 7/8 REDUCED AT 143 KIND OF TOOLS Rotary

KIND OF FUEL Butane FURNISHED BY Contract FROM ____ NO. OF HOURS 24

WATER FURNISHED BY Contract FROM ____ NO. OF HOURS 24

TOUR NO.	DEPTH FROM	DEPTH TO	FORMATION OR CORE (CORE INTERPRETATION MUST BE SIGNED)	
1			1285 T.D.	
			Finished running 5½" Casing	
			1 Larkin Float Shoe	1.20
			1 Jt 5½" 14# J-55 Casing	29.69
			1 Larkin Float Collar	1.35
			38 Jts 5½" 14# J-55 Casing	1245.59
			39 Jts & equip	1277.83
			RKB to Csg Hd Flg	7.32
			5½" Pipe set @	1285.15
			R.U. & conditioned hole. R.U. HOWCO & cemented casing with 150 sks regular mix pos mix cement. Plug down @ 2:04 PM 9-15-58 w/ 500# Hadgood returns while cementing Top plug @ 1252'	
			Released pressure @ 500 psi & rigged up B&R Service Co & ran temperature survey from 100' to 1249'. Indicated top of cement @ 450'	
			W.O.C.	

ILLEGIBLE

DATA AT END OF TOUR	TOUR 1	TOUR 2	TOUR 3
DRILL PIPE IN USE: SIZE			
LENGTH DRILL COLLARS			
LENGTH DRILL PIPE			
KELLY DOWN			
TOTAL IN HOLE			
DRILL BIT: SERIAL NO.			
DRILL BIT: NUMBER			
MAKE			
TYPE			
CORE BARREL: KIND			
SIZE			
CORE BIT: SERIAL NO.			
CORE BIT: NUMBER			
KIND			
SIZE			
STRAIGHT HOLE TEST AT			
DEGREES OFF			
MUD MATERIAL: KIND	AMOUNT	AMOUNT	AMOUNT
1.			
2.			
3.			
CHEMICAL: KIND	AMOUNT	AMOUNT	AMOUNT
1.			
2.			
3.			
4.			
MUD TYPE			
MUD WEIGHT			
VISCOSITY: 1500 cc IN, 1 quart OUT			
PH			
WATER LOSS: cc			
FILTER CAKE	/32"	/32"	/32"

FOR COMPANY REPRESENTATIVE ONLY

TIME ANALYSIS CO. TIME

DRILLING			
CORING			
DST. OPEN HOLE			
LOGGING			
CASING & WOC	7	8	8
DOWNTIME			
COMPLETING			
LOSS CIRCULATION			
FISHING			
CO. TIME w/DP	—	—	—
CO. TIME w/o /DP	—	—	—

Concise explanation of all delays and reasons therefor SHALL be indicated by each driller and verified by Company representative. Time chargeable to Company on day rate basis SHALL be fully explained.

TOUR No. 1 FROM 11:00 P M TO 7:00 A M DRILLING ____ HRS. TRIPPING ____ HRS. REPAIRS ____ HRS. OTHER ____

11:00 To 1:00 Run 35 Jts 5½ Casing, 1:00 To 1:30 Circ, 1:30 To 2:00 Cementing W/ 150 Sks Reg. Mix 4% Gel Mix Cement Plug Down @ 2:04 A M

SIGNED D. A. Pace DRILLER

TOUR No. 2 FROM ____ M TO ____ M DRILLING ____ HRS. TRIPPING ____ HRS. REPAIRS ____ HRS. OTHER ____

SIGNED [illegible] DRILLER

TOUR No. 3 FROM ____ M TO ____ M DRILLING ____ HRS. TRIPPING ____ HRS. REPAIRS ____ HRS. OTHER ____

3:00 To 11:00 Run Temp Test - Top Cement 450' T.D. 1249 W.O.C.

SIGNED [illegible] DRILLER

COMPANY REPRESENTATIVE: Accuracy and Completeness are your responsibility. SIGNED [illegible]

Tabulate drilling time, when taken, on Form 3B-744 and mail with this form. Note depth each time bit pulled and reason for pulling and depth sharp bit run. INDICATE DATE AND HOUR RIG RELEASED AND MARK LAST REPORT "FINAL"

IMPORTANT: ALL APPLICABLE SPACES MUST BE FILLED BEFORE MAILING. REPORT TO BE MAILED EACH DAY

ADK

3B-108—4-57

SIZE: 5½ (TOP TO BOTTOM)

JTS	FEET		WT.	GRADE	TH.	CL
39	1275	28	14	J-55	8R	1

CMTD. W/SLURRY CONSISTING OF 150 SX Reg Pozmix

CMT. PLUS

SCRATCHERS:

CENTRALIZERS: Howco @ 1080, 1110, 1140, 1180, 1210, 1240 + 1283

TIME PLUG DOWN: 2:04 AM 9-15-14 TOP CMT. PLUG: 1252

CSG. HD.:

TBG. HD.: OCT T1600 w/2-2" LP. outlets, 2" Bull Plug 2x8 Hyd Nipple & 2" Orbit 2000# Valve

XMAS TREE: OCT - 6" Series 600 Flange w/2" EUE 8R Top, 2" EUE 8R Orbit 2000# valve - 2" EUE 8R Tee, 2x8" Hyd Nipple, 2" Orbit 2000# Wing valve

SETTING DATA

SHOE: Larkin	1	20
SET JT. 2⅞" 14# J-55	29	69
COLLAR Larkin Float	1	25
28 JTS PIPE	1205	79
TOTAL	1277	93
RKS TO BHP	7	78
DEPTH SET	1265	15

PICKUP JT.:

PACKER:

ILLEGIBLE

PIPE TALLY

FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	SUB TOTALS
33 65	32 67	34 27	31 82										325.01
33 11	33 04	33 89	34 08										327.06
31 85	33 40	31 84	32 31										335.91
33 85	32 85	33 21	32 38										287.30
33 19	33 89	33 63	34 55										
32 64	33 75	34 56	34 12										1275.28
29 69	32 21	33 61	33 37										
31 98	31 57	33 92	34 04										
30 10	32 31	34 27	20 54										
34 9	31 37	32 69											
325 01	327 06	335 91	287 30										TOTAL

TRUCKA

ATTACHMENT 5

Permit # _____

Well Completion and Operation Data

Type Injection Well: (EOR/~~SWD/HC Storage~~) (~~New~~/Conversion)

Injection: (Continuous/~~Batch~~)

Approximate # days operating/year 365
Rate (B/D): Average 300 Maximum 500
Wellhead pressure (psi): Average 300 Maximum 900
Fluid: TDS 11100 ppm Sp. Gr. 1.008 Analyses included: (yes/~~no~~)
Source (formation name) Gallup and Morrison (Make-Up Water)
Will anything be added to the water to be injected? (~~yes~~/no)
What will those additives be? N/A

Geologic Data (all references to depths are below land surface)

Injection Interval: Top 1091 ; Bottom 1233 ; Effective Thickness Net 76' Gross 142'
Formation name U.P. & Lower Gallup Lithology See Attachment 6
Porosity (%) _____ Current Reservoir Pressure _____ Date _____
Current Fluid Level in Well _____ ft. Date _____
Permeability (md) _____
Drill Stem Test Included: (~~yes~~) (no)

Confining Zones: Thickness between injection zone and USDW (No USDW) Mancos Shale is conf. zone
Lithology See Attachment 6
Cumulative shale 1089 : thickest shale zone 1089 (interval)
Faults: Are there any faults in the area of the well which penetrate the injection interval? (~~yes~~/No)

Well Data: (all references to depths are below land surface)

Surface Elevation: 5500 (KB/GL) Total (Depth/Plugged Back Depth) 1252
Date Drilled or to be drilled 9/24/58
Type logs available on (this well/offset well): (By reference/included) None Available

Construction:	Size (in)	Depth Interval	Sacks of Cement	Hole Size	Cement Interval	How Determined
Surface Csg.	8-5/8	137.99				
Intermediate Csg.	5-1/2	1285.15	← See Well Schematic for data →			
Long String Csg.						
Liner						
Tubing	2-3/8	1060	Packer type and depth A-D 1060			

