



Amoco Production Company

2325 East 30th
Farmington, New Mexico 87401
505-325-8841

R. J. Broussard
District Manager

October 7, 1987

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501

FILE: GOM-125-400.1

*Ed Alizadeh
326-9229*

Conversion of Gallegos Federal No. 1
to a Water Disposal Well, San Juan County, New Mexico

Gentlemen:

Amoco Production Company requests approval to convert the Gallegos Federal No. 1 to a water disposal well. This well was originally drilled as a gas well, but never produced.

The original perforated intervals 5910' - 5986' and 4910' - 5160' will be isolated with a cast iron bridge plug set at 4850'. Five sacks of cement will be placed on top of bridge plug. The proposed injection interval, 2828' - 3908', is in the Blanco Mesaverde formation. The proposed zone is a sandstone which is permeable enough to accept fluids after stimulation. We will perform small matrix acid jobs on all perforated intervals. Expected injection rates will average 100 BWPD to a maximum of 500 BWPD. Proposed average injection pressures are 800 psi to a maximum of 2000 psi. The system will be closed.

The Ojo Alamo formation is an underground source of drinking water. The depth of the zone is 0' to 320'. One producing fresh water well was discovered .6 miles from the proposed injection well. The water is pumped for stock animals. Based on available geological evidence, no faults or breaks are evident within the area of review.

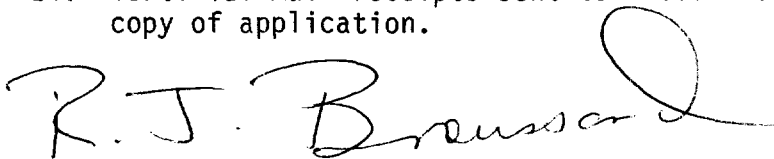
Water analysis comparisons between the injection fluid (GCU 244) and receiving formation water (State Gas Com I #1A) reveals no significant scaling tendencies when the waters are mixed.

The lease on the well expires May, 1989. Per telephone conversation with Arlin Heimer at the BLM in Farmington, a ROW is allowed to operate a disposal well with a "written policy Statement." Please inform us of any additional information required to continue using this well as a disposal well after the lease expires.

In compliance with the Form C-108, find attached an original and one copy with each of the following:

Attachment No.:

1. "Well Location and Dedication Plat" (NMOCD Form -102).
2. Location map showing all wells and leases within two miles of the proposed injection well.
3. List of names and addresses of outside operated wells and lease owners within the one half mile area of review.
4. A copy of the letter sent to all offset operators and surface land owners notifying them of our intent to convert to a disposal well.
5. Newspaper legal printed in Farmington Daily Times.
6. Water analysis for fresh water well.
7. Location map of fresh water well.
8. Water analysis for GCU 244, sample of injection fluid.
9. Water analysis for State Gas Com I #1A, sample of receiving formation.
10. Computer analysis of compatibility of GCU 244 and State Gas Com I #1A.
11. Injection Well Data Sheet for Gallegos Federal No. 1.
12. Tabulation of data for Hanson B-1. (Kimoco #1 & Odessa #1 do not penetrate injection zone)
13. Schematic of Plugging Detail of Hanson B-1.
14. Certified mail receipts sent to those listed in Attachment No. 4 with copy of application.

A handwritten signature in black ink, appearing to read "R. J. Bruns", with a large, stylized flourish extending from the end of the name.

VAC:ps

APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no
- II. Operator: Amoco Production Company
Address: 2325 E. 30th Street, Farmington, NM 87401
Contact party: Ed Alizadeh Phone: 325-8841
- III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- * VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- * X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)
- * XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification
- I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- Name: R. J. Broussard Title: District Manager
Signature: R. J. Broussard Date: _____
- * 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. _____

III. WELL DATA

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

- (1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

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

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

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

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

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

- (1) The name, address, phone number, and contact party for the applicant;
- (2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) the formation name and depth with expected maximum injection rates and pressures; and
- (4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

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

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

STATE OF NEW MEXICO
OIL AND MINERALS DEPARTMENT

U.S. CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-107
Revised 10-1

All distances must be from the outer boundaries of the Section.

Operator AMOCO PRODUCTION COMPANY			Lease AMOCO-FEDERAL-GALLEGOS		Well No. 1
Unit Letter E	Section 25	Township 27N	Range 13W	County San Juan	
Actual Footage Location of Well:					
1850		feet from the North	line and 790	feet from the West	line
Ground Level Elev: 5961	Producing Formation Wildcat		Pool Wildcat	Dedicated Acreage: unspaced Acres	

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.

