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

May 20, 1988

Mr. William J. LeMay
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87504-2088

Subject: Application for Authorization to Inject
ARCO Oil and Gas Company's Wimberly WN #1
F, Section 23, T-25-S, R-37-E
Lea County, New Mexico

Dear Mr. LeMay:

ARCO Oil and Gas Company respectfully requests administrative approval to inject produced water into its Wimberly WN #1 in the Grayburg-San Andres formation. Presently, it is a marginal Langlie Mattix gas well producing 50-55 MCFD from the Queen formation. We intend to squeeze off the Queen perforations, deepen the well to 4300' and complete it as an open hole disposal well in the Grayburg-San Andres. We intend to dispose of produced water from our Wimberly lease. February production from the lease was 66 BOPD, 572 MCF and 865 BWPD from the Blinebry, Tubb-Drinkard, and Fusselman formations in the Justis Field. One Fusselman well, the Wimberly WN #4, is capable of producing 50 BOPD and 1600 BWPD, but is shut-in due to a lack of disposal facilities. If the disposal well were available, the Wimberly lease could produce 116 BOPD and 2465 BWPD.

An Oil Conservation Divison Form C-108 and an Injection Well Data Sheet are enclosed along with the required data. The following summarizes information on Form C-108:

Item III - See Injection Well Data Sheet
Item V - Wells and leases within 2 miles and within the area of review of the Wimberly WN #1 are shown (Exhibits 1 & 2).
Item VI - A tabulation of information on wells in the area of review (Exhibits 3, 3A) is attached along with schematic diagrams of four plugged wells in the area (Exhibits 4-7). With only one exception, all of the wells in the area of review should have cement tops above the injection interval. Anderson Prichard's Harrison #5, one location south of the Wimberly WN #1, should have cement up to 4335' behind the 5½" casing, but it is a plugged well (Exhibit 5). Hendrix's Wimberly 1, two locations east of ARCO's well and just outside the area of review, should have cement behind the 5½" casing as high as 4105'. It is approximately 100' upstructure from the Wimberly WN #1 and should not be affected by our disposal operations.

Item VII - Data on proposed operation:

1. The average and maximum expected injection rates are 2500 BWPD and 12,000 BWPD respectively.
2. The system will be closed.
3. The system should operate on a vacuum. The maximum expected wellhead injection pressure is 650 psig.
4. The injection fluid will be Blinebry, Tubb-Drinkard, and Fusselman water produced from ARCO Wimberly WN lease. Analyses of these waters (Exhibit 8) show no incompatibilities.
5. The Grayburg-San Andres is not productive of oil or gas in the Justis Field. The nearest producing field is the Arrowhead Grayburg Pool near Eunice. An analysis from ARCO's State 157D #11 (J-12-22S-36E) which is approximately 24 miles north of the Wimberly WN #1 is attached (Exhibit 9). An attempt will be made to recover a sample of Grayburg-San Andres water during the conversion.

   Rice Engineering operates two Grayburg-San Andres salt water disposal wells at Justis, the WD B-12 and WD H-2 (Exhibit 10). They inject 3000 and 7000 BWPD respectively on a vacuum. All of the produced water at Justis is handled by Rice's system. No compatibility problems between the different Justis Field waters and the Grayburg have developed. No incompatibilities are expected in the Wimberly WN #1.

Item VIII- The nearest well to the Wimberly WN #1 that has penetrated the Grayburg - San Andres is ARCO's Wimberly WN #10 which is 330' to the east. Based on correlations with Rice's wells, the Grayburg is found at 3330' and the San Andres is found at 3588'. The zones are 1420' thick and extend to the top of the Glorieta at 4750'. The Grayburg and San Andres are carbonates and described as lime and sandy lime formations (Exhibit 11).

Detailed records of fresh water wells in this area have not been found. Most water is believed to come from Triassic rocks or the Ogallala and Quaternary alluvium formations. The bottom of these wells are 500' or shallower. The closest windmill to ARCO's Wimberly WN #1 is near American Exploration's Harrison #2 (I-22-25S-37E) approximately 3100' to the southwest of the Wimberly WN #1. The next closest windmill is near Amerada's I Wimberly #13 (M-24-25S-37E), approximately 4700' southeast of the Wimberly WN #1.

These wells are over 3000' away from the Wimberly WN #1 and the top of the injection zone is approximately 3000' deeper than the bottom of the fresh water wells. No fresh water zones are known to exist below the Grayburg-San Andres.

Item IX - The proposed treatment of the Wimberly WN #1 is the following:

10,000 gals 15% NEFE HCl
1 gpt corrosion inhibitor
1 gpt non-emulsifier
1 gpt iron sequesterant
1,500 # of rock salt

The stimulation will be in 4 stages divided by three 500# salt blocks for diversion. The expected treating rate is 3-4 BPM at ±2500 PSIG.

Item X - The Wimberly WN #1 was not logged. The log of ARCO's Wimberly WN #10, a well 330' away from the Wimberly WN #1, shows the picks of the Grayburg and San Andres formations (Exhibit 12). Due to the structural change, the Grayburg - San Andres should be 20-25' deeper in the Wimberly WN #1 than in the #10. A copy of the original Form C-105 filed on the Wimberly WN #1 is attached (Exhibit 12A).

Item XI - Fresh water analyses from the two windmills closest to the Wimberly WN #1 are attached (Exhibits 13 and 14).

Item XII- After examining the available geologic and engineering data, no evidence of open faults or any other hydrologic connection between the disposal zone and the fresh water zones has been found.

Item XIII-Notice of the application was published in the Hobbs Daily News-Sun (Exhibit 15).

A copy of this application was sent to the surface owners on the Wimberly lease and to offset operators within a ½ mile radius of the Wimberly WN #1 by certified mail. An affidavit of mailing is attached (Exhibit 16).

If you have any questions, please call me at (915) 688-5355.

Sincerely,

Richard S. Prentice

Richard S. Prentice
Senior Engineer

RSP:jee

cc (W/Attachments):

Mr. William J. LeMay
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87504-2088

Mr. J. T. Sexton
Oil Conservation Div.
1000 W. Broadway
P. O. Box 1980
Hobbs, NM 88204

H. D. McGee - MIO 1431
A. L. Stafford - Andrews
J. Ellis - Andrews

Table of Exhibits
ARCO Wimberly WN #1
Salt Water Disposal Application
F-23 T25S R37E
Lea County, New Mexico

Exhibit #	Description
1	1" = 4000' Land Map
2	1" = 2000' Land Map
3	Area of Review Wells
3A	Top of Cement Calculations
4	Amoco's Langlie B-5 - Wellbore Diagram
5	Anderson & Prichard Harrison #5 Wellbore Diagram
6	ARCO's Wimberly WN #13 Wellbore Diagram
7	Santa Fe Energy's Carlson A #3 Wellbore Diagram
8	Blinebry, Tubb/Drinkard, Fusselman Water Compatibility Test - ARCO's Wimberly Lease
9	Water Analysis from ARCO's State 157D #11, Arrowhead Grayburg Pool
10	Justis Area Map with Existing Grayburg - San Andres Salt Water Disposal Wells
11	Lithological Description of Grayburg - San Andres
12	Sonic Log of ARCO's Wimberly WN #10
12A	Form C-105 for Wimberly WN #1
13	Fresh Water Analyses - Section 22
14	Fresh Water Analyses - Section 24
15	Notice of Publication
16	List of Surface Owners & Offset Operators & Affidavit of Mailing

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: ARCO Oil and Gas Company

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

Contact party: Richard S. Prentice Phone: (915) 688-5355

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: Richard S. Prentice Title Senior Operations Engineer

Signature: Richard S. Prentice 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. _____

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

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.

XIII
~~IV~~. 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.

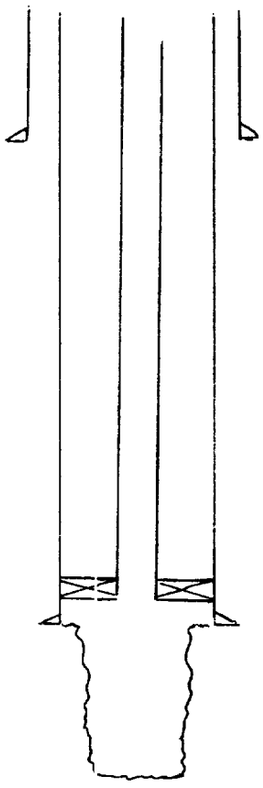
NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

INJECTION WELL DATA SHEET

ARCO Oil and Gas Company		Wimberly WN		
OPERATOR		LEASE		
1	1980' FN & WL	23	25S	37E
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Lea County, New Mexico

Schematic



Tabular Data

Surface Casing

Size 13" Cemented with 200 sx.

TOC surface feet determined by circulated

Hole size 17"

Intermediate Casing

Size _____" Cemented with _____ sx.

TOC _____ feet determined by _____

Hole size _____

Long string

Size 9 5/8" Cemented with 450 sx. - 250 sx - 990' TD

TOC 1790 feet determined by calculation (30% over guage hole and 1.5 ft³/sx yield)

Hole size 12¼"

Total depth 4300'

Injection interval planned 6¼" hole

O H 3448 feet to 4300 feet

(perforated or open-hole, indicate which)

Tubing size 2 7/8" lined with TK-70 plastic coating (material) set in a Guiberson nickel plated ER-6 (brand and model) packer at ±3400 feet (or equivalent) w/nickel plated on-off tool.

