

DISTRICT I

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

DISTRICT II

P.O. Box Drawer DD, Artesia, NM 88211-0719

DISTRICT III

1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV

P.O. Box 2088, Santa Fe, NM 87504-2088

State of New Mexico

Energy, Minerals and Natural Resources Department

Form C-101

Revised February 10, 1994

Instructions on back

Submit to Appropriate District Office

State Lease - 6 Copies

Fee Lease - 5 Copies

☐ AMENDED REPORT

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

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

¹ Operator Name and Address TEXACO EXPLORATION & PRODUCTION INC. P.O. Box 3109, Midland Texas 79702		² OGRID Number 022351
⁴ Property Code 11123	⁵ Property Name NORTH VACUUM ABO WEST UNIT	³ API Number 30-025-33953
		⁶ Well No. 29

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
E	22	17-S	34-E		2080	NORTH	660	WEST	LEA

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
L1 C/L2	22/21	17-S	34-E		590' / 1980'	NORTH / SOUTH	2080' / 760'	WEST / EAST	LEA

⁹ Proposed Pool 1

VACUUM ABO, NORTH

¹⁰ Proposed Pool 2

¹¹ Work Type Code N	¹² Well Type Code O	¹³ Rotary or C.T. ROTARY	¹⁴ Lease Type Code S	¹⁵ Ground Level Elevation 4057'
¹⁶ Multiple No	¹⁷ Proposed Depth 10770 MD	¹⁸ Formation ABO	¹⁹ Contractor NABORS	²⁰ Spud Date 4/30/97

²¹ Proposed Casing and Cement Program

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
11	8 5/8	24#	1630'	600 SACKS	SURFACE
7 7/8	5 1/2	17#	8950'	1400 SACKS	SURFACE

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.

CEMENTING PROGRAM:

SURFACE CASING: 450 SACKS CLASS C w/ 4% GEL, 2% CC (13.5 PPG, 1.74 CF/S, 9.1 GW/S). F/B 150 SACKS CLASS C w/ 2% CC (14.8 PPG, 1.34 CF/S, 6.3 GW/S).

PRODUCTION CASING: 1300 SACKS 35/65 POZ H w/ 6% GEL, 5% SALT, 1/4# FC (12.4 PPG, 2.14 CF/S, 11.9 GW/S). F/B 100 SACKS CLASS H (15.6 PPG, 1.18 CF/S, 5.2 GW/S).

Permit Expires 1 Year From Approval
Date Unless Drilling Underway

THERE ARE NO OTHER OPERATORS IN THIS QUARTER QUARTER SECTION.

DUAL LATERAL HORIZONTAL WELL, NON-STANDARD PRORATION UNIT EXCEPTION HAS BEEN APPLIED FOR. (COPY ATTACHED).

TOTAL DEPTH: L1 - 8950' TVD, 10730' MD. L2 - 8950' TVD, 10770' MD.

DD-168 (H)

²³ I hereby certify that the rules and regulations of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief.		OIL CONSERVATION DIVISION	
Signature <i>C. Wade Howard</i>			
Printed Name C. Wade Howard		Approved By: ORIGINAL SIGNED BY JERRY SEXTON, DISTRICT SUPERVISOR	
Title Eng. Assistant		Title:	
Date 4/1/97		Approval Date: MAY 05 1997	Expiration Date:
Telephone 688-4606		Conditions of Approval: Attached ☐	

DISTRICT I
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State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

Form C-102
Revised February 10, 1994

Instructions on back

Submit to Appropriate District Office

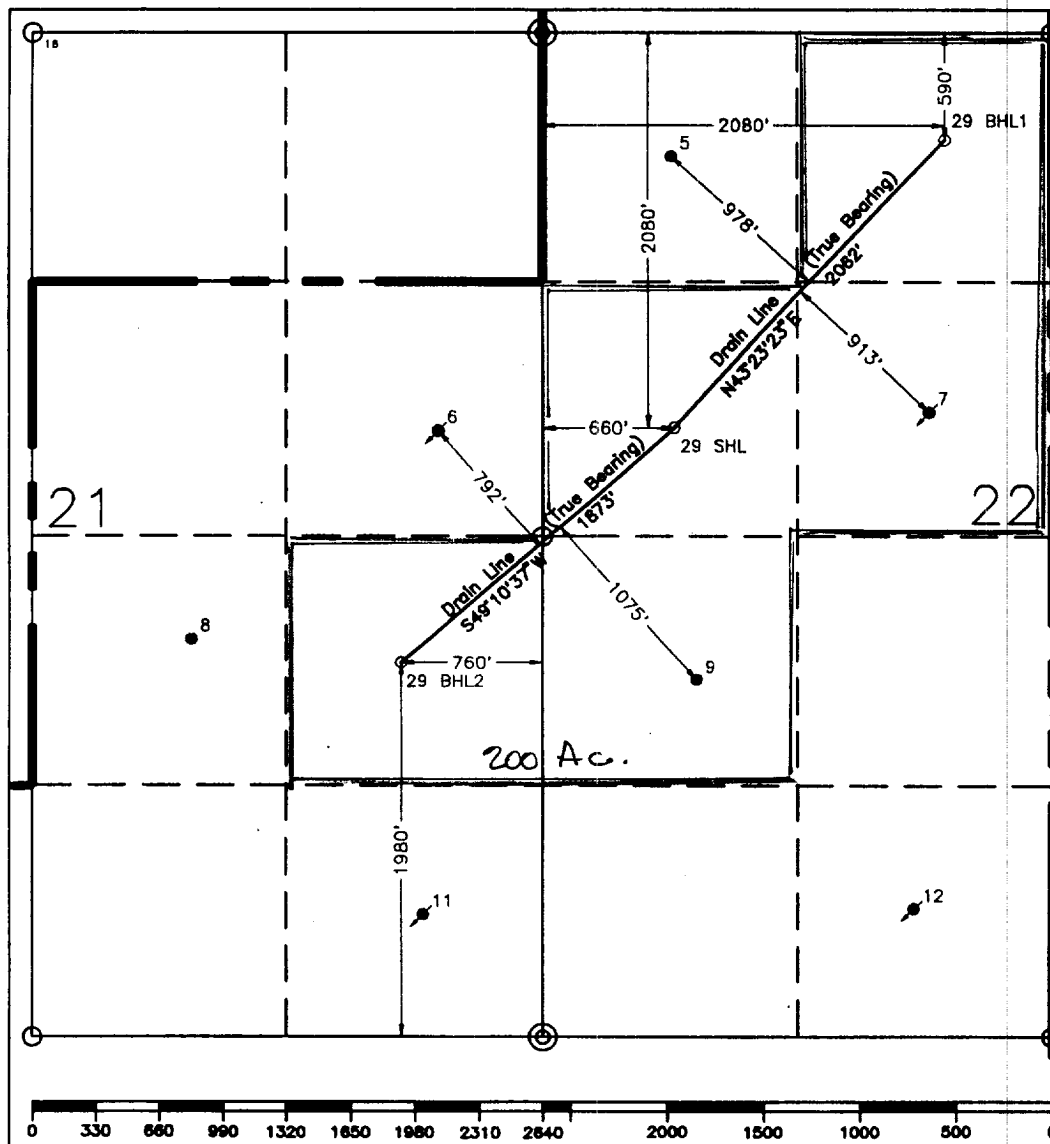
State Lease-4 copies
Fee Lease-3 copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-025-33953		² Pool Code 61760		³ Pool Name Vacuum Abo, North			
⁴ Property Code 11123		⁵ Property Name North Vacuum Abo West Unit					
⁶ GRID No. 22351		⁸ Well Number 29					
		⁹ Elevation 4057'					
⁷ Operator Name TEXACO EXPLORATION & PRODUCTION, INC.							
¹⁰ Surface Location							
UL or lot no. E	Section 22	Township 17-S	Range 34-E	Lot Idn 2080'	Feet from the North/South line North 660'	East/West line West	⁷ County Lea
¹¹ Bottom Hole Location If Different From Surface							
UL or lot no. L1 C/L2 I	Section 22/21	Township 17-S	Range 34-E	Lot Idn 590'/1980'	Feet from the North/South line North/South 2080'/760'	East/West line West/East	⁷ County Lea
¹² Dedicated Acres 200		¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No. DD-168<H>	