Other Perforated Intervals None

OTHER INDIAN LANDS

ATTACHMENT 5A

S LABORATORIES
SUTTLE STREET
BOX 2605
RANGO, CO 81302

ARCO OIL & GAS COMPANY
ATTN GLEN DORAN
1816 E. MOJAVE STREET
FARMINGTON, NM 87401

DATE SAMPLE TAKEN:8/12/87 9:40 AM
DATE SAMPLE REC'D:8/12/87
REMARKS:
SUBMITTED BY:
FIELD: HORSESHOE GALLUP
HGU B" LEASE
NO. 5
INJECTION BLEEDER
BEFORE METER

PTEMBER 3, 1987

S ID# 5626

EMICAL and PHYSICAL PROPERTIES

tal Hardness as CaCO3	265	Mg/L
tal Alkalinity as CaCO3	1140	Mg/L

NSTITUENT	Mg/Liter	Meq/Liter
dium as Na+	4560	198.36
tassium as K+	17	.43
lcium - Ca++	81.4	4.06
gnesium -- Mg++	27.5	2.26
on Total - Fe++ & Fe+++	1.5	0.00
rium - Ba++		0.00
romium Total		0.00
SITIVE SUB-TOTAL	4686	205.12
loride-(Cl-)	4640	130.85
carbonate-(HCO3-)	1120	18.36
lfate-(SO4=)	1540	32.06
rbonate-(CO3=)	132	4.40
droxide-(OH-)	0	0.00
GATIVE SUB-TOTAL	7432	185.66

tal Dissolved Solids	11100	mg/L
tal Suspended Solids		mg/L
	8.47	units
ecific Gravity	1.008	@ 77 F.
sistivity	64	ohm-cm
H2O		%
l & Grease		mg/L
vcol		%
D	102	mg/L
D	132	mg/L
ALING TENDENCY: LANGELIER		
SATURATION INDEX @ 25 C	1.54	
PI @ 25 C	14.7	

PROVED BY: _____
DR. JOE BOWDEN, DIRECTOR

R. Kuhn

S LABORATORIES
SUTTLE STREET
BOX 2605
RANGO, CO 81302

ARCO OIL & GAS COMPANY
ATTN GLEN DORAN
1816 E. MOJAVE STREET
FARMINGTON, NM 87401

DATE SAMPLE TAKEN:8/12/87 9:50 AM
DATE SAMPLE REC'D:8/12/87
REMARKS:
SUBMITTED BY:
FIELD: HORSESHOE GALLUP B" LEASE
INJECTION WELL 17
CASING BLEEDER

PTEMBER 3, 1987

S ID# 5625

EMICAL and PHYSICAL PROPERTIES

tal Hardness as CaCO3	342	Mg/L
tal Alkalinity as CaCO3	1240	Mg/L

NSTITUENT	Mg/Liter	Meq/Liter
dium as Na+	4110	178.78
tassium as K+	17	.43
lcium - Ca++	81.4	4.06
gnesium -- Mg++	27.5	2.26
n Total - Fe++ & Fe+++	.5	0.00
rium - Ba++		0.00
romium Total		0.00
SITIVE SUB-TOTAL	4236	185.54
loride-(Cl-)	4550	128.31
carbonate-(HCO3-)	1200	19.67
lfate-(SO4=)	1900	39.56
rbonate-(CO3=)	156	5.19
droxide-(OH-)	0	0.00
GATIVE SUB-TOTAL	7806	192.73

tal Dissolved Solids	11200	mg/L
tal Suspended Solids		mg/L
	8.34	units
ecific Gravity	1.008	@ 77 F.
sistivity	.64	ohm-cm
H2O		%
. & Grease		mg/L
/col		%
D	94	mg/L
D	108	mg/L
LING TENDENCY (LANGELIER		
TURATION INDEX @ 25 C	1.44	
PI @ 25 C	27.5	

These are the results of the analysis of recent water samples taken at HGU.
Glenn

PROVED BY: _____
DR. JOE BOWDEN, DIRECTOR

S LABORATORIES
SUTTLE STREET
BOX 2605
RANGO, CO 81302

ARCO OIL & GAS COMPANY
ATTN GLEN DORAN
1816 E. MOJAVE STREET
FARMINGTON, NM 87401

DATE SAMPLE TAKEN:8/12/87 9:13 AM
DATE SAMPLE REC'D:8/12/87
REMARKS:
SUBMITTED BY:
FIELD: HORSESHOE GALLUP
HGU B" LEASE
WATER PLANT
#1 PUMP DISCHARGE

PTEMBER 3, 1987

S ID# 5627

EMICAL and PHYSICAL PROPERTIES

tal Hardness as CaCO3	325	Mg/L
tal Alkalinity as CaCO3	1360	Mg/L

INSTITUENT	Mg/Liter	Meq/Liter
dium as Na+	4720	205.32
tassium as K+	17.2	.44
lcium - Ca++	70.4	3.51
gnesium -- Mg++	27.5	2.26
n Total - Fe++ & Fe+++	.5	0.00
rium - Ba++		0.00
romium Total		0.00
SITIVE SUB-TOTAL	4835	211.53
loride-(Cl-)	5120	144.36
carbonate-(HCO3-)	1340	21.96
fate-(SO4=)	1640	34.14
rbonate-(CO3=	156	5.19
droxide-(OH-)		0.00
GATIVE SUB-TOTAL	8256	205.64
tal Dissolved Solids	11700 mg/L	
tal Suspended Solids	mg/L	
	8.44 units	
ecific Gravity	1.008 @ 77 F.	
sistivity	el ohm-cm	
-2D	%	
& Grease	mg/L	
rcol	%	
	3amg/L	
	1amg/L	

ALING TENDENCY (LANGELIER
SATURATION INDEX) @ 25 C 1.51
PI @ 25 C 11.1

PROVED BY: _____
DR. JOE BOWDEN, DIRECTOR

ATTACHMENT 5B

HORSESHOE GALLUP UNIT #1

CONVERSION PROCEDURE

1. MIRU pulling unit.

2. POH w/rods and pump. POH w/tbg.

3. RIH w/cone bit and csg scraper. Clean out to PBTD at 1252'. POH tbg, csg scraper and bit.

4. RIH w/2-3/8" tbg and Baker Mode "AD-1" tension pkr at 1060'.

5. Hook up wellhead, flow meters, injection lines; and valves for reading both injection pressures.

NOTE: Existing casing and cementing, as described in the Construction Procedure File and Attachments 3B, are sufficient to satisfy application requirements. Attachments 4A and 4B are the original cementing records. As the regulation in 40 CFR 146.22(c) provides, where no USDW is endangered and the casing/cementing conforms with rules that existed at the time the well was completed, the casing/cementing will be satisfactory to comply with the UIC regulations.

ATTACHMENT 6

HORSESHOE GALLUP UNIT #1

GEOLOGY AND HYDROGEOLOGY

Enclosed here is a narrative description and diagrams describing the geology and hydrogeology of the Horseshoe Gallup Field's area. The injection zone, the confining strata, and other overlaying strata are included. Based on the information supplied here in these Attachments and the geological literature supporting the attachments, it is clear no Underground Source of Drinking Water (USDW), as defined in 40 CFR 144.3 and 146.02, exists in the area of concern.

Geologic and Hydrogeological Attachments

2A - Narrative description on geology of area and determination of no USDW in the area by ARCO geologist, Jim Perkins.

2B - Basis for fracture gradient of injection zone by ARCO reservoir engineer, Bill Severns. This data also supports the injection pressure at which the well will operate.

2C - Large view of cross section index of San Juan Basin, showing location of cross section diagram is ATTACHMENT 2D.

2D - Regional Cross Section of geology near Horseshoe Gallup field.

2E - Cross Section of injection zone specifically showing HSGU #1.

ATTACHMENT 6A

ARCO Oil and Gas Company **Internal Correspondence**

Date: March 2, 1988

Subject: Use of ARCO's Navajo #1 (#1 Horseshoe Gallup) SE SE 32, T31N, R16W for injector well - Geologic Discussion

From/Location: J. M. Perkins - MIO 1303

Telephone:

To/Location: W. C. Severns - MIO 1325

In response to your request regarding the suitability of the #1 Navajo (#1 Horseshoe Gallup) as a water injection well, the following brief geologic discussion is presented. The electric log from the #1 Navajo (SE SE Section 32, T31N, R16W) shows that the well was spud in Tertiary-Quaternary units that are composed of interbedded sands, gravels and shales ranging from completely unconsolidated to well indurated. In this area these deposits are dissected and generally drained of groundwater, and are not considered a major source of water. These deposits overlie the Creataceous Mancos shale in the area of this well and are estimated to be about 180 feet thick.