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Grayburg - San Andres

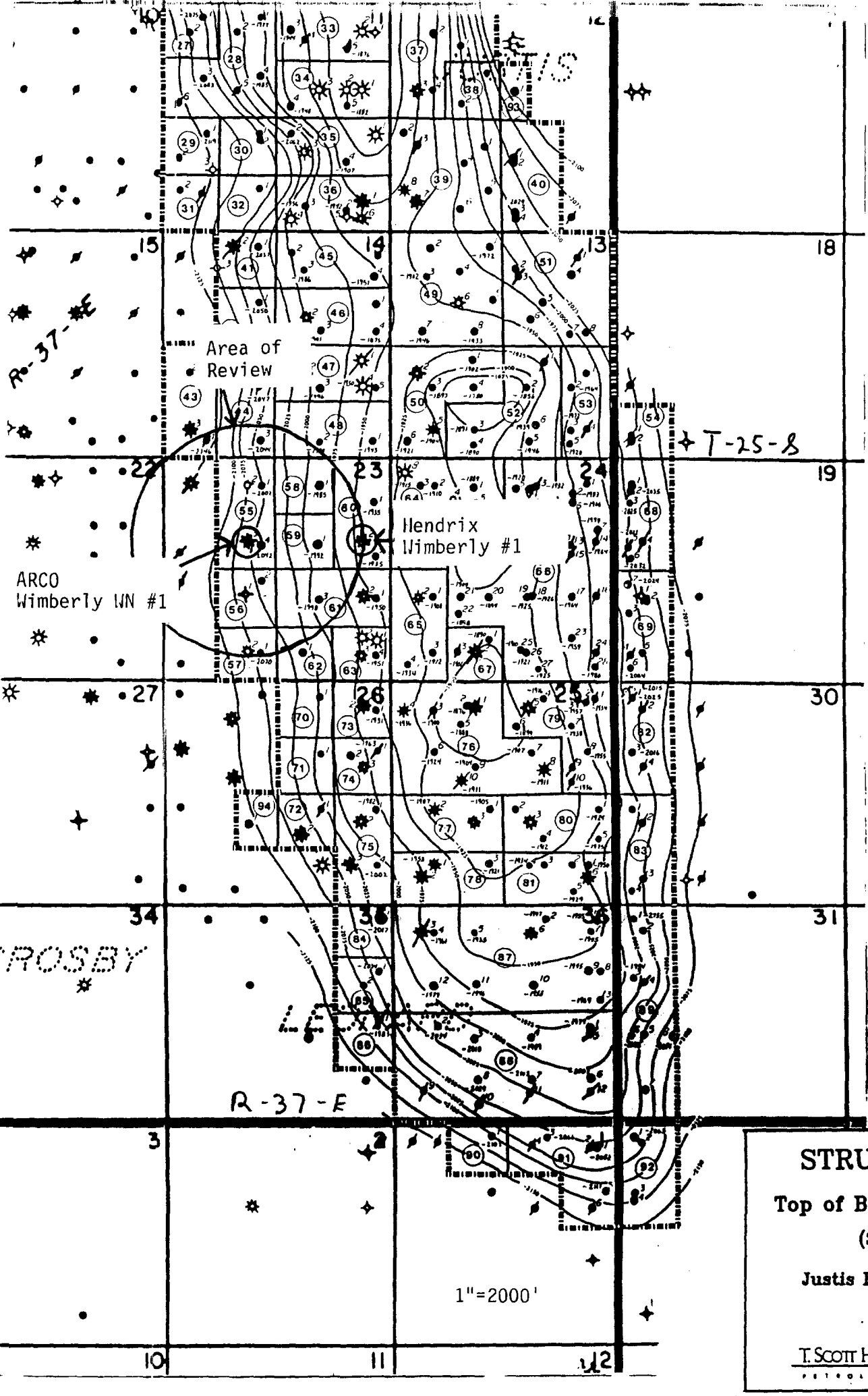
2. Name of Field or Pool (if applicable) Justis

3. Is this a new well drilled for injection? [ ] Yes [X] No

If no, for what purpose was the well originally drilled? Well was completed in the Langlie Mattix Field as a gas producer flowing 2500 MCFD on March 23, 1943.

4. 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) Queen perfs 3044-3222' (76 shots) and 3255-3325' (40 shots). To be squeezed with ± 300 sxs.

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. Jalmat Tansill Yates 7Rivers (Prorated Gas) (2210'); Langlie Mattix Oil (2600'); Justis Glorieta (Gas) (4750'); Justis Paddock Oil (5000'); Justis Blinebry Oil (5100'); Justis Tubb/Drinkard Oil (5800'); Justis McKee Oil (6500'); Justis Fusselman Oil (6700'); Justis Montoya Oil (7000') and Justis Ellenburger Oil (8000').



STRUCTURE MAP

Top of Blinebry Formation

(Subsea Feet)

Justis Field, Lea Co., N.M.

Figure 5

T. SCOTT HICKMAN & ASSOCIATES, INC.

PETROLEUM CONSULTANTS

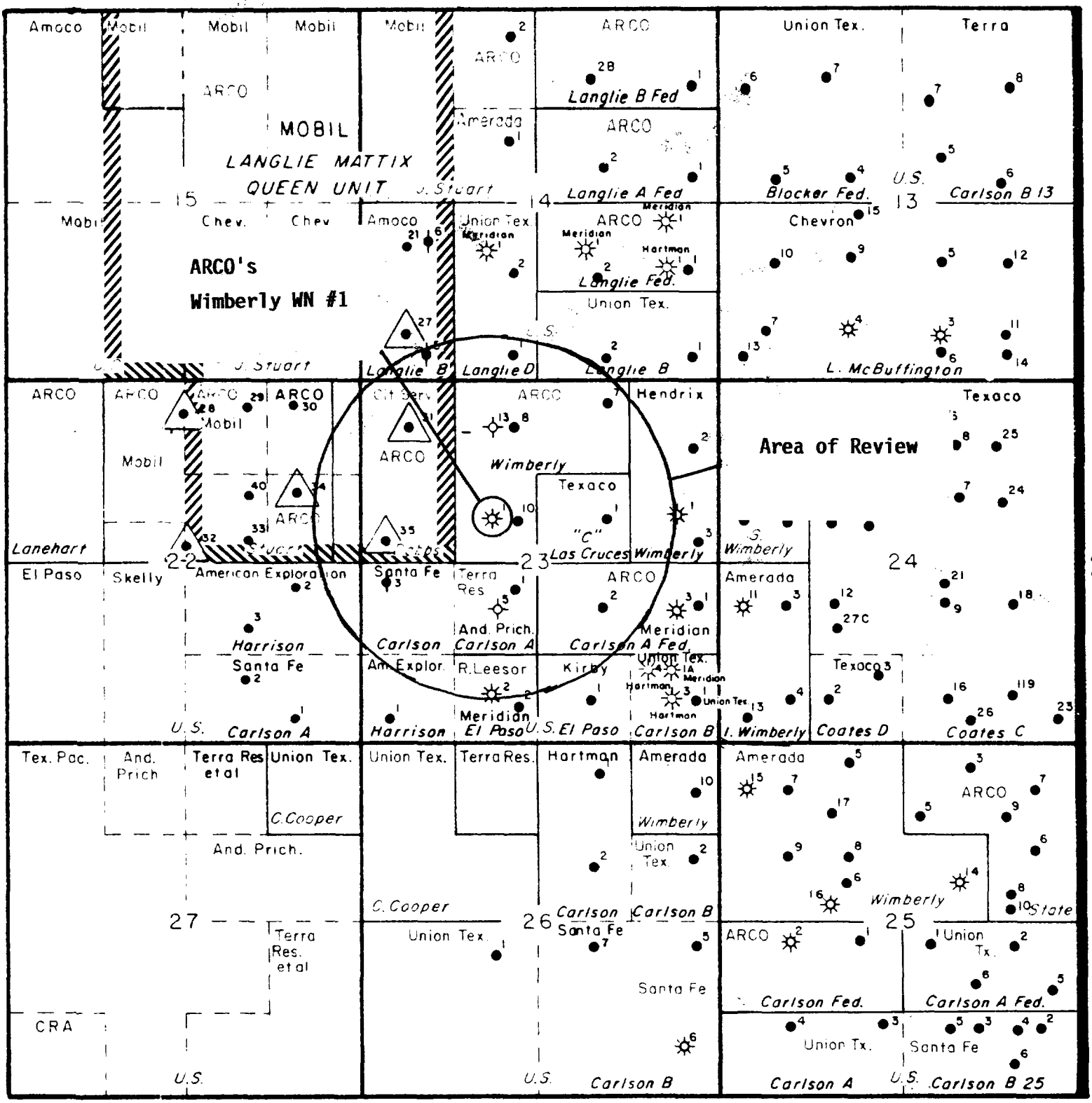


EXHIBIT 2

ARCO Oil and Gas Company
Permian District Midland, Texas

JUSTIS AREA
Lea Co., New Mexico

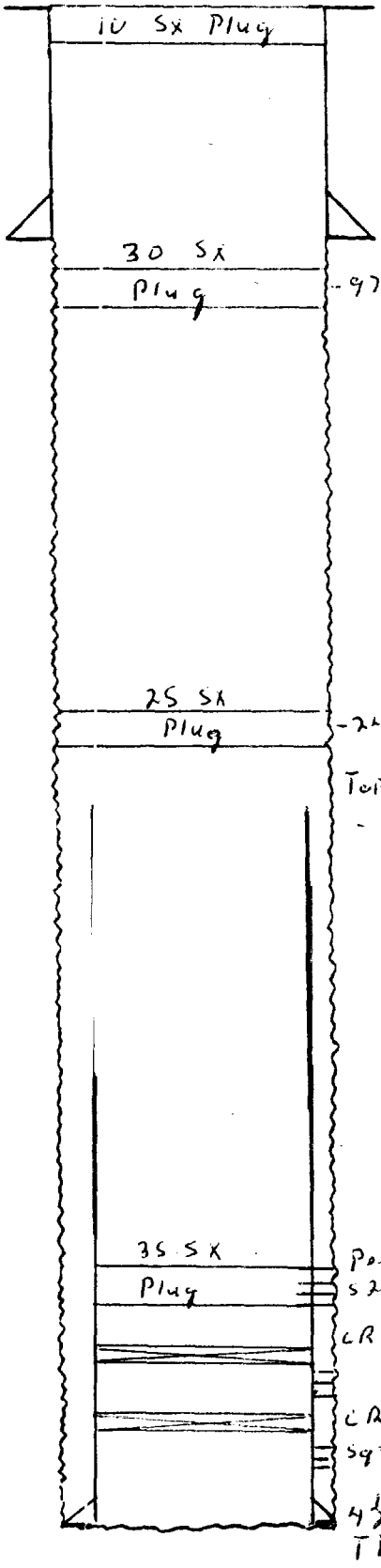
Scale: 1" = 2000

By R PRENTICE	Drawn By	Date 1-85
Date 3-7-88	Revised By RT	Date 5-12-88
Dept SOUTH ENGINEERING	Dwg No	

AtlanticRichfieldCompany
Permian District
Engineering Section

Subject : Wellbore Diagram
Well Name: Langlie B-5
Operator: Amoco Field:
Location: 330' FSL, 990' FWL Sec. 14, T-25S, R37E
By Date

Page of Pages



Elevation: GL, DF, 3103 RKB

TD: 5730 PBD: 5645

Producing Zone(s):
Blinebry 5503-5604' IP P 13 BO, 93 BW, 64 MCFD

Casing Program

8 5/8" - 958' - circulated w/425 sx.

4½" - 5730' - 925 sx.

10-24-71
shot 4½" casing @ 2847' & pulled 2535' from well.

Cement plugs; 5298-5431 - 35 sx.
2403' - 25 sx.
971' - 30 sx.
surface - 10 sx.