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.



¹⁷OPERATOR CERTIFICATION

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

Signature

C. Wade Howard

Printed Name

C. Wade Howard

Position

Engineer's Assistant

Company

Texaco Expl. & Prod. Inc.

Date

February 26, 1997

¹⁸SURVEYOR 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 knowledge and belief.

Date Surveyed

February 21, 1997

Signature & Seal of
Professional Surveyor

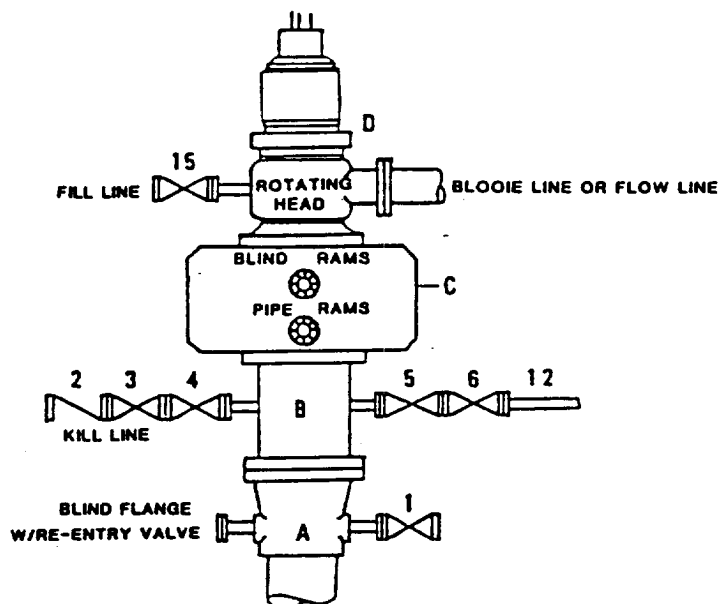
John S. Piper

Certificate No.

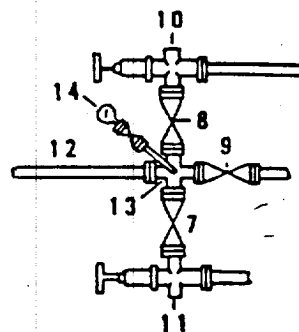
7254 John S. Piper

Sheet

**DRILLING CONTROL
CONDITION II-B 3000 WP
FOR AIR DRILLING OR
WHERE NITROGEN OR AIR BLOWS ARE EXPECTED**



H₂S TRIM REQUIRED
YES _____ NO _____



DRILLING CONTROL

MATERIAL LIST - CONDITION II - B

- | | |
|----------------|---|
| A | Texaco Wellhead |
| B | 3000# W.P. drilling spool with a 2" minimum flanged outlet for kill line and 3" minimum flanged outlet for choke line. |
| C | 3000# W.P. Dual ram type preventer, hydraulic operated with 1" steel, 3000# W.P. control lines (where sub-structure height is adequate, 2 - 3000# W.P. single ram type preventers may be utilized). |
| D | Rotating Head with fill up outlet and extended Blooe Line. |
| 1,3,4,
7,8, | 2" minimum 3000# W.P. flanged full opening steel gate valve, or Halliburton Lo Torc Plug valve. |
| 2 | 2" minimum 3000# W.P. back pressure valve. |
| 5,6,9 | 3" minimum 3000# W.P. flanged full opening steel gate valve, or Halliburton Lo Torc Plug valve. |
| 12 | 1" minimum schedule 80, Grade "B", seamless line pipe. |
| 13 | 2" minimum x 3" minimum 3000# W.P. flanged cross. |
| 10,11 | 2" minimum 3000# W.P. adjustable choke bodies. |
| 14 | Cameron Mud Gauge or equivalent (location optional in choke line). |
| 15 | 2" minimum 3000# W.P. flanged or threaded full opening steel gate valve, or Halliburton Lo Torc Plug valve. |



