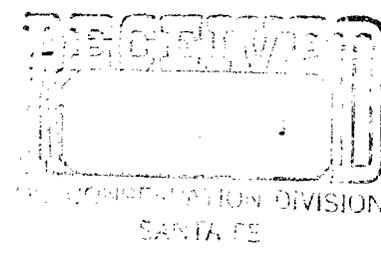


ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland Texas 79702  
Telephone 915 684 0100



November 15, 1984



Mr. Richard D. Stamets  
New Mexico Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Dear Mr. Stamets:

RE: Request for Administrative Approval to Inject  
Seven-Rivers Queen Unit No. 65  
2080' FNL, 560' FWL, Sec. 3, T23S, R36E  
Lea County, New Mexico

ARCO Oil and Gas Company respectfully requests administrative approval to inject into its Seven-Rivers Queen Unit Well No. 65, a proposed injection well in an active waterflooding unit, at a location of 2080' FNL and 560' FWL, Section 3, Township 23 South, Range 36 East, Lea County, New Mexico. The well is to be drilled as a replacement for Seven-Rivers Queen Unit No. 49 located 141' northeast of the proposed location. A casing leak was discovered in August, 1984. Due to the low production that can be attributed to SRQU No. 49, it would be uneconomical to repair the casing. This well is to be plugged and abandoned. By drilling SRQU No. 65, an additional average of 28' of pay may be flooded in the two offset producers. Most of the additional pay will be obtained by completing the well to a greater depth than SRQU No. 49. SRQU No. 49 could not be deepened due to insufficient size of the production casing. By drilling the proposed injection well, the original waterflood pattern will be restored and additional pay will be swept, thereby increasing the ultimate recovery of oil from the pattern. Attached you will find a C-108 form along with all necessary data required for proper completion of said form. Surface owners and offset operators have been notified of this request via certified mail. Attached is a plat showing the Seven-Rivers Queen Unit and the proposed well's location.

Yours very truly,

*Richard Morton*

Richard B. Morton

RBM:sc  
Atts.

cc: New Mexico Oil Conservation Division  
P. O. Box 1980  
Hobbs, New Mexico 88240

cc: Surface Owners                      cc: Offset Operators  
Seven-Rivers Queen Unit              Seven-Rivers Queen Unit  
(see attached list)                      (see attached list)

Seven Rivers Queen Unit

Surface Owners:

State of New Mexico  
c/o Commissioner of Public Lands  
P. O. Box 1148  
Santa Fe, New Mexico 87504-1148

UR Cattle Co., Inc.  
P. O. Box 347  
Eunice, New Mexico 88231

Offset Operators Within Area of Review:

Conoco Oil Company  
P. O. Box 460  
Hobbs, New Mexico 88240

Sun Exploration and Production Company  
P. O. Box 1861  
Midland, Texas 79702

Gulf Oil Exploration and Production Company  
P. O. Box 1150  
Midland, Texas 79702

APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose:  Secondary Recovery  Pressure Maintenance  Disposal  Storage  
Application qualifies for administrative approval?  yes  no
- II. Operator: ARCO Oil and Gas Company  
Address: P. O. Box 1610, Midland, Texas 79702  
Contact party: J. R. Hastings Phone: (915) 684-0149
- 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 R-4589.
- 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: Richard B. Morton Title Engineer

Signature: Richard Morton Date: November 15, 1984

- \* 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. Submitted previously - dated 1/27/84. Presented at hearing 2/1/84 to approve the Seven-Rivers Queen Unit as a tertiary project.