Well P & A'd 10-24-71

LIST:
a. OD, inches
b. No. of jts.
c. Length
d. Grade
e. Range
f. Thread
g. Setng. Depth
h. Sx of cmt, TOC
i. Open hole size & length (if applicable)

Producing Interval(s)

04/64 Perf Bly 5660-94. Acidized w/2000 gals. Set CR at 5645' & squeezed w/150 sxs. Perf Bly 5503-5604. Acidized w/2000 gals. Frac'd w/30,000 gals LO & 45,000 #sd. Set CR at 5485' and squeezed perfs 5503-5604' w/100 sxs. Perf'd 5298-5431'. Acidized w/1000 gals. Pumped for 1 month.

09-10-64 - Temporarily Abandoned

LIST:
a. Perfs, nbr & size.
b. Treatment(s)
c. Potential
d. Multiple Completions Describe in-hole equip.
e. Prod. Method

Spud Date: March 4, 1964

Completion Date: April 28, 1964

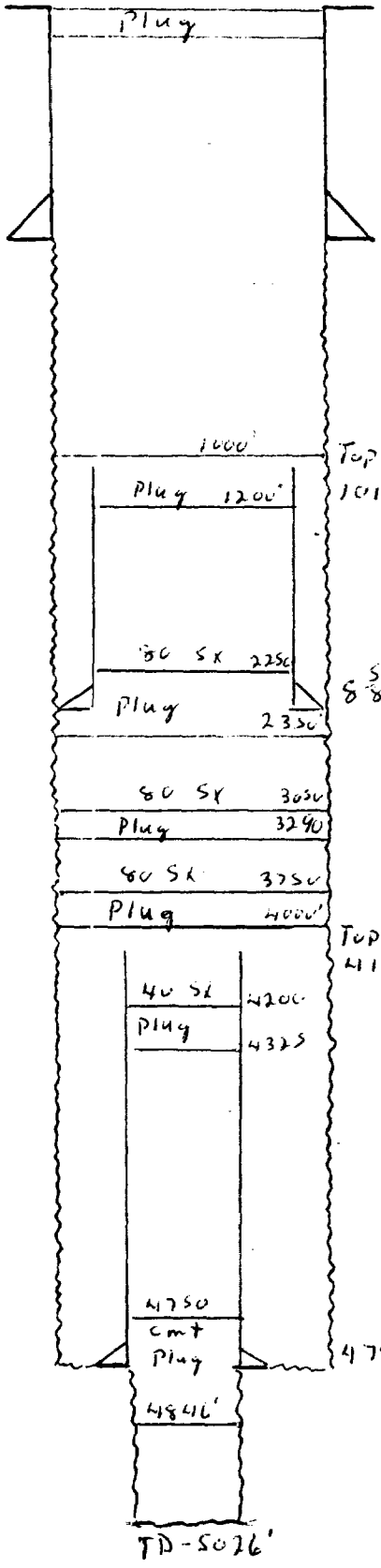
EXHIBIT 4

AtlanticRichfieldCompany
Permian District
Engineering Section

Subject : Wellbore Diagram
Well Name: Carlson - Harrison #5
Operator: Anderson Prichard Field: Justis
Location: 1980' FS & WL, Sec. 23, T-25S, R-37E

By | Date

Page of Pages



Elevation: GL, 3079' DF, RKB

TD: 5026' PBD: 4903'

Producing Zone(s):

Plugged and Abandoned September 7, 1943

Casing Program

13 3/8" - 257' - 225 sx.

8 5/8" - 2318' - 228 sx.
5½" - 4789' - 40 sx.
5½" casing shot off at 4400' and 4136' were recovered.
4750-4846'

Cement plugs 4200-4325' - 40 sxs.
3750-4000' - 80 sxs.
3050-3290' - 80 sxs.
2250-2350' - 80 sxs.

8 5/8" casing shot off at 1700' and 1011' were recovered.

Cement plug - 1000'-1200'

LIST:

a. OD, inches
b. No. of jts.
c. Length
d. Grade
e. Range
f. Thread
g. Setng. Depth
h. Sx of cmt, TOC
i. Open hole size & length (if applicable)

Producing Interval(s)

DST #1 3685-3721. Open 1 hr. - rec'd 900' sulfur water and DF.
DST #2 4776-4811. Open 30 min. - rec'd 75' o & g cut mud.
DST #3 4885-4964. Open 1 hr. - rec'd 200' o & g cut mud.
DST #4 4966-5026'. Open 1 hr. - rec'd 210' o & w cut mud.

LIST:

a. Perfs, nbr & size.
b. Treatment(s)
c. Potential
d. Multiple Completions Describe in-hole equip.
e. Prod. Method

Spud Date: 05-07-43

Completion Date: 07-31-43

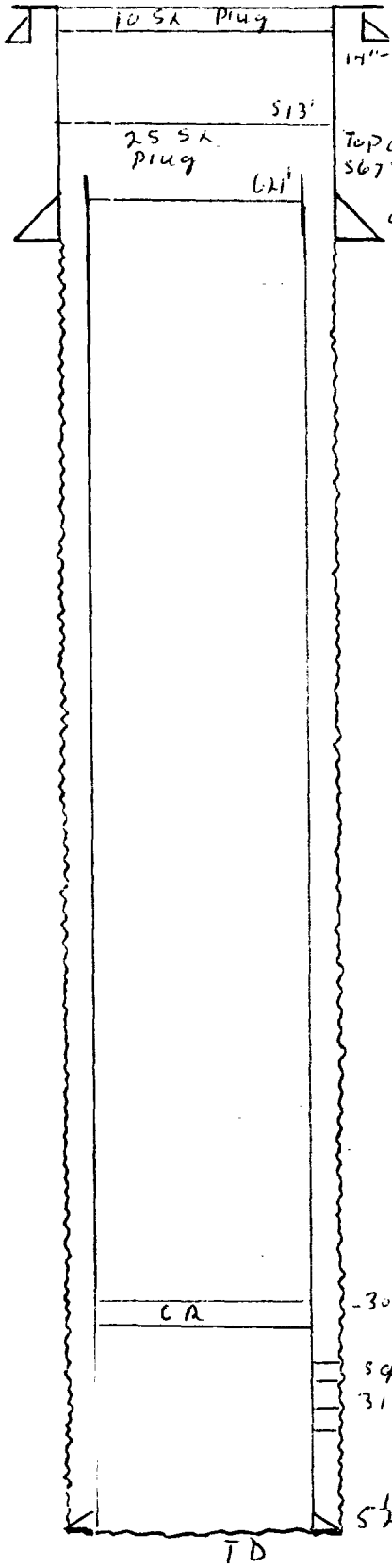
EXHIBIT 5

AtlanticRichfieldCompany
Permian District
Engineering Section

Subject : Wellbore Diagram
Well Name: Wimberly WN #13
Operator: ARCO Oil and Gas Co. Field: Justis
Location: 660' FNL, 1980' FWL, Sec. 23, T-25S, R-37E

By | Date

Page of Pages



Elevation: 3089' GL, DF, RKB

TD: 3500' PBD:

Producing Zone(s):
Plugged and Abandoned

Casing Program

14" set at 33'

8 5/8" 24# K-55 set at 785' and cemented with 510 sx.

5½" 15.5# K-55 set at 3500' and cemented with 900 sx.

LIST:

a. OD, inches
b. No. of jts.
c. Length
d. Grade
e. Range
f. Thread
g. Setng. Depth
h. Sx of cmt, TOC
i. Open hole size & length (if applicable)

Producing Interval(s)

3124-3232' - Acdzd w/2000 gals. 15% NEFE
3283-3313' - Acdzd w/1000 gals. 15% NEFE
3124-3313' - Frac'd w/11,000 gals. YFCO_2 and 21,000 # sand.
3124-3232' - Set CR @ 3083' and sqzd3124-3313' w/100 sx Cl. H neat cmt. Final pressure - 2800#.

Cut 5½" csg @ 567' and POH w/csg. Spotted 25 sx cmt 513-621'. Spotted 10 sx cmt. at surface.

LIST:

a. Perfs, nbr & size.
b. Treatment(s)
c. Potential
d. Multiple Completions Describe in-hole equip.
e. Prod. Method

EXHIBIT 6

Spud Date:

Completion Date:

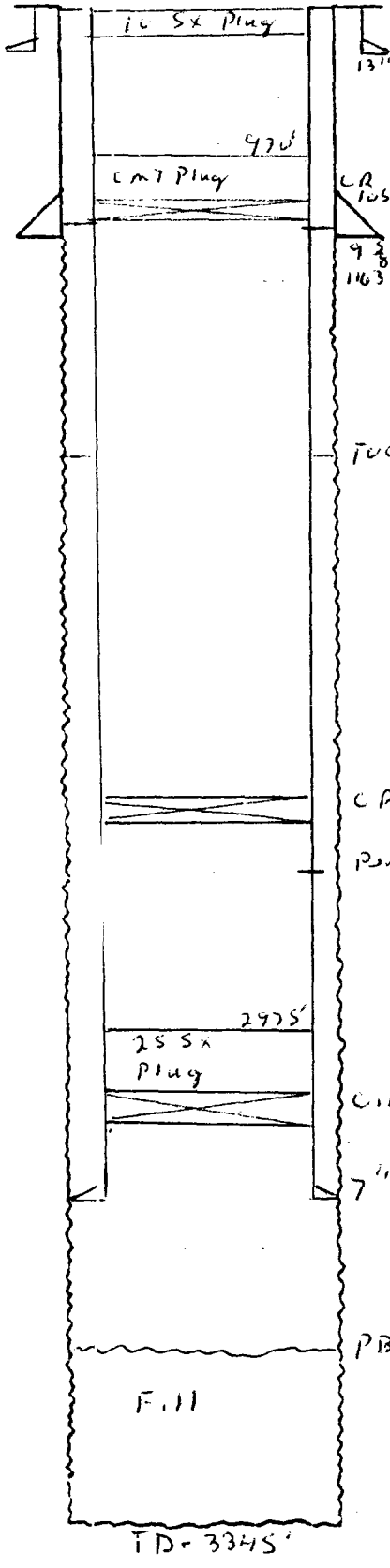
Well P & A'd 6-2-83.

AtlanticRichfieldCompany
Permian District
Engineering Section

Subject : Wellbore Diagram
Well Name: Carlson A #3 Formerly Italo Pet. Corp.
Operator: Santa Fe Energy/ Field: Langlie Mattix
Location: 2310' FSL, 330' FWL, Sec. 23

By | Date

Page of Pages



Elevation: 3066' GL, DF, RKB

TD: 3345' PBD:

Producing Zone(s):
Langlie Mattix 3223-3345' open hole

Casing Program

13' - 155' w/100 sxs.
9 5/8" - 1163' w/300 sxs.
7" - 3223' w/300 sxs.