1850'			
790'			
		Sec.	
RECEIVED 25 AUG 15 1984 BUREAU OF LAND MANAGEMENT FARMINGTON RESOURCE AREA			

CERTIFICATION

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

Original Signed By
B. D. Shaw

Name
B.D. Shaw

Position
Administrative Supervisor

Company
Amoco Production Company

Date
8-8-84

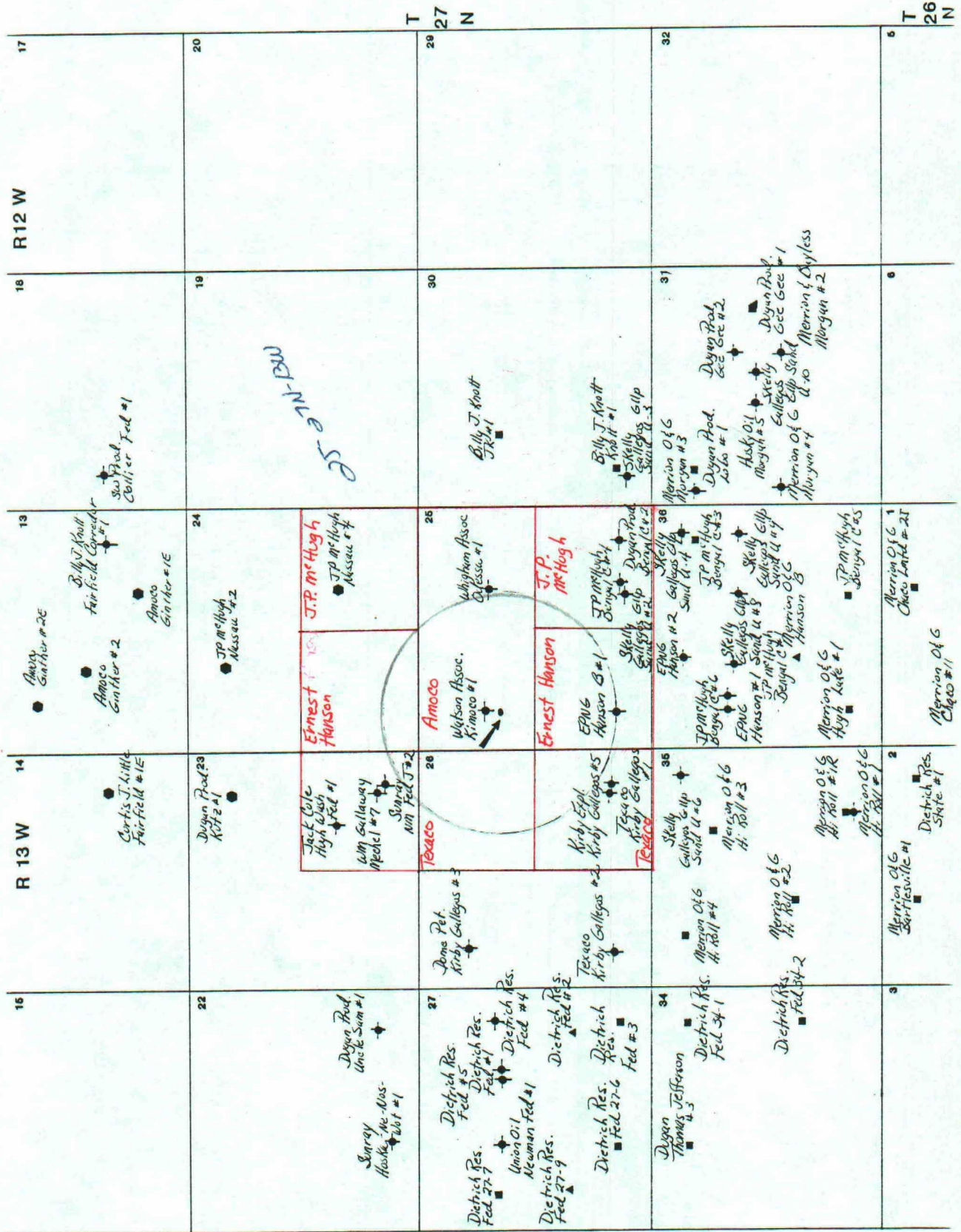
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
June 29, 1984

Registered Professional Engineer and Land Surveyor
Fred. E. Kerr Jr.

Certificate No. **4220**
3050

Scale: 1"=1000'



Navajo Tribe
P.O. Box 146
Window Rock, AZ 86515

Texaco
P.O. Box EE
Cortez, CO 81321

Ernest Hanson
P.O. Box 1515
Roswell, NM 88201

Jerome P. McHugh
650 S. Cherry #1225
Denver, CO 80222



Amoco Production Company

2325 East 30th
Farmington, New Mexico 87401
505-325-8841

R. J. Broussard
District Manager

October 6, 1987

(See attached Addressee List)

File: GOM-124-400.1

Proposed Conversion of Gallegos Federal No. 1
to a Water Disposal Well, San Juan County, New Mexico

Dear Sir:

This to to advise you that Amoco Production Company (Farmington District Office) is requesting administrative approval from the Division Director of the New Mexico Oil Conservation Division to convert to a disposal well, the:

Gallegos Federal No. 1
1850' FNL x 790' FWL
Section 25, T27N, R13W
San Juan County, New Mexico

This well is completed in the Basin Dakota and Gallup formations. To isolate the formations from injection, a permanent cast iron bridge plug will be set at 4850' with 5 sacks cement placed on top of plug. The Blanco Mesaverde formation, 2828' - 3908', will be perforated. Intended injection rates will average 100 BWPD to a maximum of 500 BWPD at injection pressures of 800 to 2000 pounds per square inch.

Find attached a copy of the application that is being submitted. Please note that you have 15 days from the date this application is received to file any objections or requests for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, NM 87501.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. J. Broussard", written over a horizontal line.

VAC:ps

Attachment

AFFIDAVIT OF PUBLICATION

No. 20663STATE OF NEW MEXICO,
County of San Juan:Betty Shipp being dulysworn, says: That he is the National Ad Manager ofTHE FARMINGTON DAILY TIMES, a daily newspaper of general circulation
published in English at Farmington, said county and state, and that thehereto attached legal notice

was published in a regular and entire issue of the said FARMINGTON DAILY
TIMES, a daily newspaper duly qualified for the purpose within the
meaning of Chapter 167 of the 1937 Session Laws of the State of New
Mexico for ~~three~~ consecutive ~~(days)~~ (weeks) on the same day as
follows:

First Publication Sunday, Sept. 20, 1987Second Publication Sunday, Sept. 27, 1987Third Publication Sunday, Oct. 4, 1987

Fourth Publication _____

and that payment therefor in the amount of \$ 32.13

has been made.