## 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.

Attachment to C-108 Form  
ARCO's Seven-Rivers Queen Unit

Section

- III. Well Data: See attached well diagram and data sheet.
- V. Area of Review: See attached map.
- VI. Well Data in Area of Review: Submitted previously. Dated 1/27/84 and presented at hearing 2/1/84 to approved the Seven-Rivers Queen Unit as a tertiary project.
- VII. 1) Proposed average daily rate: 450 BWP  
Proposed maximum daily rate: 750 BWP
- 2) System is closed.
- 3) Proposed average injection pressure: 1000 psi  
Proposed maximum injection pressure: Limited to 1250 psi plant pressure.
- 4) Injection water source: Capitan Reef  
Getty's Jal water supply  
Compatibility tests: See attached water analysis dated 11/10/81. (Also we have been injecting with no problems for ten years.)
- 5) Does not apply.
- VIII. Geological data: Submitted previously. Dated 1/27/84 and presented at hearing 2/1/84 to approve the Seven-Rivers Queen Unit as a tertiary project.
- IX. The stimulation program used for the injection well is to acidize with 2,000 gallons of 15% HCl and then hydraulically fracture with 5,000 to 10,000 gallons of gelled water carrying 10,000 to 25,000 lbs. of sand.
- X. Log and test data to be filed with the Commission upon completion of the well.
- XI. Submitted previously. Dated 1/27/84 and presented at hearing 2/1/84 for approval of the Seven-Rivers Queen Unit as a tertiary project.
- XII. Not applicable.
- XIII. Proof of Notice: Copy of application sent to surface owners and offset operators via Certified mail. Proof of publication to be received from Hobbs Daily News Sun.

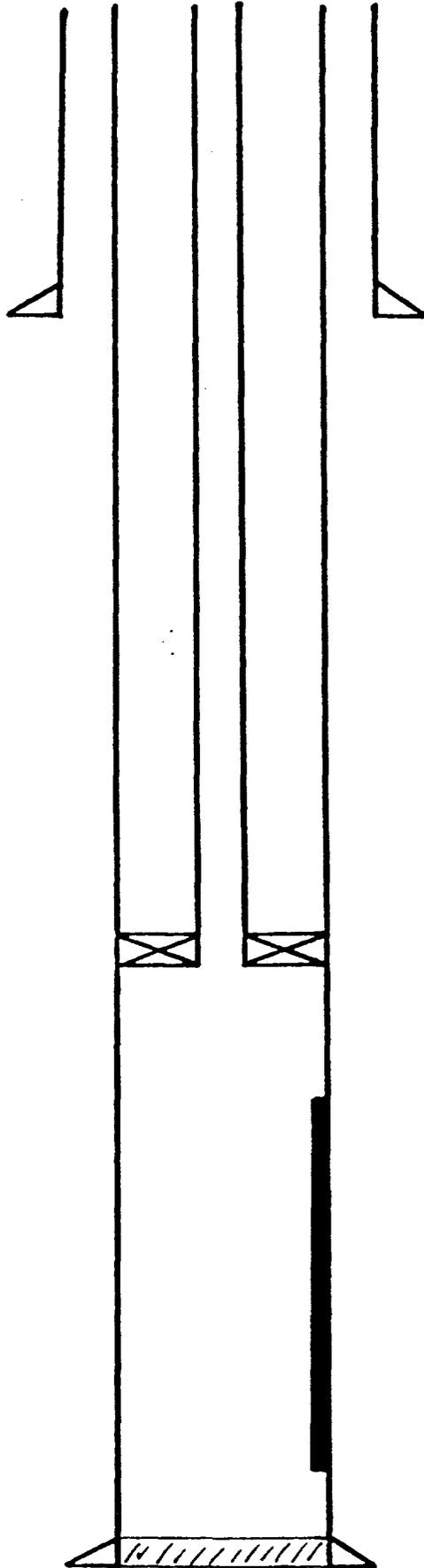
WELL DATA SHEET

Lease: Seven Rivers Queen Unit Well: No. 65

Operator: ARCO Oil and Gas Company

Location: 2080' FNL & 560' FWL

Section 3 Township 23S Range 36E  
Lea Co., New Mexico



8-5/8" csg @ 350' cmtd  
w/200 sx circ  
hole size 12-1/4"

\*Note: All depths and volumes are approximate and depend on completion of well.