09/81 Set CIBP @ 3075'. Circ. hole w/9 ppg. mud. Spot 25 sx. Cl. "C" plug 2975-3075'. Perf 7" @ 2200'. Set CR @ 2100'. Cmtd 7" w/310 sx cmt. TOC - 1800'. Perf 7" @ 1100'. Set CR @ 1050' . Cmtd 7" w/200 sxs cmt. & circ. Left 80' plug on top of retainer. Set 10 sx plug inside 7" on surface. P & A'd 09-29-81 by Santa Fe Energy.

LIST:

a. OD, inches
b. No. of jts.
c. Length
d. Grade
e. Range
f. Thread
g. Setng. Depth
h. Sx of cmt, TOC
i. Open hole size & length (if applicable)

Producing Interval(s)

OH 3223 - 3345'

Shot 3243 - 3308' w/160 quarts nitroglycerin.
IP F 240 BOPD through 3/4" choke.

LIST:

a. Perfs, nbr & size.
b. Treatment(s)
c. Potential
d. Multiple Completions Describe in-hole equip.
e. Prod. Method

Spud Date: 12-13-38

Completion Date: 01-15-39

EXHIBIT 7

P O BOX 1468
MONAHANS, TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 1087236
TO: Mr. Arley Stafford — SAMPLE RECEIVED 10-23-87
P.O. Box 949, Andrews, Texas — RESULTS REPORTED 10-28-87

COMPANY ARCO Oil & Gas Company LEASE Wimberly
FIELD OR POOL Justis
SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Produced water - taken from Wimberly #6. 10-22-87 -Fusselman
NO. 2 Produced water - taken from Wimberly #10. 10-22-87 -Blinebry

REMARKS: 1. Fusselman 2. Blinbry

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	me/l	NO. 2	me/l
Specific Gravity at 60° F.	1.0478		1.0675	
pH When Received	7.60		7.30	
Carbonate as CO_3	0	0.0	0	0.0
Bicarbonate as HCO_3	1,013	16.6	714	11.7
Supersaturation as $CaCO_3$	130		75	
Undersaturation as $CaCO_3$	---		---	
Total Hardness as $CaCO_3$	10,900		17,300	
Calcium as Ca	2,780	139.0	4,760	238.0
Magnesium as Mg	960	79.0	1,312	108.0
Sodium and/or Potassium	21,365	929.0	31,208	1,356.9
Sulfate as SO_4	2,829	58.9	1,869	38.9
Chloride as Cl	37,995	1,071.5	58,591	1,652.3
Iron as Fe	0.24	0.0	0.40	0.0
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	66,942		98,454	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
[redacted] Sulfide - Total	437		3.8	
Resistivity, ohms/m at 77° F.	0.127		0.096	
Suspended Oil				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks

Form No. 2

By ___

EXHIBIT 8

P O BOX 1468
MONAHANS TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 1087236 (Page 2)

TO: Mr. Arley Stafford
P.O. Box 949, Andrews, Texas

SAMPLE RECEIVED 10-23-87

RESULTS REPORTED 10-28-87

COMPANY ARCO Oil & Gas Company LEASE Wimberly T/D

FIELD OR POOL Justis

SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Produced water - taken from Wimberly #11. 10-22-87

NO. 2

REMARKS: Tubb-Drinkard

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	me/l	NO. 2	me/l
Specific Gravity at 60° F.	1.0857			
pH When Received	7.50			
Carbonate as CO_3	0	0.0		
Bicarbonate as HCO_3	506	8.3		
Supersaturation as $CaCO_3$	85			
Undersaturation as $CaCO_3$	---			
Total Hardness as $CaCO_3$	21,700			
Calcium as Ca	5,640	282.0		
Magnesium as Mg	1,847	152.0		
Sodium and/or Potassium	38,997	1,695.6		
Sulfate as SO_4	1,844	38.4		
Chloride as Cl	73,860	2,082.8		
Iron as Fe	5.12	0.2		
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	122,694			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide - Total	52.5			
Resistivity, ohms/m at 77° F.	0.081			
Suspended Oil				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks In comparing the results of these analyses, we see no evidence of any incompatibility between any combination of the waters represented herein. This is to say that a combination of the waters should not cause any precipitation, scaling, or other detrimental condition.

EXHIBIT 8
Cont.

Form No. 2

cc: Mr. Dick Prentice, Midland
Mr. R.D. Thompson, Andrews
Mr. Jim Ellis, Jal
Central File System, Midland

By _____
Waylan C. Martin, M.A.

P O BOX 1468
MONAHANS TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 18741

TO: Mr. Jerry Guy
P.O. Box 1710, Hobbs, NM

SAMPLE RECEIVED 2-9-87
RESULTS REPORTED 2-10-87

COMPANY ARCO Oil & Gas Company LEASE State 157-D #11
FIELD OR POOL Arrowhead
SECTION 12 BLOCK ____ SURVEY T-22S & R-36E COUNTY Lea STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Produced water - taken from State 157-D #11. 2-9-87
NO. 2

REMARKS: Grayburg

CHEMICAL AND PHYSICAL PROPERTIES				
	NO. 1	me/l	NO. 2	me/l
Specific Gravity at 60° F.	1.0101			
pH When Received	6.39			
Carbonate as CO_3	0	0.0		
Bicarbonate as HCO_3	2,074	34.0		
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	3,600			
Calcium as Ca	750	37.5		
Magnesium as Mg	419	34.5		
Sodium and/or Potassium	1,844	80.2		
Sulfate as SO_4	241	5.0		
Chloride as Cl	4,013	113.2		
Iron as Fe	0.68	0.0		
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	9,341			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide - Total	1,750			
Resistivity, ohms/m at 77° F.	0.890			
Suspended Oil				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks: Based on a comparison of the above with our records in this area, this water correlates well with Grayburg water.

EXHIBIT 9

Form No. 2

cc: Mr. Wayne Fletcher, Hobbs
Mr. Steve Smith, Hobbs
Mr. M.D. Robinson, Hobbs
Mr. Steve Suellentrop, Midland
Mr. Graham King, Midland
Mr. Myron Ellis, ARCO Chemical, Hobbs
Mr. S.M. Bucaram, Plano
[illegible], Midland

By _____
Waylan C. Martin, M.A.

Exhibit 3

Wimberly WN No. 1
Proposed SWD Well
Area of Review
T-25S R-37E, Lea County New Mexico

Operator/Well	Location	Type	Total Depth
Section 14			
Amoco/Langlie Federal B-5	330' FSL, 990' FWL (M)	P & A	5730'
Mobil/Langlie Mattix Qn. Unit #27 (originally Stanolind Langlie B-3)	660' FS & WL (M)	WIW	3453'
Union Texas/Langlie B-2 (originally Anderson Prichard Langlie B-2)	330' FSL, 1650' FEL (O)	Producer	6000'
Union Texas/Langlie Federal D-1	330' FSL, 2310' FWL (N)	Producer	8195'
Section 22			
Mobil/Langlie Mattix Qn. Unit #34 (originally Amerada Pet. Corp. F. Stuart B-1)	1650' FNL, 990' FEL (H)	Producer	3380'
Section 23			
Anderson Prichard/ Carlson Harrison #5	1980' FS & WL (K)	P & A	5026'
ARCO/Carlson A Federal 2	1980' FSL, 1650' FEL (J)	Producer	6052'
ARCO/Wimberly WN #1 (originally El Paso Natural Gas Wimberly #1)	1980' FN & WL (F)	Producer	3465'
ARCO/Wimberly WN #7 (originally Western Natural Gas Wimberly #7)	660' FNL, 1650' FEL (B)	Producer	6042'
ARCO/Wimberly WN #8 (originally Western Natural Gas Wimberly #8)	660' FNL, 2310' FWL (C)	Producer	5525'

Wimberly WN No. 1
Proposed SWD Well
Area of Review

Operator/Well	Location	Type	Total Depth
Section 23 (Cont.)			
ARCO/Wimberly WN #10	1980' FNL, 2309' FWL (F)	Producer	6100'
ARCO/Wimberly WN #13	660' FNL, 1980' FWL (C)	P & A	3500'
Hendrix/Wimberly #1 (originally R. Olsen Oil Co. Wimberly #1)	1980' FNL, 550' FEL (H)	Producer	9152'
Leeser/El Paso Federal #2 (originally King Resources El Paso Federal #2)	660' FSL, 2310' FWL (N)	Producer	7415'
Meridian Oil Inc./Carlson Fed. #2 (originally El Paso Carlson Fed. #2)	660' FSL, 1980' FWL (N)	Producer	3314'
Mobil/Langlie Mattix Qn. Unit #31 (originally Empire Dabbs #1)	660' FN & WL (D)	WIW	3476'
Mobil/Langlie Mattix Qn. Unit #35 (originally Cities Service Dabbs #2)	2310' FNL, 330' FWL (E)	WIW	3425'
Santa Fe Energy/Carlson A #3 (originally Italo Pet. Corp. Carlson A-23 #1)	2310' FSL, 330' FWL (L)	P & A	3345'
Terra Resources/Carlson A-23 #1	2310' FS & WL (K)	Producer	6200'
Texaco/Las Cruces C #1 (originally Skelly Las Cruces C #1)	1980' FNL, 1650' FEL (G)	Producer	6000'

Exhibit 3 - Page three

Wimberly WN No. 1
Proposed SWD Well
Area of Review

Operator/Well	Csg-Depth/Cement	Completion Date	Zone	Perfs	IP BOPD/BWPD/GOR
Section 14					
Amoco/Lang. Fed. B-5	8-5/8"-958'/425 4-1/2"-5730'/925	04-28-64 1972	Bly	5503-5604	13/93/4920 P & A'd
Mobil/Lang. MQU #27	8-5/8"-1247'/400 5-1/2"-2971'/460	08-30-37 11-23-69	Yates Queen	OH2971-3375 OH2971-3453	14.25 MMCFD WIW
Union Texas/Lang. B-2	9-5/8"-975'/450 7"-5999/460	07-25-60 07-24-69	Bly Tubb Bly Tubb	5338-5460 5824-60 5079-5578 5732-5860	94/0/242 427/284/824
Union Texas/Lng.Fed D-1	13-3/8"-938'/700 7"-6702'/1700	03-03-63 07-24-69	Bly Bly	5394-5515 5123-5350	85/32/1330
Section 22					
Mobil/Lang. MQU #34	7-5/8"-1115'/250 5-1/2"-3298'/200	03-17-39	Yates	OH3298-3380	137/0/547
Section 23					
Anderson P./Harr. #5	13-3/8"-257'/225 8-5/8"-2318'/825 5-1/2"-4789'/40	08-03-43			P & A'd

