



ARCO Permian
600 North Marienfeld
Midland TX 79701-4373
Post Office Box 1610
Midland TX 79702-1610
Telephone 915 688 5570

Elizabeth A. Casbeer
Regulatory/Compliance Analyst

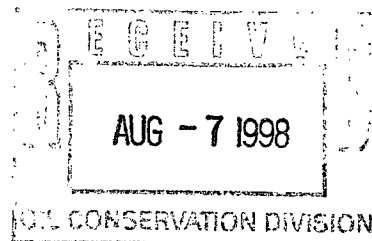
NSL 8/27/98

NSL-4003

August 4, 1998

Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

*Change to
Artesia*



Gentlemen:

Under the provisions of NMOCD Rule 104.F(3), ARCO Permian requests administrative approval for an unorthodox location for its Washington "33" State #12, a new well in the Artesia (Queen-Grayburg-San Andres) Field and the newly defined Empire-Glorieta-Yeso-SW pool, due to topography and geological conditions. The location for this proposed well is 2432'FNL and 2270'FEL of Section 33, T17S, R28E, Eddy County, New Mexico.

The following exhibits are submitted to support our request for administrative approval:

1. An amended C-101.
2. An amended C-102.
3. Geologic and Engineering Discussion.
4. A sketch plat showing topographical obstructions around the location.
5. NSL-4003 for Washington "33" State #12 dated April 14, 1998.
6. A Glorieta-Yeso type log (Washington "33" State #9).
7. San Andres type log (Washington "33" State #9).
8. Structure Map, Top Glorieta Sand.
9. Structure Map, Top San Andres.
10. Gross Pay, San Andres Dolomite.
11. Plat showing adjoining and diagonal spacing units.
12. List of offset operators.

All adjoining and diagonal spacing units are ARCO owned.

Should you have any questions, please do not hesitate to call me at 915-688-5570 or Dave Percy at 915-688-5355. Thank you for your assistance in this matter.

Sincerely,

Elizabeth A. Casbeer

Elizabeth A. Casbeer
Regulatory/Compliance Analyst

EAC:lc

cc: NMOCD, Artesia, New Mexico

Enclosures

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

District I
PO Box 1980, Hobbs, NM 88241-1980
District II
811 S. 1st Street, Artesia, NM 88210-2834
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator name and Address ARCO PERMIAN P.O. BOX 1610 MIDLAND, TX 79702		² OGRID Number 000990
		³ API Number 30-0
⁴ Property Code 22954	⁵ Property Name WASHINGTON "33" STATE	
		⁶ Well No. 12

⁷ Surface Location

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
G	33	17S	28E		2432	NORTH	2270	EAST	EDDY

⁸ Proposed Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South Line	Feet from the	East/West line	County
⁹ Proposed Pool 1 ARTESIA (GLORIETA-YESO)					¹⁰ Proposed Pool 2 ARTESIA (Q-G-SA)				

¹¹ Work Type Code N	¹² Well Type Code O	¹³ Cable/Rotary R	¹⁴ Lease Type Code S	¹⁵ Ground Level Elevation 3666'
¹⁶ Multiple NO	¹⁷ Proposed Depth 4200	¹⁸ Formation YESO	¹⁹ Contractor	²⁰ Spud Date 8/98

²¹ Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
12-1/4	8-5/8	24#	500'	450	CIRC TO SURF
7-7/8	5-1/2	15.5#	4200'	1200	CIRC TO SURF

²² Describe the proposed program. If this application is to DEEPEN or PLUG BACK give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

DRILL SURFACE HOLE W/FRESH WATER TO 500'. SET & CEMENT 8-5/8" CASING.
DRILL 7-7/8 HOLE TO 2000 W/SATURATED BRINE. DRILL 4200' TD W/SACT GEL
USING PRE-HYDRATED FW GEL SWEEPS. FL +/- 15CC. LOG WELL, RUN & CEMENT
5-1/2" CASING. COMPLETE AND TEST YESO FORMATION.

SUBJECT WELL PLANNED AS A 4200' STRAIGHT HOLE.
3000 PSI BOPE WILL BE USED FROM 500' TO TD.

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature:

Elizabeth A. Casbeer

Printed name: ELIZABETH A. CASBEER

Title: REG./COMP. ANALYST

OIL CONSERVATION DIVISION

Approved by:

Title:

Approval Date:

Expiration Date:

DISTRICT I
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code 3230	Pool Name ARTESIA (Q-G-SA)
Property Code 22954	Property Name WASHINGTON 33 STATE	Well Number 12
OGRID No. 000990	Operator Name ARCO PERMIAN	Elevation 3666'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
	33	17 S	28 E		2432	N	2270	E	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 40	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

				<p>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.</p> <p><i>Elizabeth A. Casbeer</i> Signature ELIZABETH A. CASBEER Printed Name REG. COMP. ANALYST Title 8/4/98 Date</p>	
<p>SURVEYOR CERTIFICATION</p> <p>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 belief.</p> <p>MARCH 3, 1998</p> <p>Date Surveyed Signature & Seal of Professional Surveyor RONALD J. EDISON 5-4-98 88-11-0371</p> <p>Certificate No. RONALD J. EDISON 3239 GARY EDISON 12641 JASON McDONALD 12185</p>					

DISTRICT I
P.O. Box 1880, Hobbs, NM 88241-1880

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised February 10, 1994
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

DISTRICT II
P.O. Drawer DD, Artesia, NM 88211-0719

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

~~X~~ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
		ARTESIA (GLORIETA-YESO)
Property Code	Property Name	Well Number
22954	WASHINGTON 33 STATE	12
OGRID No.	Operator Name	Elevation
000990	ARCO PERMIAN	3666'