The Mancos Formation extends from about 180' to the Horseshoe Gallup pay, 1090' deep. Within this interval there are no water-bearing units. This unit, as it occurs in this area, is described in the USGS Water Supply Paper 1576-G (1966) as follows:

> "The Mancos is relatively impermeable and is not a major aquifer....The Mancos serves a thick confining layer over the Dakota and hence water in the Dakota is under artesian pressure" (p.G39)

Since the well in question does not penetrate the Dakota, there is little potential for contamination of this regional aquifer.

This well appears to be entirely suitable for water injection since 1.) The surface formations are discontinuous [and will, for the most part, be cased off from the injected water] and 2.) the upper Mancos shale is considered to be a confining, impermeable unit incapable of serving as an aquifer.

Please contact me if you need further information or assistance.

JP:jw

ATTACHMENT 6B

ARCO Oil and Gas Company **Internal Correspondence**

Date: March 8, 1988

Subject: Fracture Gradient Horseshoe Gallup #1
Horseshoe Gallup Unit
San Juan County, New Mexico

From/Location: W. C. Severns - MIO 1325

Telephone: 688-5286

To/Location: C. T. Stilwell - MIO 1556

As you requested, I attempted to estimate the fracture gradient of the Gallup formation penetrated by the Horseshoe Gallup Unit #1. Horseshoe Gallup Unit #1 injection operations are proposed into the two sand bodies productive in the Horsesnoe Gallup Unit: the upper and lower Gallup sands. Based on two step rate tests (one in upper Gallup and one in lower Gallup) performed in 1983, the fracture gradient should be between 1.05 and 1.10 psi/ft. These are the most recent step rate tests. However, please be aware that since 1986 field operations have changed significantly with many producers and injectors being shut-in. These changes may have affected reservoir pressure and as formation parting pressure is a function of reservoir pressure, it too may have been affected.

Also, attached is a memo from J. M. Perkins, ARCO geologist, stating that no major fresh water sources are penetrated by the Horseshoe Gallup Unit #1. Based on my understanding gained from our past conversations, this minimal risk of ground water contamination may make an exact fracture gradient value unnecessary.

If you have any questions, please call me.

W. C. Severns
Engineer

WCS/lal
Attachment

cc: J. H. Roam - MIO 1302
S. M. O'Malley - MIO 1315
P. D. Willette - MIO 1308
J. M. Perkins - MIO 1303

RECEIVED
MAR 16 1988
Environmental Safety & Health

ATTACHMENT 6C

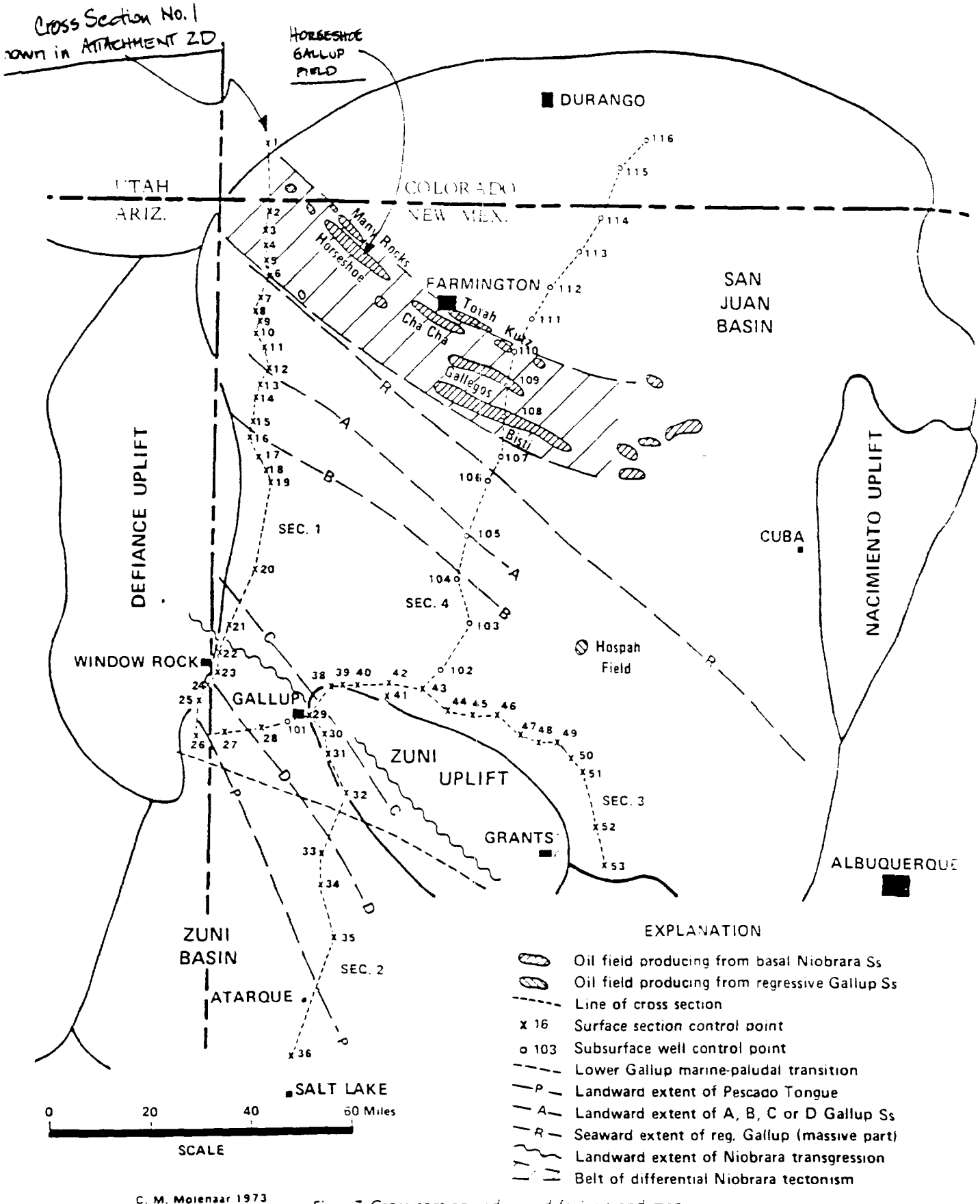


Fig. 7 Cross section index and facies trend map.

