

ATS-15-237

NM OIL CONSERVATION  
ARTESIA DISTRICT  
HIGH CAVE KARST  
JUL 29 2015

# Carlsbad Field Office OCD Artesia

Form 3160-3  
(March 2012)

RECEIVED  
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

## APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

5. Lease Serial No.  
NMNM-17220

6. If Indian, Allottee or Tribe Name

7. If Unit or CA Agreement, Name and No.

1a. Type of work:  DRILL  REENTER

1b. Type of Well:  Oil Well  Gas Well  Other  Single Zone  Multiple Zone

8. Lease Name and Well No.  
NORMA 22 FEDERAL #2H

2. Name of Operator OXY USA WTP LP

9. API Well No.  
32-015-43254

3a. Address P.O. BOX 4284  
HOUSTON, TX 77210

3b. Phone No. (include area code)  
713-513-8840

10. Field and Pool, or Exploratory  
AVALON; BONE SPRING, EAST (3713)

4. Location of Well (Report location clearly and in accordance with any State requirements.)  
At surface 1970' FNL & 420' FWL; SWNW (E)  
At proposed prod. zone 2250' FNL & 180' FWL; SWNW (E)

11. Sec., T, R, M. or Blk. and Survey or Area  
SH = SEC 23, T20S, R28E R28E  
BH = SEC 22, T20S, R26E R28E

14. Distance in miles and direction from nearest town or post office\*  
15 MILES FROM CARLSBAD, NM

12. County or Parish  
EDDY COUNTY

13. State  
NM

15. Distance from proposed\* 180'  
location to nearest  
property or lease line, ft.  
(Also to nearest drig. unit line, if any)

16. No. of acres in lease  
400

17. Spacing Unit dedicated to this well  
180

18. Distance from proposed location\*  
to nearest well, drilling, completed, 100'  
applied for, on this lease, ft.

19. Proposed Depth  
12774' MD / 7440' TVD

20. BLM/BIA Bond No. on file  
NMB000862 / ESB00226

21. Elevations (Show whether DF, KDB, RT, GL, etc.)  
3248'

22. Approximate date work will start\*  
04/01/2015

23. Estimated duration  
20 DAYS

### 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- 1. Well plat certified by a registered surveyor.
- 2. A Drilling Plan.
- 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- 4. Bond to cover the operations unless covered by an existing bond on file (see item 20 above).
- 5. Operator certification
- 6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature *Jennifer Duarte* Name (Printed/Typed) JENNIFER DUARTE (jennifer\_duarte@oxy.com) Date 11/18/2014

Title REGULATORY SPECIALIST

Approved by (Signature) *Ed Hernandez for Steve Caffey* Name (Printed/Typed) Office CARLSBAD FIELD OFFICE Date JUL 21 2015

Title FIELD MANAGER

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached. APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)

Capitan Controlled Water Basin

*APD*  
7/31/2015

Approval Subject to General Requirements  
& Special Stipulations Attached

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

**OPERATOR CERTIFICATION**

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 31 day of March, 2015.

Signature:  \_\_\_\_\_  
Name: Omar Lisigurski \_\_\_\_\_  
Position: Reservoir Management Team Leader \_\_\_\_\_  
Address: 5 Greenway Plaza, Suite 110, Houston, TX 77046 \_\_\_\_\_  
Telephone: 713-215-7506 \_\_\_\_\_  
E-mail: (optional): omar\_lisigurski@oxy.com \_\_\_\_\_  
Company: Occidental Permian LP/OXY USA Inc /OXY USA WTP LP \_\_\_\_\_  
Field Representative (if not above signatory): Dusty Weaver \_\_\_\_\_  
Address (if different from above): P.O. Box 50250 Midland, TX 79710 \_\_\_\_\_  
Telephone (if different from above): 432-685-5723 \_\_\_\_\_  
E-mail (if different from above): calvin\_weaver@oxy.com \_\_\_\_\_

District I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 392-6161 Fax: (575) 392-0720  
District II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
District III  
1000 Rio Brazos Road, Artesia, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3452

State of New Mexico  
Energy, Minerals & Natural Resources Department  
**OIL CONSERVATION DIVISION**  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office

AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number 30-015-43254	Pool Code 3713	Pool Name Avalon; Bone Spring, East
Property Code 315063	Property Name NORMA "22" FEDERAL	Well Number 2H
OGRID No. 192463	Operator Name OXY USA WTP LP	Elevation 3248.4'

**Surface Location**

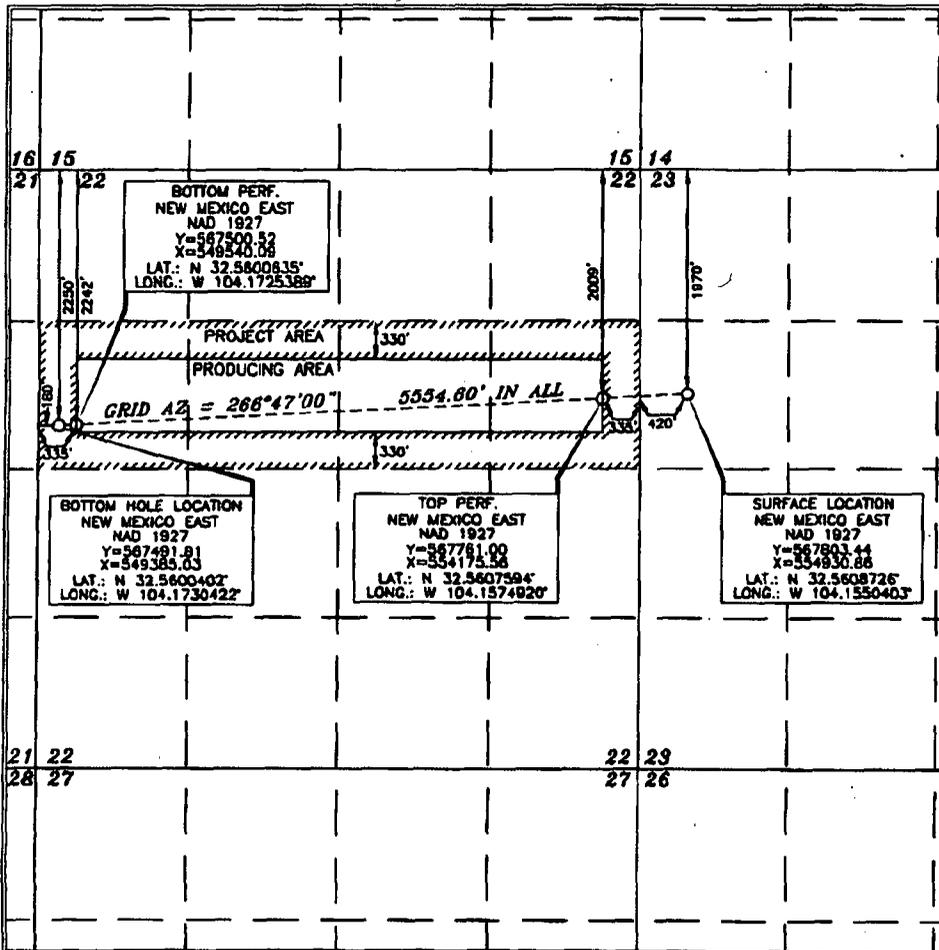
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	23	20 SOUTH	28 EAST, N.M.P.M.		1970'	NORTH	420'	WEST	EDDY

**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
E	22	20 SOUTH	28 EAST, N.M.P.M.		2250'	NORTH	180'	WEST	EDDY

Dedicated Acres 160	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.



**OPERATOR CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order hereby approved by this Division.

Jennifer Duarte 11/17/14  
Signature Date  
Jennifer Duarte  
Principal Name  
jennifer.duarte@oxy.com  
E-mail Address

**SURVEYOR CERTIFICATION**

I hereby certify that the information contained on this plat was obtained from the records of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

DATE OF SURVEY  
15079  
JULY 14, 2014  
Signature and Title of Professional Surveyor  
Terry J. Paul  
Certificate Number 15079

District I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
District II  
511 S. First St., Aztec, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-0720  
District III  
1000 Rio Grande Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department  
**OIL CONSERVATION DIVISION**  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office

AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number	Pool Code	Pool Name
	3713	Avalon; Bone Spring, East
Property Code	Property Name	Well Number
	NORMA "22" FEDERAL	2H
OGRID No.	Operator Name	Elevation
1924163	OXY USA W T P L P	3248.4'

**Surface Location**

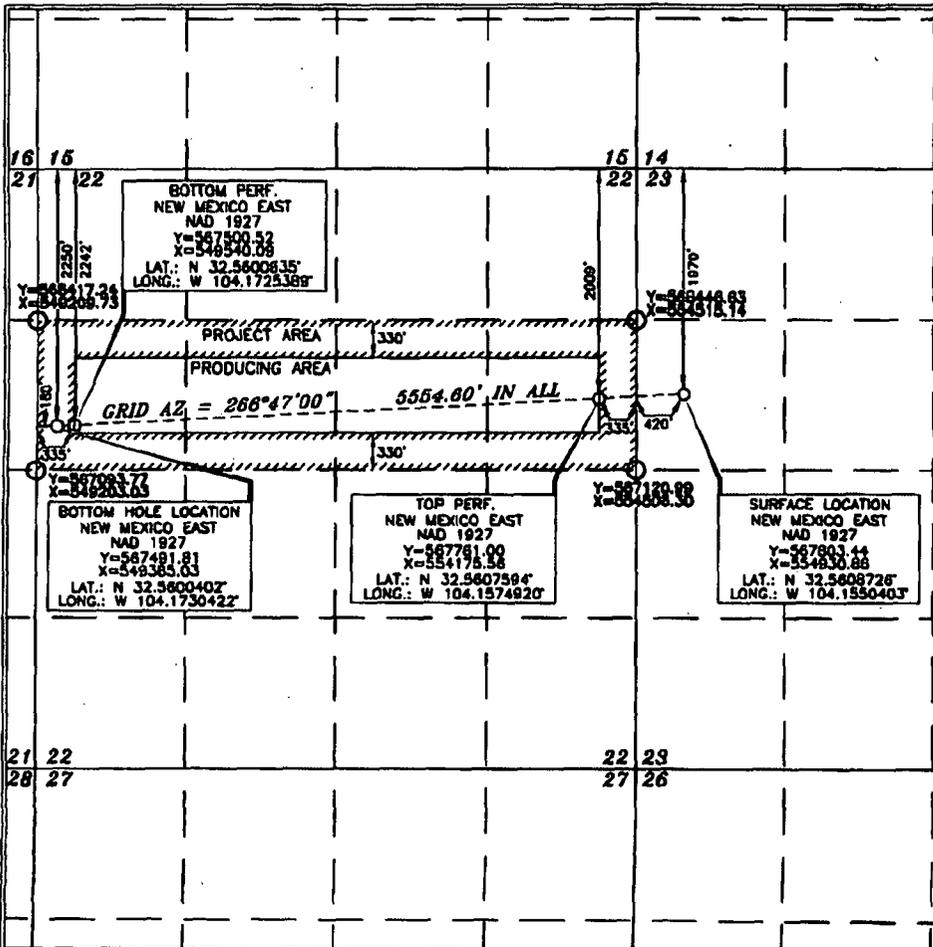
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	23	20 SOUTH	28 EAST, N.M.P.M.		1970'	NORTH	420'	WEST	EDDY

**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
E	22	20 SOUTH	28 EAST, N.M.P.M.		2250'	NORTH	180'	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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, and that this organization either owns a working interest or sole/minor interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the district.

*Jennifer Duarte* 4/17/14  
Signature  
Jennifer Duarte  
jennifer.duarte@oxy.com  
E-mail Address

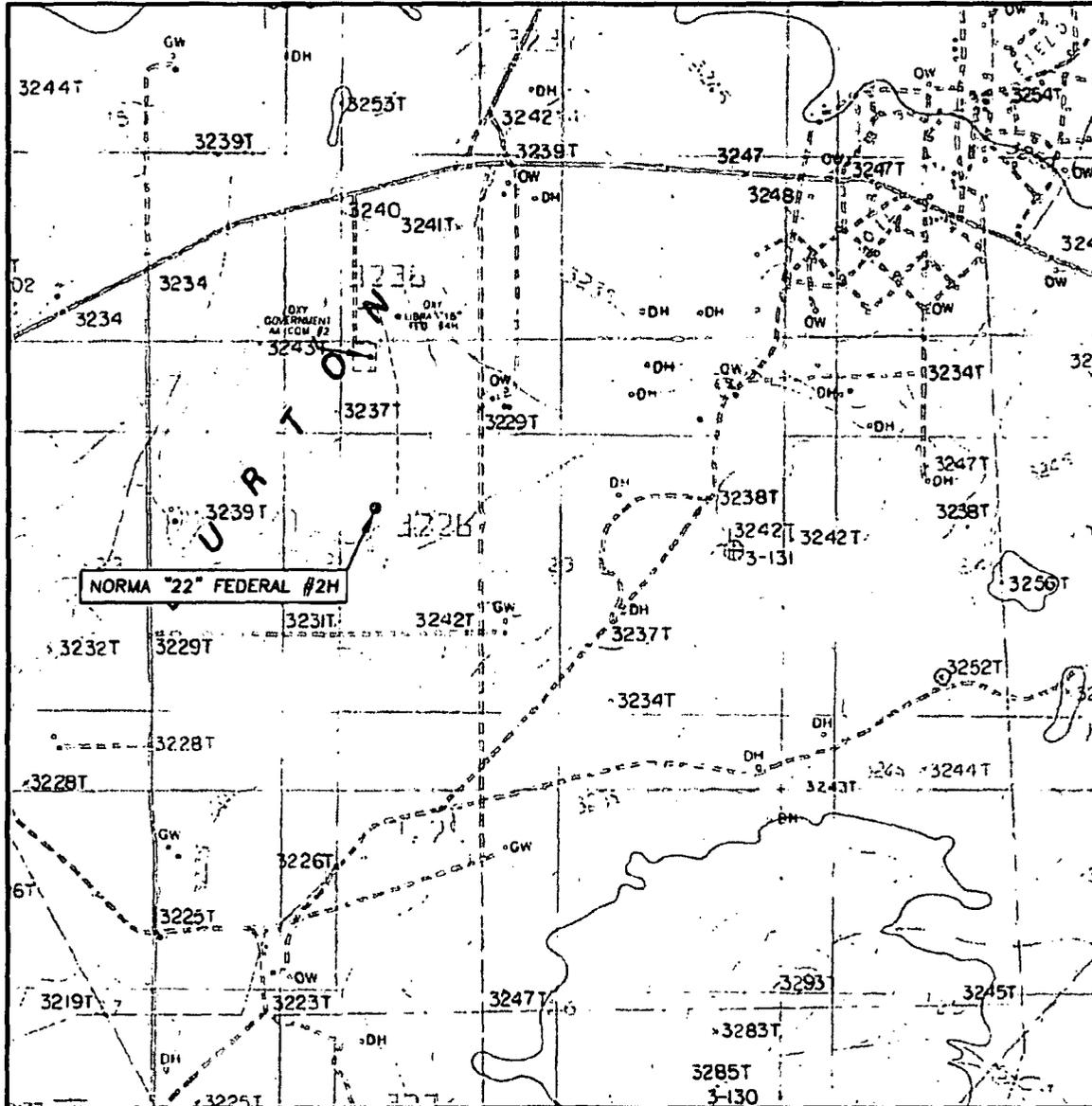
**SURVEYOR CERTIFICATION**

I hereby certify that this plat was prepared from a true and correct survey made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date of Survey: **JULY 14, 2014**  
Signature and Seal of Professional Surveyor: *Jerry J. Paul*  
Professional Surveyor License No. 15079

*Jerry J. Paul* 8/14/2014  
Certificate Number 15079

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL: 10'

SEC. 23 TWP. 20-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 1970' FNL & 420' FWL

ELEVATION 3248.4'

OPERATOR OXY USA WJPLP

LEASE NORMA "22" FEDERAL #2H

U.S.G.S. TOPOGRAPHIC MAP

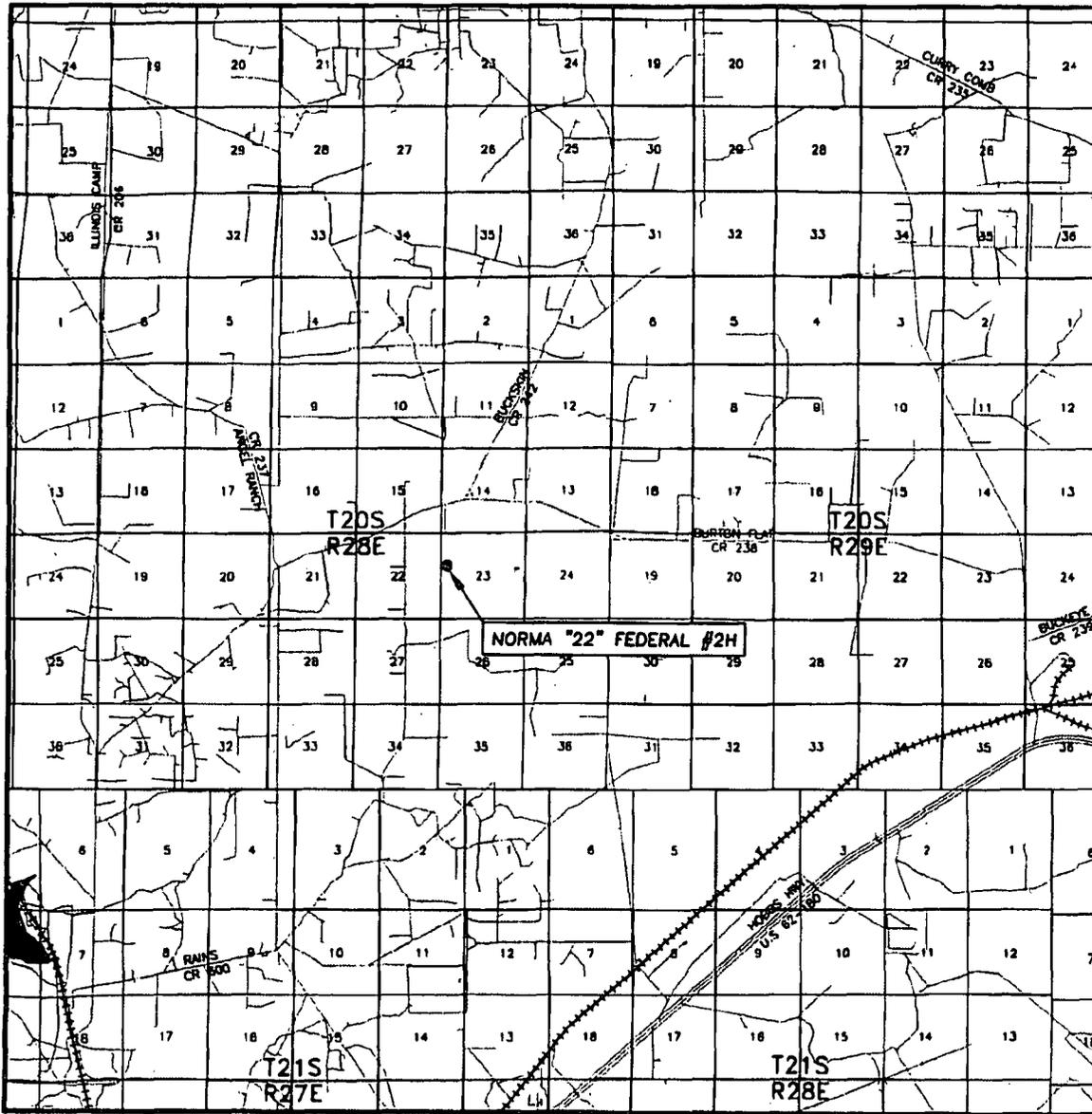
ANGEL DRAW, N.M.

Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR  
HOBBS, NEW MEXICO - 575-393-9146



# VICINITY MAP

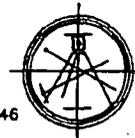


SEC. 23 TWP. 20-S RGE. 28-E  
 SURVEY N.M.P.M.  
 COUNTY EDDY  
 DESCRIPTION 1970' FNL & 420' FWL  
 ELEVATION 3248.4'  
 OPERATOR OXY USA WTR LP  
 LEASE NORMA "22" FEDERAL #2H

SCALE: 1" = 2 MILES

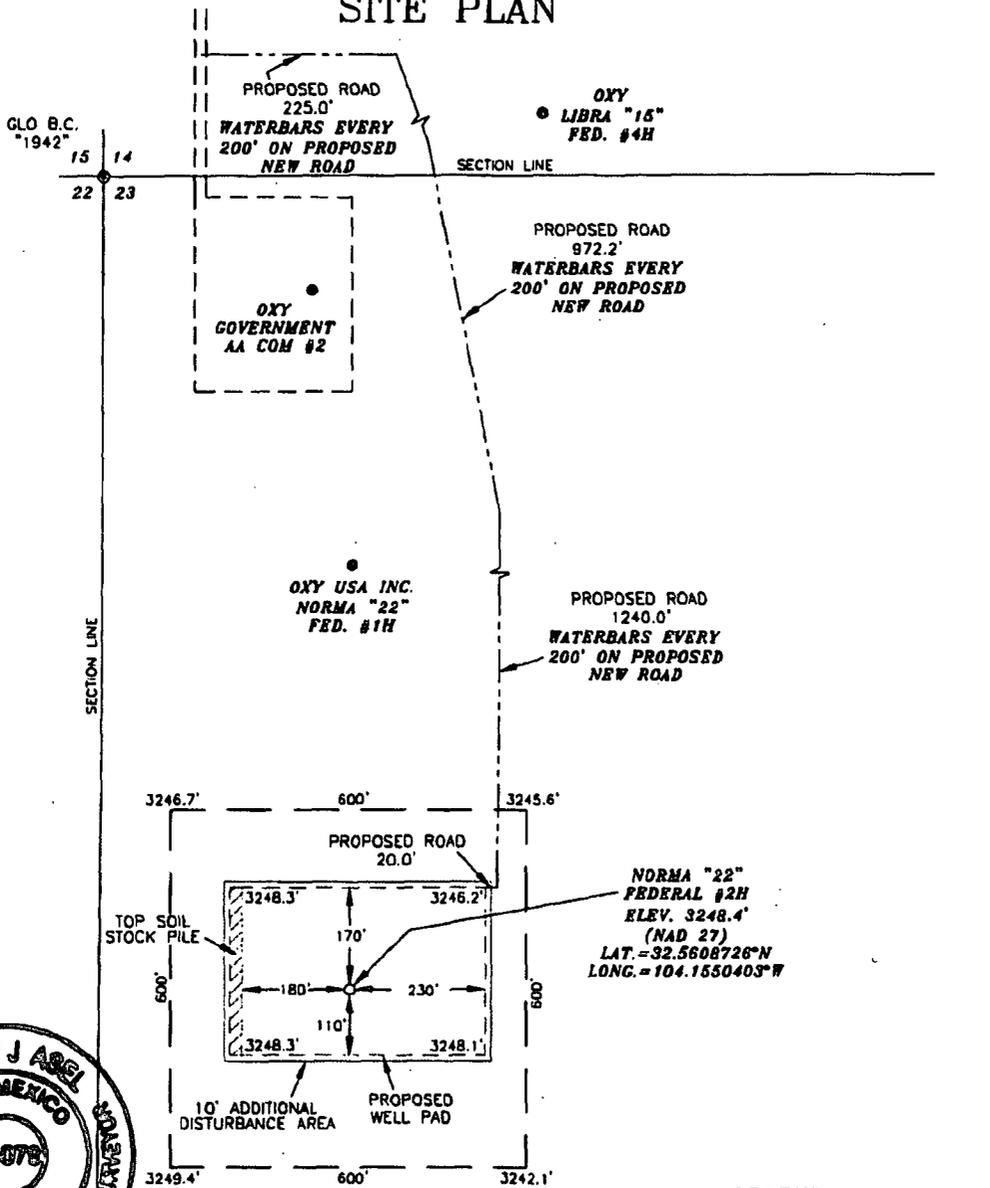
Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR  
 HOBBS, NEW MEXICO - 575-393-9146



DIRECTIONS BEGINNING AT THE INTERSECTION OF U.S. HWY. #62 AND EDDY COUNTY ROAD #238 (BURTON FLAT ROAD), GO NORTH ON EDDY COUNTY ROAD #238 FOR 2.1 MILES, GO WEST FOR 7.1 MILES, TURN LEFT ON CALICHE ROAD AND GO SOUTH FOR 0.3 MILES, TURN LEFT ON PROPOSED ROAD AND GO EAST FOR 225.0 FEET, TURN RIGHT AND GO SOUTHEAST FOR 972.2 FEET, TURN RIGHT AND GO SOUTH FOR 1240.0 FEET, TURN RIGHT AND GO WEST FOR 20.0 FEET TO LOCATION.

# OXY USA INC. NORMA "22" FEDERAL #2H SITE PLAN

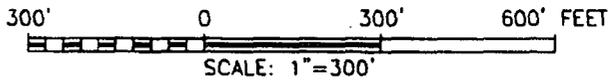


**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

*Terry J. Asel* 8/11/14  
Terry J. Asel, N.M. R.P.L.S. No. 15079

- LEGEND**
- DENOTES STOCK PILE AREA
  - DENOTES PROPOSED WELL PAD
  - DENOTES PROPOSED ROAD

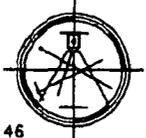


## OXY USA WTP LP

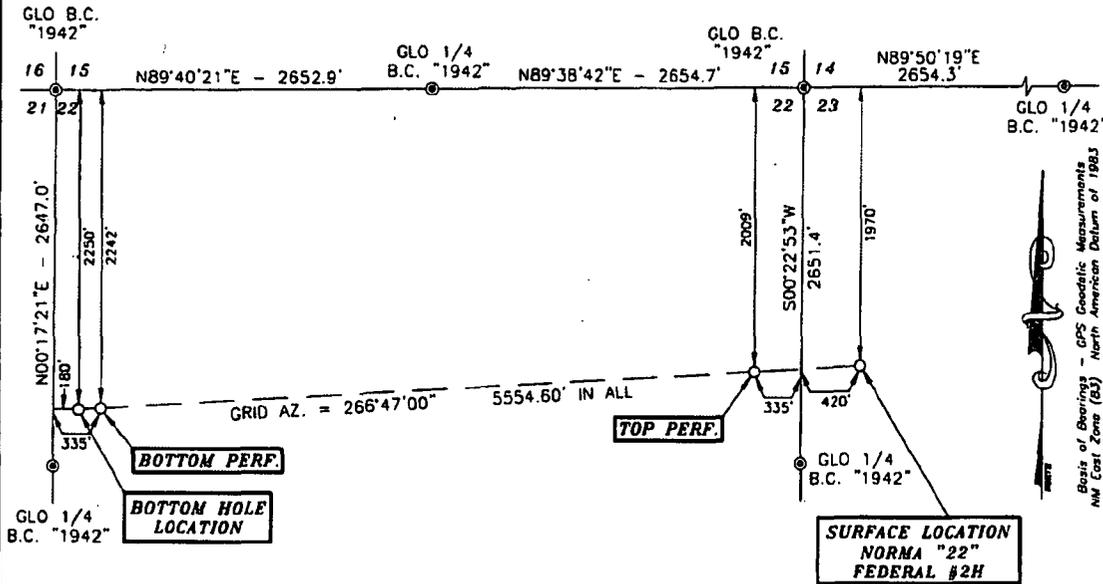
NORMA "22" FEDERAL #2H WELL PAD LOCATED AT 1970' FNL & 420' FWL IN SECTION 23, TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

Survey Date: 07/14/14	Sheet 1 of 1 Sheets
W.O. Number: 140714WL-f	Drawn By: KA Rev:
Date: 08/11/14	140714WL-f Scale: 1"=300'

Asel Surveying  
P.O. BOX 393 - 310 W. TAYLOR  
HOBBS, NEW MEXICO - 575-393-9146



SECTIONS 23 & 22, TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M.,  
EDDY COUNTY  
NEW MEXICO



DRIVING DIRECTIONS:  
BEGINNING AT THE INTERSECTION OF  
U.S. HWY. #62 AND EDDY COUNTY  
ROAD #238 (BURTON FLAT ROAD), GO  
NORTH ON EDDY COUNTY ROAD #238  
FOR 2.1 MILES, GO WEST FOR 7.1  
MILES, TURN LEFT ON CALICHE ROAD  
AND GO SOUTH FOR 0.3 MILES, TURN  
LEFT ON PROPOSED ROAD AND GO  
EAST FOR 225.0 FEET, TURN RIGHT  
AND GO SOUTHEAST FOR 972.2 FEET,  
TURN RIGHT AND GO SOUTH FOR  
1240.0 FEET, TURN RIGHT AND GO  
WEST FOR 20.0 FEET TO LOCATION.



**SURVEYORS CERTIFICATE**

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15078, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

*Terry J. Asel* 8/14/2014  
Terry J. Asel, N.M. R.P.L.S. No. 15078

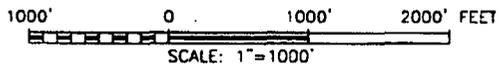
Asel Surveying



P.O. BOX 393 - 310 W. TAYLOR  
HOBBS, NEW MEXICO - 575-393-9146

**LEGEND**

⊙ - DENOTES FOUND MONUMENT AS NOTED



**OXY USA WTP LP**

NORMA "22" FEDERAL #2H LOCATED AT  
1970' FNL & 420' FWL IN SECTION 23,  
TOWNSHIP 20 SOUTH, RANGE 28 EAST,  
N.M.P.M., EDDY COUNTY, NEW MEXICO

Survey Date: 07/14/14	Sheet 1 of 1 Sheets
W.O. Number: 140714WL-f	Drawn By: KA Rev:
Date: 08/11/14	140714WL-f Scale: 1"=1000'

**OXY USA WTPLP**  
**NORMA 22 FED 2H**  
**APD DATA**

**OPERATOR NAME / NUMBER:** OXY USA WTPLP

**LEASE NAME / NUMBER:** NORMA 22 FED 2H

**STATE:** NM                      **COUNTY:** EDDY

**SURFACE LOCATION:**                      1970' FNL & 420' FWL, Sec 23, T20S, R28E

**BOTTOM HOLE LOCATION:** 2250' FNL & 180' FWL, Sec 22, T20S, R28E

**APPROX GR ELEV:** 3248.4'

**EST KB ELEV:** 3272.4' (24' KB-GL)

**1. GEOLOGIC NAME OF SURFACE FORMATION**

a. Permian

**2. ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS**

Formation	TVD - RKB	Expected Fluids
Rustler	250	---
T. Salt (Salado)	380	---
B. Salt (Tansill)	740	---
T. Yates	840	Form Water
T. Capitan Reef	1200	Form Water
T. Delaware	3050	Oil/Gas
T. Brushy Canyon	3775	Oil/Gas
T. Bone Spring	5226	Oil/Gas
T. 1st Bone Spring Sand	6475	Oil/Gas
T. 2nd Bone Spring Lime	6700	Oil/Gas
T. 2nd Bone Spring Sand	7250	Oil/Gas
Landing Point (2nd BS Sand)	7500	Oil/Gas
BHL	7440	Oil/Gas

- Fresh water may be present above the Rustler formation. Surface casing will be set below the top of the Rustler to protect any possible fresh water.

**GREATEST PROJECTED TD "HZ":** 12,774' MD / 7440' TVD    **OBJECTIVE:** 2nd Bone Spring Sand

### 3. CASING PROGRAM

Surface Casing ran in a 18.5" hole filled with 8.50 ppg mud

See  
COA

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Condition	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
18.5	300	16	75	J55	BTC	15.124	New	2630	1020	1.43	10.43	6.01

300

1<sup>st</sup> Intermediate Casing ran in a 14.75" hole filled with 10.2 ppg mud

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Condition	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
14.75	1200	11.75	47	J55	BTC	11.000	New	3070	1510	1.37	5.14	3.15

2<sup>nd</sup> Intermediate Casing ran in a 10.625" hole filled with 8.5 ppg mud

See  
COA

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Condition	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
10.625	3100	8.625	32	J55	BTC	7.921*	New	3930	2530	1.39	3.16	2.25

3000

Production Casing ran in a 7.875" hole filled with 9.0 ppg mud

Hole Size (in)	Interval (ft)	OD (in)	Wt (ppf)	Grade	Conn	ID (in)	Condition	Burst (psi)	Collapse (psi)	Burst SF	Coll SF	Ten SF
7.875	12774	5.500	17	P110	BTC	4.892	New	10640	7460	2.06	2.57	1.98

\*SPECIAL DRIFT TO 7.875"

#### Casing Design Assumptions:

##### **Burst Loads**

##### **CSG Test (Surface)**

- Internal: Displacement fluid + 70% CSG Burst rating
- External: Pore Pressure from section TD to surface

##### **CSG Test (Intermediate)**

- Internal: Displacement fluid + 70% CSG Burst rating
- External: Pore Pressure from the Intermediate hole TD to Surface CSG shoe and MW of the drilling mud that was in the hole when the CSG was run to surface

##### **CSG Test (Production)**

- Internal: Displacement fluid + 80% CSG Burst rating
- External: Pore Pressure from the well TD the Intermediate CSG shoe and MW of the drilling mud that was in the hole when the CSG was run to surface

##### **Gas Kick (Surface/Intermediate)**

- Internal: Gas Kick based on Pore Pressure or Fracture Gradient @ CSG shoe with a gas 0.115psi/ft Gas gradient to surface while drilling the next hole section (e.g. Gas Kick while drilling the production hole section is a burst load used to design the intermediate CSG)
- External: Pore Pressure from section TD to previous CSG shoe and MW of the drilling mud that was in the hole when the CSG was run to surface

##### **Stimulation (Production)**

- Internal: Displacement fluid + Max Frac treating pressure (not to exceed 80% CSG Burst rating)
- External: Pore Pressure from the well TD to the Intermediate CSG shoe and 8.5 ppg MWE to surface

##### **Collapse Loads**

##### **Lost Circulation (Surface/Intermediate)**

- Internal: Losses experienced while drilling the next hole section (e.g. losses while drilling the production hole section are used as a collapse load to design the intermediate CSG). After losses there will be a column of mud inside the CSG with an equivalent weight to the Pore Pressure of the lost circulation zone
- External: MW of the drilling mud that was in the hole when the CSG was run

**Cementing (Surface/Intermediate/Production)**

- Internal: Displacement Fluid
- External: Cement Slurries to TOC, MW to surface

**Full Evacuation (Production)**

- Internal: Atmospheric Pressure
- External: MW of the drilling mud that was in the hole when the CSG was run

**Tension Loads**

**Running CSG (Surface/Intermediate/Production)**

- Axial load of the buoyant weight of the string plus either 100 klb over-pull or string weight in air, whichever is less

**Green Cement (Surface/Intermediate/Production)**

- Axial load of the buoyant weight of the string plus the cement plug bump pressure (Final displacement pressure + 500 psi)

Burst, Collapse and Tensile SF are calculated using Landmark's Stress Check (Casing Design) software.