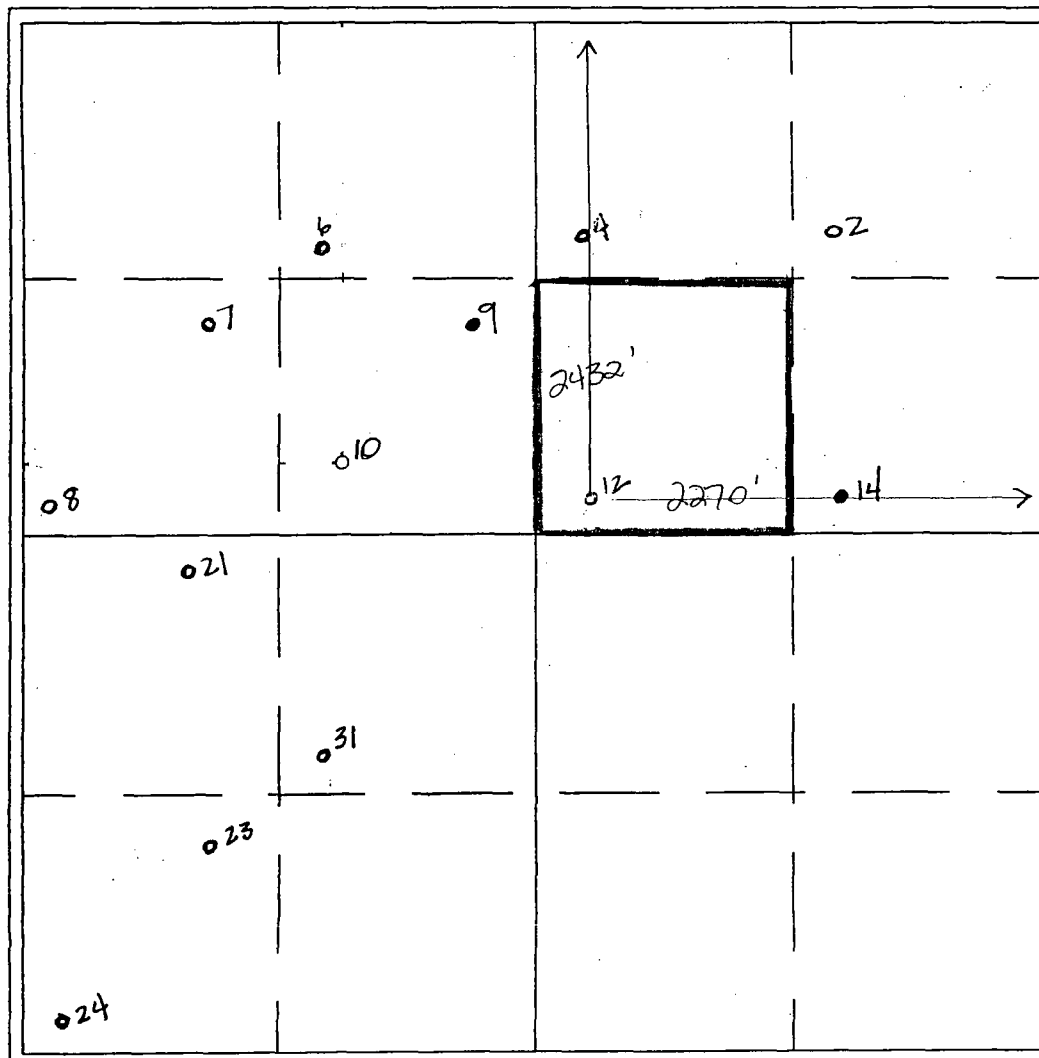
Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	33	17 S	28 E		2432	N	2270	E	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres	Joint or Infill	Consolidation Code	Order No.						
40									

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

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

Elizabeth A. Casbeer
Signature
ELIZABETH A. CASBEER
Printed Name
REG. COMP. ANALYST
Title
8/5/98
Date

SURVEYOR CERTIFICATION

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 belief.

FEBRUARY 26, 1998

Date Surveyed
Signature & Seal
Professional Surveyor
NEW MEXICO
3239
98-11-0354
3-04-98
Certificate No. RONALD EDSON 3239
GARY EDSON 12641

**Geological and Engineering Attachment
Washington "33" State #12**

Summary:

ARCO Permian requests administrative approval for an unorthodox location for Washington 33 State # 12, a new well we propose to drill to the Artesia-Q-G-SA Pool and the newly-defined Artesia (Glorieta-Yeso) Pool. This location is required for geologic reasons. This well is on the same 40-acre tract as Washington 33 State #11 (API 30-015-30193; Yeso/San Andres orthodox location approved) in Unit Letter G of Section 33. ARCO holds 100% of all rights down to the top of Abo shale on this 600-acre lease.

Background of ARCO NSL Requests in the area:

ARCO was granted NSL-4003 approval for drilling the Washington #12 location to the Queen-Grayburg-San Andres on April 14, 1998. Division Administrative Orders NSL-915-A, NSL 915-B, NSL 809-A, NSL 999-A, NSL-4007, NSL-4035, NSL-4036, and NSL-4060 have also been granted for other unorthodox Artesia (Queen-Grayburg-San Andres) locations on the same lease. Recent completions (documented below) now indicate that all remaining new wells in Section 33 should be cased through the Yeso to allow for a low-cost completion in this deeper zone. We therefore propose to drill Washington #12 to 4200', or 1100' deeper than originally proposed. An amended NSL-4060 will also be requested by separate letter to enable us to drill Washington #19 and #23 to the Yeso.