Wimberly WN No. 1
Area of Review

Operator/Well	Csg-Depth/Cement	Completion Date	Zone	Perfs	IP BOPD/BWPD/GOR
Section 23 (Cont.)					
ARCO/Carlson A Fed. #2	9-5/8"-936'/500	09-61	Paddock	4973-5020	Wet/Sqz w/270 sx
	7"-6050'/800	10-04-61	Bly	5312-86	54/51/333
	Bradenhead	10-04-61	Tubb	5808-5914	78/140/1964
	sqz. 500 sx	12-66	Bly	5203-82	244/0/172
		04-70	Tubb	P & A'd	
		06-80	Bly	5105-63 5203-6386	5/21/8000
ARCO/Wimberly WN #1	13"-207'/200 9-5/8"-3448'/700	03-30-43	Lang Mtx	3044-3325	2.5 MMCFD
ARCO/Wimberly WN #7	10-3/4"-905'/610	07-01-62	Bly	5324-5418	412/0/--
	7-5/8"-5917'/1760		Tubb/Dkd	5826-62	59/0/--
		05-65	Drinkard	5776-5888	293/24/--
		04-22-71	Bly Tubb/Dkd	5210-5656 P & A'd	
		09-01-87	Bly & T/D (Commingled)	5194-6042	9/60/2444
ARCO/Wimberly WN #8	8-5/8"-920'/500	05-22-63	Bly	5342-5451	480/0/758
	5-1/2"-5525'/950	03-21-69	Bly	5167-5451	408/36/900
ARCO/Wimberly WN #10	9-5/8"-956'/500	10-01-65	Bly	5377-5516	79/48/1120
	7"-6100'/1060		Tubb	5814-5975	16/32/690
		04-17-69	Bly	5142-5259	220/0/1200
ARCO/Wimberly WN #13	14"-44'/15	02-17-83	7 Rivers	3124-3232	
	8-5/8"-785'/310				
	5-1/2"-3430'/900	06-20-83			P & A'd
Hendrix/Wimberly #1	13-3/8"-296'/350	12-12-47	Glorieta	4740-70	12/75/112,800
	9-5/8"-2778'/3250				
	5-1/2"-6239'/400				

Wimberly WN No. 1
Area of Review

Operator/Well	Csg-Depth/Cement	Completion Date	Zone	Perfs	IP BOPD/BWPD/GOR
Section 23 (Cont.)					
Leeser/El Paso Fed. #2	8-5/8"-1207'/430 5-1/2"-6113'/700	03-17-69	Bly	5158-5522	105/270/--
Meridian/Carlson Fed. #2	8-5/8"-922'/500 5-1/2"-3304'/2110	10-23-55	Lng.Mtx.	2350-2618	320 MCFD
Mobil/Lang. MQU #31	10-3/4"-376'/200 7"-2450'/600 4-1/2"-2311-3476'/200	11-28-36 11-22-69	Yates Queen	OH2450-3361 3158-3415	37 MMCFD WIW
Mobil/Lang MQU #35	8-5/8"-1081'/600 5-1/2"-3240'/200	05-09-39 11-06-69	Yates 7R/Queen	OH3240-3360 3108-3208	640/0/780 WIW
Santa Fe/Carlson A #3	13"-155'/100 9-5/8"-1163'/300 7"-3223'/300	01-05-39 09-29-81	Yates	OH3223-3345	240/0/-- P & A'd
Terra/Carlson A-23 #1	8-5/8"-1239'/500 5-1/2"-6194'/960	09-03-77	Bly	5136-5736	90/252/--
Texaco/Las Cruces C #1	9-5/8"-910'/450 7"-6000'/700	05-01-61 04-28-61 08-07-69	Bly Tubb Bly	5345-5452 5850-5912 5090-5452	431/48/-- 387/0/--

Exhibit 3A
Top of Cement Calculations
Area of Review Wells

Operator	Lease/Well	Bit:Hole Size (in)	Csg. Size (in)	Depth (ft)	Cmt (sx)	Annular Vol (ft^3/ft)	Cmt. Ht (ft)	TOC (ft)
Section 14								
Amoco	Langlie Fed B-5	*11:--	8 5/8	958'	425			Circ
		7 7/8:8 1/2	4 1/2	5730'	925	.2836	3588'	2142'
Mobil	LMQU #27	*17:17 1/2	13	16'	5	.7486	7'	9'
		*11:11 1/2	8 5/8	1247'	400	.3156	1394'	Circ
		*8 1/2:9	5 1/2	2971'	460	.2768	1828'	1143'
Union TX	Langlie B-2	~~12~~ 1/4:13	9 5/8	975'	450	.4165	1188'	Circ
		8 3/4:9 1/4	7	5999'	~~460~~ 710	.1994	2538'	~~3461'~~ 1855'
Union TX	Langlie Fed D-1	*17:17 1/2	13 3/8	938'	700	.6946	1109'	Circ
		8 3/4:9 1/4	7	6702'	1700	.1994	9355'	Circ
Section 22								
Mobil	LMQU #34	*10:10 1/2	7 5/8	1115'	250	.2842	968'	147'
		*7 7/8:8 1/2	5 1/2	3298'	200	.2291	960'	2337'
Section 23								
And. Prichard	Harrison #5	*17:17 1/2	13 3/8	257'	225	.6946	356'	Circ
		*12:12 1/2	8 5/8	2318'	825	.4465	2032'	285'
		*7 7/8:8 1/2	5 1/2	4789'	40	.1733	254'	4535'
ARCO	Carlson A Fed 5	13 3/4:14 1/4	9 5/8	936'	500			Circ
		8 3/4:9 1/4	7	6050'	800	.1994	4413'	1637'
ARCO	Wimberly #1	17 1/2:18	13	207'	200	.8454	260'	Circ
		12 1/4:12 3/4	9 5/8	3448'	450	.3814	1298'	2150'
			9 5/8	990'	250	.3814	721'	269'

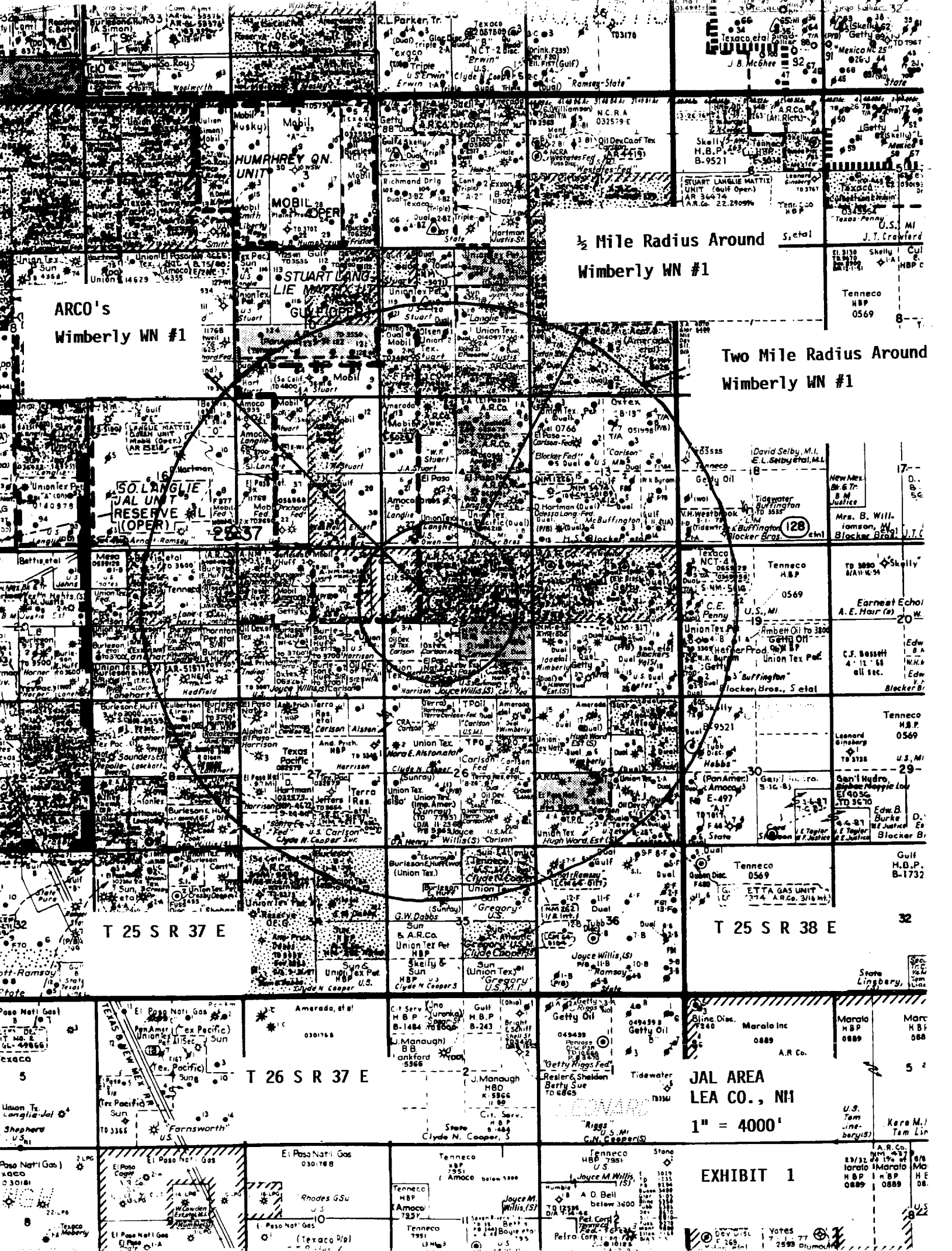
Exhibit 3A
Page 2
Top of Cement Calculations