TEXACO, INC.
MIDLAND DIVISION
MIDLAND, TEXAS



SCALE	DATE	EST NO	DRG NO
DRAWN BY			
CHECKED BY			
APPROVED BY			

EXHIBIT C

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

ADMINISTRATIVE APPLICATION COVERSHEET

THIS COVERSHEET IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS

Application Acronyms:

[NSP-Non-Standard Proration Unit] [NSL-Non-Standard Location]
 [DD-Directional Drilling] [SD-Simultaneous Dedication]
 [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
 [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
 [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
 [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
 [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] TYPE OF APPLICATION - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Directional Drilling

☐ NSL ☒ NSP ☒ DD ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement

☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery

☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or ☐ Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☒ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO

U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☒ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] INFORMATION / DATA SUBMITTED IS COMPLETE - Statement of Understanding

I hereby certify that I, or personnel under my supervision, have read and complied with all applicable Rules and Regulations of the Oil Conservation Division. Further, I assert that the attached application for administrative approval is accurate and complete to the best of my knowledge and where applicable, verify that all interest (WI, RI, ORRI) is common. I further verify that all applicable API Numbers are included. I understand that any omission of data, information or notification is cause to have the application package returned with no action taken.

Note: Statement must be completed by an individual with supervisory capacity.

C. WADE HOWARD
 Print or Type Name

C. Wade Howard
 Signature

ENGINEER ASSISTANT
 Title

3/4/97
 Date



Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

February 27, 1997

GOV - STATE AND LOCAL GOVERNMENTS
Directional Drilling - Horizontal
Non-Standard Proration Unit
North Vacuum Abo West Unit Well No. 29
Vacuum Abo, North Field
Lea County, New Mexico

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

Attention: Mr. Michael E. Stogner

Gentlemen:

Administrative approval, Rule 104.D, and Rule 111.D, is requested to directionally drill a dual lateral horizontal well in a non-standard proration unit in the Abo formation.

The North Vacuum Abo West Unit is a candidate for horizontal wells due to the heterogeneous nature of the reservoir. This Unit was designated a "Project Area" for horizontal drilling in 1996 (see Administrative Orders DD-153H and DD-154H). We have completed one successful horizontal well in this Unit (Well No. 26) and are currently drilling a second horizontal well (No. 27).

Attached for your information is a copy of our directional plans, a type log section, and Form C-102.

The "affected" offset operator to this well has been notified of this request. (See attached offset operator's list and certified mail receipts.)

Any questions concerning this request should be directed to me at (915) 688-4606.

Yours very truly,

C. W. Howard
Engineer's Assistant

CWH:
CC: NMOCD, P. O. Box 1980, Hobbs, NM 88240
Attachments

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State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
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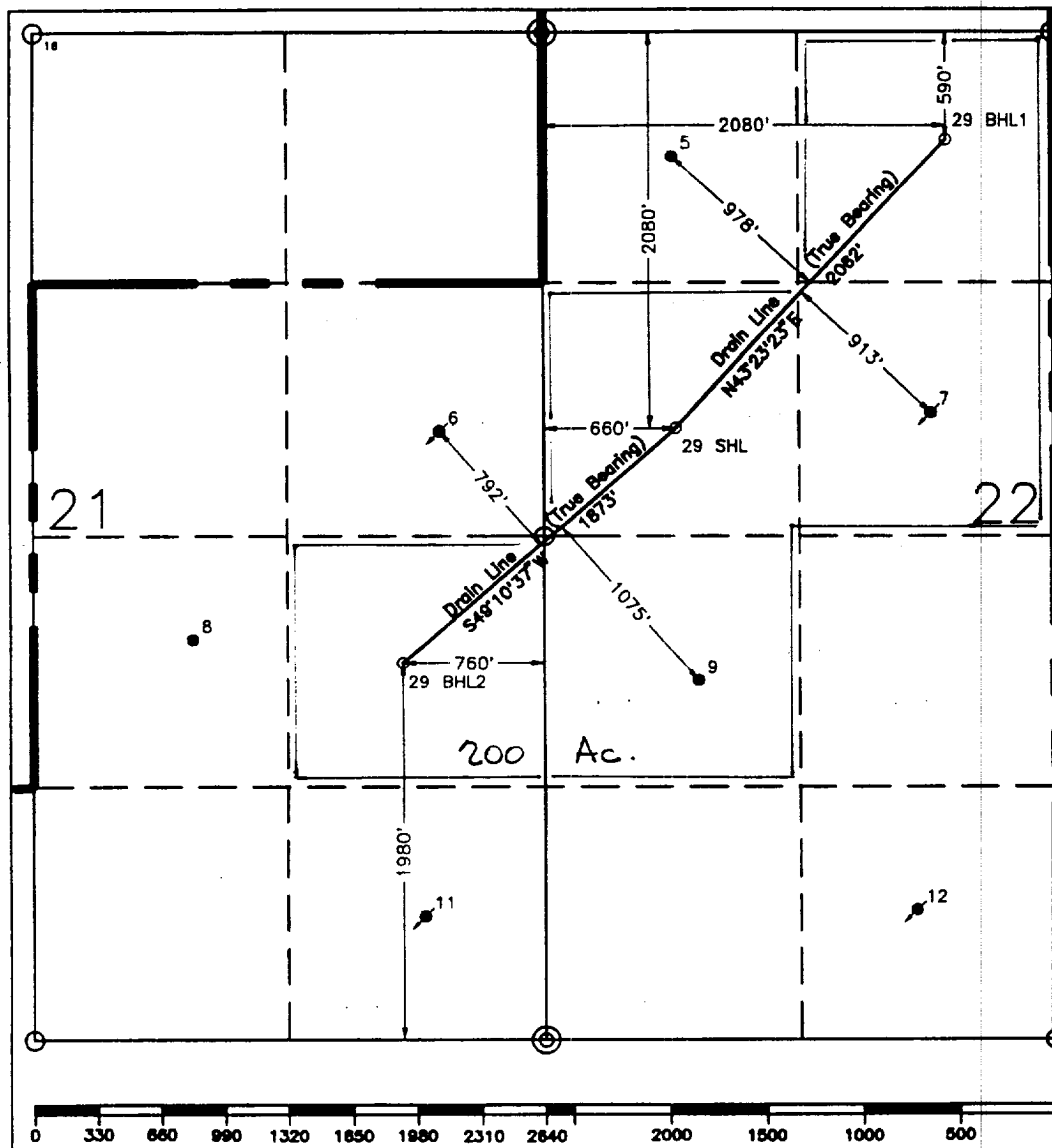
State Lease-4 copies
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¹ API Number		² Pool Code 61760		³ Pool Name Vacuum Abo, North					
⁴ Property Code 11123		⁵ Property Name North Vacuum Abo West Unit				⁶ Well Number 29			
⁷ GRID No. 22351		⁸ Operator Name TEXACO EXPLORATION & PRODUCTION, INC.				⁹ Elevation 4057'			
¹⁰ Surface Location									
UL or lot no. E	Section 22	Township 17-S	Range 34-E	Lot Idn	Feet from the 2080'	North/South line North	Feet from the 660'	East/West line West	⁷ County Lea
¹¹ Bottom Hole Location If Different From Surface									
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¹² Dedicated Acres 200		¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.			