Betty Shipp

Subscribed and sworn to before me this 5th day
of Oct., 1987.

J. Shorter
NOTARY PUBLIC, SAN JUAN COUNTY, NEW MEXICOMy Commission expires: June 23, 1990

Copy of Publication

NOTICE

Notice is hereby given that Amoco Production Company, 2325 E. 30th St., Farmington, New Mexico 87401, 505-325-8841, Attn: Ed Alizadeh, intends to convert the Gallegos Federal No. 1 to a water disposal well. Application will be filed with the New Mexico Oil Conservation Division.

The Gallegos Federal No. 1 is located in the SW1/4 NE1/4 of Section 25, Township 27 North, Range 13 West, N.M.P.M. The well is drilled to a total depth of 6072 feet and the injection zone will be into the Blanco Mesaverde formation. Five hundred barrels per day at 2000 pounds per square inch are the maximum calculated injection rates.

Any person, firm, association, or corporation, of the state of New Mexico or the United States of America, deeming that the granting of the above application will impair or be detrimental to their water rights may protest in writing the proposal set forth in said application. The protest shall set forth in writing all protestant's reasons why the application should not be approved and must be filed with the Oil and Gas Conservation Division, PO Box 2088, Santa Fe, New Mexico 87501 within 15 days of the date of last publication of this notice.

Legal No. 20663 published in the Farmington Daily Times, Farmington, New Mexico on Sundays, September 20, 27 and October 4, 1987.



API WATER ANALYSIS REPORT FORM

Company	Amec Production Co.		Sample No.	1	Date Sampled	7/26/87
Field	Legal Description		County or Parish	New Spain	State	N.M.
Lease or Unit	Well	Depth	Formation	Water, B/D		
Type of Water (Produced, Supply, etc.)			Sampling Point	Sampled By		

DISSOLVED SOLIDS

CATIONS

	mg/l	me/l
Sodium, Na (calc.)	7860	342
Calcium, Ca	273	36
Magnesium, Mg	73	6.0
Barium, Ba		
Potassium, K	5	1.2

ANIONS

Chloride, Cl	78	2
Sulfate, SO ₄	17600	367
Carbonate, CO ₃	0	0
Bicarbonate, HCO ₃	408	7

Total Dissolved Solids (calc.) 26,660

Iron, Fe (total)
Sulfide, as H₂S

2
2

REMARKS & RECOMMENDATIONS:

OTHER PROPERTIES

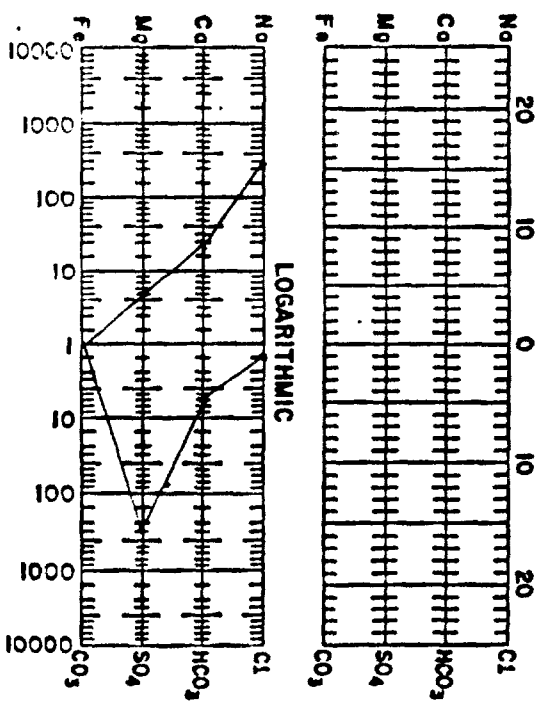
pH 8.17
Specific Gravity, 60/60 F. 1.0193
Resistivity (ohm-meters) 12° F. 0.61