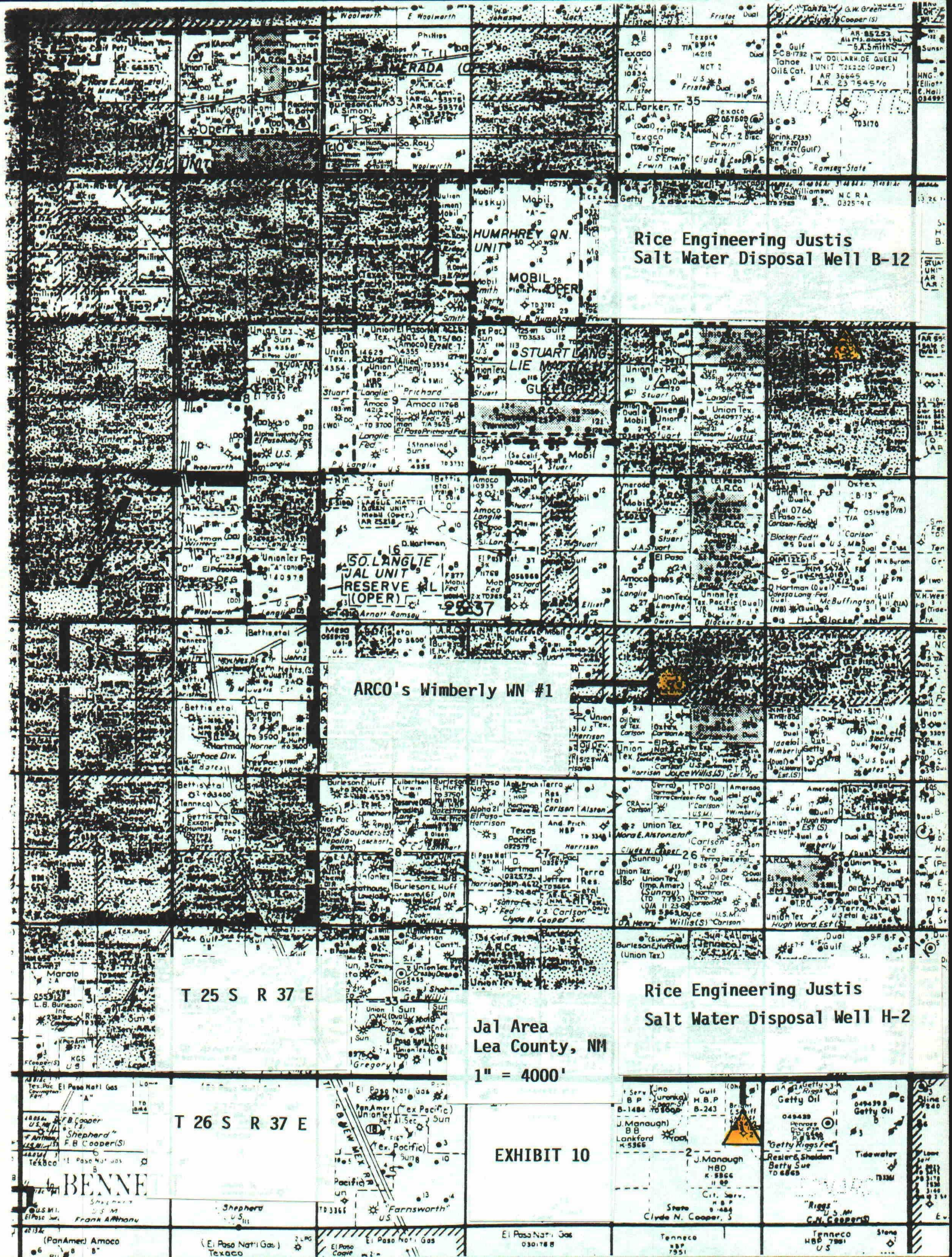
Operator	Lease/Well	Bit:Hole Size (in)	Csg. Size (in)	Depth (ft)	Cmt (sx)	Annular Vol (ft^3/ft)	Cmt. Ht (ft)	TOC (ft)
ARCO	Wimberly #7	15:15 1/2	10 3/4	905'	610			Circ
		9 7/8:10 1/4	7 5/8	5917'	360	.2559		
			7 5/8	2284'	1400	.2559		Circ
ARCO	Wimberly #8	11:11 1/2	8 5/8	920'	500			Circ
		7 7/8:8 1/4	5 1/2	5525'	950			Circ
ARCO	Wimberly #10	12 1/4:12 3/4	9 5/8	956'	500			Circ
		8 3/4:9 1/4	7	6100'	1060	.1745	6682'	Circ
ARCO	Wimberly #13	17 1/2:18	14	44'	15			Circ
		11:11 1/2	8 5/8	785'	310			Circ
		7 7/8:8 1/4	5 1/2	3430'	900			600-CBL
Hendrix	Wimberly #1	*17:17 1/2	13 3/8	296'	350	.6946	554'	Circ
		*12 1/2:13	9 5/8	2778'	3250	.4165	8583'	Circ
		7 7/8:8 1/4	5 1/2	6239'	400	.2062	2134'	4105'
Leeser	El Paso Fed #2	*11:11 1/2	8 5/8	1207'	430	.3156	1499'	Circ
		7 7/8:8 1/4	5 1/2	6113'	700	.2062	3734'	2379'
Meridian	Carlson Fed #2	*11:11 1/2	8 5/8	922'	500	.3156	1743'	Circ
		7 7/8:8 1/4	5 1/2	3304'	2110	.2062	11,256'	Circ
Mobil	LMQU #31	*15:15 1/2	10 3/4	376'	200			
		*8 3/4:9	7	2450'	600	.1745	3782'	Circ
		*6 1/4:6 3/4	4 1/2	2311'		.1381	1593'	Circ
				3476'	200			
Mobil	LMQU #35	*11:11 1/2	8 5/8	1081'	600	.3156	2091'	Circ
		7 7/8:8 1/4	5 1/2	3240'	200	.2062	1067'	2173'

Exhibit 3A
Page 3
Top of Cement Calculations

Operator	Lease/Well	Bit:Hole Size (in)	Csg. Size (in)	Depth (ft)	Cmt (sx)	Annular Vol (ft^3/ft)	Cmt. Ht (ft)	TOC (ft)
Santa Fe	Carlson A #3	*17:17 1/2	13	155'	100	.7486	147'	8'
		*12 1/2:13	9 5/8	1163'	300	.4165	792'	371'
		*8 3/4:9	7	3223'	300	.1745	1891'	1332'
Terra	Carlson A-23#1	*11:11 1/2	8 5/8	1239'	500	.3156	1743'	Circ
		7 7/8:8 1/4	5 1/2	6194'	960	.2062	5121'	1073'
Texaco	Las Cruces C#1	*12 1/2:13	9 5/8	910'	450	.4165	1188'	Circ
		8 3/4:9	7	6000'	700	.1745	4413'	1587'

*Assumed Bit Size
All Hole Sizes Assumed


ARCO's
Wimberly WN #1
½ Mile Radius Around
Wimberly WN #1
Two Mile Radius Around
Wimberly WN #1
T 25 S R 37 E
T 25 S R 38 E
T 26 S R 37 E
JAL AREA
LEA CO., NM
1" = 4000'
EXHIBIT 1


Rice Engineering Justis
Salt Water Disposal Well B-12
ARCO's Wimberly WN #1
T 25 S R 37 E
Jal Area
Lea County, NM
1" = 4000'
Rice Engineering Justis
Salt Water Disposal Well H-2
T 26 S R 37 E
EXHIBIT 10
HUMPHREY QN. UNIT
MOBIL (OPER)
SO. LANGLIE JAL UNIT RESERVE (OPER)
AMERADA (OPER)

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Commission not later than 20 days after the completion of any newly-drilled or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 30 through 34 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico				Northwestern New Mexico			
T. Anhy	900	T. Canyon		T. Ojo Alamo		T. Penn. "B"	
T. Salt		T. Strawn		T. Kirtland-Fruitland		T. Penn. "C"	
B. Salt		T. Atoka		T. Pictured Cliffs		T. Penn. "D"	
T. Yates	2345	T. Miss		T. Cliff House		T. Leadville	
T. 7 Rivers		T. Devonian		T. Menefee		T. Madison	
T. Queen	3155	T. Silurian		T. Point Lookout		T. Elbert	
T. Grayburg		T. Montoya		T. Mancos		T. McCracken	
T. San Andres	3588	T. Simpson		T. Gallup		T. Ignacio Qtzte	
T. Glorieta	4750	T. McKee		Base Greenhorn		T. Granite	
T. Paddock	4850	T. Ellenburger		T. Dakota		T.	
T. Blinebry	5158	T. Gr. Wash		T. Morrison		T.	
T. Tubb	5757	T. Granite		T. Todilto		T.	
T. Drinkard		T. Delaware Sand		T. Entrada		T.	
T. Abo		T. Bone Springs		T. Wingate		T.	
T. Wolfcamp		T.		T. Chinle		T.	
T. Penn.		T.		T. Permian		T.	
T Cisco (Bough C)		T.		T. Penn. "A"		T.	

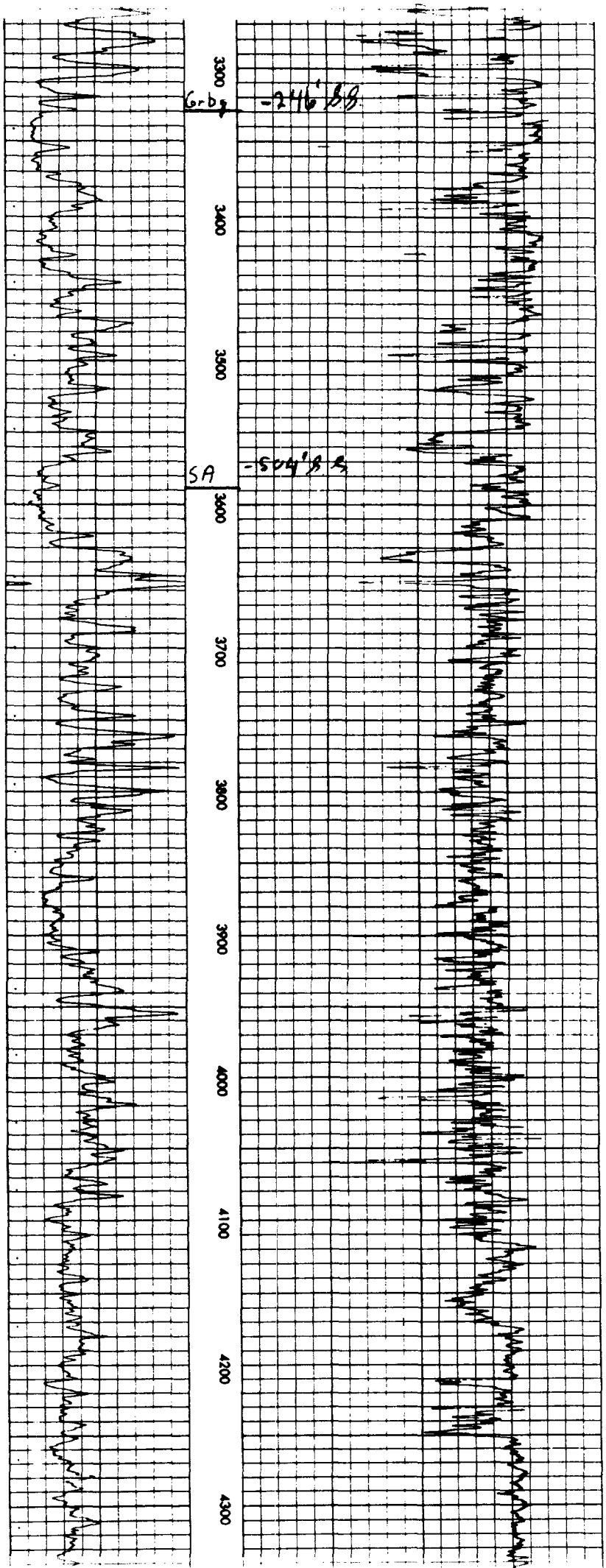
FORMATION RECORD (Attach additional sheets if necessary)