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¹⁰ OPERATOR CERTIFICATION

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Signature

C. Wade Howard

Printed Name

C. Wade Howard

Position

Engineer's Assistant

Company

Texaco Expl. & Prod. Inc.

Date

February 26, 1997

¹¹ 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 knowledge and belief.

Date Surveyed

February 21, 1997

Signature & Seal of
Professional Surveyor

John S. Piper

Certificate No.

7254 John S. Piper

Sheet



Texaco Exploration
and Production Inc

500 North Loraine
Midland TX 79701

P O Box 3109
Midland TX 79702

February 27, 1997

GOV - STATE AND LOCAL GOVERNMENTS
Directional Drilling - Horizontal
Non-Standard Location
North Vacuum Abo West Unit Well No. 29
Sec. 22, T-17-S, R-34-E
Lea County, New Mexico

TO THE OFFSET OPERATORS:

Gentlemen:

As an offset operator to the captioned unit, you are being furnished with a copy of our Application to directionally drill a horizontal well. If you have no objection, please sign the waiver at the bottom of this letter and return in the enclosed envelope.

Any questions concerning this request should be directed to me at (915) 688-4606.

Yours very truly,

C. W. Howard
Engineer's Assistant

CWH:cwh

File

WAIVER APPROVED:

COMPANY: _____

BY: _____

DATE: _____

**OFFSET OPERATOR'S LIST
North Vacuum Abo West Unit Well No. 29
LEA COUNTY, NEW MEXICO**

**Mobil Exploration and Producing US Inc.
P. O. Box 633
Midland, Texas 79702**

**Mack Energy Corporation
P. O. Box 1767
Artesia, NM 88211**

**Chevron USA Inc.
P. O. Box 1150
Midland, Texas 79702**

**Phillips Petroleum Company
4001 Penbrook
Odessa, Texas 79762**

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mobil Exploration and Producing Inc.
P. O. Box 633
Midland, TX 79702

4a. Article Number
P 329 313 829

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery
MAR 03 1997

5. Signature (Addressee)

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

6. Signature (Agent)
Jesse H. Keys

PS Form 3811, December 1991

U.S. GPO: 1993-352-714

DOMESTIC RETURN RECEIPT

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mack Energy Corporation
P. O. Box 1767
Artesia, NM 88211

4a. Article Number
P 329 313 830

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery
2-28-97

5. Signature (Addressee)
Sylvia Dingley

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

6. Signature (Agent)
Sylvia Dingley

PS Form 3811, December 1991

U.S. GPO: 1993-352-714

DOMESTIC RETURN RECEIPT

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SENDER:

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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

3. Article Addressed to:

Chevron USA Inc.
P. O. Box 1150
Midland, TX 79702

4a. Article Number

P 329 313 831

4b. Service Type

☐ Registered

☐ Insured

☒ Certified

☐ COD

☐ Express Mail

☒ Return Receipt for Merchandise

7. Date of Delivery

FEB 28 1997

5. Signature (Addressee)

6. Signature (Agent)

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

PS Form 3811, December 1991

★U.S. GPO: 1993-352-714

DOMESTIC RETURN RECEIPT

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address

2. ☐ Restricted Delivery

Consult postmaster for fee.

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

3. Article Addressed to:

Phillips Petroleum Company
4001 Penbrook
Odessa, TX 79762

4a. Article Number

P 329 313 832

4b. Service Type

☐ Registered

☐ Insured

☒ Certified

☐ COD

☐ Express Mail

☒ Return Receipt for Merchandise

7. Date of Delivery

2-28-97 Jm

5. Signature (Addressee)

6. Signature (Agent)

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

PS Form 3811, December 1991

★U.S. GPO: 1993-352-714

DOMESTIC RETURN RECEIPT

Thank you for using Return Receipt Service.