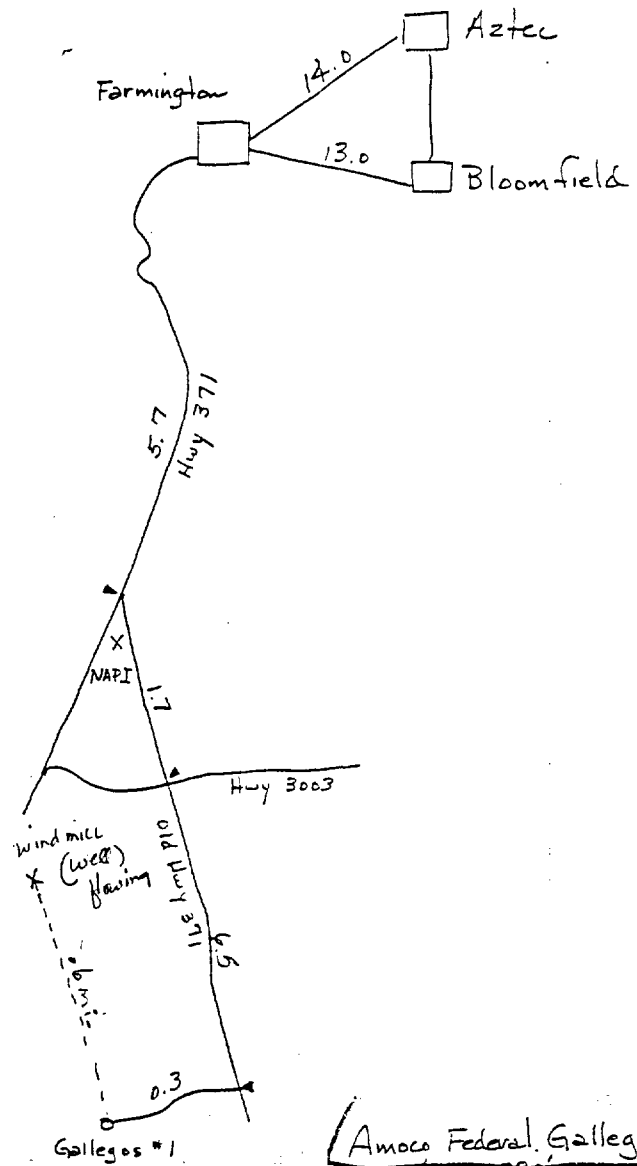
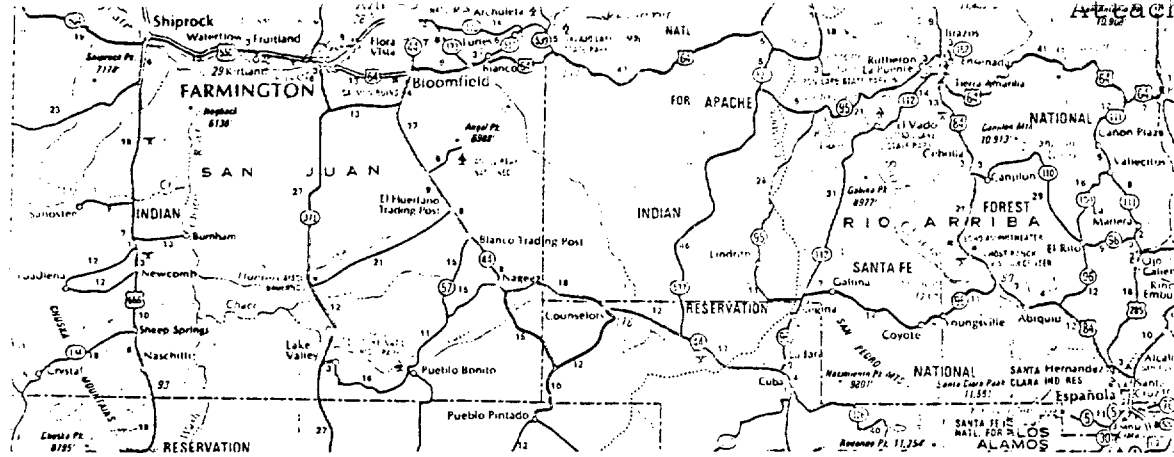
Conductivity

16000 u/mh

WATER PATTERNS — me/l

STANDARD





Amoco Federal Gallegos #1
1850 FNL, 110 FNL
Sec. 25, T27N-R13W
San Juan Co., N.M.
Rail Point: 137 mi. Gallup, NM
Mud Point: 14 mi. Farmington, NM
Cement Point: 14 mi. Farmington, NM

ANALYSIS NO. 4Q-102-85

FIELD RECEIPT NO. L824695

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company AMOCO PRODUCTION COMPANY		Sample No. 1		Date Sampled	
Field Basin Dakota	Legal Description Sec. 35, T28N, R12W		County or Parish San Juan		State NM
Lease or Unit GCU	Well 244	Depth 6324	Formation Dakota	Water, B/D	
Type of Water (Produced, Supply, etc.) Produced			Sampling Point		Sampled By Bell

DISSOLVED SOLIDS

CATIONS	mg/l	me/l	ppm
Sodium, Na (calc.)	11341	493	11272
Calcium, Ca	587	29.3	583
Magnesium, Mg	145	11.9	144
Barium, Ba	-	-	-
Potassium, K ⁺	72	1.85	72

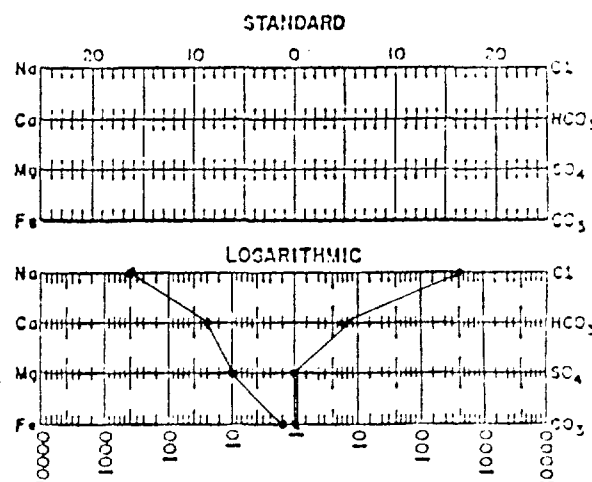
OTHER PROPERTIES

pH	7.2
Specific Gravity, 60/60 F.	1.0061
Resistivity (ohm-meters) 78° F.	0.21
Total hardness	2050

ANIONS

Chloride, Cl	18742	528	18628
Sulfate, SO ₄	25	0.525	25
Carbonate, CO ₃	0	0	0
Bicarbonate, HCO ₃	449	7.35	446

WATER PATTERNS — me/l



Total Dissolved Solids (calc.)