Baker AD-1 @3575' on  
2-3/8" PC tbq

Perfs 3675 - 3820'  
F 5-10,000 gal 10-25,000# sd  
A 2,000 gal

5-1/2" csg @ 3920' cmtd  
w/1,000 sx circ  
TD 3920'  
7-7/8" hole size

Injection Formation: South Eunice and Langlie Mattix  
 (Seven-Rivers and Queen) 3600 - 3850'  
 Well originally drilled for water injection  
 Higher Producing Zone: Jalmat (Yates Seven-Rivers) 3200-3600'  
 Lower Producing Zone: Langlie Field (Devonian) 12,400-12,600'

Proposed Well Data

Lease: Seven Rivers Queen Unit  
Well No.: 65

Location: 2080' FNL and 560' FWL  
Sec. 3, T23S, R36E  
Lea County, New Mexico

<u>Hole Size</u>	<u>Casing Size</u>	<u>Depth</u>	<u>Sacks Cmt.</u>	<u>Top Cmt.</u>
12-1/4"	8-5/8"	350'	200	Surface (circ.)
7-7/8"	5-1/2"	3920'	1000	Surface (circ.)

Tubing: 2-3/8" IPC J-55 EUE 8RD      Depth: 3575'

Packer: Baker Model AD-1              Depth: 3575'

Note: Depths and cement volumes are approximate. Final depths and volumes depend on completion of well.

RESULT OF WATER ANALYSES

TO: Mr. Jim Curfew LABORATORY NO. 118151  
P.O. Box 1710, Hobbs, NM SAMPLE RECEIVED 11-6-81  
 RESULTS REPORTED 11-10-81

COMPANY ARCO Oil & Gas Company LEASE Seven Rivers Queen Unit  
 FIELD OR POOL South Emice  
 SECTION \_\_\_\_\_ BLOCK \_\_\_\_\_ SURVEY \_\_\_\_\_ COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Produced water - taken from Seven Rivers Queen Unit, 11-6-81

NO. 2 Conoco supply water, 11-6-81 GETTY WATER ANALYSIS  
ON PAGE 2

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES				
	NO. 1	me/l	NO. 2	me/l
Specific Gravity at 60° F.	1.0393		1.0500	
pH When Received	7.2		6.4	
Carbonate as CO <sub>3</sub>	0	0.0	0.	0.0
Bicarbonate as HCO <sub>3</sub>	1,238	20.3	586	9.6
Supersaturation as CaCO <sub>3</sub>	90		15	
Uncersaturation as CaCO <sub>3</sub>	--		--	
Total Hardness as CaCO <sub>3</sub>	9,350		6,800	
Calcium as Ca	1,080	54.0	1,640	82.0
Magnesium as Mg	1,616	133.0	656	54.0
Sodium, and/or Potassium	19,312	839.7	24,775	1,077.2
Sulfate as SO <sub>4</sub>	2,750	57.2	3,944	82.0
Chloride as Cl	29,828	841.1	39,771	1,121.5
Iron as Fe	0.62	0.0	0.23	0.0
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	55,824		71,372	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide - Total	325		375	
Resistivity, ohms/m at 77° F.	0.146		0.120	
Suspended Oil				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks

RESULT OF WATER ANALYSES

TO: Mr. Jim Curfew LABORATORY NO. 118151 (Page 2)  
P.O. Box 1710, Hobbs, NM SAMPLE RECEIVED 11-6-81  
 RESULTS REPORTED 11-10-81

COMPANY ARCO Oil & Gas Company LEASE Seven Rivers Queen Unit  
 FIELD OR POOL South Eunice  
 SECTION      BLOCK      SURVEY      COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:  
 NO. 1 Getty supply water, 11-6-81  
 NO. 2     

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES				
	NO. 1	mg/l	NO. 2	me/l
Specific Gravity at 60° F.	1.0161			
pH When Received	6.8			
Carbonate as CO <sub>3</sub>	0	0.0		
Bicarbonate as HCO <sub>3</sub>	1,110	18.2		
Supersaturation as CaCO <sub>3</sub>	65			
Undersaturation as CaCO <sub>3</sub>				
Total Hardness as CaCO <sub>3</sub>	3,050			
Calcium as Ca	720	35.0		
Magnesium as Mg	304	25.0		
Sodium and/or Potassium	5,823	253.1		
Sulfate as SO <sub>4</sub>	1,712	35.6		
Chloride as Cl	9,232	260.3		
Iron as Fe	0.31	0.0		
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	18,901			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide				
<del>Resistivity, ohms/m at 77° F.</del> <b>Total</b>	438			
Suspended Oil	0.420			

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks These results clearly show no evidence of any incompatibility between any combination of these three waters. This is strong indication that the samples of Seven Rivers-Queen water and Cenozo supply water were not representative on analysis #1081149 (10-16-81).