Company: TEXACO E & P, INC.
 Lease/Well: NVAWU #29H
 Location: LEA COUNTY, NEW MEXICO
 Declination: 9.11 DEG EAST
 File name: C:\WINSERVER\NVAW29SW.SVY
 Date/Time: Friday, February 28, 1997

TRUE VERTICAL DEPTH (Ft)

#	TVD	N-S	E-W
1	8877.04	488.24	471.94
2	8784.58	898.49	943.88
3	8852.84	1488.45	1416.51

MD	INC	AZM	TVD	N-S	E-W
KOP: 8730' MD, 57.3 DEG/100'					
8730.00	.00	43.39	8730.00	.00	.00
EOB: 8879' MD, 8830' TVD, 85.33 DEG INC					
8878.92	85.33	43.39	8829.66	66.75	63.10
*Build @ 15.0 85.33°					
9444.82	85.33	43.39	8875.77	476.62	450.56
TARGET 1					
9475.98	90.00	43.39	8877.04	499.24	471.94
*Hold @ 97.4					
9525.10	97.37	43.39	8873.88	534.84	505.59
*Drop @ 15.0 97.37°					
10119.04	97.37	43.39	8797.71	962.88	910.23
TARGET 2					
10168.16	90.00	43.39	8794.56	998.49	943.88
*HOLD 85.1 DEG/100'					
10201.12	85.06	43.39	8795.98	1022.40	966.49
TD: 10859' MD, 2062' VS					
10858.65	85.06	43.39	8852.64	1498.45	1416.51

KOP: 8730' MD, 57.3 DEG/100'

EOB: 8879' MD, 8830' TVD, 85.33 DEG INC
 TARGET 1

TARGET 2

TD: 10859' MD, 2062' VS

- NORTHEAST WELL PATH

VERTICAL SECTION (Ft) @ 43.39°



Job Number: P97-102
 Company: TEXACO E & P, INC.
 Lease/Well: NVAWU #29H
 Location: LEA COUNTY, NEW MEXICO
 Rig Name:

State/Country:
 Declination: 9.11 DEG EAST
 Grid:
 File name: C:\WINSERVE\NVAW29NE.SVY
 Date/Time: 28-Feb-97 / 06:06
 Curve Name: PROPOSED WELL PATH

Phoenix Drilling Services, Inc.

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 43.39

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
-------------------------	----------------------	---------------------------	---------------------------	---------------------	-----------	-----------	---------------------------	---------------------------	------------------	-------------------------------

KOP: 8730' MD, 57.3 DEG/100'

8730.00	00	43.39	8730.00	4656.00	00	00	00	00	00	00
8740.00	5.73	43.39	8739.98	4665.98	36	34	50	50	43.39	57.30
8750.00	11.46	43.39	8749.87	4675.87	1.45	1.37	1.99	1.99	43.39	57.30
8760.00	17.19	43.39	8759.55	4685.55	3.25	3.07	4.47	4.47	43.39	57.30
3770.00	22.92	43.39	8768.94	4694.94	5.74	5.42	7.89	7.89	43.39	57.30
8780.00	28.65	43.39	8777.94	4703.94	8.90	8.41	12.24	12.24	43.39	57.30
8790.00	34.38	43.39	8786.46	4712.46	12.69	12.00	17.47	17.47	43.39	57.30
8800.00	40.11	43.39	8794.42	4720.42	17.09	16.16	23.52	23.52	43.39	57.30
8810.00	45.84	43.39	8801.73	4727.73	22.04	20.84	30.33	30.33	43.39	57.30
8820.00	51.57	43.39	8808.33	4734.33	27.50	26.00	37.84	37.84	43.39	57.30
8830.00	57.30	43.39	8814.14	4740.14	33.41	31.58	45.97	45.97	43.39	57.30
8840.00	63.03	43.39	8819.12	4745.12	39.71	37.54	54.64	54.64	43.39	57.30
8850.00	68.76	43.39	8823.20	4749.20	46.34	43.81	63.77	63.77	43.39	57.30