Regional Cross Section of Geology near Horseshoe Gallup Field

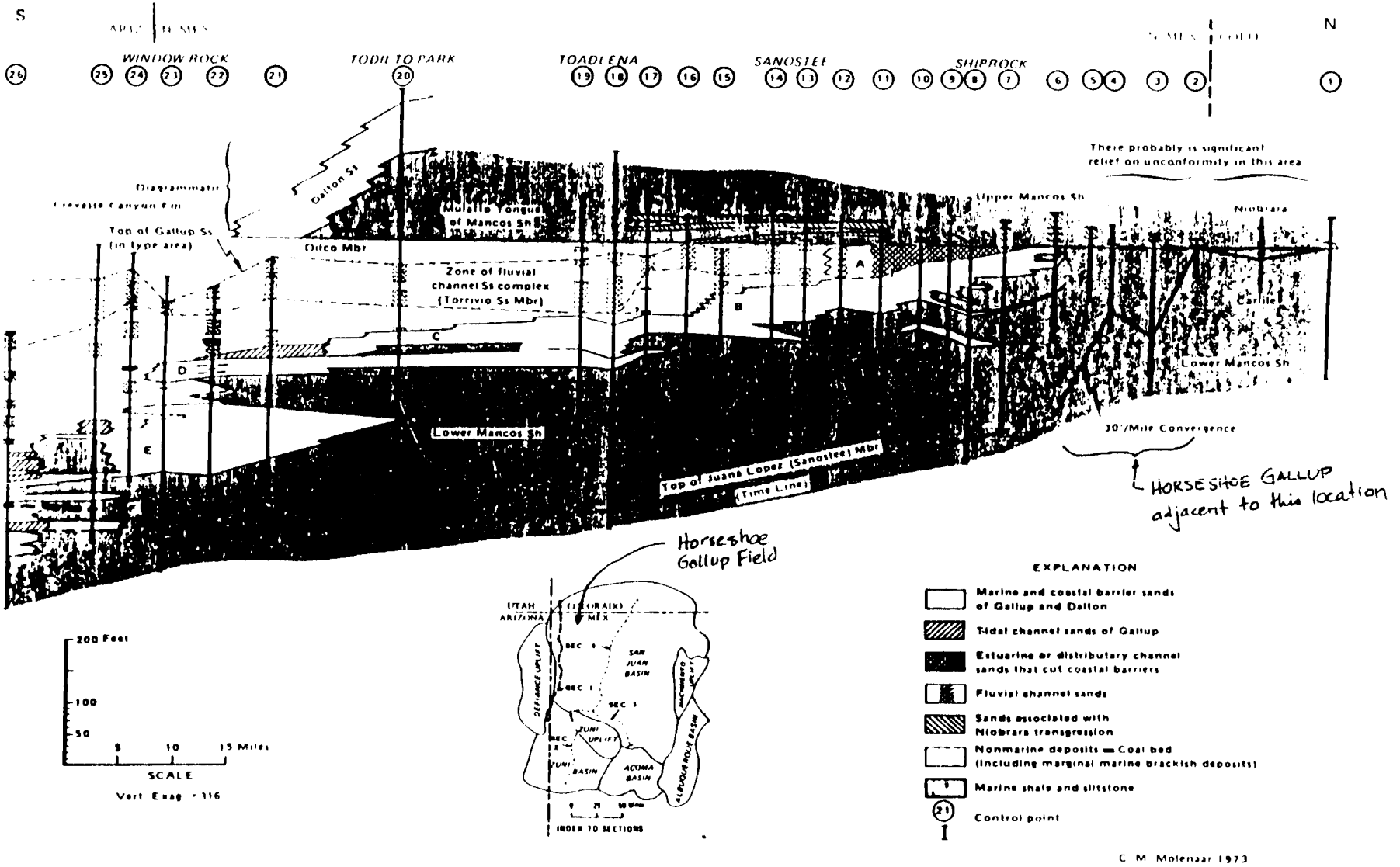


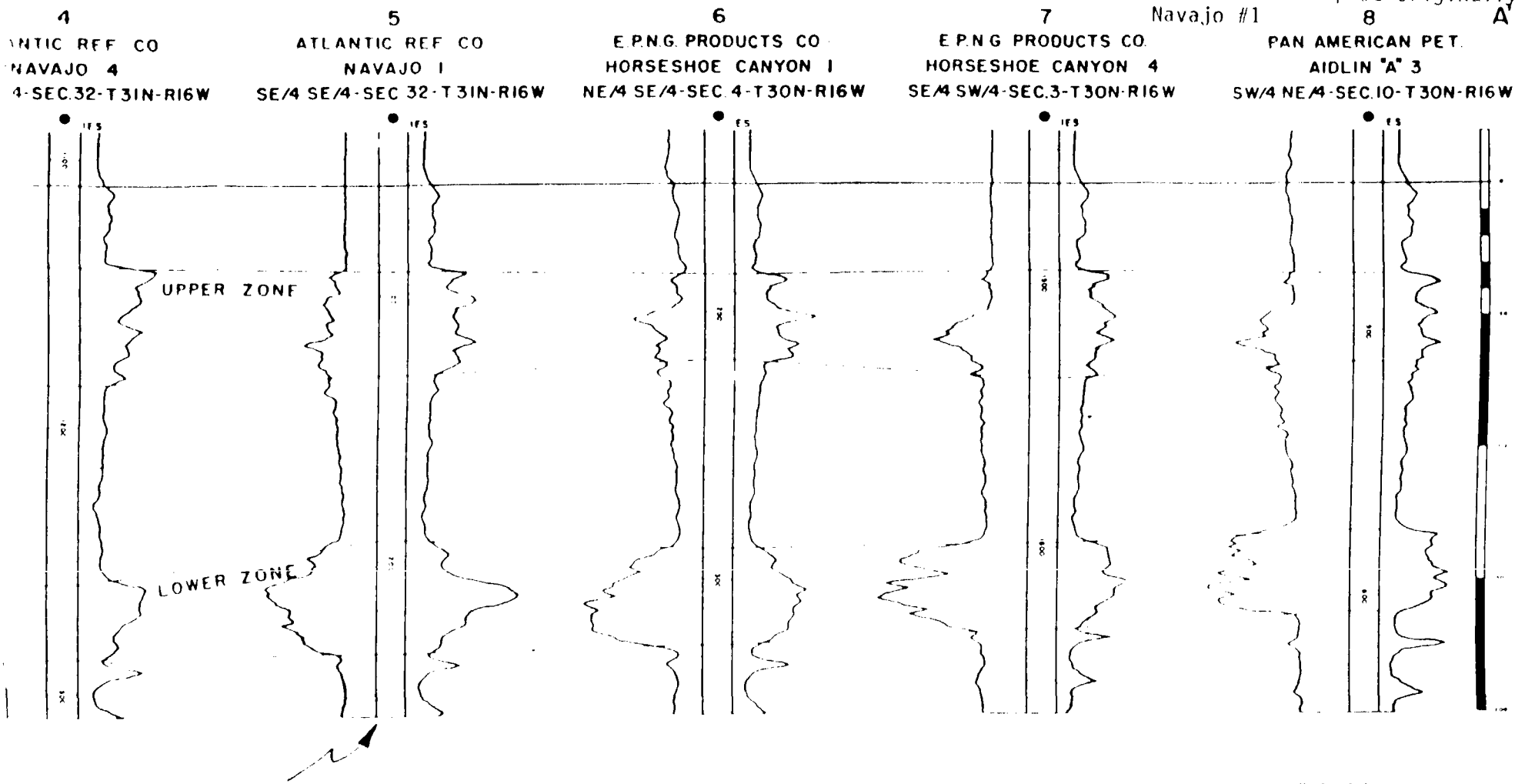
Fig. 8 Cross section No. 1: West side of San Juan Basin.

ATTACHMENT 6L

Cross Section of Injection Zone

Horseshoe Gallup #1 Originally Nam

Navajo #1



Cross Section of Horseshoe Gaalup Unit #1
(originally named Navajo Well #1)

FIGURE 10

ARCO Oil and Gas Company

Central District Midland, Texas

HORSESHOE-GALLUP UNIT

San Juan Co., New Mexico

LONGITUDAL CROSS-SECTION
A-A'

CROSS-SECTION TRACES
SHOWN ON FIG. 7

By:	Drawn By	Date
Date	Revised By:	Date
Dept	Dwg. No.	

ATTACHMENT 6A

ARCO Oil and Gas Company **Internal Correspondence**

Date: March 2, 1988

Subject: Use of ARCO's Navajo #1 (#1 Horseshoe Gallup) SE SE 32, T31N, R16W for injector well - Geologic Discussion

From/Location: J. M. Perkins - MIO 1303

Telephone:

To/Location: W. C. Severns - MIO 1325

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Please contact me if you need further information or assistance.

JP:jw

ATTACHMENT 6B

ARCO Oil and Gas Company **Internal Correspondence**

Date: March 8, 1988

Subject: Fracture Gradient Horseshoe Gallup #1
Horseshoe Gallup Unit
San Juan County, New Mexico

From/Location: W. C. Severns - MIO 1325

Telephone: 688-5286

To/Location: C. T. Stilwell - MIO 1556

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If you have any questions, please call me.