31,360

Iron, Fe (total)

Fe⁺⁺ 0; Fe⁺⁺⁺ 0Sulfide, as H₂S

REMARKS & RECOMMENDATIONS:

ANALYST: Russ Pyeatt

THE WESTERN COMPANY OF
NORTH AMERICA, FARMINGTON, NM
(505) 327-6222

Please refer any questions to: Clay Terry, District Engineer or
Tom Burris, Field Engineer
Russ Pyeatt, Field Engineer

CL1-51 (REV. 1966)



CHEM LAB

WATER ANALYSIS EXCHANGE REPORT

MEMBER	Amoco Production Co.	LAB NO.	27925-6	REPORT NO.	
OPERATOR	Amoco Production Co.	LOCATION	Sec. 2-29N-9W		
WELL NO.	State Gas Com "I" #1A	FORMATION	Mesaverde		
FIELD	Blanco-Mesaverde	INTERVAL			
COUNTY	San Juan	SAMPLE FROM	Production (6-15-78)		
STATE	New Mexico	DATE	July 17, 1978		

REMARKS & CONCLUSIONS:

Cations			Anions		
	mg/l	meq/l		mg/l	meq/l
Sodium	4837	210.41	Sulfate	0	0.00
Potassium	123	3.15	Chloride	7000	197.40
Lithium			Carbonate	-	
Calcium	66	3.29	Bicarbonate	1281	21.01
Magnesium	19	1.56	Hydroxide	-	
Iron	-		Hydrogen sulfide	-	
Total Cations		218.41	Total Anions		218.41

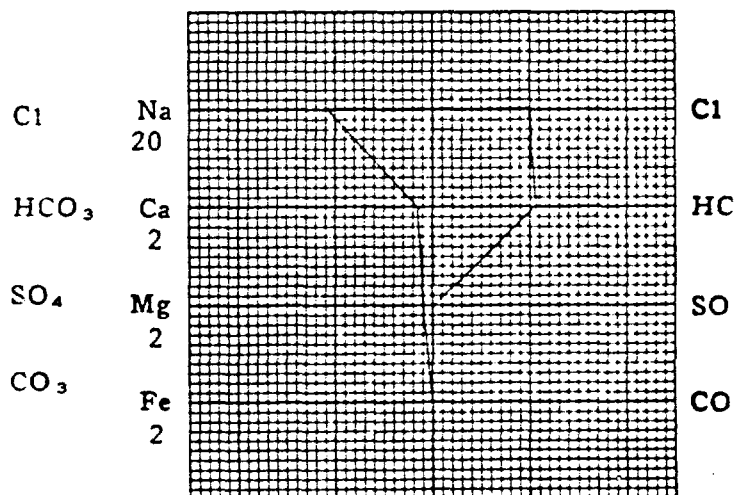
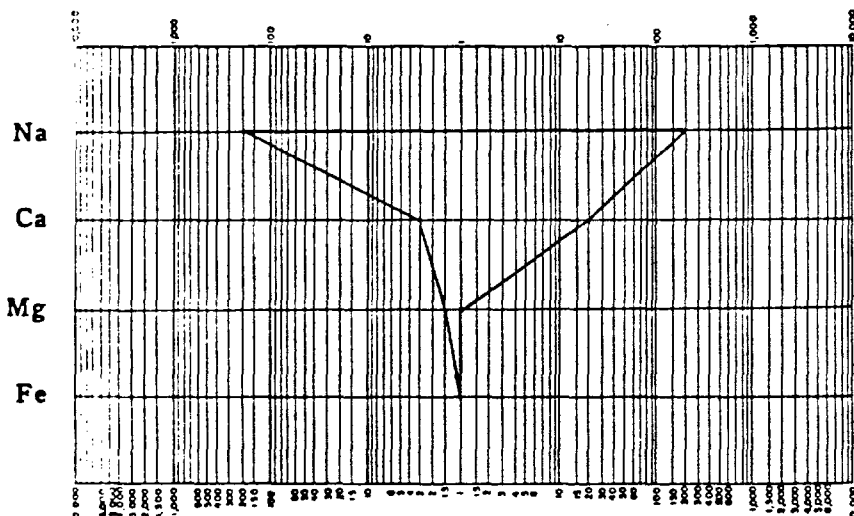
Total dissolved solids, mg/l	12676	Specific resistance @ 68° F.:	
NaCl equivalent, mg/l	12407	Observed	0.57 ohm-meters
Observed pH	7.5	Calculated	0.53 ohm-meters

WATER ANALYSIS PATTERNS

MEQ per unit

LOGARITHMIC

STANDARD



(Na value in above graphs includes Na, K, and Li)

NOTE: Mg/l=Milligrams per liter. Meq/l=Milligram equivalents per liter

SCALE PREDICTIONS, MIXTURE NO. 1: 10.0 PERCENT DAKOTA
90.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 1 IN MG/L:
(NA)= 5487. (CL)= 8174.
(CA)= 78. (SD4)= 2.
(MG)= 32. (HCO3)= 1198.
(BA)= 0. (CO3)= 0.
(SR)= 0. PH= 7.5

MOLAL IONIC STRENGTH= 0.252
SPECIFIC GRAVITY= 1.010

SCALING TENDENCIES(MG/L):

TEMP(F)	P(PSI)	CD2(PSI)	CASD4	SCALE INDEX(MG/L)	SRSD4	CACD3
70.	300.0	0.000	-584	-7.	-376.	167.
70.	600.0	0.000	-593	-7.	-384.	166.
70.	900.0	0.000	-610	-7.	-391.	164.
70.	1200.0	0.000	-624	-7.	-399.	163.
70.	1500.0	0.000	-634	-7.	-407.	161.
70.	2000.0	0.000	-663	-7.	-420.	158.
100.	300.0	0.000	-45	-10.	-428.	170.
100.	600.0	0.000	-46	-10.	-436.	169.
100.	900.0	0.000	-47	-10.	-444.	168.
100.	1200.0	0.000	-48	-11.	-452.	167.
100.	1500.0	0.000	-49	-11.	-466.	164.
100.	2000.0	0.000	-51	-13.	-466.	164.
130.	300.0	0.000	-35	-13.	-406.	175.
130.	600.0	0.000	-37	-14.	-414.	174.
130.	900.0	0.000	-38	-14.	-421.	173.
130.	1200.0	0.000	-39	-14.	-428.	172.
130.	1500.0	0.000	-40	-14.	-440.	170.
130.	2000.0	0.000	-40	-14.	-440.	170.