Washington #9 and #14 Results:

In June 1998, ARCO completed Washington #9 in unit letter F of Section 33 for 28 BOPD, 65 MCFD and 716 BWPD, after sandfrac. A copy of this nearby log showing the Yeso dolomite pay is attached. Washington #14 in Unit letter H was also completed in June from the Yeso, and potentialed for 9 BOPD, 25 MCFD, and 863 BWPD. We believe the larger 175,000# frac on the latter well is responsible for improved stabilized production of around 40 BOPD. According to the NMOCD Artesia office, this new field will be designated the Artesia (Glorieta-Yeso) Pool. These wells also have uphole San Andres pay, as shown on the second attached log.

Geology:

The Yeso (the upper part of which is sometimes called the Paddock Formation) is a fine-crystalline, anhydritic, slightly vuggy dolomite that lies under the Glorieta sand. The lower Yeso (which we are not producing from) is sometimes called the Tubb and Drinkard in Lea County. A structure map of the top Glorieta sand, which is a better geologic marker than the Yeso, has been provided. This map shows up to 5-degree dip to the SE in Section 33, with the "crest" of the structure plunging due east, one mile north of us in Section 28. The gross 250' of Yeso pay we produce from is the same dolomite interval as found at Atoka (Glorieta/Yeso) Field, East Empire (Yeso), and the deeper Grayburg-Jackson (San Andres) pay. This dolomite rarely produces without a major frac job.

The San Andres dolomite is an established pay from offset wells, and maps showing top San Andres Structure and Gross Pay are also included. The San Andres structure dips SE and is similar to the Glorieta structure. Gross pay interval across Section 33 ranges from 500 to 600 feet.

Surface location Problems:

ARCO attempted to obtain an orthodox location for #12 at 2310' FN& EL, but was prevented access by a buried east-west flowline under the location (see engineer's sketch plat). We had to shift the location 122' south (to 2432 FNL, 2270 FEL) to allow adequate and safe setback from the pipeline for the small United rig we will use. Any location on the north side of the pipeline would be too close to #11 to effectively drain in-place oil. The location is unorthodox because of the north measurement. As shown on the attached plat, this unorthodox location is completely surrounded by other ARCO tracts in the same lease, so there will be no impact on any other party.

Engineering Justification for Revised NSL Request:

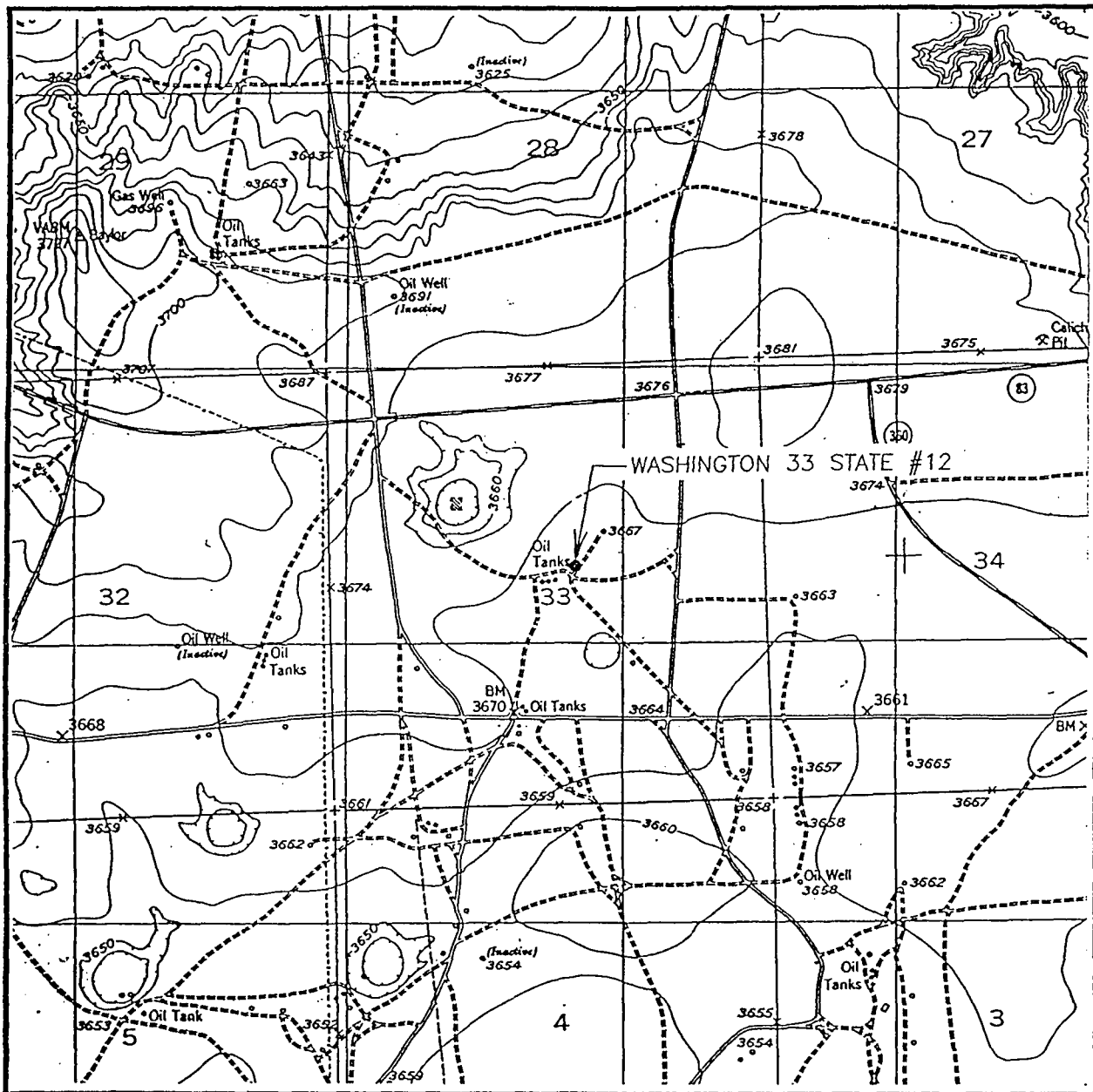
ARCO has already shown the need for 2 strategically spaced wells in each 40-acre tract to recover reserves in the Artesia (Q-G-SA) Field, with 550-600' of gross pay interval. The new Artesia (Glorieta-Yeso) Field, with similar pay type and 220-250' of gross pay, is expected to perform like the San Andres, with low-rate, long-life reserves. Analog San Andres fields indicate we should expect 50 MBO per completion on 20-acre spacing, while other Yeso fields suggest 35 MBO on 20-acre spacing from this deeper pay. Based on other Yeso fields in Eddy County, we expect high variability in pay count and oil rate from one 20-acre Yeso location to the next, and need to retain maximum flexibility to make economic completions. ARCO cannot justify drilling any new well for Yeso reserves alone, nor could we consider directional drilling.