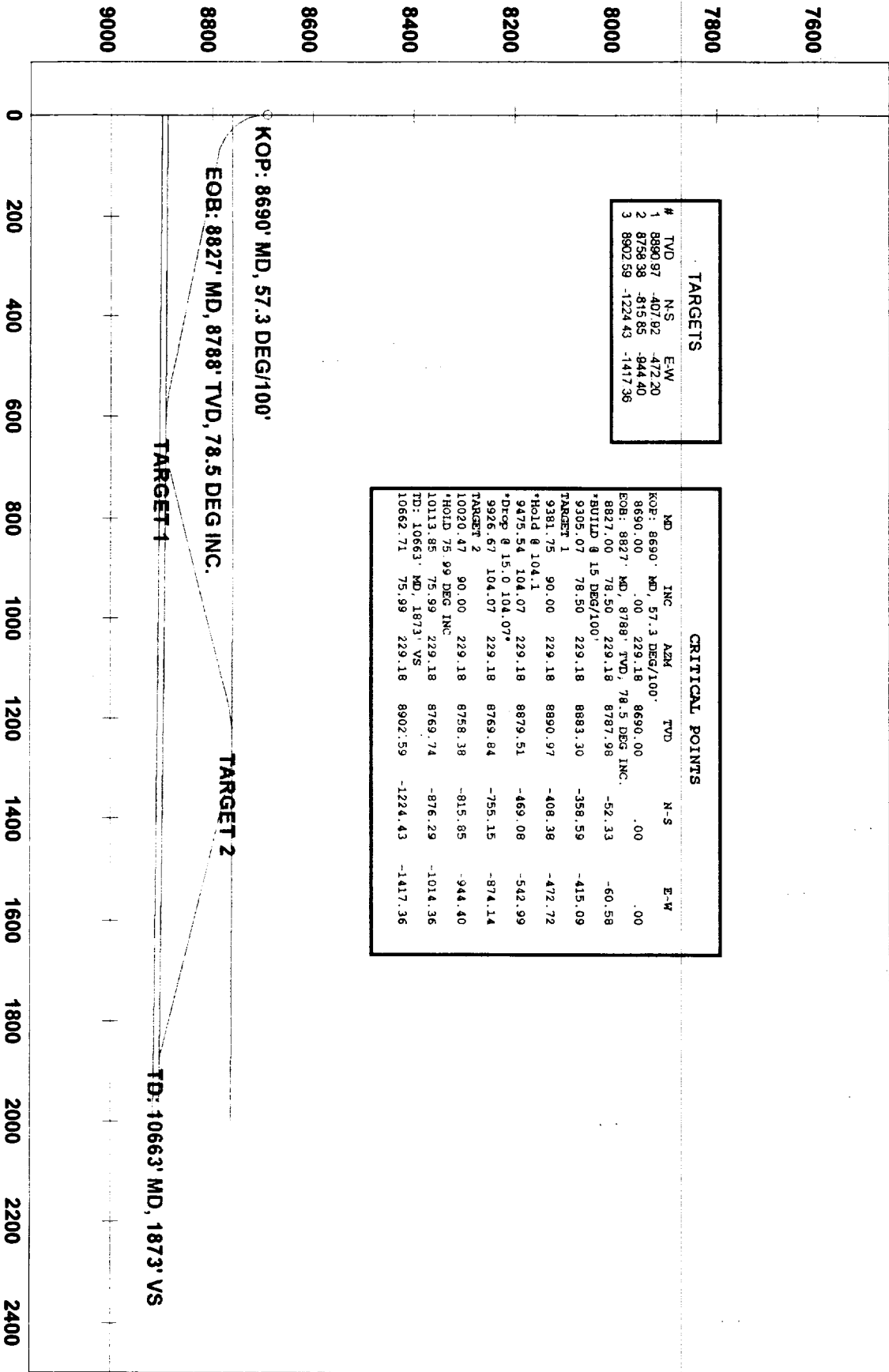
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
8860.00	74.49	43.39	8826.35	4752.35	53.23	50.32	73.25	73.25	43.39	57.30
8870.00	80.22	43.39	8828.54	4754.54	60.32	57.02	83.01	83.01	43.39	57.30
EOB: 8879' MD, 8830' TVD, 85.33 DEG INC										
8878.92	85.33	43.39	8829.66	4755.66	66.75	63.10	91.85	91.85	43.39	57.29
8979.11	85.33	43.39	8837.82	4763.82	139.32	131.70	191.71	191.71	43.39	.00
9079.11	85.33	43.39	8845.97	4771.97	211.74	200.16	291.38	291.38	43.39	.00
9179.11	85.33	43.39	8854.12	4780.12	284.17	268.63	391.05	391.05	43.39	.00
9279.11	85.33	43.39	8862.27	4788.27	356.60	337.10	490.71	490.71	43.39	.00
9379.11	85.33	43.39	8870.41	4796.41	429.03	405.57	590.38	590.38	43.39	.00
Build @ 15.0 85.33°										
9444.82	85.33	43.39	8875.77	4801.77	476.62	450.56	655.87	655.87	43.39	.00
9445.98	85.50	43.39	8875.86	4801.86	477.46	451.35	657.03	657.03	43.39	15.00
9455.98	87.00	43.39	8876.51	4802.51	484.71	458.21	667.01	667.01	43.39	15.00
9465.98	88.50	43.39	8876.91	4802.91	491.97	465.07	677.00	677.00	43.39	15.00
TARGET 1										
9475.98	90.00	43.39	8877.04	4803.04	499.24	471.94	687.00	687.00	43.39	15.00
9485.98	91.50	43.39	8876.91	4802.91	506.51	478.81	697.00	697.00	43.39	15.00
9495.98	93.00	43.39	8876.51	4802.51	513.77	485.67	706.99	706.99	43.39	15.00
9505.98	94.50	43.39	8875.86	4801.86	521.02	492.53	716.97	716.97	43.39	15.00
9515.98	96.00	43.39	8874.95	4800.95	528.25	499.37	726.93	726.93	43.39	15.00
Hold @ 97.4										
9525.10	97.37	43.39	8873.88	4799.88	534.84	505.59	735.99	735.99	43.39	15.00
9625.10	97.37	43.39	8861.06	4787.06	606.91	573.72	835.16	835.16	43.39	.00
9725.10	97.37	43.39	8848.23	4774.23	678.98	641.85	934.34	934.34	43.39	.00
9825.10	97.37	43.39	8835.41	4761.41	751.05	709.98	1033.51	1033.51	43.39	.00
9925.10	97.37	43.39	8822.58	4748.58	823.12	778.11	1132.68	1132.68	43.39	.00
10025.10	97.37	43.39	8809.76	4735.76	895.19	846.23	1231.86	1231.86	43.39	.00
Drop @ 15.0 97.37°										
10119.04	97.37	43.39	8797.71	4723.71	962.88	910.23	1325.01	1325.01	43.39	.00
10119.11	97.36	43.39	8797.70	4723.70	962.93	910.27	1325.08	1325.08	43.39	15.00
10128.16	96.00	43.39	8796.65	4722.65	969.47	916.45	1334.08	1334.08	43.39	15.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
TARGET 2										
10138.16	94.50	43.39	8795.73	4721.73	976.71	923.29	1344.03	1344.03	43.39	15.00
10148.16	93.00	43.39	8795.08	4721.08	983.96	930.15	1354.01	1354.01	43.39	15.00
10158.16	91.50	43.39	8794.69	4720.69	991.22	937.01	1364.00	1364.00	43.39	15.00
TARGET 2										
10168.16	90.00	43.39	8794.56	4720.56	998.49	943.88	1374.00	1374.00	43.39	15.00
10178.16	88.50	43.39	8794.69	4720.69	1005.75	950.75	1384.00	1384.00	43.39	15.00
10188.16	87.00	43.39	8795.08	4721.08	1013.01	957.61	1393.99	1393.99	43.39	15.00
10198.16	85.50	43.39	8795.73	4721.73	1020.26	964.47	1403.97	1403.97	43.39	15.00
HOLD 85.1 DEG/100'										
10201.12	85.06	43.39	8795.98	4721.98	1022.40	966.49	1406.92	1406.92	43.39	15.00
10301.12	85.06	43.39	8804.59	4730.59	1094.80	1034.93	1506.55	1506.55	43.39	.00
10401.12	85.06	43.39	8813.21	4739.21	1167.20	1103.37	1606.17	1606.17	43.39	.00
10501.12	85.06	43.39	8821.83	4747.83	1239.60	1171.81	1705.80	1705.80	43.39	.00
10601.12	85.06	43.39	8830.44	4756.44	1312.00	1240.25	1805.43	1805.43	43.39	.00
10701.12	85.06	43.39	8839.06	4765.06	1384.40	1308.69	1905.06	1905.06	43.39	.00
10801.12	85.06	43.39	8847.68	4773.68	1456.80	1377.13	2004.69	2004.69	43.39	.00
TD: 10859' MD, 2062' VS										
10858.65	85.06	43.39	8852.64	4778.64	1498.45	1416.51	2062.00	2062.00	43.39	.00