**4. CEMENT PROGRAM:**

**Surface Interval**

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
<b>Lead:</b> 0' - 300' (150% Excess)	310	300	Premium Plus Cement with 2% Calcium Chloride (Accelerator)	6.39	14.8	1.35	1326

**1<sup>st</sup> Intermediate Interval**

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
<b>Lead:</b> 0' - 700' (180% Excess)	350	700	Halliburton Light Premium Plus Cement with 5% Salt (Salt), 5 lbm/sk Kol-Seal (Lost Circulation Additive), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive)	9.59	12.9	1.88	760
<b>Tail:</b> 700' - 1200' (105% Excess)	340	500	Premium Plus Cement with 1 % Calcium Chloride (Accelerator)	6.36	14.8	1.34	1650

**2<sup>nd</sup> Intermediate Interval**

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
<b>Lead:</b> 0' - 2513' (180% Excess)	450	2513	Halliburton Light Premium Plus Cement with 5% Salt (Salt), 5 lbm/sk Kol-Seal (Lost Circulation Additive), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive)	9.59	12.9	1.88	760
<b>Tail:</b> 2513' - 3100' (105% Excess)	200	587	Premium Plus Cement with 1 % Calcium Chloride (Accelerator)	6.36	14.8	1.34	1650

**Post Tool will be placed at 1250' for contingency. If returns are not lost during first stage, DV cancellation plug will be run and 2nd stage cancelled. If returns are lost during first stage, the post tool will be opened and contingency recipe for 2nd stage will be pumped as follows:**

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
<b>Lead:</b> 0' - 1250' (30% Excess)	220	1250	Halliburton Light Premium Plus Cement with 5% Salt (Salt), 5 lbm/sk Kol-Seal (Lost Circulation Additive), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive)	9.59	12.9	1.88	760

### Production Casing

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft <sup>3</sup> /sk	24 Hr Comp
<i>See COA</i> Lead: <i>1285</i> 2600' - 6783' (100% Excess)	380	4183	Tuned Light Cement 3 lbm/sk Kol-Seal, 0.125 lbm/sk Poly-E-Flake 0.65% SCR-100	17.53	9.8 (Surf.) 10.2 (Down hole)	3.662	788
Tail: 6783' - 12774' (30% Excess)	840	5991	Super H Cement with 0.5 % Halad(R)-344 (Low Fluid Loss Control), 0.4 % CFR-3 (Dispersant), 3 lbm/sk Salt (Salt), 0.2 % HR-800 (Retarder), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive)	8.55	13.2	1.64	1673

The volumes indicated above may be revised depending on caliper measurement.

#### Production Interval

#### 5. DIRECTIONAL PLAN

Please see attached directional plan

#### 6. PRESSURE CONTROL EQUIPMENT

Surface: 0 - 300' None.

Intermediate1: 0 - 1200' Operator shall request a variance to use a 2M Annular Diverter for the 1st intermediate hole as Onshore Order 2 requires a BOP. The diverter will be lined up to the panic line on the same choke manifold.

2<sup>nd</sup> Intermediate and Production: 3100' MD/TVD - 12,774' MD / 7440' TVD . 2<sup>nd</sup> Intermediate and Production hole will be drilled with a 13-5/8" 10M three ram stack with a 5M annular preventer and a 5M Choke Manifold.

- See COA*
- a. All BOP's and associated equipment will be tested in accordance with Onshore Order #2 (250/5000 psi on rams for 10 minutes each and 250/3500 psi for 10 minutes for annular preventer, equal to 70% of working pressure) with a third party BOP testing service before drilling out the surface casing shoe. A Multibowl wellhead system will be used in this well therefore the BOPE test will cover the test requirements for the 2<sup>nd</sup> Intermediate and Production sections.
  - b. The Surface and Intermediate casings strings will be tested to 70% of their burst rating for 30 minutes. This will also test the seals of the lock down pins that hold the pack-off in place in the Multibowl wellhead system.
  - c. Pipe rams will be function tested every 24 hours and blind rams will be tested each time the drill pipe is out of the hole. These functional tests will be documented on the daily driller's log. A 2" kill line and 3" choke line will be accommodated on the drilling spool below the ram-type BOP.
  - d. The BOPE test will be repeated within 30 days of the original test, on the first trip, if drilling the 2<sup>nd</sup> Intermediate or Production section takes more time than planned.
  - e. Other accessory BOP equipment will include a floor safety valve, choke lines, and choke manifold having a 5000 psi working pressure rating and tested to 5000 psi.
  - f. The Operator also requests a variance to connect the BOP choke outlet to the choke manifold using a co-flex hose manufactured by Contitech Rubber Industrial KFT. It is a 3" ID x 35' flexible hose with a 10,000 psi working pressure. It has been tested to 15,000 psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps (certifications attached).
  - g. BOP & Choke manifold diagrams attached.

## 7. MUD PROGRAM:

Depth	Mud Wt ppg	Vis Sec	Fluid Loss	Type System
0 - <del>300</del> 360	8.4 - 8.9	32 - 34	NC	Fresh Water /Spud Mud
<del>300</del> - 1300' <sup>360</sup>	9.8 - 10	28 - 29	NC	Brine Water
1300' - <del>3100</del> <sup>360</sup>	8.6 - 8.8	28 - 29	NC	Fresh Water
<del>3100</del> - 12774'	9.0 - 9.2	28 - 50	NC	Brine Water

Remarks: Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times.

Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

## 8. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT

- a. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.

## 9. POTENTIAL HAZARDS:

- a. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6. Measured amounts and formations will be reported to the BLM.
- b. No abnormal temperatures or pressures are anticipated. The highest anticipated pressure gradient is 0.473 psi/ft. Maximum anticipated bottom hole pressure is 3516 psi.
- c. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

## 10. WIRELINE LOGGING / MUD LOGGING / LWD

- a. Wireline Logging: Triple Combo (GR, Den/Neu/Resist.) from KOP to Surface.
- b. Mud loggers to be rigged up from surface casing shoe to TD
- c. Acquire GR while drilling, from Intermediate casing shoe to TD

## 11. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 35 days. If production casing is run, then an additional 30 days will be needed to complete the well and construct surface facilities and/or lay flow lines in order to place well on production.

**COMPANY PERSONNEL:**

<b><u>Name</u></b>	<b><u>Title</u></b>	<b><u>Office Phone</u></b>	<b><u>Mobile Phone</u></b>
Ricardo Vilorio	Drilling Engineer	(713)366-5063	(832) 763-8728
Sebastian Millan	Drilling Engineer Supervisor	(713)350-4950	(832) 528-3268
Roger Allen	Drilling Superintendent	(713)215-7617	(281) 682-3919
Oscar Quintero	Drilling Manager	(713)985-6343	(713) 689-4946



**OXY**

**Eddy County, New Mexico**

**Norma 22 Federal 2H**

**Norma 22F 2H**

**Wellbore #1**

**Plan: Design #2**

## **Standard Planning Report**

**29 September, 2014**



[www.scientificdrilling.com](http://www.scientificdrilling.com)



**Norma 22F 2H**  
**Eddy County, New Mexico**  
**Northing: 567803.44**  
**Easting: 554930.86**  
**Design #2**

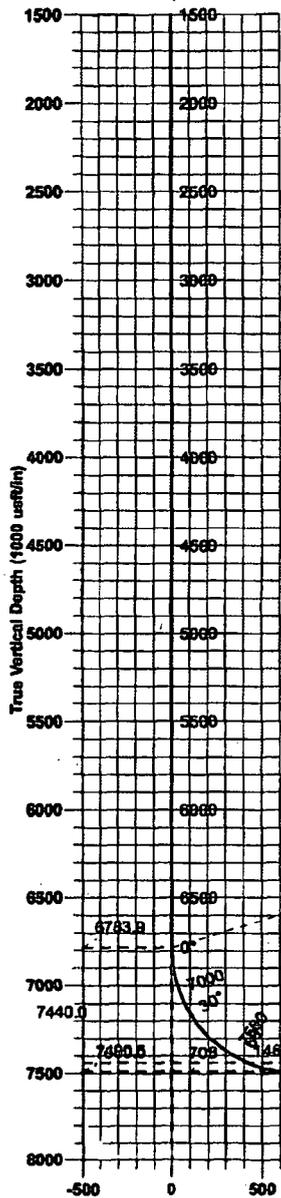


To convert Magnetic North to Grid, Add 7.38°  
 To convert True North to Grid, Subtract 0.10°

Azimuths to Grid North  
 True North: -0.10°  
 Magnetic North: 7.38°  
 Magnetic Field  
 Strength: 48428.6nT  
 Dip Angle: 80.32°  
 Date: 09/25/2014  
 Model: IGRF2010



KB @ 3272.4usft  
 Gr @ 3248.4



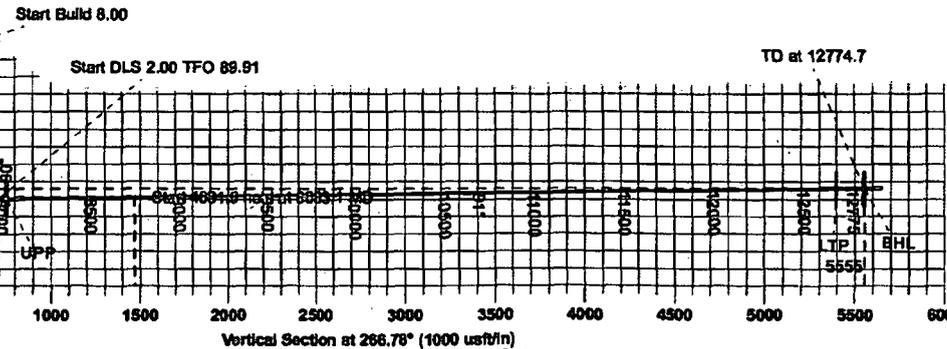
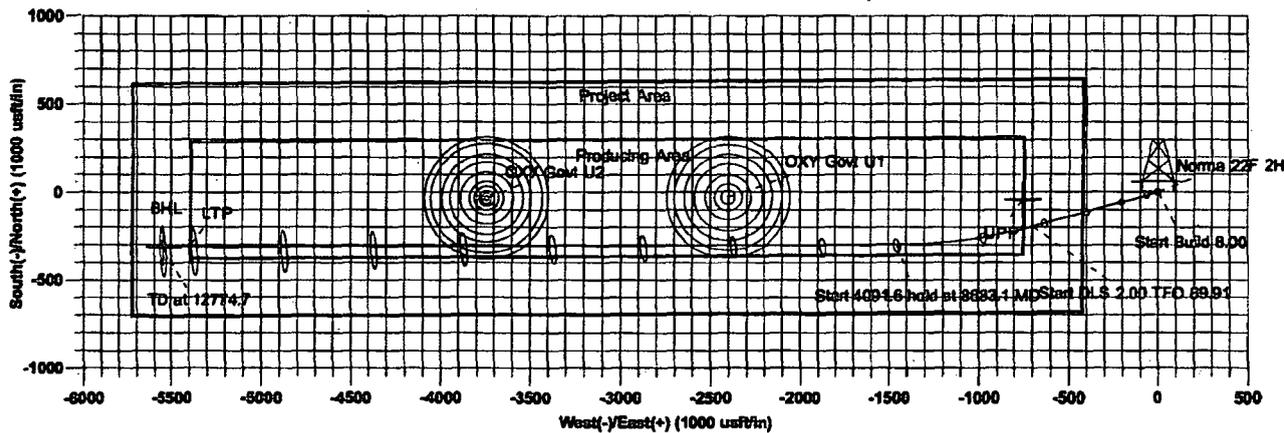
WELL DETAILS Norma 22F 2H					
Ground Level: 3248.4					
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	567803.44	554930.86 32° 33' 38.141 N 104° 8' 18.145 W		

DESIGN TARGET DETAILS					
Name	TVD	+N-S	+E-W	Northing	Easting
22F 2H BHL	7440.0	-311.6	-5545.9	567481.81	548385.00
22F 2H LTP	7442.0	-302.9	-5390.8	567600.52	548540.09
22F 2H UPP	7500.0	-42.4	-755.3	567761.00	554176.56

SECTION DETAILS									
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSecl	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
8783.9	0.00	0.00	8783.9	0.0	0.0	0.00	0.00	0.0	
7917.8	90.71	254.50	7500.0	-193.8	-696.7	8.00	254.50	708.5	
8683.1	90.71	269.81	7490.5	-297.9	-1454.8	2.00	89.91	1489.0	
12774.7	90.71	269.81	7440.0	-311.6	-5545.9	0.00	0.00	5554.6	22F 2H BHL

**PROJECT DETAILS:**  
 Eddy County, New Mexico  
 Geodetic System: US State Plane 1927 (Exact solution)  
 Datum: NAD 1927 (NADCON CONUS)  
 Ellipsoid: Clarke 1866  
 Zone: New Mexico East 3001  
 System Datum: Mean Sea Level

**SITE DETAILS:**  
 Norma 22 Federal 2H  
 Site Centre Northing: 567803.44  
 Easting: 554930.86  
 Positional Uncertainty: 0.0  
 Convergence: 0.10  
 Local North: Grid





**Scientific Drilling, Int'l**  
Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Norma 22F 2H
<b>Company:</b>	OXY	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Project:</b>	Eddy County, New Mexico	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site:</b>	Norma 22 Federal 2H	<b>North Reference:</b>	Grid
<b>Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

<b>Project</b>	Eddy County, New Mexico, New Mexico.		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

<b>Site</b>	Norma 22 Federal 2H				
<b>Site Position:</b>		<b>Northing:</b>	587,803.44 usft	<b>Latitude:</b>	32° 33' 39.141 N
<b>From:</b>	Map	<b>Easting:</b>	554,930.88 usft	<b>Longitude:</b>	104° 8' 18.145 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.10 °

<b>Well</b>	Norma 22F 2H					
<b>Well Position</b>	+N-S	0.0 usft	<b>Northing:</b>	587,803.44 usft	<b>Latitude:</b>	32° 33' 39.141 N
	+EJ-W	0.0 usft	<b>Easting:</b>	554,930.88 usft	<b>Longitude:</b>	104° 8' 18.145 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft	<b>Ground Level:</b>	3,248.4 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2010	09/25/14	(°)	(°)	(nT)
			7.48	60.32	48,429

<b>Design</b>	Design #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N-S</b>	<b>+EJ-W</b>	<b>Direction</b>
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	268.78

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+EJ-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
6,783.9	0.00	0.00	6,783.9	0.0	0.0	0.00	0.00	0.00	0.00	
7,917.8	90.71	254.50	7,500.0	-193.8	-698.7	8.00	8.00	0.00	254.50	
8,883.1	90.71	269.81	7,490.5	-297.9	-1,454.6	2.00	0.00	2.00	69.91	
12,774.7	90.71	269.81	7,440.0	-311.6	-5,545.9	0.00	0.00	0.00	0.00	22F 2H BHL



Scientific Drilling, Int'l  
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Norma 22F 2H
Company:	OXY	TVD Reference:	KB @ 3272.4usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 3272.4usft
Site:	Norma 22 Federal 2H	North Reference:	Grid
Well:	Norma 22F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00



Scientific Drilling, Int'l  
Planning Report



Database:	EDM 6000.1 Single User Db	Local Co-ordinate Reference:	Well Norma 22F 2H
Company:	OXY	TVD Reference:	KB @ 3272.4usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 3272.4usft
Site:	Norma 22 Federal 2H	North Reference:	Grid
Well:	Norma 22F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,783.9	0.00	0.00	6,783.9	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	1.29	254.50	6,800.0	0.0	-0.2	0.2	8.00	8.00	0.00
6,850.0	5.29	254.50	6,849.9	-0.8	-2.9	3.0	8.00	8.00	0.00
6,900.0	9.29	254.50	6,899.5	-2.5	-9.0	9.2	8.00	8.00	0.00
6,950.0	13.29	254.50	6,948.5	-5.1	-18.5	18.7	8.00	8.00	0.00
7,000.0	17.29	254.50	6,996.7	-8.6	-31.2	31.6	8.00	8.00	0.00
7,050.0	21.29	254.50	7,043.9	-13.1	-47.1	47.7	8.00	8.00	0.00
7,100.0	25.29	254.50	7,089.8	-18.3	-68.1	67.1	8.00	8.00	0.00
7,150.0	29.29	254.50	7,134.3	-24.5	-88.2	89.5	8.00	8.00	0.00
7,200.0	33.29	254.50	7,177.0	-31.4	-113.2	114.8	8.00	8.00	0.00
7,250.0	37.29	254.50	7,217.8	-39.1	-141.1	143.0	8.00	8.00	0.00
7,300.0	41.29	254.50	7,256.5	-47.6	-171.6	174.0	8.00	8.00	0.00
7,350.0	45.29	254.50	7,292.9	-56.7	-204.6	207.5	8.00	8.00	0.00
7,400.0	49.29	254.50	7,326.8	-66.8	-240.0	243.4	8.00	8.00	0.00
7,450.0	53.29	254.50	7,358.0	-77.0	-277.6	281.5	8.00	8.00	0.00
7,500.0	57.29	254.50	7,386.5	-88.0	-317.2	321.6	8.00	8.00	0.00
7,550.0	61.29	254.50	7,412.0	-99.4	-358.6	363.6	8.00	8.00	0.00
7,600.0	65.29	254.50	7,434.5	-111.4	-401.6	407.2	8.00	8.00	0.00
7,650.0	69.29	254.50	7,453.8	-123.7	-446.1	452.3	8.00	8.00	0.00
7,700.0	73.29	254.50	7,469.8	-136.4	-491.7	498.6	8.00	8.00	0.00
7,750.0	77.29	254.50	7,482.5	-149.3	-538.3	545.8	8.00	8.00	0.00
7,800.0	81.29	254.50	7,491.8	-162.4	-585.6	593.8	8.00	8.00	0.00
7,850.0	85.29	254.50	7,497.7	-175.7	-633.5	642.3	8.00	8.00	0.00
7,900.0	89.29	254.50	7,500.0	-189.0	-681.6	691.1	8.00	8.00	0.00
7,917.8	90.71	254.50	7,500.0	-193.8	-698.7	706.5	8.00	8.00	0.00
8,000.0	90.71	258.14	7,499.0	-214.6	-778.2	789.0	2.00	0.00	2.00
8,100.0	90.71	258.14	7,497.8	-236.8	-875.7	887.6	2.00	0.00	2.00
8,200.0	90.71	260.14	7,496.5	-255.7	-973.9	986.7	2.00	0.00	2.00
8,300.0	90.72	262.15	7,495.3	-271.1	-1,072.7	1,086.2	2.00	0.00	2.00
8,400.0	90.71	264.15	7,494.0	-283.0	-1,172.0	1,186.0	2.00	0.00	2.00
8,500.0	90.71	266.15	7,492.8	-291.5	-1,271.6	1,286.0	2.00	0.00	2.00
8,600.0	90.71	268.15	7,491.5	-298.4	-1,371.5	1,385.9	2.00	0.00	2.00
8,683.1	90.71	269.81	7,490.5	-297.8	-1,454.6	1,469.0	2.00	0.00	2.00
8,700.0	90.71	269.81	7,490.3	-298.0	-1,471.4	1,485.8	0.00	0.00	0.00
8,800.0	90.71	269.81	7,489.1	-298.3	-1,571.4	1,585.7	0.00	0.00	0.00
8,900.0	90.71	269.81	7,487.8	-298.7	-1,671.4	1,685.6	0.00	0.00	0.00
9,000.0	90.71	269.81	7,486.6	-299.0	-1,771.4	1,785.4	0.00	0.00	0.00
9,100.0	90.71	269.81	7,485.4	-299.3	-1,871.4	1,885.3	0.00	0.00	0.00
9,200.0	90.71	269.81	7,484.1	-299.7	-1,971.4	1,985.1	0.00	0.00	0.00
9,300.0	90.71	269.81	7,482.9	-300.0	-2,071.4	2,085.0	0.00	0.00	0.00