ARCO and the State of New Mexico would be best served if all wells were cased to enable Yeso completions.

Production Planning:

In most cases, we expect to complete first in the San Andres dolomite, unless logs or neighboring well performance indicates the Yeso is more prolific. We plan to soon apply to vertically expand the Artesia- Q-G-SA field to include the Yeso, and thus enable co-mingling Yeso with San Andres to keep the wells economic, as was done at Grayburg-Jackson Field by Marbob.

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL - 10'

SEC. 33 TWP. 17-S. RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 2432' FNL & 2270' FEL

ELEVATION 3666'

OPERATOR ARCO PERMIAN

LEASE WASHINGTON 33 STATE

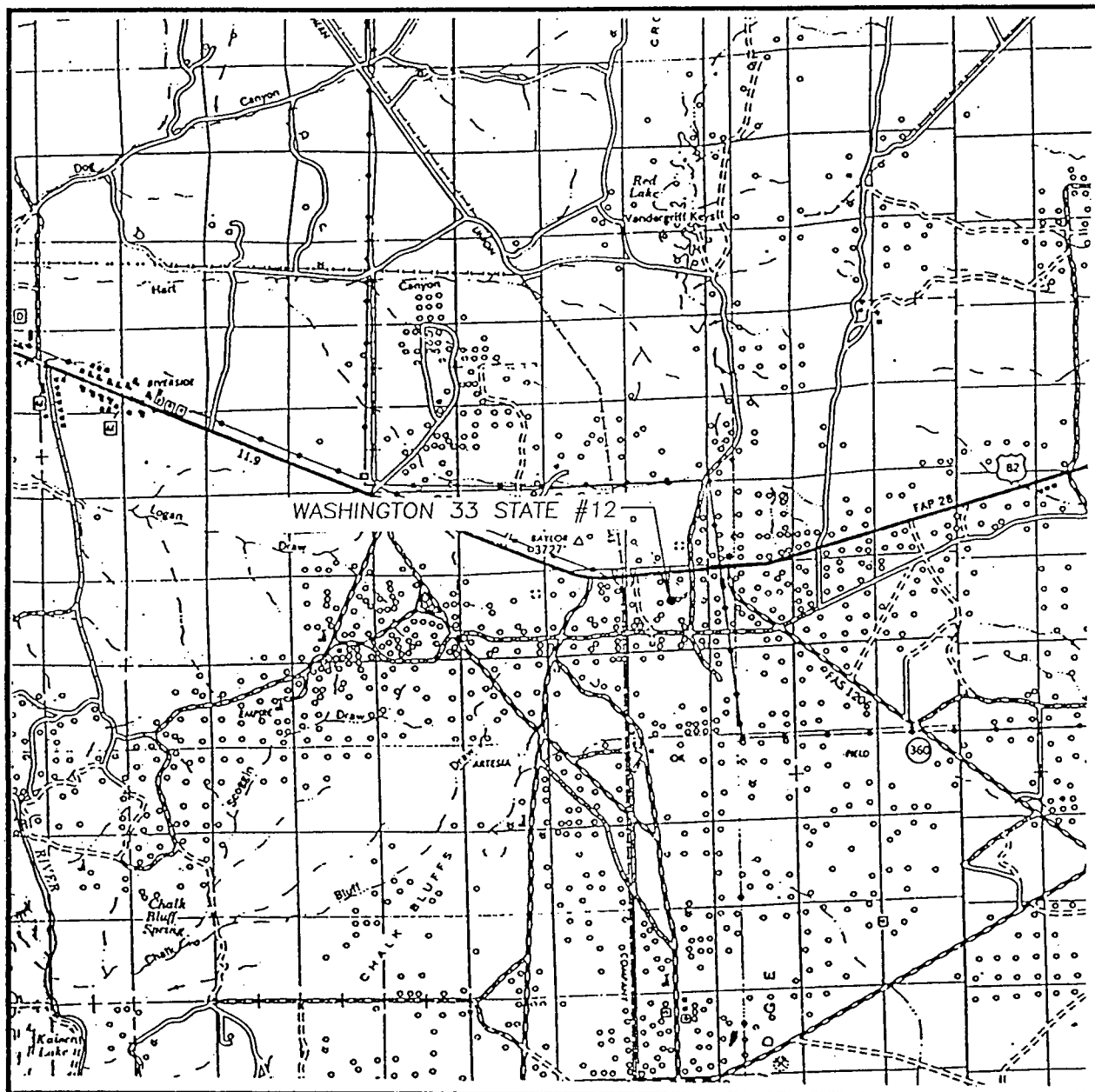
U.S.G.S. TOPOGRAPHIC MAP

RED LAKE, NM

**JOHN WEST ENGINEERING
HOBBS, NEW MEXICO**

(505) 393-3117

NO. 211



SEC. 33 TWP. 17-S RGE. 28-E

SURVEY _____ N.M.P.M.

COUNTY EDDY

DESCRIPTION 2432' FNL & 2270' FEL

ELEVATION 3666'

OPERATOR ARCO PERMIAN

LEASE WASHINGTON 33 STATE

**JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
(505) 393-3117**



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

April 14, 1998

RECEIVED

APR 23 1998

REGULATORY

ARCO Permian
P. O. Box 1610
Midland, Texas 79702-1610
Attention: Elizabeth A. Casbeer

Administrative Order NSL-4003

Dear Ms. Casbeer:

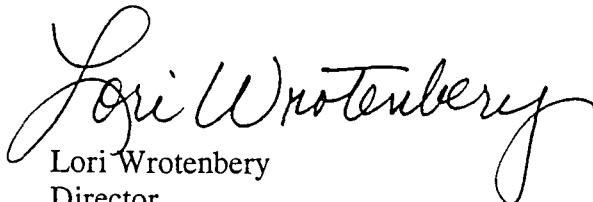
Reference is made to your application dated March 31, 1998 for an unorthodox oil well location in the Artesia Queen-Grayburg-San Andres Pool for the proposed Washington "33" State Well No. 12 to be drilled 2432 feet from the North line and 2270 feet from the East line (Unit G) of Section 33, Township 17 South, Range 28 East, NMPM, Eddy County, New Mexico. The SW/4 NE/4 of said Section 33 is to be dedicated to said well in order to form a standard 40-acre oil spacing and proration unit for said pool.

Further, the NE/4, NE/4 NW/4, S/2 NW/4, and S/2 of said Section 33 compose a single State lease (New Mexico State Land Office Lease No. X-00647) in which ARCO Permian ("ARCO") is the leasehold operator; therefore, there are no affected offsets to the subject 40-acre tract within the Grayburg/San Andres interval other than ARCO.

The subject application has been duly filed under the provisions of Rule 104.F of the General Rules and Regulations of the New Mexico Oil Conservation Division ("Division").

By the authority granted me under the provisions of Division General Rule 104.F(2), the above-described unorthodox oil well location is hereby approved.

Sincerely,


Lori Wrotenberg
Director

LW/MES/kv

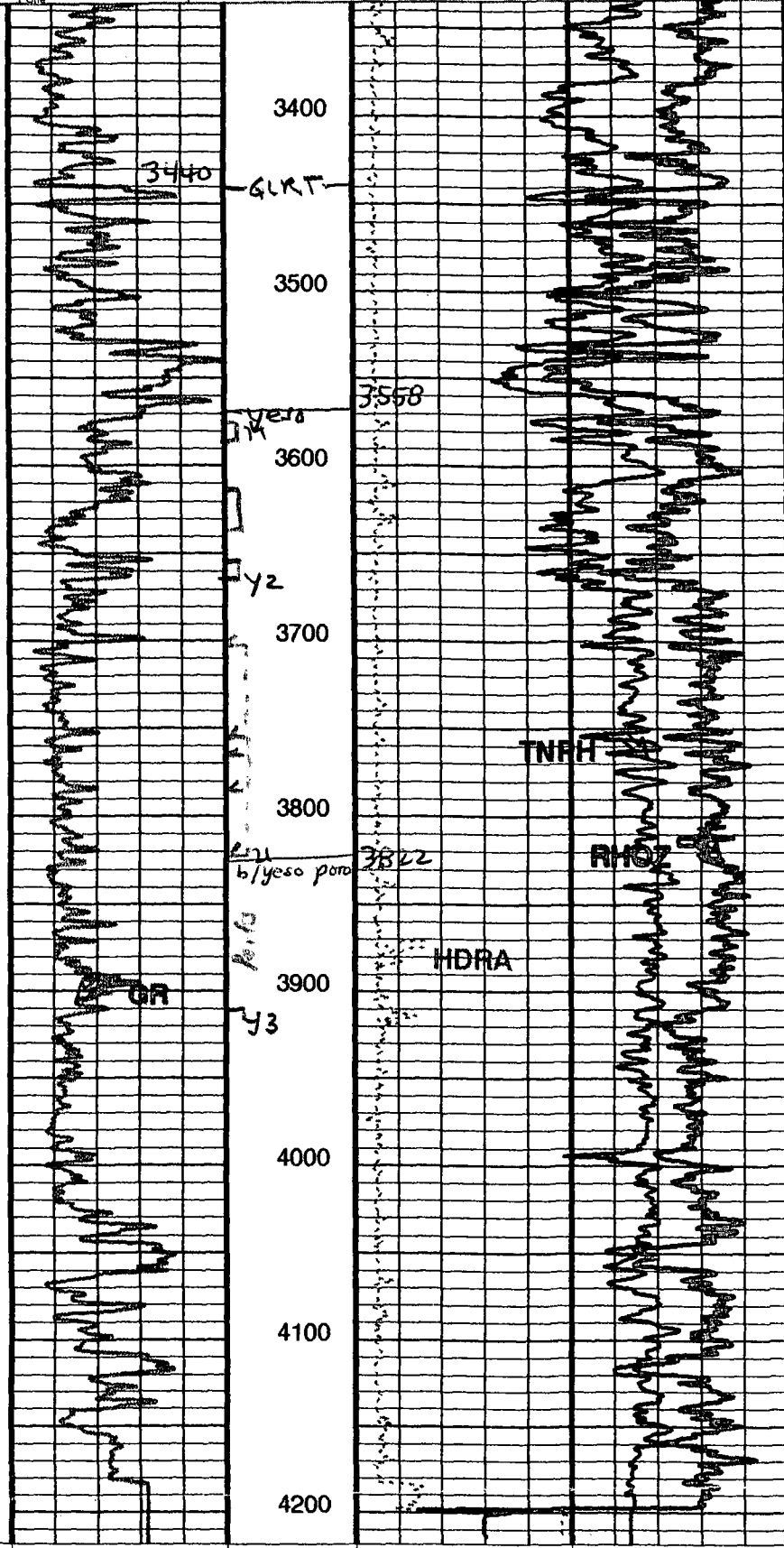
cc: New Mexico Oil Conservation Division - Artesia
New Mexico State Land Office - Santa Fe