Form No. 2 cc: Mr. Robert Craig, Midland  
 Mr. J. P. McDonald, Dallas  
 Mr. W. G. Price, Midland  
 Mr. Vergil Herring, Hobbs  
 Central File System, Midland

By \_\_\_\_\_  
 Waylan C. Martin, M. A.

NEW MEXICO OIL CONSERVATION COMMISSION  
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102  
Supersedes C-128  
Effective 1-1-65

All distances must be from the outer boundaries of the Section

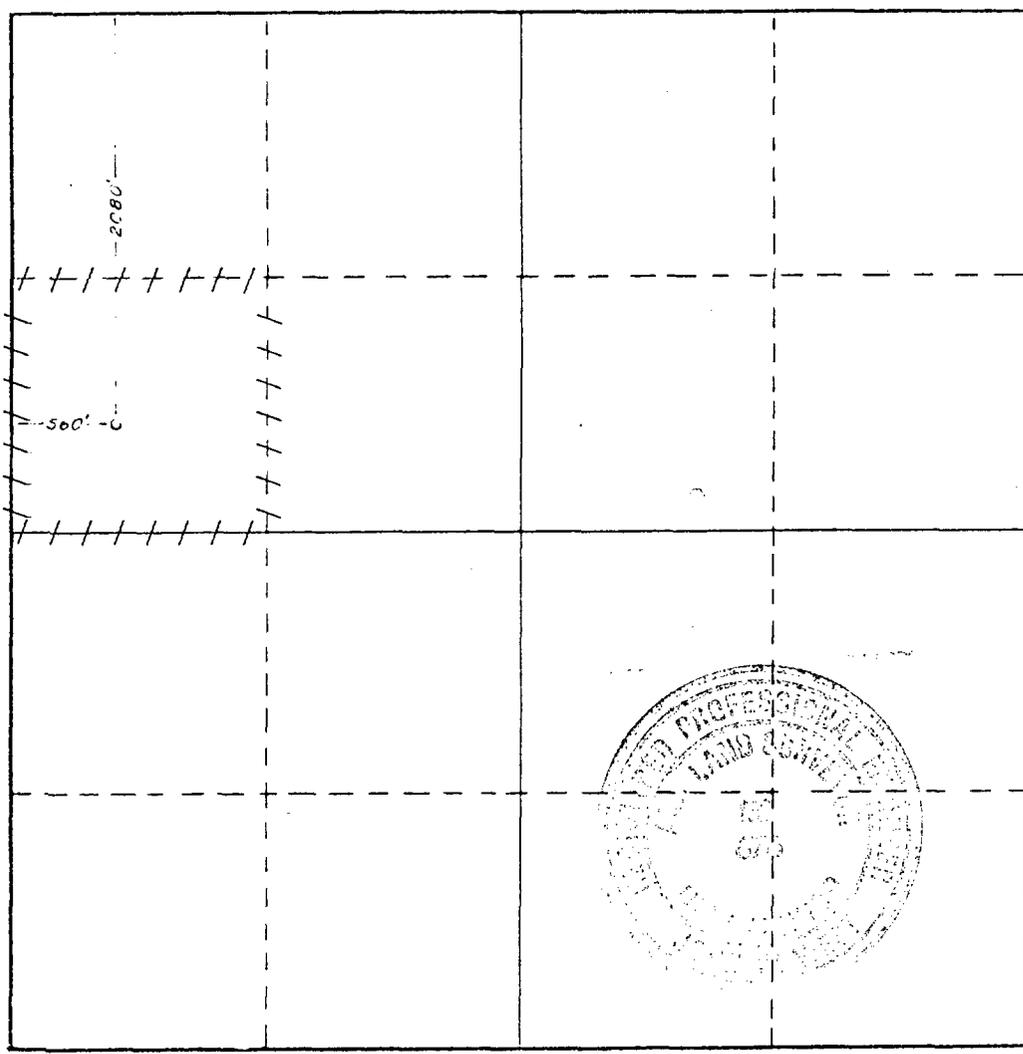
Operator ARCO OIL & GAS COMPANY		Lease SEVEN RIVERS QUEEN UNIT			Well No. 65
Tract Letter E	Section 3	Township 23-SOUTH	Range 36-EAST	County LEA	
Actual Storage Location of Well: 2080 feet from the NORTH line and 560 feet from the WEST line					
Ground Level Elev. 3482.6 FEET	Producing Formation Seven Rivers Queen		Pool Langlie Mattix	Dedicated Acreage: 40 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 Unitization