From	To	Thickness in Feet	Formation	From	To	Thickness in Feet	Formation
0	84	84	Surface rock & Red Bed	5310	5359	49	Dolomite & Lime
84	850	766	Red Bed & Anhydrite	5359	5430	71	Dolomite & Sand Streaks
850	956	106	Anhydrite	5430	5480	50	Dolomite
956	2017	1061	Anhydrite & salt	5480	5523	43	Lime & Sand Streaks
2017	2730	713	Anhydrite	5523	5595	72	Dolomite & Sand Streaks
2730	2763	33	Anhydrite & Sand	5595	5642	47	Dolomite
2763	2817	54	Anhydrite & Gyp	5642	5755	113	Dolomite & Lime
2817	2935	118	Anhydrite	5755	5865	110	Dolomite
2935	3144	209	Anhydrite & Sand	5865	6100TD	235	Lime
3144	3238	94	Anhydrite				
3238	3291	53	Anhydrite & Sandy Strks.				
3291	3371	80	Sandy Lime				
3371	3437	66	Lime				
3437	3471	34	Lime & Sandy Lime				
3471	3768	297	Lime				
3768	3935	167	Lime & Sand				
3935	4131	196	Lime & Sandy Lime				
4131	4478	347	Lime				
4478	4518	40	Lime & Sandy Lime				
4518	4575	57	Sandy Lime				
4575	4765	190	Lime				
4765	4814	49	Lime & Sand				
4814	4910	96	Dolomite & Sand Streakcs				
4910	4952	42	Dolomite Lime				
4952	5120	168	Dolomite & Sand				
5120	5217	97	Lime				
5217	5310	93	Dolomite				

Lithological Description
of Grayburg and San Andres

ARCO's Wimberly WN #10

EXHIBIT 11



ARCO's Wimberly WN #10

Sonic Log

09-14-65

GL - 3084

EXHIBIT 12

FORM C-105

N.

NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

WELL RECORD

Mail to Oil Conservation Commission, Santa Fe, New Mexico, or its proper agent not more than twenty days after completion of well. Follow instructions in the Rules and Regulations of the Commission. Indicate questionable data by following it with (?). SUBMIT IN TRIPLICATE.

AREA 640 ACRES
LOCATE WELL CORRECTLY

W. G. Co — Company or Operator; Drawer H Bennett — Address

Weinbaley — Lease; Well No. 1 in SE NW of Sec. 23, T. 25

R. 37, N. M. P. M., Langlie Field, Lea County.

Well is 1980 feet south of the North line and 1980 feet east of the West line of Sec 23-25-37

If State land the oil and gas lease is No. ________ Assignment No. ________

If patented land the owner is S. D. Weinbaley, Address Delano Calif

If Government land the permittee is ________, Address ________

The Lessee is ________, Address ________

Drilling commenced 3-1 1943 Drilling was completed 3-29 1943

Name of drilling contractor Lee, Address Tulsa Okla.

Elevation above sea level at top of casing 3090 feet.

The information given is to be kept confidential until NOT 19__

OIL SANDS OR ZONES

No. 1, from Gas 3044 to 3220 No. 4, from ________ to ________

No. 2, from ________ to ________ No. 5, from ________ to ________

No. 3, from ________ to ________ No. 6, from ________ to ________

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from Pit 3320 to 25 feet.

No. 2, from ________ to ________ feet.

No. 3, from ________ to ________ feet.

No. 4, from ________ to ________ feet.

CASING RECORD

SIZE	WEIGHT PER FOOT	THREADS PER INCH	MAKE	AMOUNT	KIND OF SHOE	CUT & FILLED FROM	PERFORATED FROM	PERFORATED TO	PURPOSE
13	40	8	J&L	186					[illegible]
5 7/8	31 & 40	8	-	3431	Hall		3044	3325	

MUDDING AND CEMENTING RECORD

[signature]

Place Jal, New Mexico
Date March 30, 1943

Glenn Staley
Proration Office.

EXHIBIT 12A
Page 1

17	13	267	200			
12¼	9⅝	3448	700		11.4	

PLUGS AND ADAPTERS

Heaving plug—Material ____ Length ____ Depth Set ____

Adapters—Material ____ Size ____

RECORD OF SHOOTING OR CHEMICAL TREATMENT

SIZE	SHELL USED	EXPLOSIVE OR CHEMICAL USED	QUANTITY	DATE	DEPTH SHOT OR TREATED	DEPTH CLEANED OUT

Results of shooting or chemical treatment ____

RECORD OF DRILL-STEM AND SPECIAL TESTS

If drill-stem or other special tests or deviation surveys were made, submit report on separate sheet and attach hereto.

TOOLS USED

Rotary tools were used from 0 feet to 3465 feet, and from ____ feet to ____ feet

Cable tools were used from ____ feet to ____ feet, and from ____ feet to ____ feet

PRODUCTION

Put to producing 3-29, 1943

The production of the first 24 hours was ____ barrels of fluid of which ____ % was oil; ____ % emulsion; ____ % water; and ____ % sediment. Gravity, Be ____

If gas well, cu. ft. per 24 hours 2,500,000 Gallons gasoline per 1,000 cu. ft. of gas Small Amt H2O

Rock pressure, lbs. per sq. in. ____

EMPLOYEES

C.C. Watson, Driller — Arvie Bryant, Driller

Ed Van Zandt, Driller — ____, Driller

FORMATION RECORD ON OTHER SIDE

I hereby swear or affirm that the information given herewith is a complete and correct record of the well and all work done on it so far as can be determined from available records.

Subscribed and sworn to before me this ____ day of ____, 19 ____

____ Notary Public

My Commission expires ____

Place: Jackson — Date: 3/30/43

Name ____

Position [illegible]

Representing [illegible] (Company or Operator)

Address [illegible]

FORM C-103

NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

MISCELLANEOUS REPORTS ON WELL

Submit this report in triplicate to the Oil Conservation Commission or its proper agent within ten days after t work specified is completed. It should be signed and sworn to before a notary public for reports on beginnir drilling operations, results of shooting well, results of test of casing shut-offs, result of plugging of well, ar other important operations, even though the work was witnessed by an agent of the commission. Reports on min operations need not be signed and sworn to before a notary public. See additional instructions in the Rules ar Regulations of the Commission.

Indicate nature of report by checking below:

REPORT ON BEGINNING DRILLING OPERATIONS		REPORT ON REPAIRING WELL	
REPORT ON RESULT OF SHOOTING OR CHEMICAL TREATMENT OF WELL		REPORT ON PULLING OR OTHERWISE ALTERING CASING	X
REPORT ON RESULT OF TEST OF CASING SHUT-OFF		REPORT ON DEEPENING WELL	
REPORT ON RESULT OF PLUGGING OF WELL			

Jal, New Mexico (Place) March 29, 1943 (Date)

OIL CONSERVATION COMMISSION
Santa Fe, New Mexico.
Gentlemen:

Following is a report on the work done and the results obtained under the heading noted above at the

WESTERN GAS COMPANY (Company or Operator) Wimberley (Lease) Well No. 1 in t

SE¼ NW¼ of Sec. 23, T. 25, R. 37, N. M. P. M

Langlie Field, Lea Coun

The dates of this work were as follows: March 27, 1943

Notice of intention to do the work was (~~was not~~) submitted on Form C-102 on March 27 19 4
and approvalof the proposed plan was (~~was not~~) obtained. (Cross out incorrect words.)

DETAILED ACCOUNT OF WORK DONE AND RESULTS OBTAINED

Perforated 9 5/8" Casing 3255 to 3325 and bailed for 12 hours and tested small amount salt water with slight show of oil.

Perforated 9 5/8" Casing 3044 to 3220 and gauged 2,500,00 cubic feet of gas with small amounts of water.

Witnessed by Harvey Henderson (Name) Halliburton (Company) (Title)

Subscribed and sworn to before me this 29th day of March, 1943.

George S. Kimbrell
Notary Public

My Commission expires Oct. 12, 1945

I hereby swear or affirm that the information giv above is true and correct.

Name W. K. Davis

Position Superintendent

Representing WESTERN GAS COMPANY (Company or Operator)

Address Drawer "H", Bennett, N.M.

Remarks:

Roy Yarbrough
Name

(illegible)
Title

EXHIBIT 12A
Page 3

RECEIVED

MISCELLANEOUS NOTICES

HO Submit this notice in triplicate to the Oil Conservation Commission or its proper agent before the work specified is to begin. A copy will be returned to the sender on which will be given the approval, with any modifications considered advisable, or the rejection by the Commission or its agent, of the plan submitted. The plan as approved should be followed, and work should not begin until approval is obtained. See additional instructions in the Rules and Regulations of the Commission.

Indicate nature of notice by checking below:

NOTICE OF INTENTION TO TEST CASING SHUT-OFF	X	NOTICE OF INTENTION TO SHOOT OR CHEMICALLY TREAT WELL	
NOTICE OF INTENTION TO CHANGE PLANS		NOTICE OF INTENTION TO PULL OR OTHERWISE ALTER CASING	
NOTICE OF INTENTION TO REPAIR WELL		NOTICE OF INTENTION TO PLUG WELL	
NOTICE OF INTENTION TO DEEPEN WELL			

Jal, New Mexico (Place) March 22, 1943 (Date)

OIL CONSERVATION COMMISSION,

Santa Fe, New Mexico.

Gentlemen:

Following is a notice of intention to do certain work as described below at the Western Gas Company (Company or Operator) Wimberley (Lease) Well No. 1 in SE¼NW¼ of Sec. 23, T. 25, R. 37, N. M. P. M., Langlie Field, Lea County.

FULL DETAILS OF PROPOSED PLAN OF WORK

FOLLOW INSTRUCTIONS IN THE RULES AND REGULATIONS OF THE COMMISSION

At total depth of 3465 feet ran 9 5/8" casing to 3448 feet and cemented with 450 sacks on bottom in first stage. Then perforated casing at 1000 feet and cemented with 250 sacks in the second stage. Will test casing shut-off March 25, 1943.