orig: Vaughn - M1019
cc: D. Pearson - M1023
Murrish - EUN
Cherry

WELL: Washington '33' State No. 9
FIELD: Yeso
COUNTY: Eddy STATE: New Mex

Glorieta- Yeso
Type Log

COUNTY: Eddy FIELD: Yeso LOCATION: Washington '33' State No. 9 WELL: AFCCO Permian COMPANY: AFCCO Permian	Platform Express Three Detector Density Compensated Neutron	
	Schlumberger	
	1650 FNL & 2270 FNL	Elev.: K.B. 3' G.L. 2' D.F. 3'
	Permanent Datum: Ground Level	Elev.: 3672 F
	Log Measured From: Kelly Bushing	7.0 F above P.D.
Drilling Measured From: Kelly Bushing		
API Serial No. 30-015-30191	SECTION 33	TOWNSHIP 17S
Logging Date 11-MAY-1998	R28E	
Run Number	Q10	



GR (GR)	HRDD Density
0 (GAPI) 100	Correction (HDRA)
	-0.05 (G/C3) 0.45
	Stan Res Formation Density (RHO2)
	2 (G/C3) 3
	TNPH (TNPH)
	0.3 (V/V) -0.1

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description
RHEI	Reservoir Fluid Type

COMPANY: ARCO Permian

WELL: Washington 33 State No. 9

FIELD: Yeso

COUNTY: Eddy STATE: New Mex

Platform Express
 Schlumberger
 Three Detector Denr
 Compensated Neutr

1650 FNL & 2270 FNL

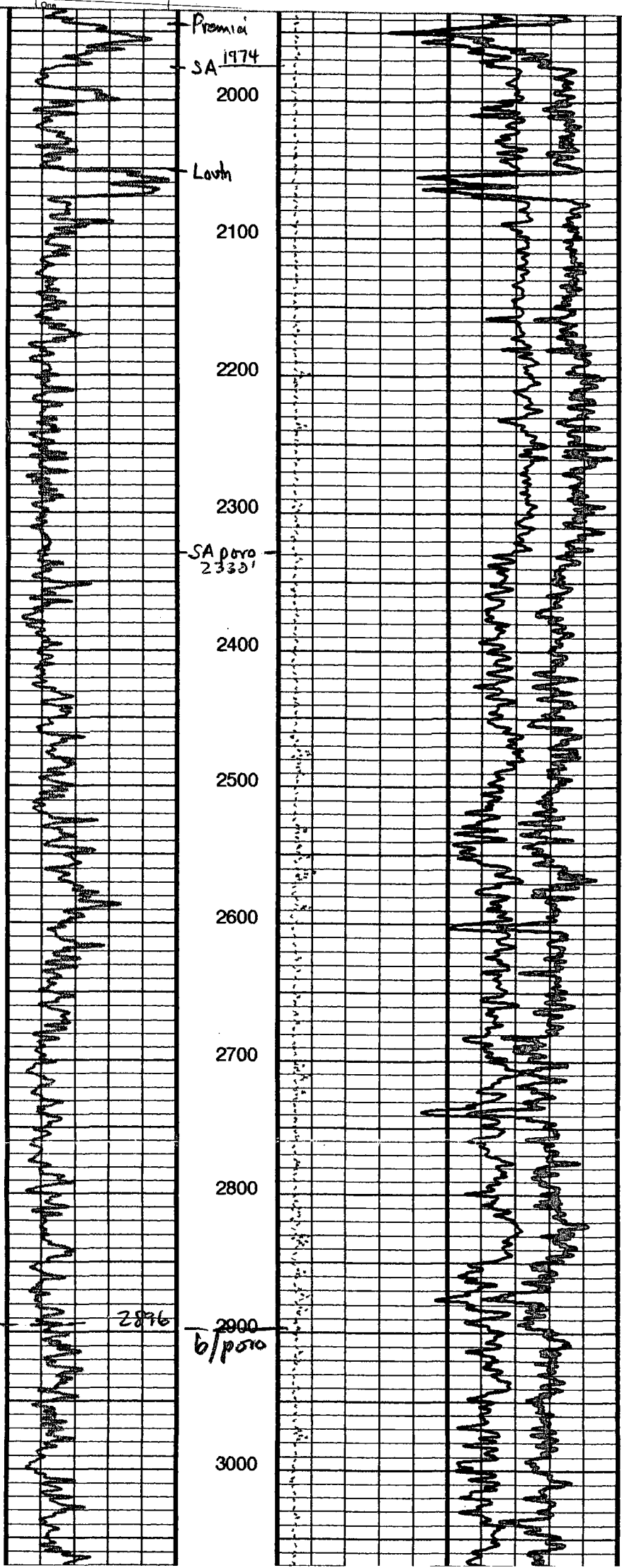
Permanent Datum: Ground Level Elev.: 3672 F
 Log Measured From: Kelly Bushing 7.0 F above P
 Drilling Measured From: Kelly Bushing