Company: TEXACO E & P INC.
 Lease/Well: NVAWU #29H
 Location: LEA COUNTY, NEW MEXICO
 Declination: 9.11 DEG EAST
 File name: C:\WINSERVE\NVAW29SW.SVY
 Date/Time: Friday, February 28, 1997

#	TVD	N-S	E-W
1	8890.97	-407.92	-472.20
2	8756.38	-815.85	-944.40
3	8902.59	-1224.43	-1417.36

MD	INC	AZM	TVD	N-S	E-W
KOP: 8690'	MD, 57.3 DEG/100'				
8690.00	.00	229.18	8690.00	.00	.00
EOB: 8827'	MD, 87.88' TVD, 78.5 DEG INC.				
8827.00	78.50	229.18	8787.98	-52.33	-60.58
*BUILD @ 15 DEG/100'					
9305.07	78.50	229.18	8883.30	-358.59	-415.09
TARGET 1					
9381.75	90.00	229.18	8890.97	-408.38	-472.72
*Hold @ 104.1					
9475.54	104.07	229.18	8879.51	-469.08	-542.99
Drop @ 15.0 104.07					
9926.67	104.07	229.18	8769.84	-755.15	-874.14
TARGET 2					
10020.47	90.00	229.18	8758.38	-815.85	-944.40
*HOLD 75.99 DEG INC.					
10113.85	75.99	229.18	8769.74	-876.29	-1014.36
TD: 10663'	MD, 187.3' VS				
10662.71	75.99	229.18	8902.59	-1224.43	-1417.36





Job Number: P97-102
 Company: TEXACO E & P, INC.
 Lease/Well: NVAWU #29H
 Location: LEA COUNTY, NEW MEXICO
 Rig Name:

State/Country:
 Declination: 9.11 DEG EAST
 Grd:
 File name: C:\WINSERVE\NVAW29SW.SVY
 Date/Time: 28-Feb-97 / 06:50
 Curve Name: SOUTHWEST WELL PATH

Phoenix Drilling Services, Inc.

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 229.18

Measured Depth Ft	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD Ft	N-S Ft	E-W Ft	Vertical Section Ft	CLOSURE Distance Ft	Direction Deg	Dogleg Severity Deg/100
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KOP: 8690' MD, 57.3 DEG/100'

8690.00	.00	229.18	8690.00	4616.00	.00	.00	.00	.00	.00	.00
8700.00	5.73	229.18	8699.98	4625.98	-.33	-.38	.50	.50	229.18	57.30
8710.00	11.46	229.18	8709.87	4635.87	-1.30	-1.51	1.99	1.99	229.18	57.30
8720.00	17.19	229.18	8719.55	4645.55	-2.92	-3.38	4.47	4.47	229.18	57.30
3730.00	22.92	229.18	8728.94	4654.94	-5.16	-5.97	7.89	7.89	229.18	57.30
8740.00	28.65	229.18	8737.94	4663.94	-8.00	-9.26	12.24	12.24	229.18	57.30
8750.00	34.38	229.18	8746.46	4672.46	-11.42	-13.22	17.47	17.47	229.18	57.30
8760.00	40.11	229.18	8754.42	4680.42	-15.37	-17.80	23.52	23.52	229.18	57.30
8770.00	45.84	229.18	8761.73	4687.73	-19.83	-22.95	30.33	30.33	229.18	57.30
8780.00	51.57	229.18	8768.33	4694.33	-24.74	-28.64	37.84	37.84	229.18	57.30
8790.00	57.30	229.18	8774.14	4700.14	-30.05	-34.79	45.97	45.97	229.18	57.30
8800.00	63.03	229.18	8779.12	4705.12	-35.72	-41.35	54.64	54.64	229.18	57.30
8810.00	68.76	229.18	8783.20	4709.20	-41.69	-48.26	63.77	63.77	229.18	57.30