Scientific Drilling, Int'l  
Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well: Norma 22F 2H
<b>Company:</b>	OXY	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Project:</b>	Eddy County, New Mexico	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site:</b>	Norma 22 Federal 2H	<b>North Reference:</b>	Grid
<b>Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,400.0	90.71	269.81	7,481.7	-300.3	-2,171.4	2,184.8	0.00	0.00	0.00	
9,500.0	90.71	269.81	7,480.4	-300.7	-2,271.4	2,284.7	0.00	0.00	0.00	
9,600.0	90.71	269.81	7,479.2	-301.0	-2,371.4	2,384.5	0.00	0.00	0.00	
9,700.0	90.71	269.81	7,478.0	-301.3	-2,471.4	2,484.4	0.00	0.00	0.00	
9,800.0	90.71	269.81	7,476.7	-301.7	-2,571.4	2,584.2	0.00	0.00	0.00	
9,900.0	90.71	269.81	7,475.5	-302.0	-2,671.4	2,684.1	0.00	0.00	0.00	
10,000.0	90.71	269.81	7,474.3	-302.3	-2,771.3	2,783.9	0.00	0.00	0.00	
10,100.0	90.71	269.81	7,473.0	-302.7	-2,871.3	2,883.8	0.00	0.00	0.00	
10,200.0	90.71	269.81	7,471.8	-303.0	-2,971.3	2,983.6	0.00	0.00	0.00	
10,300.0	90.71	269.81	7,470.6	-303.3	-3,071.3	3,083.5	0.00	0.00	0.00	
10,400.0	90.71	269.81	7,469.3	-303.7	-3,171.3	3,183.4	0.00	0.00	0.00	
10,500.0	90.71	269.81	7,468.1	-304.0	-3,271.3	3,283.2	0.00	0.00	0.00	
10,600.0	90.71	269.81	7,466.9	-304.3	-3,371.3	3,383.1	0.00	0.00	0.00	
10,700.0	90.71	269.81	7,465.6	-304.7	-3,471.3	3,482.9	0.00	0.00	0.00	
10,800.0	90.71	269.81	7,464.4	-305.0	-3,571.3	3,582.8	0.00	0.00	0.00	
10,900.0	90.71	269.81	7,463.1	-305.4	-3,671.3	3,682.6	0.00	0.00	0.00	
11,000.0	90.71	269.81	7,461.9	-305.7	-3,771.3	3,782.5	0.00	0.00	0.00	
11,100.0	90.71	269.81	7,460.7	-306.0	-3,871.3	3,882.3	0.00	0.00	0.00	
11,200.0	90.71	269.81	7,459.4	-306.4	-3,971.2	3,982.2	0.00	0.00	0.00	
11,300.0	90.71	269.81	7,458.2	-306.7	-4,071.2	4,082.0	0.00	0.00	0.00	
11,400.0	90.71	269.81	7,457.0	-307.0	-4,171.2	4,181.9	0.00	0.00	0.00	
11,500.0	90.71	269.81	7,455.7	-307.4	-4,271.2	4,281.7	0.00	0.00	0.00	
11,600.0	90.71	269.81	7,454.5	-307.7	-4,371.2	4,381.6	0.00	0.00	0.00	
11,700.0	90.71	269.81	7,453.3	-308.0	-4,471.2	4,481.4	0.00	0.00	0.00	
11,800.0	90.71	269.81	7,452.0	-308.4	-4,571.2	4,581.3	0.00	0.00	0.00	
11,900.0	90.71	269.81	7,450.8	-308.7	-4,671.2	4,681.1	0.00	0.00	0.00	
12,000.0	90.71	269.81	7,449.6	-309.0	-4,771.2	4,781.0	0.00	0.00	0.00	
12,100.0	90.71	269.81	7,448.3	-309.4	-4,871.2	4,880.9	0.00	0.00	0.00	
12,200.0	90.71	269.81	7,447.1	-309.7	-4,971.2	4,980.7	0.00	0.00	0.00	
12,300.0	90.71	269.81	7,445.9	-310.0	-5,071.2	5,080.6	0.00	0.00	0.00	
12,400.0	90.71	269.81	7,444.6	-310.4	-5,171.1	5,180.4	0.00	0.00	0.00	
12,500.0	90.71	269.81	7,443.4	-310.7	-5,271.1	5,280.3	0.00	0.00	0.00	
12,600.0	90.71	269.81	7,442.2	-311.0	-5,371.1	5,380.1	0.00	0.00	0.00	
12,700.0	90.71	269.81	7,440.9	-311.4	-5,471.1	5,480.0	0.00	0.00	0.00	
12,774.7	90.71	269.81	7,440.0	-311.6	-5,545.9	5,554.6	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
22F 2H BHL - hit/miss target - Shape - Point	0.00	0.00	7,440.0	-311.6	-5,545.9	587,491.81	549,385.00	32° 33' 38.145 N	104° 10' 22.952 W	
22F 2H LTP - plan misses target center by 8.2usft at 12619.9usft MD (7441.9 TVD, -311.1 N, -5390.7 E) - Point	0.00	0.00	7,442.0	-302.9	-5,360.8	587,500.52	549,540.09	32° 33' 38.229 N	104° 10' 21.140 W	
22F 2H UPP - plan misses target center by 160.9usft at 7934.2usft MD (7499.8 TVD, -198.1 N, -714.5 E) - Point	0.00	0.00	7,500.0	-42.4	-755.3	587,761.00	554,175.56	32° 33' 39.734 N	104° 8' 28.971 W	



Scientific Drilling, Int'l  
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Norma 22F 2H
Company:	OXY	TVD Reference:	KB @ 3272.4usft
Project:	Eddy County, New Mexico	MD Reference:	KB @ 3272.4usft
Site:	Norma 22 Federal 2H	North Reference:	Grid
Well:	Norma 22F 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		



**OXY**

**Eddy County, New Mexico  
Norma 22 Federal 2H  
Norma 22F 2H**

**Wellbore #1  
Design #2**

## **Anticollision Report**

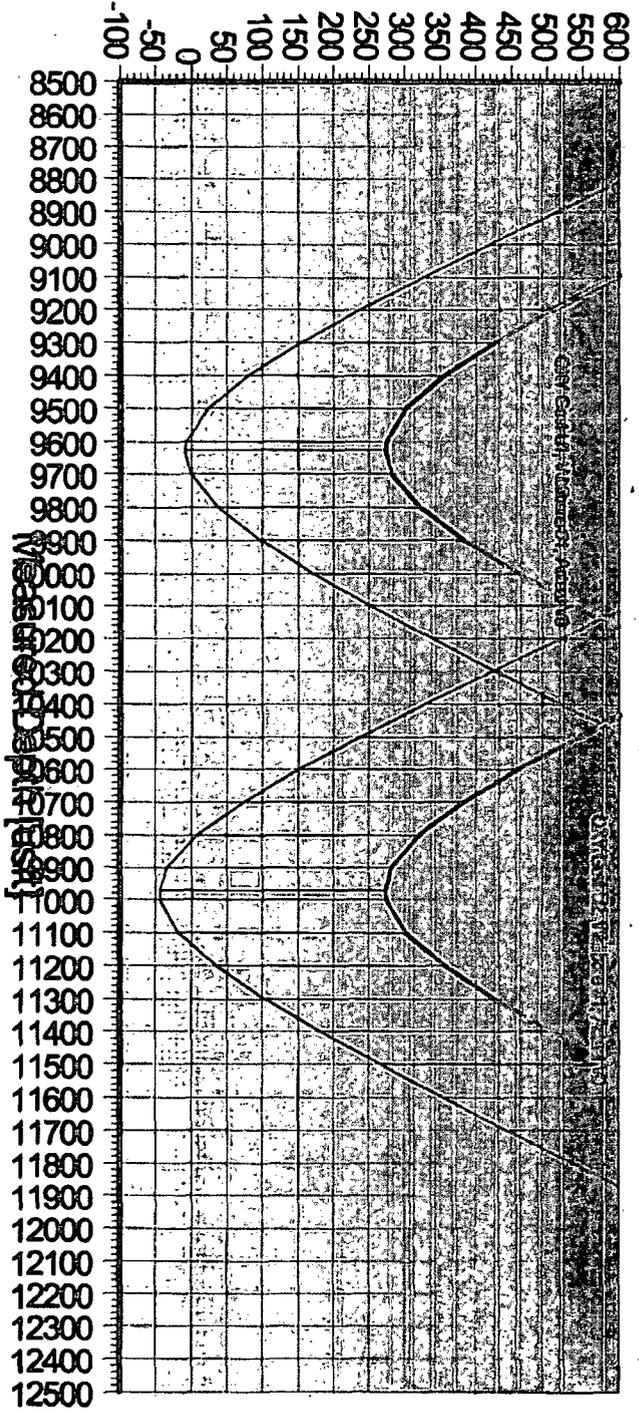
**29 September, 2014**



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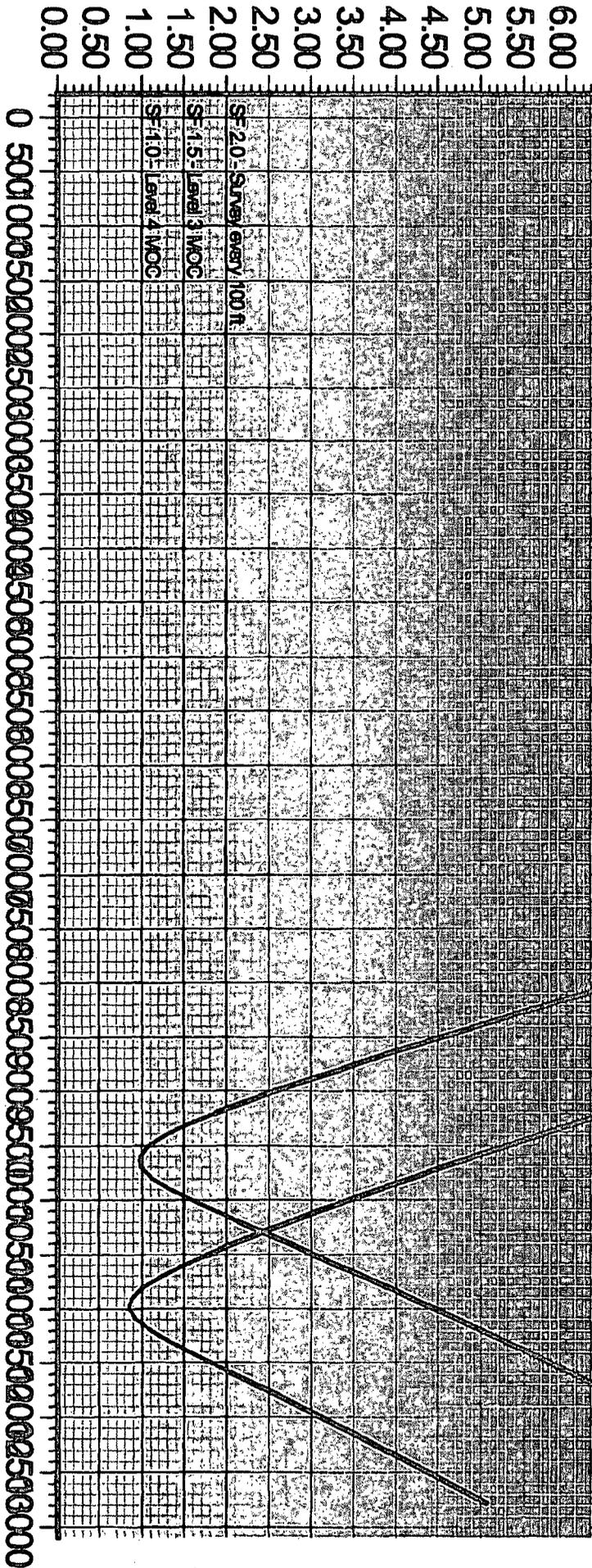


# Centre to Centre Separation [usft]



Pilar Design #2 (Norma ZF 2H Wellbore #1)

# Separation Factor



Measured Depth [ustft]

Plan: Design #2 (Norma 22F 2H-Wellbore #1)



Scientific Drilling, Int'l  
Anticollision Report



<b>Company:</b>	OXY	<b>Local Co-ordinates Reference:</b>	Well Norma 22F 2H
<b>Project:</b>	Eddy County, New Mexico	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Reference Site:</b>	Norma 22 Federal 2H	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User.Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Design #2		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0usft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 10,000.0 usft	<b>Error Surface:</b>	Circular Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	Date 09/29/14		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
0.0	12,774.6	Design #2 (Wellbore #1)	SDI MWD
			<b>Description</b>
			SDI MWD - Standard ver 1.0.1

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (usft)</b>	<b>Offset Measured Depth (usft)</b>	<b>Distance Between Centres (usft)</b>	<b>Distance Between Ellipses (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
Offset Well - Wellbore - Design						
Norma 22 Federal 2H						
OXY Govt U1 - Wellbore #1 - Actual	9,628.7	7,439.4	272.2	-8.8	0.969	SF 1.0 - Level 4 MOC, CC, E
OXY Govt U2 - Wellbore #1 - Actual	10,969.9	7,417.4	272.1	-44.4	0.860	SF 1.0 - Level 4 MOC, CC, E

<b>Offset Design</b>											<b>Offset 800 Error:</b>	0.0 usft
Norma 22 Federal 2H - OXY Govt U1 - Wellbore #1 - Actual											<b>Offset Well Error:</b>	0.0 usft
Survey Program: 350-Inclinometer												
<b>Reference</b>		<b>Offset</b>		<b>Semi Major Axis</b>			<b>Distance</b>				<b>Warning</b>	
<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Reference (usft)</b>	<b>Offset (usft)</b>	<b>Highside Toolface (°)</b>	<b>Offset Wellbore Centre +N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Between Centres (usft)</b>	<b>Between Ellipses (usft)</b>	<b>Minimum Separation (usft)</b>	<b>Separation Factor</b>
0.0	0.0	0.0	0.0	0.0	0.0	-90.69	-28.9	-2,401.0	2,401.5			
100.0	100.0	60.1	60.1	0.1	0.9	-90.69	-28.9	-2,401.0	2,401.2	2,400.2	1.00	2,405.604
200.0	200.0	160.1	160.1	0.3	2.4	-90.69	-28.9	-2,401.0	2,401.2	2,398.4	2.74	875.923
300.0	300.0	260.1	260.1	0.5	3.9	-90.69	-28.9	-2,401.0	2,401.2	2,396.7	4.48	535.444
400.0	400.0	360.1	360.1	0.8	5.6	-90.69	-28.9	-2,401.0	2,401.2	2,394.8	8.38	376.303
500.0	500.0	460.1	460.1	1.0	8.7	-90.69	-28.9	-2,401.0	2,401.2	2,391.5	9.64	249.019
600.0	600.0	560.1	560.1	1.2	11.7	-90.69	-28.9	-2,401.0	2,401.2	2,388.3	12.90	188.079
700.0	700.0	660.1	660.1	1.4	14.7	-90.69	-28.9	-2,401.0	2,401.2	2,385.0	18.17	148.538
800.0	800.0	760.1	760.1	1.7	17.8	-90.69	-28.9	-2,401.0	2,401.2	2,381.7	19.43	123.602
900.0	900.0	860.1	860.1	1.9	20.8	-90.69	-28.9	-2,401.0	2,401.2	2,378.5	22.69	105.835
1,000.0	1,000.0	960.1	960.1	2.1	23.8	-90.69	-28.9	-2,401.0	2,401.2	2,375.2	25.95	92.532
1,100.0	1,100.0	1,060.1	1,060.1	2.3	26.9	-90.69	-28.9	-2,401.0	2,401.2	2,372.0	29.21	82.201
1,200.0	1,200.0	1,160.1	1,160.1	2.6	29.9	-90.69	-28.9	-2,401.0	2,401.2	2,368.7	32.47	73.946
1,300.0	1,300.0	1,260.2	1,260.1	2.8	33.0	-90.69	-28.9	-2,401.0	2,401.2	2,365.4	35.74	67.193
1,400.0	1,400.0	1,360.2	1,360.1	3.0	36.0	-90.69	-28.9	-2,401.0	2,401.2	2,362.2	39.00	61.573
1,500.0	1,500.0	1,460.2	1,460.1	3.2	39.0	-90.69	-28.9	-2,401.0	2,401.2	2,358.9	42.26	56.819
1,600.0	1,600.0	1,560.2	1,560.1	3.5	42.1	-90.69	-28.9	-2,401.0	2,401.2	2,355.7	45.52	52.749
1,700.0	1,700.0	1,660.2	1,660.1	3.7	45.1	-90.69	-28.9	-2,401.0	2,401.2	2,352.4	48.78	49.222
1,800.0	1,800.0	1,760.2	1,760.1	3.9	48.1	-90.69	-28.9	-2,401.0	2,401.2	2,349.1	52.04	46.137
1,900.0	1,900.0	1,860.3	1,860.1	4.1	51.2	-90.69	-28.9	-2,401.0	2,401.2	2,345.9	55.31	43.416
2,000.0	2,000.0	1,960.3	1,960.1	4.4	54.2	-90.69	-28.9	-2,401.0	2,401.2	2,342.6	58.57	40.997
2,100.0	2,100.0	2,060.3	2,060.1	4.6	57.2	-90.69	-28.9	-2,401.0	2,401.2	2,339.3	61.83	38.836
2,200.0	2,200.0	2,160.3	2,160.1	4.8	60.3	-90.69	-28.9	-2,401.0	2,401.2	2,336.1	65.09	36.888
2,300.0	2,300.0	2,260.3	2,260.1	5.0	63.3	-90.69	-28.9	-2,401.0	2,401.2	2,332.8	68.35	35.128
2,400.0	2,400.0	2,360.3	2,360.1	5.3	66.4	-90.69	-28.9	-2,401.0	2,401.2	2,329.6	71.62	33.528