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH
THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH
COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS
UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

SCALE PREDICTIONS, MIXTURE NO. 3: 30.0 PERCENT DAKOTA
70.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 3 IN MG/L:

(NA)= 6788.
(CA)= 191.
(MG)= 57.
(BA)= 0.
(SR)= 0.
PH= 7.4

MOLAL IONIC STRENGTH= 0.321
SPECIFIC GRAVITY= 1.013

SCALING TENDENCIES(MG/L):

TEMP(F)	P(PSI)	CO2(PSI)	CASO4	BASO4	SRSO4	CACD3
70.	300.0	0.000	-693	-4	-411	448
70.	600.0	0.000	-712	-5	-419	446
70.	900.0	0.000	-731	-5	-427	445
70.	1200.0	0.000	-750	-5	-436	443
70.	1500.0	0.000	-770	-5	-444	441
70.	2000.0	0.000	-803	-5	-458	438
100.	300.0	0.000	-531	-7	-458	452
100.	600.0	0.000	-554	-8	-467	451
100.	900.0	0.000	-565	-8	-475	450
100.	1200.0	0.000	-575	-8	-484	449
100.	1500.0	0.000	-594	-9	-493	447
130.	300.0	0.000	-618	-11	-508	445
130.	600.0	0.000	-437	-11	-435	457
130.	900.0	0.000	-448	-11	-443	456
130.	1200.0	0.000	-456	-11	-451	455
130.	1500.0	0.000	-470	-12	-459	454
130.	2000.0	0.000	-485	-12	-467	453
					-480	451

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH
THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH
COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS
UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

SCALE PREDICTIONS, MIXTURE NO. 2: 20.0 PERCENT DAKOTA
80.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 2 IN MG/L:
(NA)= 6138.
(CA)= 135.
(MG)= 44.
(BA)= 0.
(SR)= 0.
(CL)= 9348.
(SO4)= 5.
(HCO3)= 1115.
(CO3)= 0.
PH= 7.4

MOLAL IONIC STRENGTH= 0.286
SPECIFIC GRAVITY= 1.012

SCALING TENDENCIES(MG/L):

TEMP(F)	P(PSI)	CD2(PSI)	CASO4	SCALE INDEX (MG/L)	CACD3
70.	300.0	0.000	-652	BASO4 -5	308
70.	600.0	0.000	-665	SRSO4 -394	305
70.	900.0	0.000	-683	-402	303
70.	1200.0	0.000	-700	-410	302
70.	1500.0	0.000	-727	-418	309
70.	2000.0	0.000	-751	-426	312
100.	300.0	0.000	-506	-439	311
100.	600.0	0.000	-518	-440	308
100.	900.0	0.000	-531	-456	307
100.	1200.0	0.000	-544	-473	305
100.	1500.0	0.000	-556	-488	316
100.	2000.0	0.000	-578	-418	315
130.	300.0	0.000	-401	-425	314
130.	600.0	0.000	-411	-433	312
130.	900.0	0.000	-421	-440	311
130.	1200.0	0.000	-431	-448	
130.	1500.0	0.000	-441	-461	
130.	2000.0	0.000	-458		

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH
THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH
COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS
UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

SCALE PREDICTIONS, MIXTURE NO. 4: 40.0 PERCENT DAKOTA
60.0 PERCENT MESAVERDE

CALCULATED COMPOSITION OF MIXTURE NO. 4 IN MG/L:

(NA)= 7439.
(CA)= 248.
(MG)= 69.
(BA)= 0.
(SR)= 0.
(CL)= 11697.
(SO4)= 10.
(HCO3)= 948.
(CO3)= 0.
PH= 7.4

MOLAL IONIC STRENGTH= 0.355
SPECIFIC GRAVITY= 1.014

SCALING TENDENCIES(MG/L):

TEMP(F)	P (PSI)	CO2(PSI)	CASD4	SCALE INDEX (MG/L)	CASD3
70.	300.0	0.000	-724	-4	5888
70.	600.0	0.000	-744	-4	5887
70.	900.0	0.000	-765	-4	5885
70.	1200.0	0.000	-785	-4	5884
70.	1500.0	0.000	-807	-4	5882
70.	2000.0	0.000	-843	-5	5879
100.	300.0	0.000	-581	-7	5922
100.	600.0	0.000	-591	-7	5920
100.	900.0	0.000	-602	-7	5909
100.	1200.0	0.000	-623	-7	5888
100.	1500.0	0.000	-645	-8	5885
100.	2000.0	0.000	-677	-10	5877
130.	300.0	0.000	-443	-10	5957
130.	600.0	0.000	-453	-10	5955
130.	900.0	0.000	-463	-10	5954
130.	1200.0	0.000	-480	-11	5953
130.	1500.0	0.000	-493	-11	5951
130.	2000.0	0.000	-513	-11	5951

SCALE INDEX = ANALYZED CONCENTRATION - EQUILIBRIUM SOLUBILITY
A POSITIVE SCALE INDEX INDICATES SCALE PRECIPITATION CAN OCCUR WITH
THE MAGNITUDE OF THE SCALE INDEX INDICATING THE MAXIMUM AMOUNT WHICH
COULD PRECIPITATE. A NEGATIVE SCALE INDEX INDICATES THE WATER IS
UNSATURATED AND NO SCALE PRECIPITATION WILL OCCUR.