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.



**CERTIFICATION**

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

---

Name: Elizabeth S. Bush  
Position: Drlg. Engr.  
Company: ARCO Oil and Gas Co. Div. of Atlantic Richfield Co.  
Date: 10/29/84

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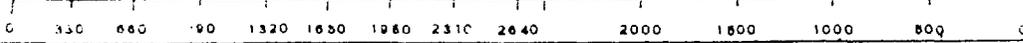
*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.*

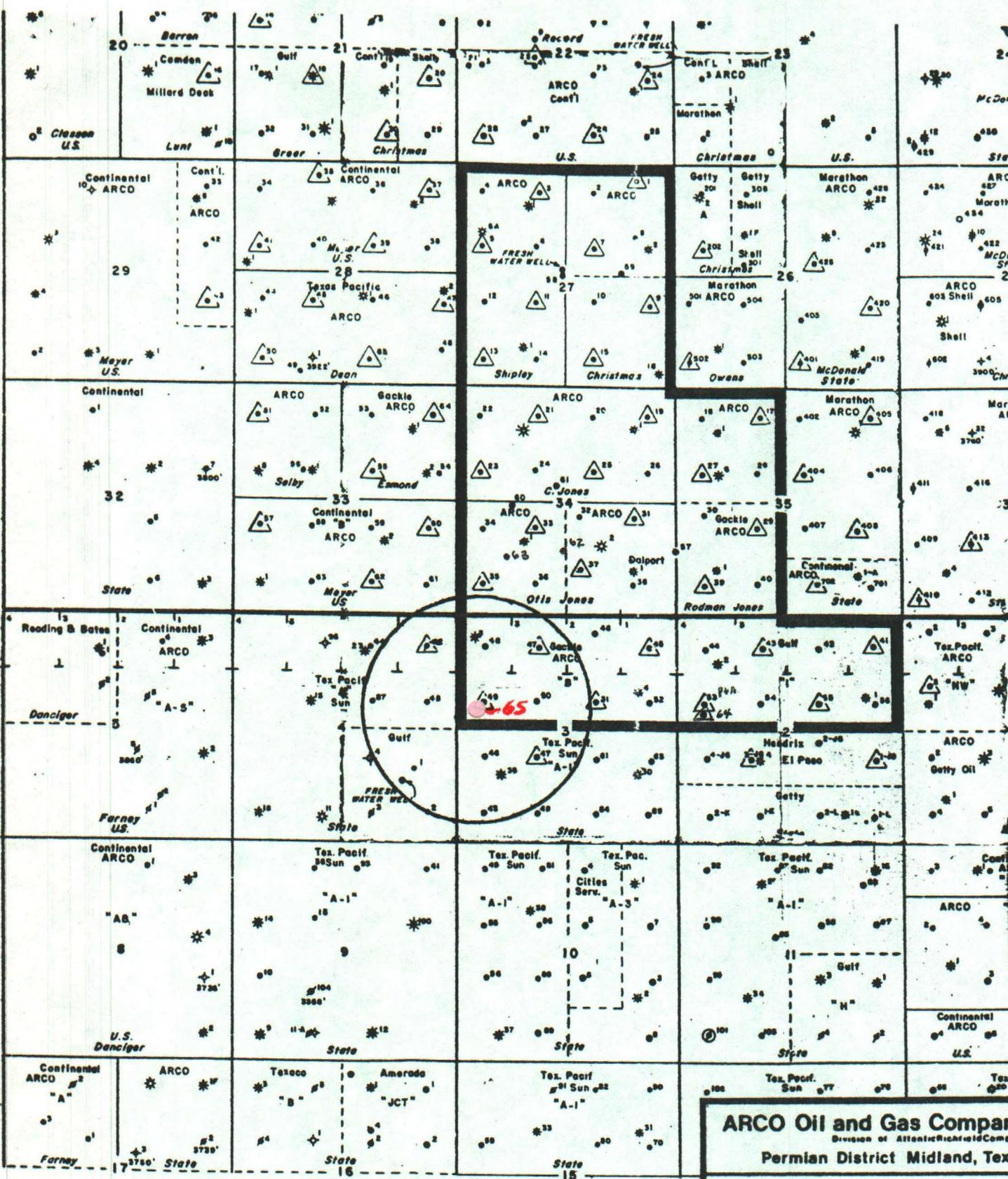
---

Date Surveyed: 10/17/84  
Registered Professional Engineer and/or Land Surveyor:  
John W West

---

Certificate No. JOHN W WEST, 676  
RONALD J. EIDSON, 3239





 UNIT OUTLINE  
 AREA OF REVIEW

**ARCO Oil and Gas Company**   
 Division of AtlanticRichfield Company  
 Permian District Midland, Texas

---

**SEVEN RIVERS-QUEEN UNIT**  
 LEA COUNTY, NEW MEXICO

---

By: _____	Drawn By: _____
Date: _____	Revised By: _____
Dept: WEST AREA ENGR.      Day No: _____	

**AFFIDAVIT OF PUBLICATION**

State of New Mexico,

County of Lea.

I, \_\_\_\_\_

Robert L. Summers

of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not in a supplement thereof for a period

of \_\_\_\_\_

One weeks.

Beginning with the issue dated

November 22, 19 84

and ending with the issue dated

November 22, 19 84

\_\_\_\_\_  
Publisher.

Sworn and subscribed to before

me this 26 day of

November, 19 84

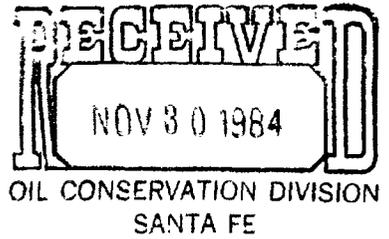
*Jane Paulowsky*  
Notary Public.

My Commission expires \_\_\_\_\_