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



**Scientific Drilling, Int'l**  
Anticollision Report



<b>Company:</b>	OXY	<b>Local Co-ordinate Reference:</b>	Well Norma 22F 2H
<b>Project:</b>	Eddy County, New Mexico	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Reference Site:</b>	Norma 22 Federal 2H	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000:1 Single User Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:
Norma 22 Federal 2H - OXY Govt U1 - Wellbore #1 - Actual													0.0 usft
Survey Program: 350-Inchmcsort1													Offset Well Error:
													0.0 usft
Reference		Offset		Best Major Axis		Highests Tuffifica (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
2,500.0	2,500.0	2,480.3	2,480.1	5.5	69.4	-90.69	-28.9	-2,401.0	2,401.2	2,328.3	74.66	32.066	
2,600.0	2,600.0	2,580.3	2,580.1	5.7	72.4	-90.69	-28.9	-2,401.0	2,401.2	2,323.0	78.14	30.729	
2,700.0	2,700.0	2,660.3	2,660.1	5.9	75.5	-90.69	-28.9	-2,401.0	2,401.2	2,319.8	81.40	29.468	
2,800.0	2,800.0	2,760.4	2,760.1	6.2	78.5	-90.69	-28.9	-2,401.0	2,401.2	2,316.5	84.66	28.362	
2,900.0	2,900.0	2,860.4	2,860.1	6.4	81.5	-90.69	-28.9	-2,401.0	2,401.2	2,313.2	87.92	27.310	
3,000.0	3,000.0	2,960.4	2,960.1	6.6	84.6	-90.69	-28.9	-2,401.0	2,401.2	2,310.0	91.19	26.333	
3,100.0	3,100.0	3,060.4	3,060.1	6.8	87.6	-90.69	-28.9	-2,401.0	2,401.2	2,306.7	94.45	25.424	
3,200.0	3,200.0	3,160.4	3,160.1	7.1	90.7	-90.69	-28.9	-2,401.0	2,401.2	2,303.5	97.71	24.575	
3,300.0	3,300.0	3,260.4	3,260.1	7.3	93.7	-90.69	-28.9	-2,401.0	2,401.2	2,300.2	100.87	23.781	
3,400.0	3,400.0	3,360.4	3,360.1	7.5	96.7	-90.69	-28.9	-2,401.0	2,401.2	2,296.9	104.23	23.037	
3,500.0	3,500.0	3,460.4	3,460.1	7.7	99.8	-90.69	-28.9	-2,401.0	2,401.2	2,293.7	107.49	22.338	
3,600.0	3,600.0	3,560.4	3,560.1	8.0	102.8	-90.69	-28.9	-2,401.0	2,401.2	2,290.4	110.75	21.680	
3,700.0	3,700.0	3,660.4	3,660.1	8.2	105.8	-90.69	-28.9	-2,401.0	2,401.2	2,287.2	114.02	21.060	
3,800.0	3,800.0	3,760.4	3,760.1	8.4	108.9	-90.69	-28.9	-2,401.0	2,401.2	2,283.9	117.28	20.474	
3,900.0	3,900.0	3,860.4	3,860.1	8.6	111.9	-90.69	-28.9	-2,401.0	2,401.2	2,280.6	120.54	19.920	
4,000.0	4,000.0	3,960.4	3,960.1	8.9	114.9	-90.69	-28.9	-2,401.0	2,401.2	2,277.4	123.80	19.396	
4,100.0	4,100.0	4,060.4	4,060.1	9.1	118.0	-90.69	-28.9	-2,401.0	2,401.2	2,274.1	127.06	18.898	
4,200.0	4,200.0	4,160.4	4,160.1	9.3	121.0	-90.69	-28.9	-2,401.0	2,401.2	2,270.9	130.32	18.425	
4,300.0	4,300.0	4,260.4	4,260.1	9.5	124.1	-90.69	-28.9	-2,401.0	2,401.2	2,267.6	133.58	17.975	
4,400.0	4,400.0	4,360.4	4,360.1	9.8	127.1	-90.69	-28.9	-2,401.0	2,401.2	2,264.3	136.85	17.546	
4,500.0	4,500.0	4,460.4	4,460.1	10.0	130.1	-90.69	-28.9	-2,401.0	2,401.2	2,261.1	140.11	17.136	
4,600.0	4,600.0	4,560.4	4,560.1	10.2	133.2	-90.69	-28.9	-2,401.0	2,401.2	2,257.8	143.37	16.748	
4,700.0	4,700.0	4,660.4	4,660.1	10.4	136.2	-90.69	-28.9	-2,401.0	2,401.2	2,254.6	146.63	16.376	
4,800.0	4,800.0	4,760.4	4,760.1	10.6	139.2	-90.69	-28.9	-2,401.0	2,401.2	2,251.3	149.89	16.019	
4,900.0	4,900.0	4,860.4	4,860.1	10.9	142.3	-90.69	-28.9	-2,401.0	2,401.2	2,248.0	153.15	15.678	
5,000.0	5,000.0	4,960.4	4,960.1	11.1	145.3	-90.69	-28.9	-2,401.0	2,401.2	2,244.8	156.42	15.351	
5,100.0	5,100.0	5,060.4	5,060.1	11.3	148.4	-90.69	-28.9	-2,401.0	2,401.2	2,241.5	159.68	15.038	
5,200.0	5,200.0	5,160.4	5,160.1	11.5	151.4	-90.69	-28.9	-2,401.0	2,401.2	2,238.2	162.94	14.737	
5,300.0	5,300.0	5,260.4	5,260.1	11.8	154.4	-90.69	-28.9	-2,401.0	2,401.2	2,235.0	166.20	14.447	
5,400.0	5,400.0	5,360.4	5,360.1	12.0	157.5	-90.69	-28.9	-2,401.0	2,401.2	2,231.7	169.46	14.169	
5,500.0	5,500.0	5,460.4	5,460.1	12.2	160.5	-90.69	-28.9	-2,401.0	2,401.2	2,228.4	172.72	13.902	
5,600.0	5,600.0	5,560.5	5,560.1	12.4	163.5	-90.69	-28.9	-2,401.0	2,401.2	2,225.2	175.99	13.644	
5,700.0	5,700.0	5,660.5	5,660.1	12.7	166.6	-90.69	-28.9	-2,401.0	2,401.2	2,221.9	179.25	13.396	
5,800.0	5,800.0	5,760.5	5,760.1	12.9	169.6	-90.69	-28.9	-2,401.0	2,401.2	2,218.7	182.51	13.156	
5,900.0	5,900.0	5,860.5	5,860.1	13.1	172.7	-90.69	-28.9	-2,401.0	2,401.2	2,215.4	185.77	12.925	
6,000.0	6,000.0	5,960.5	5,960.1	13.3	175.7	-90.69	-28.9	-2,401.0	2,401.2	2,212.1	189.03	12.702	
6,100.0	6,100.0	6,060.5	6,060.1	13.6	178.7	-90.69	-28.9	-2,401.0	2,401.2	2,208.9	192.30	12.487	
6,200.0	6,200.0	6,160.5	6,160.1	13.8	181.8	-90.69	-28.9	-2,401.0	2,401.2	2,205.6	195.56	12.279	
6,300.0	6,300.0	6,260.5	6,260.1	14.0	184.8	-90.69	-28.9	-2,401.0	2,401.2	2,202.4	198.82	12.077	
6,400.0	6,400.0	6,360.5	6,360.1	14.2	187.8	-90.69	-28.9	-2,401.0	2,401.2	2,199.1	202.08	11.882	
6,500.0	6,500.0	6,460.5	6,460.1	14.5	190.9	-90.69	-28.9	-2,401.0	2,401.2	2,195.8	205.34	11.693	
6,600.0	6,600.0	6,560.5	6,560.1	14.7	193.9	-90.69	-28.9	-2,401.0	2,401.2	2,192.6	208.61	11.511	
6,700.0	6,700.0	6,660.5	6,660.1	14.9	196.9	-90.69	-28.9	-2,401.0	2,401.2	2,189.3	211.87	11.333	
6,800.0	6,800.0	6,760.5	6,760.1	15.1	200.0	14.82	-28.9	-2,401.0	2,401.0	2,185.9	215.13	11.161	
6,900.0	6,899.5	6,860.0	6,859.6	15.3	203.0	15.08	-28.9	-2,401.0	2,392.1	2,173.6	218.34	10.956	
7,000.0	6,996.7	6,957.3	6,956.6	15.5	206.0	15.69	-28.9	-2,401.0	2,389.9	2,148.4	221.50	10.699	
7,100.0	7,089.6	7,050.4	7,049.9	15.8	209.8	16.77	-28.9	-2,401.0	2,334.9	2,110.3	224.56	10.398	
7,200.0	7,177.0	7,137.8	7,137.1	16.1	211.4	18.43	-28.9	-2,401.0	2,287.8	2,060.3	227.40	10.056	
7,300.0	7,256.5	7,217.1	7,216.6	16.5	213.8	20.86	-28.9	-2,401.0	2,229.5	1,999.2	230.30	9.681	
7,400.0	7,326.8	7,287.4	7,286.9	17.0	216.0	24.42	-28.9	-2,401.0	2,161.3	1,926.4	232.98	9.277	
7,500.0	7,386.5	7,347.1	7,346.6	17.7	217.8	29.69	-28.9	-2,401.0	2,084.7	1,849.1	235.52	8.851	
7,600.0	7,434.5	7,395.1	7,394.5	18.7	219.3	37.63	-28.9	-2,401.0	2,001.1	1,763.1	237.93	8.410	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Scientific Drilling, Int'l  
Anticollision Report



Company:	OXY	Local Co-ordinate Reference:	Well Norma 22F 2H
Project:	Eddy County, New Mexico	TVD Reference:	KB @ 3272.4usft
Reference Site:	Norma 22 Federal 2H	KID Reference:	KB @ 3272.4usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Norma 22F 2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Norma 22 Federal 2H - OXY Govt U1 - Wellbore #1 - Actual													0.0 usft
Survey Program: 350-Inchmeter1													Offset Well Error:
													0.0 usft
Reference				Offset		Semi-Major Axis		Distance					Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +NW-8 (usft)	Offset Wellbore Centre +SE-W (usft)	Between Centre (usft)	Between Ellipse (usft)	Minimum Separation (usft)	Separation Factor	
7,700.0	7,469.8	7,430.4	7,429.9	19.9	220.3	49.69	-28.9	-2,401.0	1,912.3	1,672.1	240.19	7.962	
7,800.0	7,491.8	7,452.4	7,451.9	21.3	221.0	67.08	-28.9	-2,401.0	1,820.3	1,578.0	242.25	7.514	
7,900.0	7,500.0	7,480.6	7,480.1	22.8	221.2	86.13	-28.9	-2,401.0	1,728.9	1,482.8	244.06	7.076	
8,000.0	7,499.0	7,469.6	7,469.1	24.5	221.2	91.82	-28.9	-2,401.0	1,633.4	1,387.8	245.72	6.647	
8,100.0	7,497.8	7,458.4	7,457.9	26.3	221.2	92.00	-28.9	-2,401.0	1,539.4	1,291.9	247.50	6.220	
8,200.0	7,496.5	7,457.1	7,456.6	28.2	221.1	92.09	-28.9	-2,401.0	1,445.0	1,195.6	249.36	5.794	
8,300.0	7,495.3	7,455.9	7,455.4	30.2	221.1	92.18	-28.9	-2,401.0	1,350.2	1,098.8	251.35	5.372	
8,400.0	7,494.0	7,454.6	7,454.1	32.3	221.1	92.26	-28.9	-2,401.0	1,255.0	1,001.6	253.38	4.953	
8,500.0	7,492.8	7,453.4	7,452.9	34.4	221.0	92.34	-28.9	-2,401.0	1,159.6	904.1	255.45	4.539	
8,600.0	7,491.5	7,452.1	7,451.6	36.6	221.0	92.41	-28.9	-2,401.0	1,063.7	808.2	257.58	4.130	
8,700.0	7,490.3	7,450.9	7,450.4	38.8	220.9	92.41	-28.9	-2,401.0	967.7	708.0	259.73	3.728	
8,800.0	7,489.1	7,449.7	7,449.2	41.0	220.9	92.15	-28.9	-2,401.0	872.2	610.3	261.91	3.330	
8,900.0	7,487.8	7,448.4	7,447.9	43.2	220.9	91.69	-28.9	-2,401.0	777.9	513.7	264.12	2.945	
9,000.0	7,486.6	7,447.2	7,446.7	45.5	220.6	91.63	-28.9	-2,401.0	685.1	418.7	266.36	2.572	
9,100.0	7,485.4	7,446.0	7,445.5	47.8	220.6	91.37	-28.9	-2,401.0	594.6	326.0	268.62	2.214	
9,200.0	7,484.1	7,444.7	7,444.2	50.1	220.6	91.11	-28.9	-2,401.0	507.8	236.9	270.90	1.875 SF 2.0 - Survey every 100 ft	
9,300.0	7,482.8	7,443.5	7,443.0	52.5	220.7	90.85	-28.9	-2,401.0	426.8	153.6	273.20	1.562 SF 2.0 - Survey every 100 ft	
9,400.0	7,481.7	7,442.3	7,441.8	54.8	220.7	90.59	-28.9	-2,401.0	345.5	80.0	275.51	1.290 SF 1.5 - Level 3 MOC	
9,500.0	7,480.4	7,441.0	7,440.5	57.2	220.6	90.33	-28.9	-2,401.0	301.1	23.3	277.94	1.084 SF 1.5 - Level 3 MOC	
9,600.0	7,479.2	7,439.8	7,439.3	59.6	220.6	90.07	-28.9	-2,401.0	273.7	-8.4	280.18	0.977 SF 1.0 - Level 4 MOC	
9,626.7	7,478.8	7,439.4	7,438.9	60.3	220.6	90.00	-28.9	-2,401.0	272.2	-6.6	280.85	0.968 SF 1.0 - Level 4 MOC, CC, ES, SF	
9,700.0	7,478.0	7,438.6	7,438.1	62.0	220.6	89.81	-28.9	-2,401.0	281.4	-1.1	282.53	0.998 SF 1.0 - Level 4 MOC	
9,800.0	7,476.7	7,437.3	7,436.8	64.3	220.5	89.55	-28.9	-2,401.0	321.6	36.7	284.88	1.129 SF 1.5 - Level 3 MOC	
9,900.0	7,475.5	7,436.1	7,435.6	66.7	220.5	89.30	-28.9	-2,401.0	384.3	97.1	287.25	1.338 SF 1.5 - Level 3 MOC	
10,000.0	7,474.3	7,434.9	7,434.4	69.2	220.5	89.04	-28.9	-2,401.0	460.4	170.7	289.62	1.590 SF 2.0 - Survey every 100 ft	
10,100.0	7,473.0	7,433.6	7,433.1	71.6	220.4	88.78	-28.9	-2,401.0	544.2	282.2	292.00	1.864 SF 2.0 - Survey every 100 ft	
10,200.0	7,471.8	7,432.4	7,431.9	74.0	220.4	88.52	-28.9	-2,401.0	632.8	338.4	294.38	2.150	
10,300.0	7,470.6	7,431.1	7,430.7	76.4	220.3	88.26	-28.9	-2,401.0	724.3	427.8	296.77	2.441	
10,400.0	7,469.3	7,429.9	7,429.4	78.9	220.3	88.00	-28.9	-2,401.0	817.9	518.7	299.17	2.734	
10,500.0	7,468.1	7,428.7	7,428.2	81.3	220.3	87.74	-28.9	-2,401.0	912.8	611.2	301.57	3.027	
10,600.0	7,466.9	7,427.4	7,427.0	83.7	220.2	87.48	-28.9	-2,401.0	1,008.6	704.7	303.97	3.318	
10,700.0	7,465.6	7,426.2	7,425.7	86.2	220.2	87.22	-28.9	-2,401.0	1,105.3	798.9	306.38	3.606	
10,800.0	7,464.4	7,425.0	7,424.5	88.6	220.2	86.96	-28.9	-2,401.0	1,202.4	893.6	308.79	3.894	
10,900.0	7,463.1	7,423.7	7,423.2	91.1	220.1	86.70	-28.9	-2,401.0	1,300.0	988.6	311.20	4.177	
11,000.0	7,461.9	7,422.5	7,422.0	93.5	220.1	86.44	-28.9	-2,401.0	1,397.9	1,084.3	313.62	4.458	
11,100.0	7,460.7	7,421.3	7,420.8	96.0	220.0	86.18	-28.9	-2,401.0	1,496.1	1,180.1	316.03	4.734	
11,200.0	7,459.4	7,420.0	7,419.5	98.4	220.0	85.92	-28.9	-2,401.0	1,594.6	1,276.1	318.45	5.007	
11,300.0	7,458.2	7,418.8	7,418.3	100.9	220.0	85.67	-28.9	-2,401.0	1,693.2	1,372.3	320.86	5.277	
11,400.0	7,457.0	7,417.6	7,417.1	103.4	219.9	85.41	-28.9	-2,401.0	1,791.9	1,468.6	323.30	5.543	
11,500.0	7,455.7	7,416.3	7,415.8	105.8	219.9	85.15	-28.9	-2,401.0	1,890.8	1,565.1	325.73	5.805	
11,600.0	7,454.5	7,415.1	7,414.6	108.3	219.9	84.89	-28.9	-2,401.0	1,989.8	1,661.7	328.16	6.064	
11,700.0	7,453.3	7,413.9	7,413.4	110.8	219.8	84.63	-28.9	-2,401.0	2,088.9	1,758.3	330.59	6.319	
11,800.0	7,452.0	7,412.6	7,412.1	113.2	219.8	84.38	-28.9	-2,401.0	2,188.1	1,855.1	333.02	6.570	
11,900.0	7,450.8	7,411.4	7,410.9	115.7	219.7	84.12	-28.9	-2,401.0	2,287.4	1,951.9	335.46	6.819	
12,000.0	7,449.6	7,410.2	7,409.7	118.2	219.7	83.86	-28.9	-2,401.0	2,386.7	2,048.6	337.89	7.063	
12,100.0	7,448.3	7,408.9	7,408.4	120.7	219.7	83.61	-28.9	-2,401.0	2,486.0	2,145.7	340.33	7.305	
12,200.0	7,447.1	7,407.7	7,407.2	123.1	219.6	83.35	-28.9	-2,401.0	2,585.5	2,242.7	342.77	7.543	
12,300.0	7,445.9	7,406.6	7,406.0	125.6	219.6	83.09	-28.9	-2,401.0	2,684.9	2,339.7	345.21	7.778	
12,400.0	7,444.6	7,405.2	7,404.7	128.1	219.6	82.84	-28.9	-2,401.0	2,784.4	2,436.8	347.65	8.009	
12,500.0	7,443.4	7,404.0	7,403.5	130.6	219.5	82.58	-28.9	-2,401.0	2,883.9	2,533.9	350.09	8.236	
12,600.0	7,442.2	7,402.7	7,402.3	133.0	219.5	82.33	-28.9	-2,401.0	2,983.5	2,631.0	352.53	8.463	
12,700.0	7,440.9	7,401.5	7,401.0	135.5	219.4	82.07	-28.9	-2,401.0	3,083.1	2,728.1	354.97	8.685	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