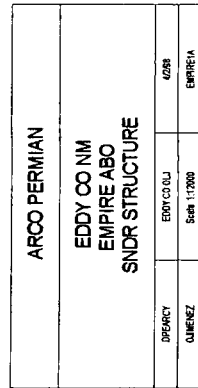
API Serial No. 30-015-30191 SECTION 33 TOWNSHIP 17S R 28E

Logging Date 11-MAY-1998

Run Number One

San Andres
 Type Log



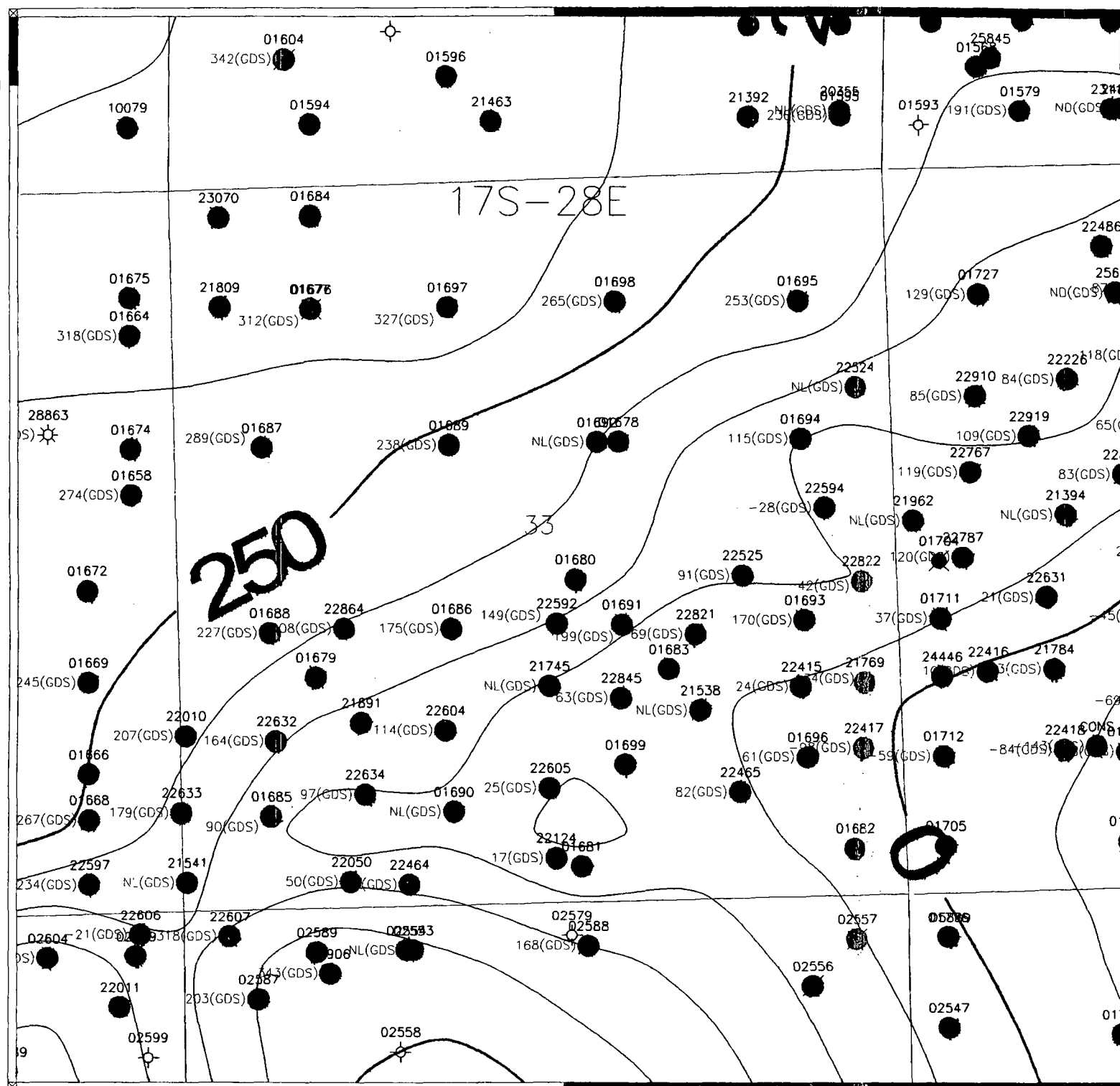


Scale 1:12000.