3-24, 19 87

(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.



**LEGAL NOTICE**  
**NOVEMBER 22, 1984**  
Notice is hereby given that ARCO Oil and Gas Company, Inc. is to be located 200' FNL, 560' FWL, Sec. 3, Township 23 South, Range 34E, Lea County, New Mexico. The well is to be a replacement well for Seven-Rivers Queen Unit No. 49 which is to be plugged and abandoned. Water is to be injected into the Langlie, Mattix-Seven-Rivers Queen formation at an approximate depth of 3650' to 3850' to increase oil recovery. A maximum injection rate of 750 BWPD and a maximum surface pressure of 1250 psig is expected. Refer questions to Rick Morton, ARCO Oil and Gas Company, P.O. Box 1610, Hobbs, New Mexico 87501, within 15 days.

WFX-540





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

November 20, 1984

TONY ANAYA  
 GOVERNOR

POST OFFICE BOX 1980  
 HOBBS, NEW MEXICO 88240  
 (505) 393-6161

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

RE: Proposed:

MC \_\_\_\_\_  
 DHC \_\_\_\_\_  
 NSL \_\_\_\_\_  
 NSP \_\_\_\_\_  
 SWD \_\_\_\_\_  
 WFX \_\_\_\_\_ X \_\_\_\_\_  
 PMX \_\_\_\_\_

Gentlemen:

I have examined the application for the:

ARCO Oil & Gas Co.	Seven Rivers Queen Unit	No. 65 3-23-36
Operator	Lease & Well No. Unit	S-T-R

and my recommendations are as follows:

O.K.----J.S.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Yours very truly,

Jerry Sexton  
 Supervisor, District 1

/mc