**Scientific Drilling, Int'l**  
Anticollision Report



<b>Company:</b>	OXY	<b>Local Co-ordinate Reference:</b>	Well Norma 22F 2H
<b>Project:</b>	Eddy County, New Mexico	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Reference Site:</b>	Norma 22 Federal 2H	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User.Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													<b>Offset Site Error:</b>	0.0 usft
Norma 22 Federal 2H - OXY Govt U1 - Wellbore #1 - Actual													<b>Offset Well Error:</b>	0.0 usft
Survey Program: 350-Inchometer														
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Edges (usft)	Minimum Separation (usft)	Separation Factor	Warning	
12,774.7	7,440.0	7,400.6	7,406.1	137.4	210.4	81.66	-26.9	-2,401.0	3,167.5	2,600.7	356.80	8.650		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation





Scientific Drilling, Int'l  
Anticollision Report



<b>Company:</b>	OXY	<b>Local Co-ordinate Reference:</b>	Well Norma 22F 2H
<b>Project:</b>	Eddy County, New Mexico	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Reference Site:</b>	Norma 22 Federal 2H	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 usft
Norma 22 Federal 2H - OXY Govt U2 - Wellbore #1 - Actual													Offset Well Error:	0.0 usft
Survey Program: 100-Inclinometer														
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Footcage (')	Offset Wellbore Centre +N-S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,200.0	5,200.0	5,155.0	5,154.8	11.5	155.0	-90.51	-33.5	-3,742.1	3,742.2	3,575.7	155.58	22.465		
5,300.0	5,300.0	5,255.0	5,254.8	11.8	155.1	-90.51	-33.5	-3,742.1	3,742.2	3,572.4	159.84	22.034		
5,400.0	5,400.0	5,355.0	5,354.8	12.0	151.1	-90.51	-33.5	-3,742.1	3,742.2	3,569.1	173.10	21.819		
5,500.0	5,500.0	5,455.0	5,454.8	12.2	164.1	-90.51	-33.5	-3,742.1	3,742.2	3,565.9	176.36	21.219		
5,600.0	5,600.0	5,555.0	5,554.8	12.4	167.2	-90.51	-33.5	-3,742.1	3,742.2	3,562.6	179.62	20.634		
5,700.0	5,700.0	5,655.0	5,654.8	12.7	170.2	-90.51	-33.5	-3,742.1	3,742.2	3,559.3	182.89	20.482		
5,800.0	5,800.0	5,755.0	5,754.8	12.9	173.3	-90.51	-33.5	-3,742.1	3,742.2	3,556.1	186.15	20.104		
5,900.0	5,900.0	5,855.0	5,854.8	13.1	176.3	-90.51	-33.5	-3,742.1	3,742.2	3,552.8	189.41	19.757		
6,000.0	6,000.0	5,955.0	5,954.8	13.3	179.3	-90.51	-33.5	-3,742.1	3,742.2	3,549.6	192.67	19.423		
6,100.0	6,100.0	6,055.0	6,054.8	13.6	182.4	-90.51	-33.5	-3,742.1	3,742.2	3,546.3	195.93	19.100		
6,200.0	6,200.0	6,155.0	6,154.8	13.8	185.4	-90.51	-33.5	-3,742.1	3,742.2	3,543.0	199.19	18.787		
6,300.0	6,300.0	6,255.0	6,254.8	14.0	188.4	-90.51	-33.5	-3,742.1	3,742.2	3,539.8	202.46	18.484		
6,400.0	6,400.0	6,355.0	6,354.8	14.2	191.5	-90.51	-33.5	-3,742.1	3,742.2	3,536.5	205.72	18.191		
6,500.0	6,500.0	6,455.0	6,454.8	14.5	194.5	-90.51	-33.5	-3,742.1	3,742.2	3,533.3	208.98	17.907		
6,600.0	6,600.0	6,555.0	6,554.8	14.7	197.5	-90.51	-33.5	-3,742.1	3,742.2	3,530.0	212.24	17.632		
6,700.0	6,700.0	6,655.0	6,654.8	14.9	200.6	-90.51	-33.5	-3,742.1	3,742.2	3,526.7	215.50	17.365		
6,800.0	6,800.0	6,755.0	6,754.8	15.1	203.6	14.89	-33.5	-3,742.1	3,742.1	3,523.3	218.76	17.106		
6,900.0	6,899.5	6,854.8	6,854.3	15.3	206.6	15.22	-33.5	-3,742.1	3,733.2	3,511.2	221.96	16.816		
7,000.0	6,998.7	6,951.8	6,951.5	15.6	209.6	15.80	-33.5	-3,742.1	3,711.0	3,485.9	225.13	16.484		
7,100.0	7,099.6	7,044.9	7,044.6	15.8	212.4	15.79	-33.5	-3,742.1	3,676.0	3,447.8	228.19	16.109		
7,200.0	7,177.0	7,132.1	7,131.8	16.1	215.1	16.32	-33.5	-3,742.1	3,626.8	3,397.7	231.13	15.700		
7,300.0	7,256.5	7,211.5	7,211.3	16.5	217.5	20.54	-33.5	-3,742.1	3,670.5	3,338.8	233.94	15.263		
7,400.0	7,326.6	7,281.6	7,281.6	17.0	219.8	23.78	-33.5	-3,742.1	3,602.2	3,285.6	236.61	14.802		
7,500.0	7,388.5	7,341.6	7,341.3	17.7	221.4	26.58	-33.5	-3,742.1	3,425.3	3,186.2	239.16	14.323		
7,600.0	7,434.5	7,389.6	7,389.3	18.7	222.9	35.90	-33.5	-3,742.1	3,341.4	3,099.8	241.57	13.832		
7,700.0	7,469.8	7,424.9	7,424.6	19.9	224.0	47.31	-33.5	-3,742.1	3,252.0	3,008.2	243.63	13.337		
7,800.0	7,491.6	7,448.9	7,448.6	21.3	224.6	64.60	-33.5	-3,742.1	3,159.1	2,913.2	245.89	12.848		
7,900.0	7,500.0	7,455.1	7,454.8	22.8	224.8	87.86	-33.5	-3,742.1	3,064.5	2,816.8	247.69	12.372		
8,000.0	7,499.0	7,454.1	7,453.8	24.6	224.8	92.28	-33.5	-3,742.1	2,969.4	2,720.0	249.35	11.908		
8,100.0	7,497.8	7,452.9	7,452.6	26.3	224.8	92.50	-33.5	-3,742.1	2,873.6	2,622.4	251.14	11.442		
8,200.0	7,496.5	7,451.6	7,451.3	28.2	224.8	92.77	-33.5	-3,742.1	2,777.1	2,524.1	253.02	10.976		
8,300.0	7,495.3	7,450.4	7,450.1	30.2	224.7	93.11	-33.5	-3,742.1	2,679.9	2,424.8	254.88	10.510		
8,400.0	7,494.0	7,449.1	7,448.8	32.3	224.7	93.64	-33.5	-3,742.1	2,582.2	2,325.2	257.01	10.047		
8,500.0	7,492.8	7,447.9	7,447.6	34.4	224.7	94.11	-33.5	-3,742.1	2,483.9	2,224.8	259.09	9.587		
8,600.0	7,491.5	7,446.6	7,446.3	36.6	224.6	94.93	-33.5	-3,742.1	2,385.1	2,123.9	261.21	9.131		
8,700.0	7,490.3	7,445.4	7,445.1	38.8	224.6	95.68	-33.5	-3,742.1	2,286.0	2,022.6	263.36	8.680		
8,800.0	7,489.1	7,444.2	7,443.9	41.0	224.5	95.62	-33.5	-3,742.1	2,188.7	1,921.2	265.54	8.235		
8,900.0	7,487.8	7,442.9	7,442.6	43.2	224.5	95.37	-33.5	-3,742.1	2,087.6	1,819.8	267.76	7.796		
9,000.0	7,486.6	7,441.7	7,441.4	45.5	224.5	95.11	-33.5	-3,742.1	1,988.6	1,718.5	270.00	7.365		
9,100.0	7,485.4	7,440.5	7,440.2	47.8	224.4	94.65	-33.5	-3,742.1	1,889.5	1,617.2	272.26	6.940		
9,200.0	7,484.1	7,439.2	7,438.9	50.1	224.4	94.59	-33.5	-3,742.1	1,790.6	1,516.0	274.54	6.522		
9,300.0	7,482.9	7,438.0	7,437.7	52.5	224.4	94.33	-33.5	-3,742.1	1,691.8	1,415.0	276.84	6.111		
9,400.0	7,481.7	7,436.8	7,436.5	54.8	224.3	94.07	-33.5	-3,742.1	1,593.2	1,314.0	279.15	5.707		
9,500.0	7,480.4	7,435.5	7,435.2	57.2	224.3	93.82	-33.5	-3,742.1	1,494.8	1,213.3	281.48	5.310		
9,600.0	7,479.2	7,434.3	7,434.0	59.6	224.2	93.56	-33.5	-3,742.1	1,396.6	1,112.8	283.81	4.921		
9,700.0	7,478.0	7,433.0	7,432.6	62.0	224.2	93.30	-33.5	-3,742.1	1,298.6	1,012.5	286.16	4.536		
9,800.0	7,476.7	7,431.8	7,431.5	64.3	224.2	93.04	-33.5	-3,742.1	1,201.0	912.5	288.52	4.163		
9,900.0	7,475.5	7,430.6	7,430.3	66.7	224.1	92.78	-33.5	-3,742.1	1,103.9	813.0	290.88	3.795		
10,000.0	7,474.3	7,429.3	7,429.1	69.2	224.1	92.52	-33.5	-3,742.1	1,007.3	714.0	293.25	3.435		
10,100.0	7,473.0	7,428.1	7,427.8	71.6	224.1	92.26	-33.5	-3,742.1	911.4	615.8	295.63	3.083		
10,200.0	7,471.8	7,426.9	7,426.6	74.0	224.0	92.00	-33.5	-3,742.1	816.5	516.6	298.02	2.740		
10,300.0	7,470.6	7,425.6	7,425.4	76.4	224.0	91.74	-33.5	-3,742.1	723.0	422.6	300.41	2.407		

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



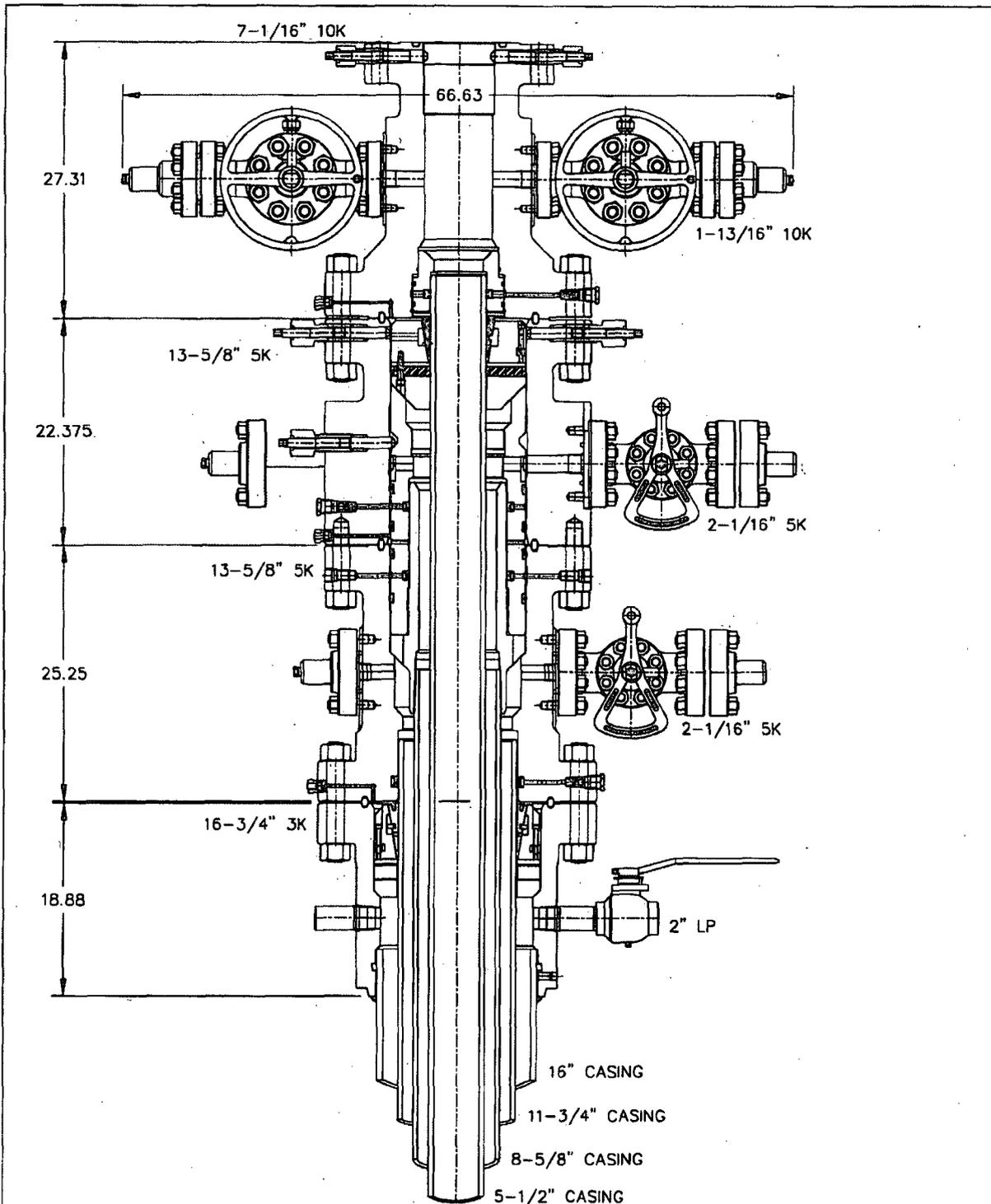
Scientific Drilling, Int'l  
Anticollision Report