32.800

32.800

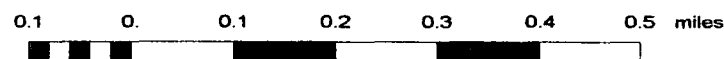


ARCO (Atlantic Richfield Company)

Scale 1:12000.

EDDY CO OLJ
 Empire Abo
 Top Subsea GRLT C.I.: 50'

Jimenez Oscar	eddy co olj	8/3/98
DPearcy	Scale 1:12000.	Empire's



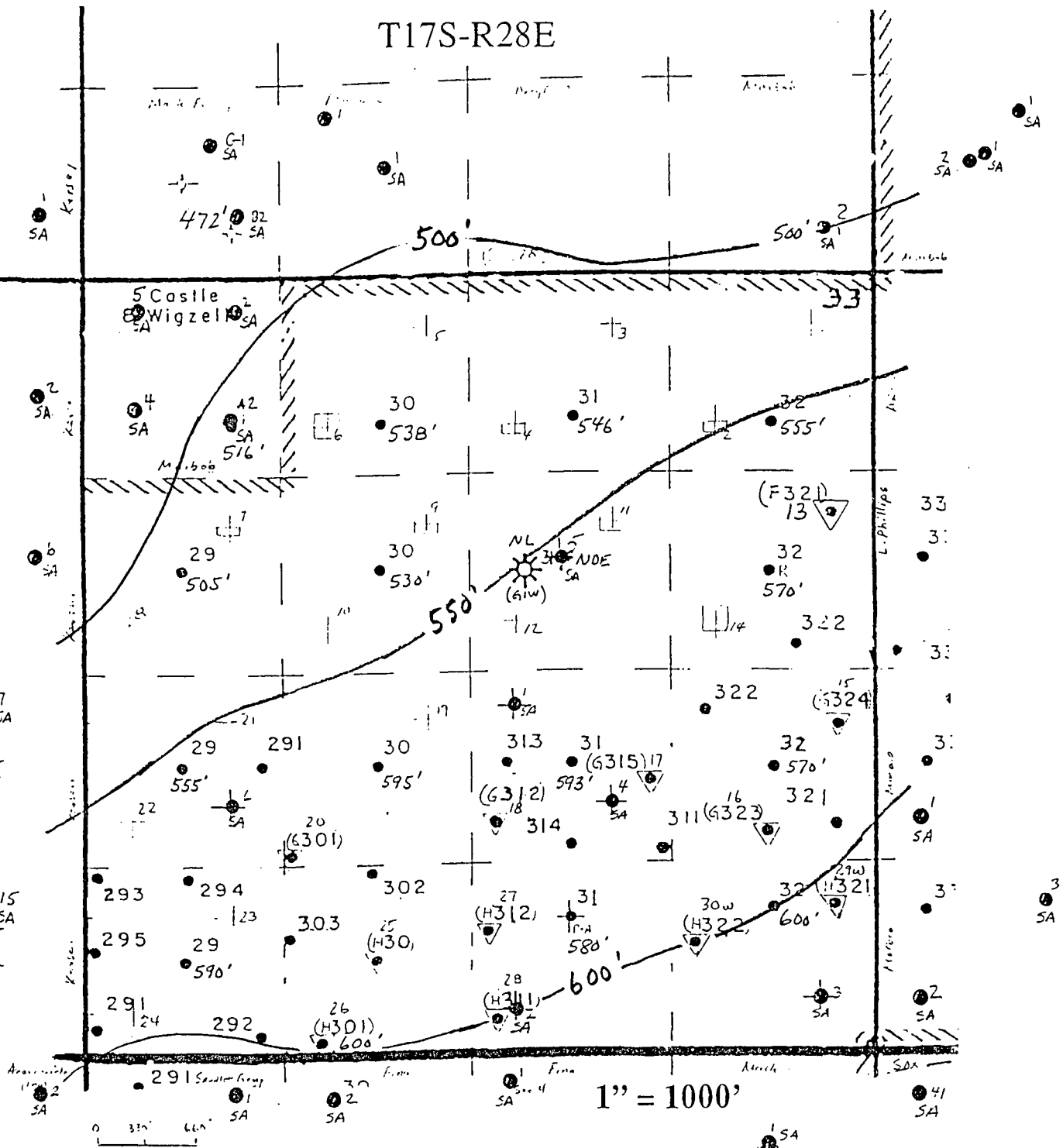
T17S-R28E

E

F

G

H



ARCO Permian

GROSS PAY, SAN ANDRES DOLO.

Washington 33 Lease

Sec. 33 T17S-R28E

Eddy Co. NM

Abo And San Andres Well Locations

DBP 3/98



San Andres recomplete Candidates



San Andres Locations



Primary Yeso Locations



Recomplete alternate in Yeso



Possible / contingent Yeso TD



Relevant San Andres wells
Showing well #

Section 33 (below)

T17S R28E

27

29
KERSEY
CO.

Mack Chase
MACK CHASE

CONOCO
FINA

Arco, et al

MARBOB
Penroe
(4-654 11-11)

MARBOB TO 3500'
ALTURA

KERSEY
E

32

F

G

KERSEY

H

Castle & Wiggzell

Marbob

291 Sandlett Energy

30 Fina

Fina

Mack

Sax

0 330 660

1" = 1000'
660

- ▽ San Andres recomplete candidates
- + San Andres Locations
- Primary Yaso Locations
- R Recomplete alternative in Yaso
- Possible / Contingent Yaso 70

20P 2/19/98

**OFFSET OPERATORS
WASHINGTON "33" STATE #12**

**ARCO Permian
P. O. Box 1610
Midland, Texas 79702**