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
8820.00	74.49	229.18	8786.35	4712.35	-47.89	-55.43	73.25	73.25	229.18	57.30
EOB: 8827' MD, 8788' TVD, 78.5 DEG INC.										
8827.00	78.50	229.18	8787.98	4713.98	-52.33	-60.58	80.06	80.06	229.18	57.30
8927.00	78.50	229.18	8807.92	4733.92	-116.40	-134.74	178.05	178.05	229.18	.00
9027.00	78.50	229.18	8827.86	4753.86	-180.46	-208.89	276.04	276.04	229.18	.00
9127.00	78.50	229.18	8847.80	4773.80	-244.52	-283.04	374.03	374.03	229.18	.00
9227.00	78.50	229.18	8867.74	4793.74	-308.58	-357.20	472.03	472.03	229.18	.00
9275.00	78.50	229.18	8877.31	4803.31	-339.32	-392.79	519.06	519.06	229.18	.00
BUILD @ 15 DEG/100'										
9305.07	78.50	229.18	8883.30	4809.30	-358.59	-415.09	548.53	548.53	229.18	.00
9315.07	80.00	229.18	8885.17	4811.17	-365.01	-422.53	558.36	558.36	229.18	15.00
9325.07	81.50	229.18	8886.78	4812.78	-371.47	-430.00	568.23	568.23	229.18	15.00
9335.07	83.00	229.18	8888.12	4814.12	-377.94	-437.49	578.14	578.14	229.18	15.00
9345.07	84.50	229.18	8889.21	4815.21	-384.44	-445.02	588.08	588.08	229.18	15.00
9355.07	86.00	229.18	8890.04	4816.04	-390.96	-452.56	598.04	598.04	229.18	15.00
9365.07	87.50	229.18	8890.61	4816.61	-397.48	-460.11	608.03	608.03	229.18	15.00
9375.07	89.00	229.18	8890.91	4816.91	-404.02	-467.68	618.02	618.02	229.18	15.00
TARGET 1										
9381.75	90.00	229.18	8890.97	4816.97	-408.38	-472.72	624.69	624.69	229.18	15.00
9391.75	91.50	229.18	8890.84	4816.84	-414.91	-480.29	634.69	634.69	229.18	15.00
9401.75	93.00	229.18	8890.45	4816.45	-421.45	-487.85	644.68	644.68	229.18	15.00
9411.75	94.50	229.18	8889.79	4815.79	-427.97	-495.40	654.66	654.66	229.18	15.00
9421.75	96.00	229.18	8888.88	4814.88	-434.48	-502.94	664.62	664.62	229.18	15.00
9431.75	97.50	229.18	8887.70	4813.70	-440.97	-510.45	674.55	674.55	229.18	15.00
9441.75	99.00	229.18	8886.27	4812.27	-447.44	-517.94	684.45	684.45	229.18	15.00
9451.75	100.50	229.18	8884.58	4810.58	-453.88	-525.40	694.30	694.30	229.18	15.00
9461.75	102.00	229.18	8882.62	4808.62	-460.29	-532.82	704.11	704.11	229.18	15.00
9471.75	103.50	229.18	8880.42	4806.42	-466.67	-540.20	713.86	713.86	229.18	15.00
Hold @ 104.1										
9475.54	104.07	229.18	8879.51	4805.51	-469.08	-542.99	717.55	717.55	229.18	15.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
9575.54	104.07	229.18	8855.20	4781.20	-532.49	-616.40	814.55	814.55	229.18	.00
9675.54	104.07	229.18	8830.89	4756.89	-595.90	-689.80	911.55	911.55	229.18	.00
9775.54	104.07	229.18	8806.58	4732.58	-659.31	-763.20	1008.55	1008.55	229.18	.00
9875.54	104.07	229.18	8782.27	4708.27	-722.73	-836.60	1105.55	1105.55	229.18	.00
Drop @ 15.0 104.07°										
9926.67	104.07	229.18	8769.84	4695.84	-755.15	-874.14	1155.15	1155.15	229.18	.00
9926.69	104.07	229.18	8769.84	4695.84	-755.16	-874.15	1155.16	1155.16	229.18	15.00
9930.47	103.50	229.18	8768.94	4694.94	-757.56	-876.93	1158.83	1158.83	229.18	15.00
9940.47	102.00	229.18	8766.73	4692.73	-763.93	-884.31	1168.59	1168.59	229.18	15.00
9950.47	100.50	229.18	8764.78	4690.78	-770.35	-891.73	1178.39	1178.39	229.18	15.00
9960.47	99.00	229.18	8763.09	4689.09	-776.79	-899.19	1188.25	1188.25	229.18	15.00
9970.47	97.50	229.18	8761.65	4687.65	-783.26	-906.67	1198.14	1198.14	229.18	15.00
9980.47	96.00	229.18	8760.48	4686.48	-789.75	-914.19	1208.08	1208.08	229.18	15.00
9990.47	94.50	229.18	8759.56	4685.56	-796.26	-921.72	1218.03	1218.03	229.18	15.00
10000.47	93.00	229.18	8758.91	4684.91	-802.78	-929.28	1228.01	1228.01	229.18	15.00
10010.47	91.50	229.18	8758.52	4684.52	-809.31	-936.84	1238.00	1238.00	229.18	15.00
TARGET 2										
10020.47	90.00	229.18	8758.38	4684.38	-815.85	-944.40	1248.00	1248.00	229.18	15.00
10030.47	88.50	229.18	8758.52	4684.52	-822.39	-951.97	1258.00	1258.00	229.18	15.00
10040.47	87.00	229.18	8758.91	4684.91	-828.92	-959.53	1267.99	1267.99	229.18	15.00
10050.47	85.50	229.18	8759.56	4685.56	-835.44	-967.08	1277.97	1277.97	229.18	15.00
10060.47	84.00	229.18	8760.48	4686.48	-841.95	-974.62	1287.93	1287.93	229.18	15.00
10070.47	82.50	229.18	8761.65	4687.65	-848.44	-982.13	1297.86	1297.86	229.18	15.00
10080.47	81.00	229.18	8763.09	4689.09	-854.91	-989.62	1307.76	1307.76	229.18	15.00
10090.47	79.50	229.18	8764.78	4690.78	-861.36	-997.08	1317.61	1317.61	229.18	15.00
10100.47	78.00	229.18	8766.73	4692.73	-867.77	-1004.50	1327.42	1327.42	229.18	15.00
10110.47	76.50	229.18	8768.94	4694.94	-874.14	-1011.88	1337.17	1337.17	229.18	15.00
HOLD 75.99 DEG INC										
10113.85	75.99	229.18	8769.74	4695.74	-876.29	-1014.36	1340.45	1340.45	229.18	15.00
10213.85	75.99	229.18	8793.95	4719.95	-939.72	-1087.79	1437.48	1437.48	229.18	.00
10313.85	75.99	229.18	8818.15	4744.15	-1003.15	-1161.21	1534.51	1534.51	229.18	.00
10413.85	75.99	229.18	8842.35	4768.35	-1066.58	-1234.63	1631.53	1631.53	229.18	.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Subsea TVD FT	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
10513.85	75.99	229.18	8866.56	4792.56	-1130.00	-1308.06	1728.56	1728.56	229.18	.00
10613.85	75.99	229.18	8890.76	4816.76	-1193.43	-1381.48	1825.59	1825.59	229.18	.00
TD: 10663' MD, 1873' VS										
10662.71	75.99	229.18	8902.59	4828.59	-1224.43	-1417.36	1873.00	1873.00	229.18	.00