W. C. Severns

W. C. Severns
Engineer

WCS/lal
Attachment

cc: J. H. Roam - MIO 1302
S. M. O'Malley - MIO 1315
P. D. Willette - MIO 1308
J. M. Perkins - MIO 1303

RECEIVED

MAR 16 1988

Environmental Safety & Health

ATTACHMENT 6C

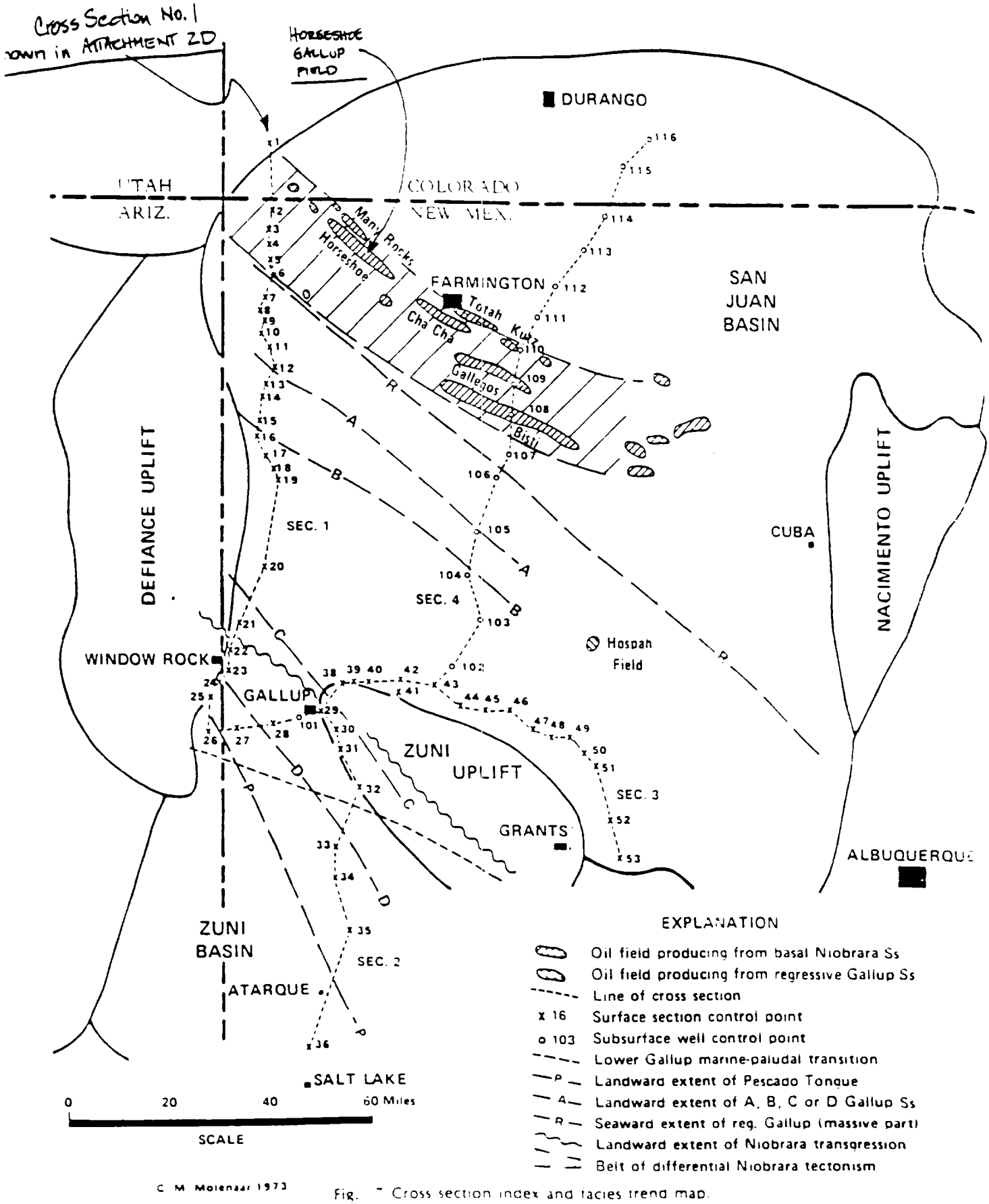

Fig. - Cross section index and facies trend map.

Regional Cross Section of Geology near Horseshoe Gallup Field

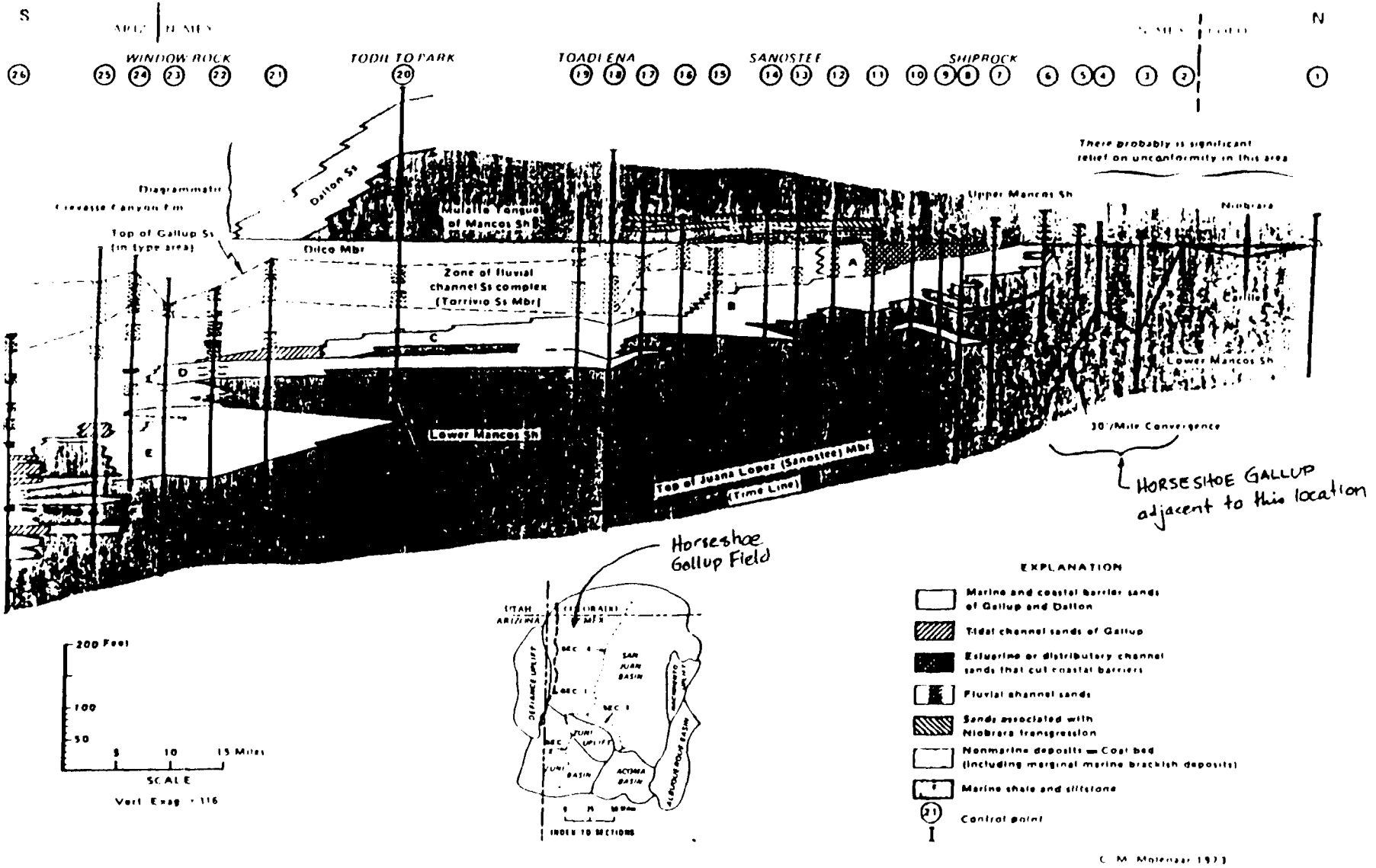

Fig. 8 Cross section No. 1: West side of San Juan Basin.

ATTACHMENT 8

HORSESHOE GALLUP #1 WELL

VERIFICATION OF NOTICE GIVEN TO LANDOWNER

As required by 40 CFR 147.3002, notice was sent to the Navajo Indian Tribe, which is the sole surface and mineral owner in the area. This notice was in the form of a letter to The Navajo Nation, at the address below:

The Navajo Nation
Navajo EPA
P.O. Box 308
Window Rock, Navajo Nation Arizona

No tenants or operators other than ARCO are within one-half mile of the HSGU #1 Well. At the suggestion of Mr. Raymond Roessel of the UIC Department of the Navajo EPA, the notice was sent to the Navajo EPA.