Approved MAR 25 1943, 19

ex

EXHIBIT 12A

Page 4

WESTERN GAS COMPANY
Company or Operator

By W. K. Davis

Position Production Superintendent

Send communications regarding well to

Name W. K. Davis

Address Drawer "H"

Bennett, New Mexico

OIL CONSERVATION COMMISSION,

By Roy Yarbrough

Title OIL & GAS INSPECTOR

P O BOX 1468
MONAHANS, TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 388394

TO: Mr. Arley Stafford
P.O. Box 949, Andrews, Texas

SAMPLE RECEIVED 3-30-88
RESULTS REPORTED 4-6-88

COMPANY ARCO Oil & Gas Company LEASE

FIELD OR POOL

SECTION 22 BLOCK I SURVEY T-25S & R-37E COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Raw water - taken from windmill near American Exploration's Harrison #2. 3-30-88

NO. 2

NO. 3

NO. 4

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0048			
pH When Sampled				
pH When Received	7.14			
Bicarbonate as HCO_3	307			
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	910			
Calcium as Ca	222			
Magnesium as Mg	86			
Sodium and/or Potassium	370			
Sulfate as SO_4	390			
Chloride as Cl	749			
Iron as Fe	0.08			
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	2,124			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
~~XXXXXX~~ Sulfide - Total	0.0			
Resistivity, ohms/m at 77° F.	2.95			
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

EXHIBIT 13

Form No. 3

cc: Mr. Bill Knight, Midland
Mr. Randy Thompson, Andrews
Mr. Jim Ellis, Jal, NM
Mr. Dick Prentice, Midland
Central File System, Midland

By Ronnie D. Tucker, B.S.

P O BOX 1468
MONAHANS TEXAS 79756
PH 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W. INDIANA
MIDLAND TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 088395

TO: Mr. Arley Stafford
P.O. Box 949, Andrews, Texas

SAMPLE RECEIVED 3-30-88
RESULTS REPORTED 4-6-88

COMPANY ARCO Oil & Gas Company LEASE

FIELD OR POOL

SECTION 29 BLOCK M SURVEY T-25S & R-37E COUNTY Lea STATE NM

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Raw water - taken from windmill near Amerada Hess' Ida Wimberly #13. 3-30-88

NO. 2

NO. 3

NO. 4

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0055			
pH When Sampled				
pH When Received	7.20			
Bicarbonate as HCO_3	171			
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	1,360			
Calcium as Ca	346			
Magnesium as Mg	120			
Sodium and/or Potassium	189			
Sulfate as SO_4	821			
Chloride as Cl	550			
Iron as Fe	15.6			
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	2,197			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
~~Hydrogen~~ Sulfide - Total	0.0			
Resistivity, ohms/m at 77° F.	2.98			
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

EXHIBIT 14

Form No. 3

cc: Mr. Bill Knight, Midland
Mr. Randy Thompson, Andrews
Mr. Jim Ellis, Jal, NM
Mr. Dick Prentice, Midland
Central File System, Midland

By Ronnie D. Tucker, B.S.

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I,_____

William H. Shearman, Jr.

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 a supplement thereof for a period

of_____

One weeks.
Beginning with the issue dated

May 10, 1988
and ending with the issue dated

May 10, 1988

Bill Shearman
Publisher.

Sworn and subscribed to before

me this 19 day of

May, 1988

Vera Murphy
Notary Public.

My Commission expires_____

November 14, 1988
(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
May 10, 1988

"ARCO Oil and Gas Company intends to apply for authorization to dispose of salt water by injection into the Wimberly WN#1, which is located 1980' FN & WL, Section 23, T-25-S, R-37-E, in Lea County, New Mexico. ARCO intends to inject produced water into the Grayburg formation from 3448' to 4300' at a maximum rate of 12,000 BPD with a maximum wellhead pressure of 650 PSIG. Please address questions to Mr. R.S. Prentice, ARCO Oil and Gas Co., P. O. Box 1610, Midland, TX 79702, 915/688-5355. Interested parties must file objections or requests for a hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days."

EXHIBIT 15

Exhibit 16

AFFIDAVIT OF MAILING

Richard S. Prentice, being duly sworn states that he is an engineer for ARCO Oil and Gas Company, the Applicant herein.

That on the 20th day of May, 1988, in the City of Midland, Midland County, Texas, he mailed in a sealed envelope, postage prepaid, a copy of the application and plat herein attached to the following:

Wimberly Lease Surface Owners

1. Ms. Kathleen Cone
   Drawer 1509
   Lovington, NM 88260

2. Mr. S. E. Cone, Jr. &
   Ms. Marjorie Cone Kastman
   2420 Quaker, #5
   Lubbock, TX 79410

3. Ms. Jewel Ward &
   Ms. Benita J. Birmingham
   Box 868
   Eunice, NM 88231

Offset Leasehold Operators

1. American Exploration Co.
   4500 Republic Bank Tower
   Houston, TX 77002

2. Amoco Production Co.
   P. O. Box 3092
   Houston, TX 77253

3. Cities Service
   P. O. Box 1919
   Midland, TX 79702

4. El Paso Natural Gas Co.
   One Petroleum Center
   3300 N. "A" St, Bldg. 2
   Midland, TX 79705

5. John Hendrix Corp.
   505 Midland Tower
   Midland, TX 79701

6. Kirby Exploration Co.
   P. O. Box 1745
   Houston, TX 77001

7. Russel E. Leeser
   1390 Ridge Road
   Littleton, Co 80120

8. Meridian Oil Inc.
   21 Desta Drive
   Midland, TX 79705

9. Mobil Exp. & Prod., Inc.
   P. O. Box 633
   Midland, TX 79702

10. Santa Fe Energy
    500 W. Illinois
    Midland, TX 79701

11. Terra Resources
    10 Desta Drive
    Suite 500, West
    Midland, TX 79705

12. Texaco, Inc.
    P. O. Box 728
    Hobbs, NM 88240

13. Union Texas Petroleum
    P. O. Box 2120
    Houston, TX 77252-2120

Richard S. Prentice

Richard S. Prentice

State of Texas §
§
County of Midland §

Before me the undersigned, a Notary Public in and for the said County and State, on this 19th day of May, 1988, personally appeared Richard S. Prentice, to me known to be the identical person who executed the within and foregoing instrument and acknowledged to me that he excecuted the same as his free and voluntary act and deed for the uses and purposes herein set forth.

Given under my hand and seal the day and year last above written.

My Commission Expires:

JANE E. HILL
COMMISSION EXPIRES
MAY 28, 1990

Jane E. Hill
Notary Public

May 20, 1988

CERTIFIED MAIL
RETURN RECEIPT
REQUESTED

Gentlemen:

Attached is a copy of Form C-108 submitted to the New Mexico Oil Conservation Division requesting permission to dispose of water in the Wimberly WN #1. For your convenience, we have included a plat indicating the location of the well covered by this application.

This letter will serve as formal notice, as required by the NMOCD, of our intention to convert the Wimberly WN #1 to a water disposal well.

We will be happy to provide you with any additional information that you may require at your request. Thank you for your cooperation.

Yours very truly,

Richard S. Prentice

Richard S. Prentice
Senior Engineer

RSP:jee

Attachments

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

July 18, 1988

Mr. David Catenach
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504-2088

Subject: Application for Authorization to Inject
ARCO Oil & Gas Company's Wimberly WN #1
Justis Field, Lea County, New Mexico

As you requested, attached is a Blinebry structure map of the area in which our Wimberly WN #1 is located. The Grayburg structure overlies the Blinebry and should have similar relief. Hendrix's Wimberly 1, which is approximately 2700' to the east of ARCO's Wimberly WN #1, was a deep test that encountered both the San Andres and the Blinebry. The following tabulates the expected and actual formation tops in our well and Hendrix's well.

	ARCO Wimberly WN #1 Expected Tops (SS)	Hendrix Wimberly 1 Actual Tops (SS)
San Andres	-525'	-409'
Blinebry	-2055'	-1944'

The estimated tops for the Wimberly WN #1 are derived from our nearby #10 well. Based on this analysis, the relief between the subject well and the Hendrix well is approximately 111' in the Blinebry and 116' in the San Andres. Our well is down structure from Hendrix's well. The current disposal wells in the area (operated by Rice) are on a vacuum. We expect to dispose of water from our operations into the Grayburg on a vacuum too. Also, water should move by gravity drainage down structure away from Hendrix's well and should not be a hazard to his operations.

If you have any further questions, please call me at 915-688-5355.

Richard S. Prentice

R. S. Prentice
Senior Engineer

RSP:ls

xc: Mr. J. T. Sexton
Oil Conservation Division
1004 W. Broadway
P O Box 1980
Hobbs, New Mexico 88204

H. D. McGee - MIO 1431
A. L. Stafford - Andrews

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

May 7, 1988

CERTIFIED MAIL
RETURN RECEIPT
REQUESTED

Hobbs Daily News-Sun
201 N. Thorp
Hobbs, NM 88240

Gentlemen:

ARCO Oil and Gas Company intends to convert a producing well in Lea County to a salt water disposal well. Please print the following notice in your classified ad section for one day as soon as possible:

"ARCO Oil and Gas Company intends to apply for authorization to dispose of salt water by injection into the Wimberly WN #1, which is located 1980' FN & WL, Section 23, T-25-S, R-37-E, in Lea County, New Mexico. ARCO intends to inject produced water into the Grayburg formation from 3448' to 4300' at a maximum rate of 12,000 BPD with a maximum wellhead pressure of 650 PSIG. Please address questions to Mr. R. S. Prentice, ARCO Oil and Gas Co., P. O. Box 1610, Midland, TX 79702, 915/688-5355. Interested parties must file objections or requests for a hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days."

Please send proof of publication, including a copy of the legal advertisement, to Mr. William J. LeMay, Oil Conservation Division, P. O. Box 2088, Santa Fe, NM 87504-2088. Please send an additional proof of publication and your bill to ARCO Oil and Gas Company, P. O.Box 1610, Midland, TX 79702 to my attention.

Thank you.

Sincerely,

Richard S. Prentice

R. S. Prentice
Senior Engineer

RSP:jee

xc: A. Stafford - Andrews
J. Ellis - Andrews
Mr. W. J. LeMay - NMOCD

STATE OF NEW MEXICO

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

HOBBS DISTRICT OFFICE

5-26-88

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88241-1980
(505) 393-6161

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

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

Gentlemen:

I have examined the application for the:

Arco Oil & Gas Co. Wimberly WN H1-F 23-25-37
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

OK

Yours very truly,

Jerry Sexton
Supervisor, District 1

/ed