<b>Company:</b>	OXY	<b>Local Co-ordinates Reference:</b>	Well Norma 22F 2H
<b>Project:</b>	Eddy County, New Mexico	<b>TVD Reference:</b>	KB @ 3272.4usft
<b>Reference Site:</b>	Norma 22 Federal 2H	<b>MD Reference:</b>	KB @ 3272.4usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Norma 22F 2H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at:</b>	2.00 sigma
<b>Reference Wellbore:</b>	Wellbore #1	<b>Database:</b>	EDM 5000:1 Single User.Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 usft
Norma 22 Federal 2H - OXY Govt U2 - Wellbore #1 - Actual													Offset Well Error:	0.0 usft
Survey Program: 100-Inchometer														
Reference				Offset		Beam Major Axis		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,400.0	7,489.3	7,424.4	7,424.1	78.9	223.9	91.48	-33.5	-3,742.1	631.5	328.7	302.80	2.088		
10,500.0	7,488.1	7,423.2	7,422.9	81.3	223.9	91.22	-33.5	-3,742.1	543.0	237.8	305.20	1.779 SF 2.0 - Survey every 100 ft		
10,600.0	7,486.9	7,421.9	7,421.7	83.7	223.9	90.98	-33.5	-3,742.1	458.2	151.8	307.60	1.493 SF 1.5 - Level 3 MOC		
10,700.0	7,485.6	7,420.7	7,420.4	86.2	223.8	90.70	-33.5	-3,742.1	383.3	73.2	310.01	1.238 SF 1.5 - Level 3 MOC		
10,800.0	7,484.4	7,419.5	7,419.2	88.8	223.8	90.44	-33.5	-3,742.1	320.8	8.4	312.42	1.027 SF 1.5 - Level 3 MOC		
10,900.0	7,483.1	7,418.2	7,417.9	91.1	223.8	90.18	-33.5	-3,742.1	281.0	-33.9	314.83	0.892 SF 1.0 - Level 4 MOC		
10,969.9	7,482.3	7,417.4	7,417.1	92.8	223.7	90.00	-33.5	-3,742.1	272.1	-44.4	316.52	0.880 SF 1.0 - Level 4 MOC, CC, ES, SF		
11,000.0	7,481.9	7,417.0	7,416.7	93.5	223.7	89.92	-33.5	-3,742.1	273.8	-43.5	317.26	0.863 SF 1.0 - Level 4 MOC		
11,100.0	7,480.7	7,415.8	7,415.5	96.0	223.7	89.68	-33.5	-3,742.1	301.6	-18.1	319.67	0.944 SF 1.0 - Level 4 MOC		
11,200.0	7,479.4	7,414.5	7,414.2	98.4	223.6	89.40	-33.5	-3,742.1	358.3	34.3	322.09	1.108 SF 1.5 - Level 3 MOC		
11,300.0	7,478.2	7,413.3	7,413.0	100.9	223.6	89.14	-33.5	-3,742.1	427.8	103.3	324.51	1.318 SF 1.5 - Level 3 MOC		
11,400.0	7,477.0	7,412.1	7,411.8	103.4	223.6	88.88	-33.5	-3,742.1	508.9	182.0	326.94	1.557 SF 2.0 - Survey every 100 ft		
11,500.0	7,475.7	7,410.8	7,410.5	105.8	223.5	88.62	-33.5	-3,742.1	595.8	266.5	329.37	1.808 SF 2.0 - Survey every 100 ft		
11,600.0	7,474.5	7,409.6	7,409.3	108.3	223.5	88.38	-33.5	-3,742.1	688.3	354.5	331.80	2.088		
11,700.0	7,473.3	7,408.4	7,408.1	110.8	223.5	88.10	-33.5	-3,742.1	779.1	444.9	334.23	2.331		
11,800.0	7,472.0	7,407.1	7,406.8	113.2	223.4	87.84	-33.5	-3,742.1	873.5	538.8	336.66	2.595		
11,900.0	7,470.8	7,405.9	7,405.6	115.7	223.4	87.58	-33.5	-3,742.1	969.0	629.9	339.09	2.858		
12,000.0	7,469.6	7,404.6	7,404.4	118.2	223.3	87.32	-33.5	-3,742.1	1,065.4	723.8	341.53	3.119		
12,100.0	7,468.3	7,403.4	7,403.1	120.7	223.3	87.06	-33.5	-3,742.1	1,162.3	818.3	343.96	3.379		
12,200.0	7,467.1	7,402.2	7,401.9	123.1	223.3	86.81	-33.5	-3,742.1	1,259.7	913.3	346.40	3.637		
12,300.0	7,465.9	7,400.9	7,400.7	125.6	223.2	86.55	-33.5	-3,742.1	1,357.5	1,008.7	348.84	3.892		
12,400.0	7,464.6	7,399.7	7,399.4	128.1	223.2	86.29	-33.5	-3,742.1	1,455.8	1,104.4	351.28	4.144		
12,500.0	7,463.4	7,398.5	7,398.2	130.6	223.2	86.03	-33.5	-3,742.1	1,554.0	1,200.3	353.72	4.393		
12,600.0	7,462.2	7,397.2	7,397.0	133.0	223.1	85.77	-33.5	-3,742.1	1,652.5	1,296.4	356.16	4.640		
12,700.0	7,460.9	7,396.0	7,395.7	135.5	223.1	85.51	-33.5	-3,742.1	1,751.2	1,392.6	358.61	4.883		
12,774.7	7,460.0	7,395.1	7,394.8	137.4	223.1	85.32	-33.5	-3,742.1	1,825.1	1,484.7	360.43	5.084		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



02  
REV

**NOTE:**

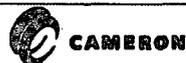
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CHECKED	T. TAYLOR	DATE	2013JUN06
APPROVED		DATE	

INITIAL USE B/M



Cameron International  
Surface Systems, DPS  
PO Box 1212  
Houston, TX 77251-1212

PROPOSAL DRAWING

OXY USA

13-5/8" 5K 'MBS' WELLHEAD SYSTEM

CASING PROGRAM: 16" X 11-3/4" X 8-5/8" X 5-1/2"

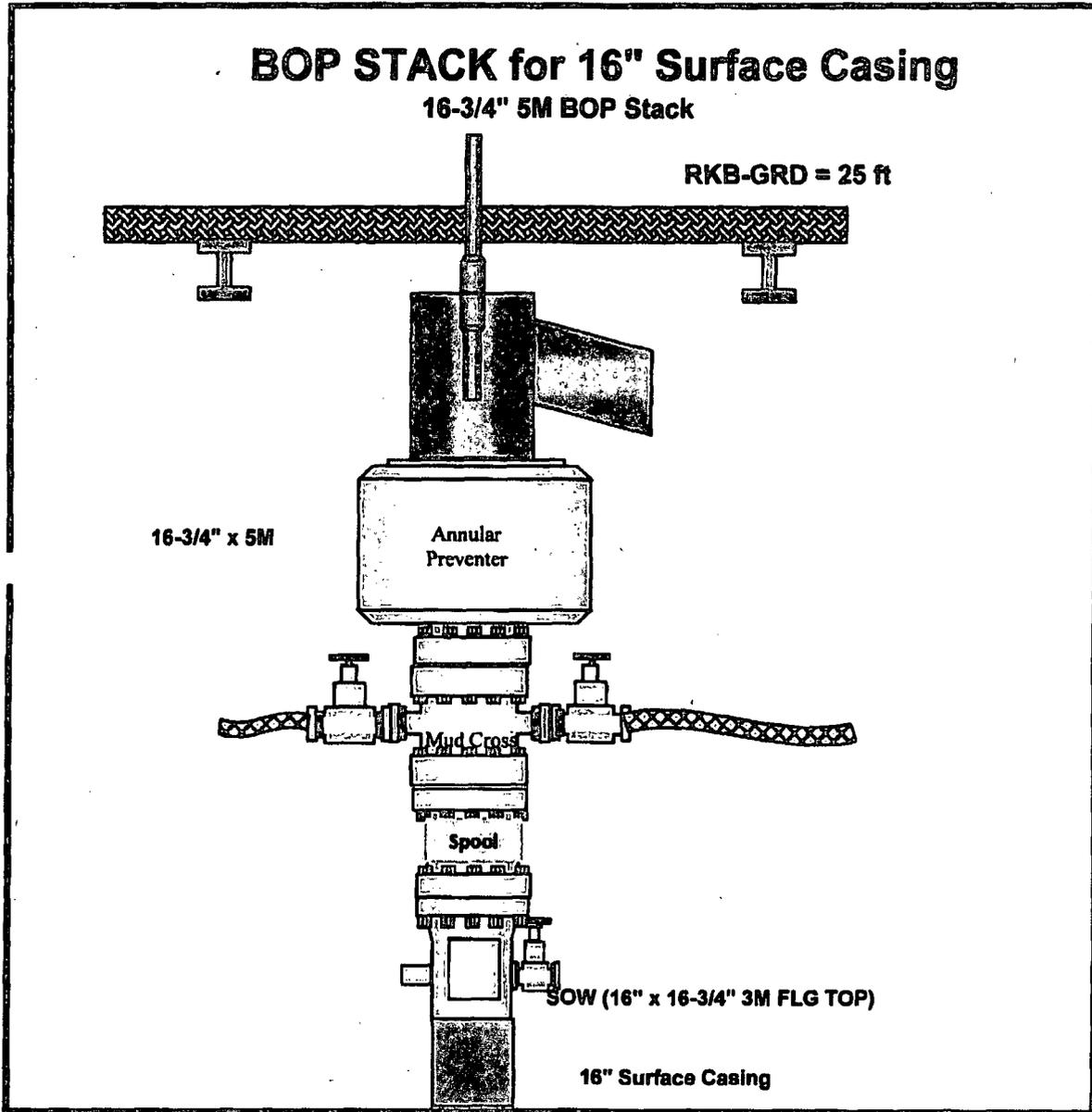
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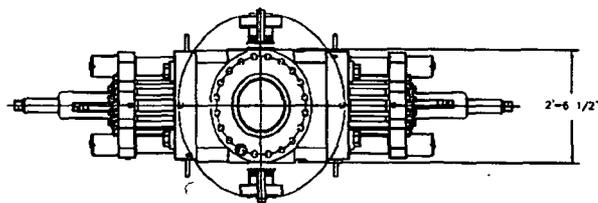
SHEET  
1 of 1

SD-045856-70-01

# BOP STACK for 16" Surface Casing

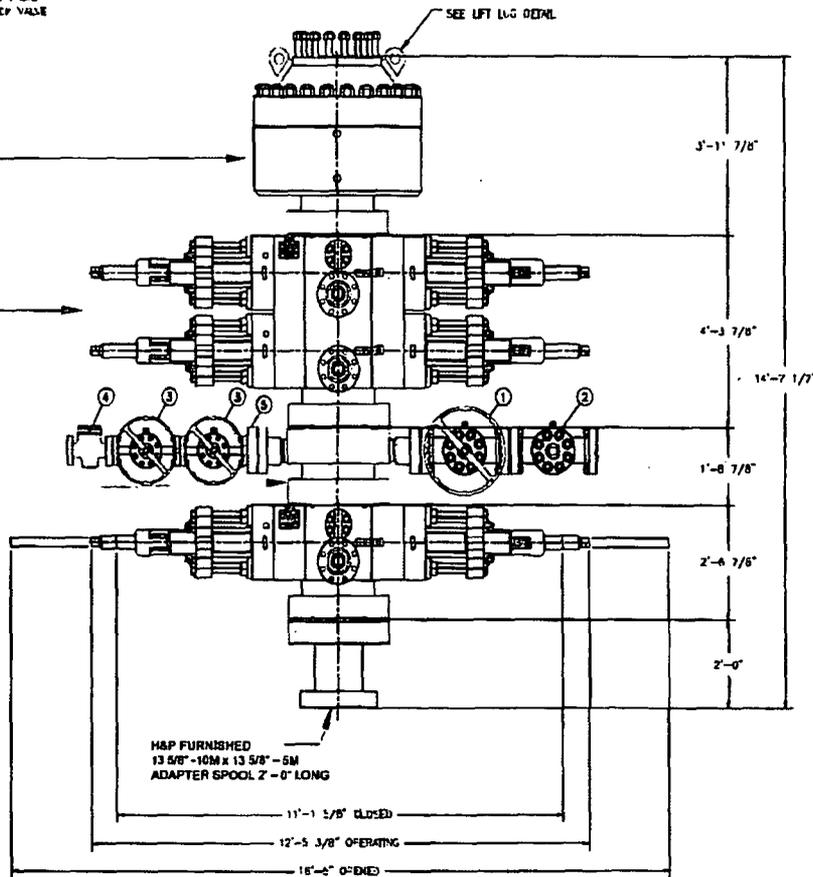
16-3/4" 5M BOP Stack





**LEADS**

- ① - 4 1/16"-10M FLANGED END GATE VALVE
- ② - 4 1/16"-10M FLANGED END GATE VALVE WITH DOUBLE ACTING HYDRAULIC ACTUATOR
- ③ - 2 1/16"-10M FLANGED END GATE VALVE
- ④ - 2 1/16"-10M FLANGED END CHECK VALVE
- ⑤ - DOUBLE STUCCED ADAPTER



SHAFFER BOLTED-COVER SPHERICAL ANNULAR PREVENTER (API 16A MONOGRAMMED 13 5/8"-10M #2), 10M BOTTOM FLANGE = 5M STUCCED TOP HEIGHT = 14,300 LBS WITH SHAFFER API 16A HCT OIL RESISTANT ACRYLONITRILE ELEMENT)

CAMERON LW DOUBLE RAM-TYPE PREVENTER (API 16A MONOGRAMMED 13 5/8"-10M #2), WITH 5" CAMERON PFE RAMS (CAMRAM FRONT PACKERS & TOP SEALS IN TOP CAVITY AND CAMERON DS SHEARING BLIND RAMS IN BOTTOM CAVITY, BOTTOM FLANGE & STUCCED TOP (WEIGHT = 21,100 LBS. WITH RAMS)

13 5/8"-10M WP CAMERON DRILLING SPOOL (API 16A MONOGRAMMED), STUCCED TOP & FLANGED BOTTOM WITH 4 1/16"-10M WP FLANGED OUTLETS (WEIGHT APPROXIMATELY 8,000 LBS)

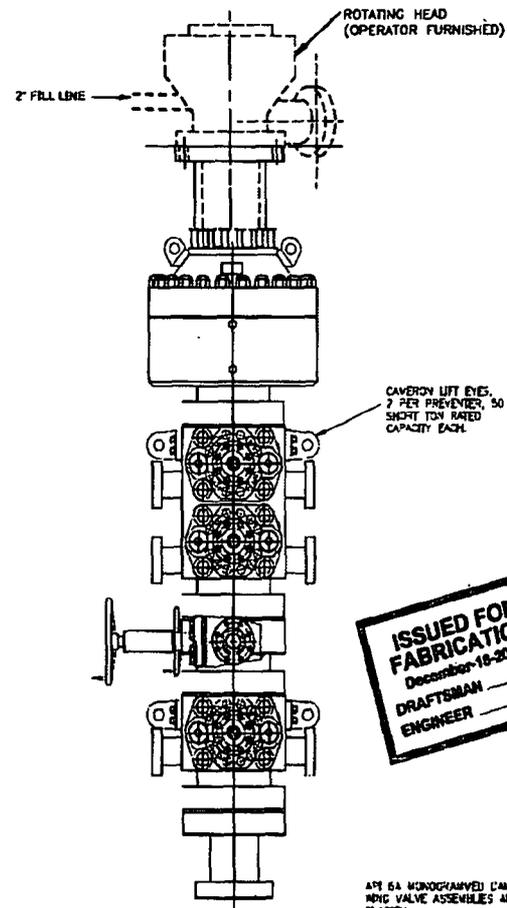
CAMERON LW SINGLE RAM-TYPE PREVENTER (API 16A MONOGRAMMED 13 5/8"-10M #2), WITH 5" CAMERON PFE RAMS (CAMRAM FRONT PACKER & T SEALS) BOTTOM FLANGE & STUCCED TOP (WEIGHT = 10,920 LBS)

H&P FURNISHED  
13 5/8"-10M x 13 5/8"-5M  
ADAPTER SPOOL 2'-0" LONG

**13 5/8 - 10M BOP STACK  
WITH 13 5/8 - 5M ANNULAR**

**PROPRIETARY**

THIS DRAWING AND THE LEGEND AND INFORMATION INCLUDED IN THIS DRAWING ARE PROPRIETARY AND ARE NOT TO BE REPRODUCED, ESTABLISHED OR OTHERWISE IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF A DULY AUTHORIZED OFFICER OF HELMERICH & PAYNE INT'L DRILLING CO.



**ISSUED FOR FABRICATION**  
December-16-2007  
DRAFTSMAN \_\_\_\_\_  
ENGINEER \_\_\_\_\_

API 6A MONOGRAMMED CAMERON CHOKE AND HCT HINGE VALVE ASSEMBLIES ARE NOT SHOWN FOR CLARITY  
HEIGHTS DO NOT INCLUDE NOSES, ADAPTER SPOOLS OR QUICK CONNECT FITTINGS

**HELMERICH & PAYNE**  
INTERNATIONAL DRILLING CO.

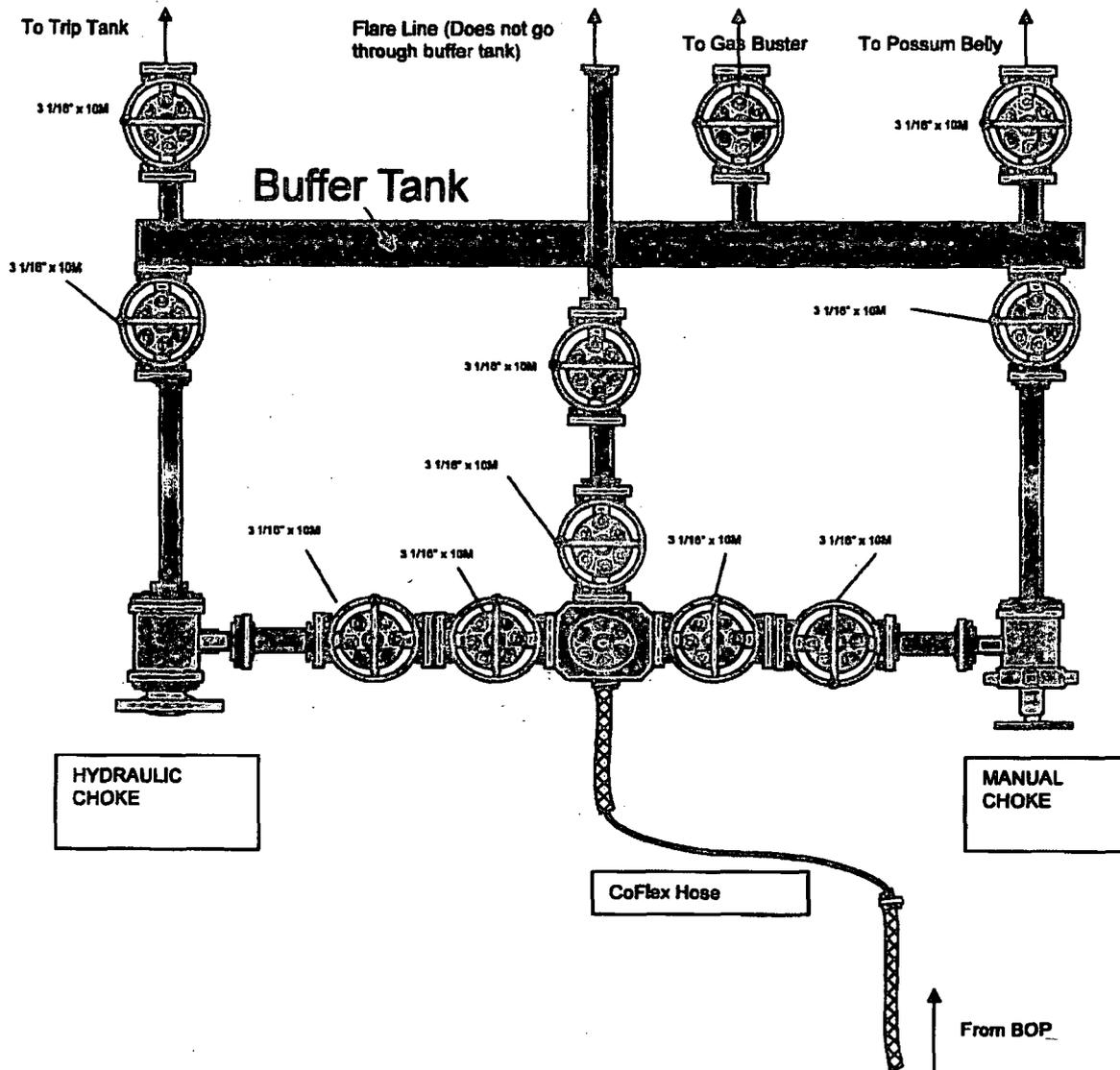
**13 5/8"-10M BOP 3 RAM STACK FLEXRIG3**