ATTACHMENT 9

HORSESHOE GALLUP #1

ALTERNATIVE PROOF OF MECHANICAL INTEGRITY

1. To demonstrate there is no significant fluid movement through channels adjacent to the well bore, enclosed are cementing records (Attachment 4A). This demonstration is sufficient to satisfy the regulatory requirement, as stated in 40 CFR 146.08, because of the fact no Underground Source of Drinking Water (as defined in UIC regulations, see ATTACHMENT 6 for proof) exists near the HSGU #1 Well.

2. To demonstrate there are no significant leaks in the casing, tubing or packer, monitoring will be performed showing the absence of significant changes in the relationship between injection pressures and low injection low rate as allowed by 40 CFR 146.08(b)(3). Additionally, the casing-casing annulus pressure will be monitored. This "Bradenhead" monitoring is currently being done successfully in existing injection wells in the Horseshoe Gallup Field. See the specific monitoring procedures below.

   This demonstration, with no initial annulus pressure test, is justified because no USDW exists as explained in ATTACHMENT 6.

MONITORING PROCEDURES

1. The casing-casing annulus pressure, injection pressures, and injection flow rates will be recorded weekly by the operator in the field. More frequent observations of the well will be made on the operator's routine rounds in the field.

2. The observations and data recorded in 1. above will be analyzed for any abnormal increase or decrease which may indicate a leak in the well's casing.

3. Weekly values of the casing-casing annulus, injection pressures, and injection flow rates will be summarized in a report to the Navajo's UIC office. This report will be submitted annually, starting one year after the permit's issuance.

4. Data on cumulative volume of water injected into the well will be available in BLM's Monthly Report of Operations (BLM Form 3160-3). This report will be sent to the Navajo UIC office upon request.

NOTE: The above procedure satisfies the following:

a. UIC Monitoring Requirements described in 40 CFR 146.23(b); and

b. UIC Mechanical Integrity demonstration in 40 CFR 146.08(b)(1) for proof of no significant leaks in the casing, tubing, or packer. The second Mechanical Integrity demonstration in 40 CFR 146.08(c)(2) is satisfied by submitting the cementing records (ATTACHMENTS 4A and 4B). These are sufficient demonstrations given the fact no Underground Sources of Drinking Water exist in the area.

ATTACHMENT 10

HORSESHOE GALLUP #1 WELL

PROOF OF FINANCIAL RESPONSIBILITY

Attached are copies of two nationwide bonds which Atlantic Richfield Company (ARCO Oil and Gas Company is a division of Atlantic Richfield) has secured for activity on BLM and Indian lands. One or both of these bonds should satisfy the Financial Responsibility requirements of the UIC regulations.

Form 3000-4
(June 1987)
(Formerly
3104-1, 3104-2, 3104-8,
3106-4, 3200-12,
3200-13, 3200-16)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OIL AND GAS OR GEOTHERMAL LEASE BOND

Act of February 25, 1920 (30 U.S.C. 181 et seq.)
Act of August 7, 1947 (30 U.S.C. 351-359)
Department of the Interior Appropriations Act, FY 1981 (94 Stat. 2959)
Act of December 24, 1970 (30 U.S.C. 1001-1025)
Other Oil and Gas and Geothermal Leasing Authorities as Applicable

Bond Number

U-630642

Lease Serial Number (For Individual Bond Only)

CHECK ONE: ☒ OIL AND GAS ☐ GEOTHERMAL RESOURCES

CHECK ONE:

☒ SURETY BOND

KNOW ALL BY THESE PRESENTS, THAT ATLANTIC RICHFIELD COMPANY, a Delaware corporation
(name)

of Post Office Box 2819, Dallas, Texas 75221
(address)

as principal, and UNITED PACIFIC INSURANCE COMPANY, a Washington corporation
(name)

of 505 North Brand Boulevard, Glendale, California 91203, as surety,
(address)

are held and firmly bound unto the United States of America in the sum of ONE HUNDRED FIFTY THOUSAND AND NO/100----------

---------- dollars ($ 150,000.00----------),

lawful money of the United States, which may be increased or decreased by a rider hereto executed in the same manner as this bond.

☐ PERSONAL BOND

IN THE FORM OF (CHECK ONE) ☐ CASH or ☐ NEGOTIABLE SECURITIES

KNOW ALL BY THESE PRESENTS, That _____
(name)

of _____, as obligor, is held and firmly
(address)

bound unto the United States of America in the sum of _____

_____ dollars ($ _____), lawful money of the United States which sum may be

increased or decreased by a rider hereto executed in the same manner as this bond.

The obligor, in order to more fully secure the United States in the payment of the aforesaid sum, hereby pledges as security therefore United States negotiable securities or cash, of a par value equal to the amount specified.

The obligor, pursuant to the authority conferred by Section 1 of the Act of September 13, 1982 (31 U.S.C. 9303), does hereby constitute and appoint the Secretary of the Interior to act as his attorney. The interest accruing on the United States securities deposited, in the absence of any default in the performance of any of the conditions, or stipulations set forth in this bond and the instrument(s) granting rights and interests in Federal lands, must be paid to the obligor. The obligor hereby for himself, herself, any heirs, executors, administrators, successors, and assigns, joint and severally, ratifies and confirms whatever the Secretary shall do by virtue of these presents.

The principal surety shall apply this bond or the Secretary shall transfer this deposit as security for the faithful performance of any and all of the conditions and stipulations as set forth in this bond and the instruments granting rights and interests in Federal lands. In the case of any default in the performance of the conditions and stipulations of such undertaking, it is agreed that: (1) for a Surety Bond, the surety-principal shall apply the bond or any portion thereof; (2) for a Personal Bond, the Secretary shall have full power to assign, appropriate, apply or transfer the deposit or any portion thereof, to the satisfaction of any damages, assessments, late payment charges, penalties, or deficiencies arising by reason of such default.

This bond is required for the use and benefit of (1) the United States; (2) the owner of any of the land subject to the coverage of this bond, who has a statutory right to compensation in connection with a reservation of the oil and gas and geothermal deposits to the United States, (3) any lessee, permittee, or contractor, under a lease, permit, or resource sale contract issued, or to be issued, by the United States covering the same land subject to this bond, covering the use of the surface or the prospecting for, or the development of other mineral deposits in any portion of such land, to be paid to the United States. For such payment, well and truly to be made, we bind ourselves and each of our heirs, executors, administrators, successors, and assigns, jointly and severally.

CHECK ONE

☒ NATIONWIDE BOND — This bond shall cover all operations conducted on Federal land by or on behalf of the principal obligor in the United States except the National Petroleum Reserve in Alaska (NPR-A) and provided a rider is obtained, coverage of multiple exploration operations.

☐ STATEWIDE BOND — This bond shall cover all operations conducted on Federal land by or on behalf of the principal obligor except the NPR-A and, provided a rider is obtained, also shall cover multiple explorations within the single State of _____

☐ INDIVIDUAL BOND — This bond shall cover all operations conducted by or on behalf of the principal obligor on the single lease identified by serial number above.

NATIONAL PETROLEUM RESERVE IN ALASKA (NPR-A) BOND — This bond shall cover

☐ NPR-A LEASE BOND — The terms and conditions of a single lease.

☐ NPR-A WIDE BOND — The terms and conditions of all leases, and provided a rider is obtained, coverage of multiple exploration operations.

UNITED PACIFIC INSURANCE COMPANY

HEAD OFFICE, FEDERAL WAY, WASHINGTON

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, That the UNITED PACIFIC INSURANCE COMPANY, a corporation duly organized under the laws of the State of Washington, does hereby make, constitute and appoint

W. C. DOYLE of LOS ANGELES, CALIFORNIA ----------

its true and lawful Attorney-in-Fact, to make, execute, seal and deliver for and on its behalf, and as its act and deed

ANY AND ALL BONDS AND UNDERTAKINGS OF SURETYSHIP ------

and to bind the UNITED PACIFIC INSURANCE COMPANY thereby as fully and to the same extent as if such bonds and undertakings and other writings obligatory in the nature thereof were signed by an Executive Officer of the UNITED PACIFIC INSURANCE COMPANY and sealed and attested by one other of such officers, and hereby ratifies and confirms all that its said Attorney(s)-in-Fact may do in pursuance hereof.

This Power of Attorney is granted under and by authority of Article VII of the By-Laws of UNITED PACIFIC INSURANCE COMPANY which became effective September 7, 1978, which provisions are now in full force and effect, reading as follows.