INJECTION WELL DATA SHEET

Attachment 11

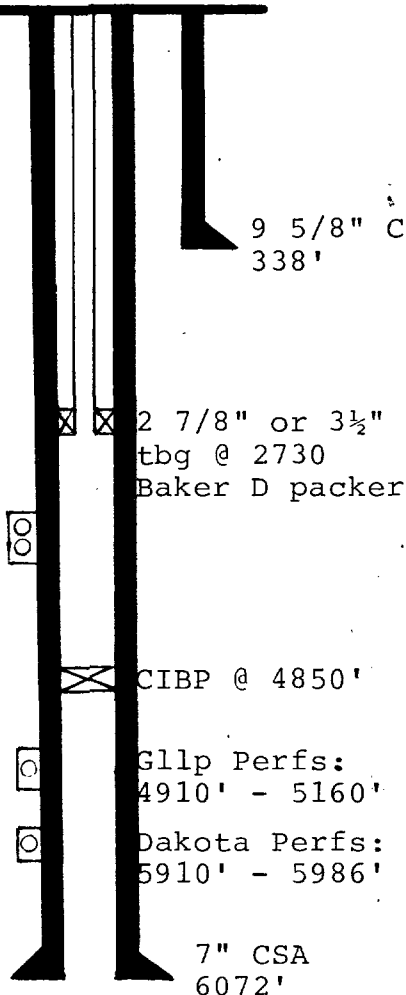
Amoco Production Company		Gallegos Federal		
OPERATOR		LEASE		
No. 1	1850' FNL x 790' FWL	Section 25	T27N	R13W
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

SchematicTubular Data

ER 5961'

MV Perfs:
2828'-3908'

TD 6072'

Surface Casing

Size 9 5/8 " Cemented with 366 cf cmt
TOC Surface feet determined by return during
cement job
Hole size 12 1/4"

Intermediate Casing

Size _____ " Cemented with _____ sx.
TOC _____ feet determined by _____
Hole size _____

Long string

Size 7 " Cemented with 1277 cf cmt
TOC Surface feet determined by return during
cement job
Hole size 8 3/4"
Total depth 6072'

Injection interval

2828 feet to 3908 feet
(perforated or open-hole, indicate which)

238' of performances:

2828 - 2848
2906 - 2916
3010 - 3020
3066 - 3076
3196 - 3208
3258 - 3274
3292 - 3308
3314 - 3328
3390 - 3408
3542 - 3588
3624 - 3636
3854 - 3908

Tubing size 2 7/8" or 3 1/2" lined with none set in a
(material)
Baker Model D packer at 2730 feet.
(brand and model)

(or describe any other casing-tubing seal).

Other Data

- Name of the injection formation Mesaverde
- Name of Field or Pool (if applicable) Blanco Mesaverde
- Is this a new well drilled for injection? ☐ Yes ☒ No
If no, for what purpose was the well originally drilled? Natural Gas Well
- Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used)
4910' - 5160' 5910' - 5986'
CIBP @ 4850' x 5 sx cmt
- Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.
Pictured Cliff top @ 1280'
Gallup top @ 4892'

DATE 9/29/87WELL COMPLETION AND WORKOVER DATAWELL NAME: Hanson B-1LOCATION: 800' FSL x800 FWL T27N, R13W, Sec. 25San Juan County, New Mexico

ELEVATION:

GL: 5975'

KB: _____

TD: _____

PBD: _____

CASING & CEMENT: 10 3/4" 32.75# CSA 161' x 150 sx cmt5 1/2" 15.50# CSA 5191' x 300 sx cmtCOMPLETION DATE: 9-8-57FIRST DELIVERY: 4-24-58COMPLETION INTERVAL: 5032' - 5110'PERFORATIONS: 5032' - 5062' 5074' - 5110'SPECIAL EQUIPMENT: Packer @ 4986'INITIAL POTENTIAL: 165 BO

CORE INTERVAL: _____

DST RESULTS: _____

LOGS RUN: _____

ORIGINAL COMPLETION: Frac X 37,145 gal oil 40,000 lb. sn. flush 5100
gal oilWORKOVERS AND EQUIPMENT CHANGES: 8-14-68 Squeeze perms x 25 sx cmt from
4891' - 5110'. Spot 30 sx cmt, 4 % gel at 1850' - 1995'. Spot 30
sx cmt 4% gel at 1250' to 1140'. Spot 10 sx cmt top surface csg

GL 5965'

SPOT 10 SX CMT
TO SURFACE10 3/4" 32.75# CSA
161' X 150 SX CMTSPOT 30 SX CMT
AT 1140' TO 1250'*1250'
Pickup
cable
1535'**line to
surface*SPOT 30 SX CMT
AT 1850' TO 1995'*Leaves
shale**shot 7"
and pulled
at 1943'**2095'**Measured**4012'**Top of cement by
comp survey at
3750'*SPOT 25 SX CMT
AT 4891' TO 5110'GALLUP PERFS:
5032'-5062'
5074'-5110'5 1/2" 15.50# CSA
5191' X 300 SX CMT

HANSON B-1

PS Form 3811, July 1983 447-845

DOMESTIC RETURN RECEIPT

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.