ARTICLE VII - EXECUTION OF BONDS AND UNDERTAKINGS

1. The Board of Directors, the President, the Chairman of the Board, any Senior Vice President, any Vice President or Assistant Vice President or other officer designated by the Board of Directors shall have power and authority to (a) appoint Attorneys-in-Fact and to authorize them to execute on behalf of the Company, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and (b) to remove any such Attorney-in-Fact at any time and revoke the power and authority given to him.

2. Attorneys-in-Fact shall have power and authority, subject to the terms and limitations of the power of attorney issued to them, to execute and deliver on behalf of the Company, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof. The corporate seal is not necessary for the validity of any bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof.

3. Attorneys-in-Fact shall have power and authority to execute affidavits required to be attached to bonds, recognizances, contracts of indemnity or other conditional or obligatory undertakings and they shall also have power and authority to certify the financial statement of the Company and to copies of the By Laws of the Company or any article or section thereof.

This power of attorney is signed and sealed by facsimile under and by authority of the following Resolution adopted by the Board of Directors of UNITED PACIFIC INSURANCE COMPANY at a meeting held on the 5th day of June, 1979, at which a quorum was present, and said Resolution has not been amended or repealed.

> "Resolved, that the signatures of such directors and officers and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the UNITED PACIFIC INSURANCE COMPANY has caused these presents to be signed by its Vice President, and its corporate seal to be hereto affixed, this 23rd day of June 19 87

UNITED PACIFIC INSURANCE COMPANY

Charles B. Schmalz

Vice President

STATE OF Washington
COUNTY OF King } ss.

On this 23rd day of June, 19 87 personally appeared Charles B. Schmalz

to me known to be the Vice-President of the UNITED PACIFIC INSURANCE COMPANY, and acknowledged that he executed and attested the foregoing instrument and affixed the seal of said corporation thereto, and that Article VII, Section 1, 2, and 3 of the By-Laws of said Company, and the Resolution, set forth therein, are still in full force.

My Commission Expires:

May 15, 1990

Pamela Young

Notary Public in and for State of Washington

Residing at Tacoma

I, Lawrence W. Carlstrom, Assistant Secretary of the UNITED PACIFIC INSURANCE COMPANY, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by said UNITED PACIFIC INSURANCE COMPANY, which is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Company this 3rd day of February 19 88

I, JAMES R. COFFEE, Assistant Secretary of ATLANTIC RICHFIELD COMPANY, a Delaware corporation, hereby certify that the following is a true copy of a Power of Attorney executed on August 1, 1985, in favor of J. D. HENRY, by ATLANTIC RICHFIELD COMPANY, a Delaware corporation, acting by and through its authorized officers, JAMES A. MIDDLETON, Senior Vice President, and DAVID ASTON, Assistant Secretary.

POWER OF ATTORNEY [GENERAL]

KNOW ALL MEN BY THESE PRESENTS:

That ATLANTIC RICHFIELD COMPANY, a corporation duly organized under the laws of the State of Delaware, does hereby make, constitute and appoint for a term commencing on the date hereof and expiring on August 1, 1988, J. D. HENRY, its true and lawful attorney for it and in its name and behalf to execute any contract, agreement, release, assignment, lease, conveyance, deed, transfer of real or personal property and any other instrument, in the name and on behalf of ATLANTIC RICHFIELD COMPANY, which he may deem necessary or proper in connection with the business of ATLANTIC RICHFIELD COMPANY. The said J. D. HENRY, as Attorney in Fact, is empowered to execute, acknowledge and deliver any such instruments or documents as fully as if special authority had been granted in each particular case by the Board of Directors of ATLANTIC RICHFIELD COMPANY.

EXECUTED as of the 1st day of August, 1985.

ATTEST: ATLANTIC RICHFIELD COMPANY

/s/ David Aston
David Aston
Assistant Secretary

By /s/ James A. Middleton
James A. Middleton
Senior Vice President

I further certify that such Power of Attorney remains in force and effect as of the date of this certification.

WITNESS MY HAND AND SEAL this 9th day of February, 1988.

James R. Coffee
Assistant Secretary
Atlantic Richfield Company
a Delaware corporation

Bond No. U62 94 84

Form 5-156
Oct. 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

NATIONWIDE OIL AND GAS LEASE BOND

KNOW ALL MEN BY THESE PRESENTS, That we, Atlantic Richfield Company, A Delaware corporation, of P. O. Box 2819, Dallas, TX 75221 as principal, and United Pacific Insurance Company, of One Dallas Centre, Dallas, Texas 75201 as surety, are held and firmly bound unto the United States of America in the sum of seventy-five thousand dollars ($75,000), lawful money of the United States, for the payment of which, well and truly to be made, we bind ourselves and each of us, our and each of our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

Sealed with our seals and dated this 12th day of June, 1987

The condition of this obligation is such that whereas the said principal has heretofore or may hereafter enter into or otherwise acquire an interest in oil and gas mining leases and oil and gas prospecting permits of various dates and periods of duration covering lands or interests in lands held by the United States in trust for individual Indians, or tribes or bands of Indians, or subject to restrictions against alienation without the consent of the Secretary of the Interior or his authorized representative, which leases and permits have been or may hereafter be granted or approved by the Secretary of the Interior or his authorized representative, and the identification of which herein is expressly waived by both principal and surety hereto.

WHEREAS the principal and surety agree that the coverage of this bond shall extend to and include all extensions and renewals of leases and permits covered by this bond, such coverage to continue without any interruption due to the expiration of the term set forth therein.

WHEREAS the surety hereby waives any right to notice of any modification of any such lease or permit, or obligation thereunder whether effected by extension of time for performance, by commitment of such lease to unit, cooperative, or communitization agreement, by waiver, suspension, or change in rental, except an increase thereof, by minimum royalty payment, except an increase thereof, by compensatory royalty payment, or otherwise, this bond to remain in full force and effect notwithstanding.

WHEREAS the principal and surety agree that the neglect or forbearance of the obligee of any such lease or permit in enforcing the payment of any rental or royalty or the performance of any other covenant, condition, or agreement of any such lease or permit shall not in any way release the principal and surety, or either of them, from any liability under this bond; and

WHEREAS the principal and surety agree that in the event of any default under any such lease or permit, the obligee may prosecute any claim, suit, action, or other proceeding against the principal and surety, or either of them, without the necessity of joining the other.

Now, if the said principal herein shall faithfully carry out and observe all the obligations assumed in said leases and permits to which Atlantic Richfield Company is now or may hereafter become a party, and shall observe all the [illegible]

tions made, or which shall be . .de, thereunder, for the government of ..ade and intercourse with Indian tribes, and all rules and regulations that have been or shall hereafter be lawfully prescribed by the Secretary of the Interior relative to said oil and gas mining leases and permits, and shall in all particulars comply with the provisions of said leases, permits, rules and regulations, then this obligation shall become null and void; otherwise, to remain in full force and effect.

The rate of premium charged on this bond is $ 750.00; the total premium paid is $ 750.00

Signed and sealed in the presence of—

WITNESSES*

Linda Buchanan

P. O. P.O. Box 2819, Dallas, TX 75221

P. O. Susan Strickland P.O. Box 2819, Dallas, TX 75221

as to Atlantic Richfield Company [SEAL]

By J. H. Kinney

ATTEST:

P. O. Diane McCallom One Dallas Centre, Dallas TX

P. O. Douglas E. Miland One Dallas Centre, Dallas TX

as to United Pacific Insurance Company [SEAL]

By Donald H. Lipper

Donald H. Lipper Attorney-In-Fact

P. O.

P. O.

as to [SEAL]

P. O.

P. O.

as to [SEAL]

*Two witnesses to each signature.

DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
Washington 25, D. C.

....., 19....

Approved:

Commissioner of Indian Affairs.

U. S. GOVERNMENT PRINTING OFFICE : 1957—O-413466

UNITED PACIFIC INSURANCE COMPANY

HOME OFFICE, FEDERAL WAY, WASHINGTON

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, That the UNITED PACIFIC INSURANCE COMPANY, a corporation duly organized under the laws of the State of Washington, does hereby make, constitute and appoint Donald H. Lipper of Dallas, Texas

its true and lawful Attorney-in-Fact, to make, execute, seal and deliver for and on its behalf, and as its act and deed any and all bonds and undertakings of Suretyship,

and to bind the UNITED PACIFIC INSURANCE COMPANY thereby as fully and to the same extent as if such bonds and undertakings and other writings obligatory in the nature thereof were signed by an Executive Officer of the UNITED PACIFIC INSURANCE COMPANY and sealed and attested by one other of such officers, and hereby ratifies and confirms all that its said Attorney(s)-in-Fact may do in pursuance hereof.

This Power of Attorney is granted under and by authority of Article VII of the By-Laws of UNITED PACIFIC INSURANCE COMPANY which became effective September 7, 1978, which provisions are now in full force and effect, reading as follows:

ARTICLE VII – EXECUTION OF BONDS AND UNDERTAKINGS

1. The Board of Directors, the President, the Chairman of the Board, any Senior Vice President, any Vice President or Assistant Vice President or other officer designated by the Board of Directors shall have power and authority to (a) appoint Attorneys-in-Fact and to authorize them to execute on behalf of the Company, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and (b) to remove any such Attorney-in-Fact at any time and revoke the power and authority given to him.

2. Attorneys-in-Fact shall have power and authority, subject to the terms and limitations of the power of attorney issued to them, to execute and deliver on behalf of the Company, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof. The corporate seal is not necessary for the validity of any bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof.

3. Attorneys-in-Fact shall have power and authority to execute affidavits required to be attached to bonds, recognizances, contracts of indemnity or other conditional or obligatory undertakings and they shall also have power and authority to certify the financial statement of the Company and to copies of the By-Laws of the Company or any article or section thereof.

This power of attorney is signed and sealed by facsimile under and by authority of the following Resolution adopted by the Board of Directors of UNITED PACIFIC INSURANCE COMPANY at a meeting held on the 5th day of June, 1979, at which a quorum was present, and said Resolution has not been amended or repealed:

> "Resolved, that the signatures of such directors and officers and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the UNITED PACIFIC INSURANCE COMPANY has caused these presents to be signed by its Asst. Vice President, and its corporate seal to be hereto affixed, this 14th day of November 19 84

UNITED PACIFIC INSURANCE COMPANY

SEAL

Asst. Vice President

STATE OF Pennsylvania
COUNTY OF Philadelphia } ss.

On this 14th day of November, 19 84, personally appeared Enrico J. Pennisi, Jr.
Asst.
to me known to be the Vice-President of the UNITED PACIFIC INSURANCE COMPANY, and acknowledged that he executed and attested the foregoing instrument and affixed the seal of said corporation thereto, and that Article VII, Section 1, 2, and 3 of the By-Laws of said Company, and the Resolution, set forth therein, are still in full force.

My Commission Expires:

May 24, 1986

Notary Public in and for State of Pennsylvania

Residing at Philadelphia

I, P. D. Crossetta, Assistant Secretary of the UNITED PACIFIC INSURANCE COMPANY, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by said UNITED PACIFIC INSURANCE COMPANY, which is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Company this 12th day of June 1987

SEAL

Assistant Secretary

SDU-1431 Ed. 6/79

I, JAMES R. COFFEE, Assistant Secretary of ATLANTIC RICHFIELD COMPANY, a Delaware corporation, hereby certify that the following is a true copy of a Power of Attorney executed on August 1, 1985, in favor of J. D. HENRY, by ATLANTIC RICHFIELD COMPANY, a Delaware corporation, acting by and through its authorized officers, JAMES A. MIDDLETON, Senior Vice President, and DAVID ASTON, Assistant Secretary.

POWER OF ATTORNEY [GENERAL]

KNOW ALL MEN BY THESE PRESENTS:

That ATLANTIC RICHFIELD COMPANY, a corporation duly organized under the laws of the State of Delaware, does hereby make, constitute and appoint for a term commencing on the date hereof and expiring on August 1, 1988, J. D. HENRY, its true and lawful attorney for it and in its name and behalf to execute any contract, agreement, release, assignment, lease, conveyance, deed, transfer of real or personal property and any other instrument, in the name and on behalf of ATLANTIC RICHFIELD COMPANY, which he may deem necessary or proper in connection with the business of ATLANTIC RICHFIELD COMPANY. The said J. D. HENRY, as Attorney in Fact, is empowered to execute, acknowledge and deliver any such instruments or documents as fully as if special authority had been granted in each particular case by the Board of Directors of ATLANTIC RICHFIELD COMPANY.

EXECUTED as of the 1st day of August, 1985.

ATTEST: ATLANTIC RICHFIELD COMPANY

/s/ David Aston
David Aston
Assistant Secretary

By /s/ James A. Middleton
James A. Middleton
Senior Vice President

I further certify that such Power of Attorney remains in force and effect as of the date of this certification.

WITNESS MY HAND AND SEAL this 13th day of August, 1987.

James R. Coffee
Assistant Secretary
Atlantic Richfield Company
a Delaware corporation

ATTACHMENT 11

PLUGGING AND ABANDONMENT PROCEDURE

1) MIRU. RIH below the bottom perforation w/tbg open ended. Pump sufficient cement inside casing to cover top perforation by 50'.

2) POH w/tbg. GIH w/wireline and perforate casing as specified by New Mexico Oil Commission. Perf approximately 20 ft. below surface csg. bottom. Number of shots should be sufficient to allow cement squeeze. POH w/wireline. GIH w/tbg. open ended. Squeeze cement to provide plug inside and outside of casing to surface.

3) POH w/tbg. Cut casing one foot below ground level. Weld a blind flange to casing, and weld a dry hole marker on blind flange. Fill hole and move off.

4) Rehabilitate location and access road using stipulations supplied by the Bureau of Land Management.

5) Estimated cost of P/A: $5,000

ARCO Oil and Gas Company
Central District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 688 5200

June 8, 1989

Mr. David Catanack
UIC Section
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

Dear Mr. Catanack:

Subject: Proof of Public Notice and Landowner Notification
ARCO HSGU #1 Injection Well
San Juan County, New Mexico

Enclosed is proof ARCO Oil and Gas Company published a legal advertisement and notified the Ute Mountain Indian Tribe of our intention to convert the Horseshoe Gallup #1 Well into an injection well. I trust this is the final information needed to issue a permit from your agency.

Sincerely,

C. T. Stilwell
Environmental Coordinator

RECEIVED
JUN 12 1989
OIL CONSERVATION DIV.
SANTA FE

CTS:pjk

Attachments

P 649 119 639
RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to	Tribal Energy Dept
Street and No.	Ute Mountain Indian Tribe
P.O., State and ZIP Code	P.O. Box 54 Towaoc CO 81334
Postage	$ 2.40
Certified Fee	.85
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	.90
Return Receipt showing to whom, Date and Address of Delivery	
TOTAL Postage and Fees	$ 4.15
Postmark or Date	

PS Form 3800, June 1985

201 LEGALS

NOTICE

ARCO Oil and Gas Company intends to convert an existing shut in oil well for use as an injection well in their Horseshoe Gallup Field. The Horseshoe Gallup #1 Well will be converted as a minor expansion of the existing waterflood in the field. Below is specific data on the well to be converted:

1. Legal Location: 660' FSL, 417' FEL, Section 32, T-31N, R-16W, San Juan County, New Mexico
2. Depth and Formation of Injection/ Producing Zone: 1091'-1233', Gallup Formation
3. Maximum Injection Rate: 500 BPD. Maximum Injection Pressure: 900 psig (surface)
4. ARCO Contact: Dave Corzine, ARCO Oil & Gas Company, 1816 E. Mojave, Farmington, New Mexico 87401 (505) 325-7527

Interested parties must file objections to this activity or request a hearing from the New Mexico Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days of this notice.

Legal No. 23562 published in the Farmington Daily Times, Farmington, New Mexico on Saturday, May 27, 1989.

STATE OF NEW MEXICO

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

OIL CONSERVATION DIVISION
BOX 2088
SANTA FE, NEW MEXICO 87501

DATE 5-12-89

RE: Proposed MC _____
Proposed DHC _____
Proposed NSL _____
Proposed SWD _____
Proposed WFX X
Proposed PMX _____

Gentlemen:

I have examined the application dated 5-11-89

for the ARCO OIL & GAS CO. — Horseshoe Gallup Unit #1 — 32-31N-16W
Operator — Lease and Well No. — Unit, S-T-R

and my recommendations are as follows:

Approve

Yours truly,

[signature]