2. ☐ Restricted Delivery.

3. Article Addressed to:
Navajo Tribe
P.O. Box 146
Window Rock, AZ 86515

4. Type of Service: Article Number
☐ Registered ☐ Insured
☒ Certified ☐ COD *P-488 634 094*
☐ Express Mail

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X *Alfred Sanchez*

7. Date of Delivery
10/20/87

8. Addressee's Address (ONLY if requested and fee paid)

PS Form 3811, July 1983 447-845

DOMESTIC RETURN RECEIPT

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.

2. ☐ Restricted Delivery.

3. Article Addressed to:
Jerome F. McHugh
650 S. Cherry #1225
Denver, CO 80222

4. Type of Service: Article Number
☐ Registered ☐ Insured
☒ Certified ☐ COD *P-488 634 095*
☐ Express Mail

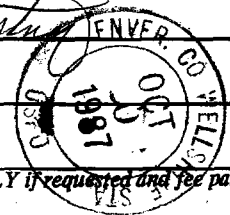
Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X *Arda Dastgheib*

6. Signature — Agent
X

7. Date of Delivery

8. Addressee's Address (ONLY if requested and fee paid)



PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.

2. ☐ Restricted Delivery.

3. Article Addressed to:
*Texaco
 P.O. Box EE
 Cortez, CO 81321*

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail	<i>P488 634 093</i>

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
 X

6. Signature — Agent
 X *[Signature]*

7. Date of Delivery
[Signature]

8. Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.

2. ☐ Restricted Delivery.

3. Article Addressed to:
*Ernest Hanson
 P.O. Box 1515
 Roswell, NM 88201*

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail	<i>P-488 634 092</i>

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
 X *[Signature]*

6. Signature — Agent
 X

7. Date of Delivery
10-20-87

8. Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

<p>SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.</p> <p>Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. <u>The return receipt fee will provide you the name of the person delivered to and the date of delivery.</u> For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.</p> <p>1. <input type="checkbox"/> Show to whom delivered, date, and addressee's address. 2. <input type="checkbox"/> Restricted Delivery ↑(Extra charge)↑ ↑(Extra charge)↑</p>	
<p>3. Article Addressed to:</p> <p><i>Bureau of Land Management</i> <i>Caller Service 4104</i> <i>Farmington, NM 87499</i></p>	<p>4. Article Number</p> <p><i>P 684 173 998</i></p> <p>Type of Service:</p> <p><input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail</p> <p>Always obtain signature of addressee or agent and <u>DATE DELIVERED.</u></p>
<p>5. Signature — Addressee</p> <p>X</p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p>
<p>6. Signature — Agent</p> <p>X <i>[Signature]</i></p>	
<p>7. Date of Delivery</p> <p><i>11/12/87</i></p>	

PS Form 3811, Mar. 1987

★ U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

<p>SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.</p> <p>Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. <u>The return receipt fee will provide you the name of the person delivered to and the date of delivery.</u> For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.</p> <p>1. <input type="checkbox"/> Show to whom delivered, date, and addressee's address. 2. <input type="checkbox"/> Restricted Delivery ↑(Extra charge)↑ ↑(Extra charge)↑</p>	
<p>3. Article Addressed to:</p> <p><i>Bureau of Indian Affairs</i> <i>Land Operations</i> <i>P.O. Box 966</i> <i>Shiprock, NM 87420</i></p>	<p>4. Article Number</p> <p><i>P 684 173 997</i></p> <p>Type of Service:</p> <p><input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail</p> <p>Always obtain signature of addressee or agent and <u>DATE DELIVERED.</u></p>
<p>5. Signature — Addressee</p> <p>X <i>[Signature]</i></p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p>
<p>6. Signature — Agent</p> <p>X <i>[Signature]</i></p>	
<p>7. Date of Delivery</p> <p><i>11/16/87</i></p>	

PS Form 3811, Mar. 1987

★ U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

Prepared by D. Catarack

OPERATOR

El Paso

WELL

Hanson B" 16.1

CATION

800 FS & FW

SECTION

25

TOWNSHIP

27N

RANGE

13W

10 SK surface
plug.

20 SK

1140 1250

1595

Cut & Perforated 5 1/2" casing at
1943'

30 SK 1850-1995'

Kenn's Scale

1850

1995

2095

Pressure

At bottom

4891

4902

5110

3750

5191

25 SK 4891-5110

10 3/4" @ 174 ft cemented w/
150 SK. Circ to surface.

Casing Plug 5030-5110'

5 1/2" @ 5191 feet cemented w/
300 SK cement. TOC by TS-3750



STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

GARREY CARRUTHERS
GOVERNOR

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

107-2117
Date: 10/28/87

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

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

Gentlemen:

I have examined the application dated 10/26/87
for the Amoco Prod. Co. Sullivan Federal #1
Operator Lease & Well No.

E-25-27N-13W and my recommendations are as follows:
Unit, S-T-R

Approved

Yours truly,

Tracy D. [Signature]



Amoco Production Company

2325 East 30th Street
Farmington, New Mexico 87401
505-325-8841

R. J. Broussard
District Manager

November 19, 1987

Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87501

File: GOM-142-400

Conversion of Gallegos Federal No. 1
to a Water Disposal Well
San Juan County, New Mexico

A copy of the application dated October 7, 1987 was sent to the Bureau of Land Management and Bureau of Indian Affairs. Attached are the certified mail receipts.

Sincerely,

VAC/ct

Attachments

W10