ENGINEER APPROVAL	DATE	TITLE
12/14/07		ISSUED SHEET 01
12/14/07		CHANGED RAMS TO 5" PFE RAMS
12/14/07		ADDED TO SPACER ADAPTER SPOOL
12/14/07		ADDED ADAPTER SPOOL
12/14/07		COMPLETED BOP STACK

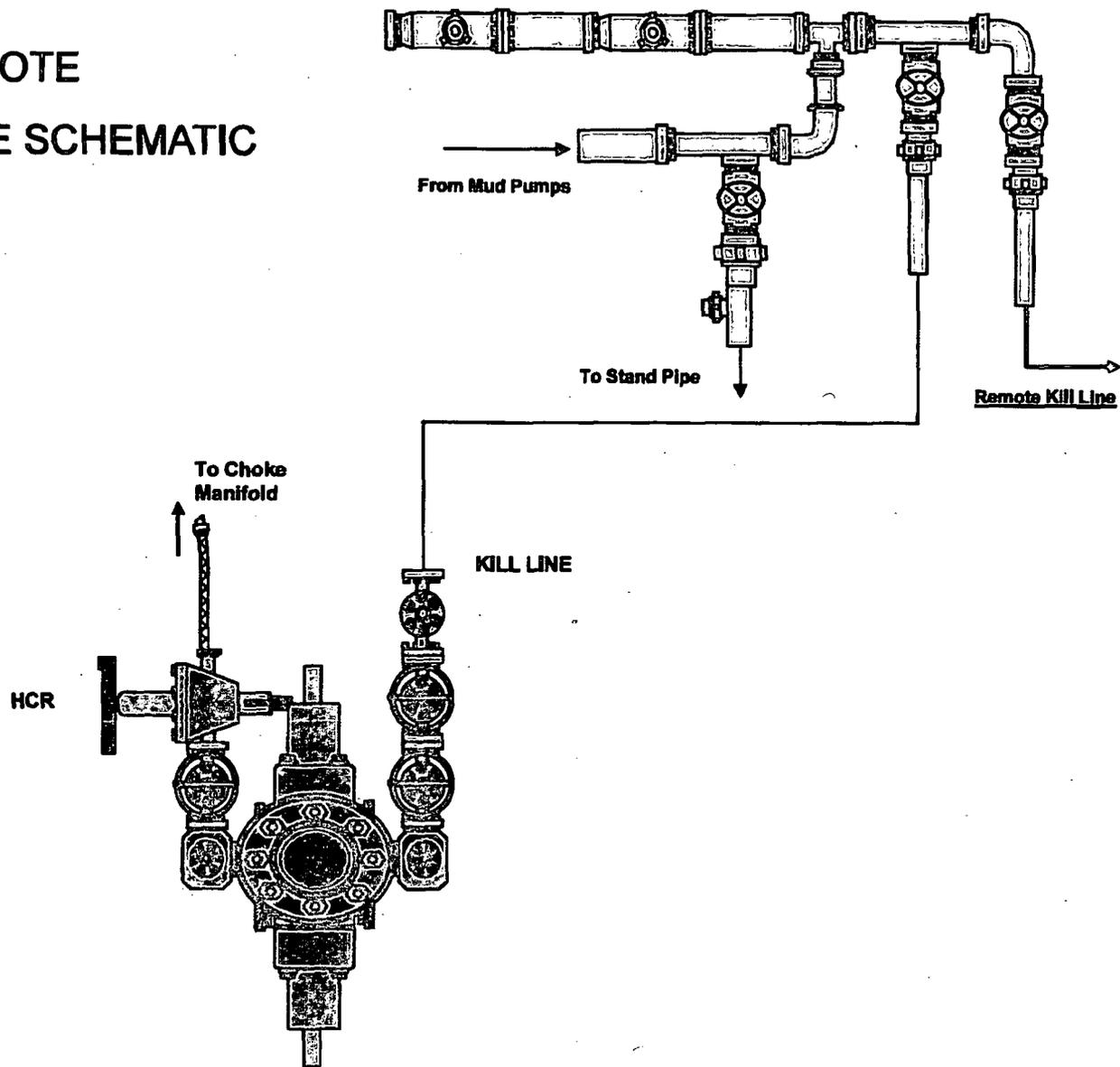
  

CUSTOMER NO.	PROJECT	DATE	DRAWN	DATE	FILE NO.	REV
	FLEXRIG-3	8-3-07	MFS	8-3-07	210-P1-07	E
SCALE		SHEET		OF		
1/4" = 1'		2		10		

# FLEX3 STD CHOKE MANIFOLD (COMPREHENSIVE)

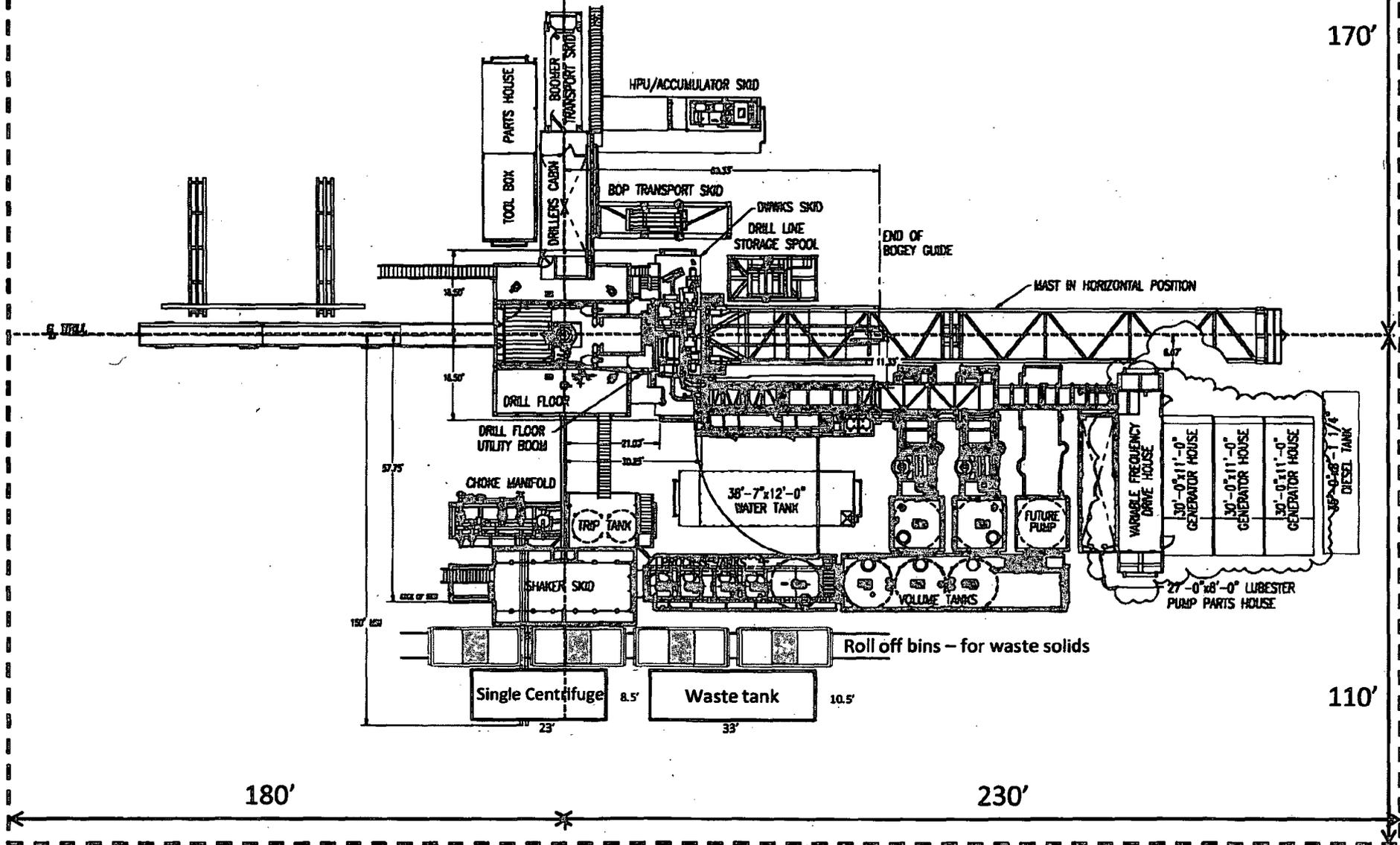


# 10M REMOTE KILL LINE SCHEMATIC

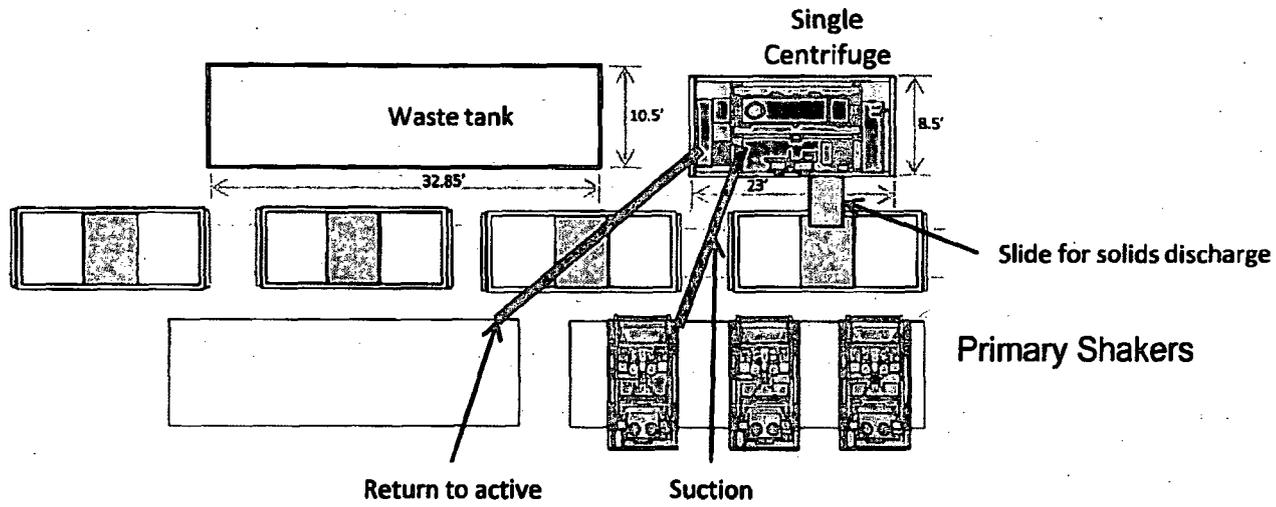


Oxy Single Centrifuge  
 Closed Loop System – New  
 Mexico Flex III

May 28, 2013



Oxy



Well Head



Oxy Single Centrifuge  
Closed Loop System – New  
Mexico Flex III  
May 28, 2013

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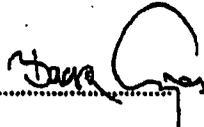
**CERTIFICATE OF CONFORMITY**

**Supplier** : CONTITECH RUBBER INDUSTRIAL KFT.  
**Equipment** : 6 pcs. Choke and Kill Hose with installed couplings  
**Type** : 3" x 10,67 m WP: 10000 psi  
**Supplier File Number** : 412638  
**Date of Shipment** : April. 2008  
**Customer** : Phoenix Beattie Co.  
**Customer P.o.** : 002491  
**Referenced Standards**  
**/ Codes / Specifications** : API Spec 16 C  
**Serial No.:** 52754,52755,52776,52777,52778,52782

**STATEMENT OF CONFORMITY**

We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

**COUNTRY OF ORIGIN HUNGARY/EU**

Signed : 

Position: Q.C. Manager

ContiTech Rubber  
Industrial Kft.  
Quality Control Dept.  
01

Date: 04. April. 2008





**Coflex Hose Certification**

Form No 100/12



**Phoenix Beattie Corp**

11533 Brittoncove Park Drive  
Houston, TX 77041  
Tel: (281) 327-0341  
Fax: (281) 327-0343  
E-mail: [usa1@phoenixbeattie.com](mailto:usa1@phoenixbeattie.com)  
[www.phoenixbeattie.com](http://www.phoenixbeattie.com)

**Delivery Note**

<b>Customer Order Number</b>	370-369-001	<b>Delivery Note Number</b>	003078	<b>Page</b>	1
<b>Customer / Invoice Address</b> HELMERICH & PAYNE INT'L DRILLING CO 1437 SOUTH BOULDER TULSA, OK 74129		<b>Delivery / Address</b> HELMERICH & PAYNE IDC ATTN: JOE STEPHENSON - RIG 370 13609 INDUSTRIAL ROAD HOUSTON, TX 77015			

<b>Customer Acc No</b>	<b>Phoenix Beattie Contract Manager</b>	<b>Phoenix Beattie Reference</b>	<b>Date</b>
H01	JJL	006330	05/23/2008

Item No	Beattie Part Number / Description	Qty Ordered	Qty Sent	Qty To Follow
1	HP10CK3A-35-F1 3" 10K 16C C&K HOSE x 35ft OAL CN 4.1/16" API SPEC FLANGE E/ End 1: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange End 2: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange c/w BX155 Standard ring groove at each end Suitable for H2S Service Working pressure: 10,000psi Test pressure: 15,000psi Standard: API 16C Full specification Armor Guarding: Included Fire Rating: Not Included Temperature rating: -20 Deg C to +100 Deg C	1	1	0
2	SECK3-HPF3 LIFTING & SAFETY EQUIPMENT TO SUIT HP10CK3-35-F1 2 x 160mm ID Safety Clamps 2 x 244mm ID Lifting Collars & element C's 2 x 7ft Stainless Steel wire rope 3/4" OD 4 x 7.75t Shackles	1	1	0
3	SC725-200CS SAFETY CLAMP 200MM 7.25T C/S GALVANISED	1	1	0

Continued...

All goods remain the property of Phoenix Beattie until paid for in full. Any damage or shortage on this delivery must be advised within 5 days. Returns may be subject to a handling charge.

Coflex Hose Certification



Fluid Technology  
Quality Document

<b>QUALITY CONTROL INSPECTION AND TEST CERTIFICATE</b>			CERT. N°: 746	
PURCHASER: Phoenix Beattie Co.			P.O. N°: 002491	
CONTITECH ORDER N°: 412638		HOSE TYPE: 3" ID Choke and Kill Hose		
HOSE SERIAL N°: 52777		NOMINAL / ACTUAL LENGTH: 10,67 m		
W.P. 68,96 MPa 10000 psi		T.P. 103,4 MPa 15000 psi		Duration: 60 ~ min.
Pressure test with water at ambient temperature  <p align="center">See attachment. (1 page)</p>				
↑ 10 mm = 10 Min. → 10 mm = 25 MPa				
<b>COUPLINGS</b>				
Type	Serial N°	Quality	Heat N°	
3" coupling with 4 1/16" Flange end	917 913	AISI 4130	T7998A	
		AISI 4130	28884	
<b>INFOCHIP INSTALLED</b>			API Spec 16 C Temperature rate: "B"	
All metal parts are flawless				
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.				
Date:	Inspector	Quality Control		
04. April. 2008		ContinTech Rubber Industrial Kit. Quality Control Dept. 		

Coflex Hose Certification

Form No 100/12



**Phoenix Beattie Corp**

11535 Brifemore Park Drive  
Houston, TX 77041  
Tel: (281) 317-0141  
Fax: (281) 317-0140  
E-mail: [enr1@phoenixbeattie.com](mailto:enr1@phoenixbeattie.com)  
[www.phoenixbeattie.com](http://www.phoenixbeattie.com)

## Delivery Note

<b>Customer Order Number</b>	370-369-001	<b>Delivery Note Number</b>	003078	<b>Page</b>	2
<b>Customer / Invoice Address</b> HELMERICH & PAYNE INT'L DRILLING CO 1437 SOUTH BOULDER TULSA, OK 74119		<b>Delivery / Address</b> HELMERICH & PAYNE IDC ATTN: JOE STEPHENSON - RIG 370 13609 INDUSTRIAL ROAD HOUSTON, TX 77015			

<b>Customer Acc No</b>	<b>Phoenix Beattie Contract Manager</b>	<b>Phoenix Beattie Reference</b>	<b>Date</b>
H01	J.J.L.	006330	05/23/2008

Item No	Beattie Part Number / Description	Qty Ordered	Qty Sent	Qty To Follow
4	SC725-132CS SAFETY CLAMP 132MM 7.25T C/S GALVANIZED C/H BOLTS	1	1	0
5	DDCERT-HYDRO HYDROSTATIC PRESSURE TEST CERTIFICATE	1	1	0
6	DDCERT-LOAD LOAD TEST CERTIFICATES	1	1	0
7	DDFREIGHT INBOUND / OUTBOUND FREIGHT PRE-PAY & ADD TO FINAL INVOICE NOTE: MATERIAL MUST BE ACCOMPANIED BY PAPERWORK INCLUDING THE PURCHASE ORDER, RIG NUMBER TO ENSURE PROPER PAYMENT	1	1	0

Phoenix Beattie Inspection Signature : \_\_\_\_\_

Received In Good Condition : Signature \_\_\_\_\_

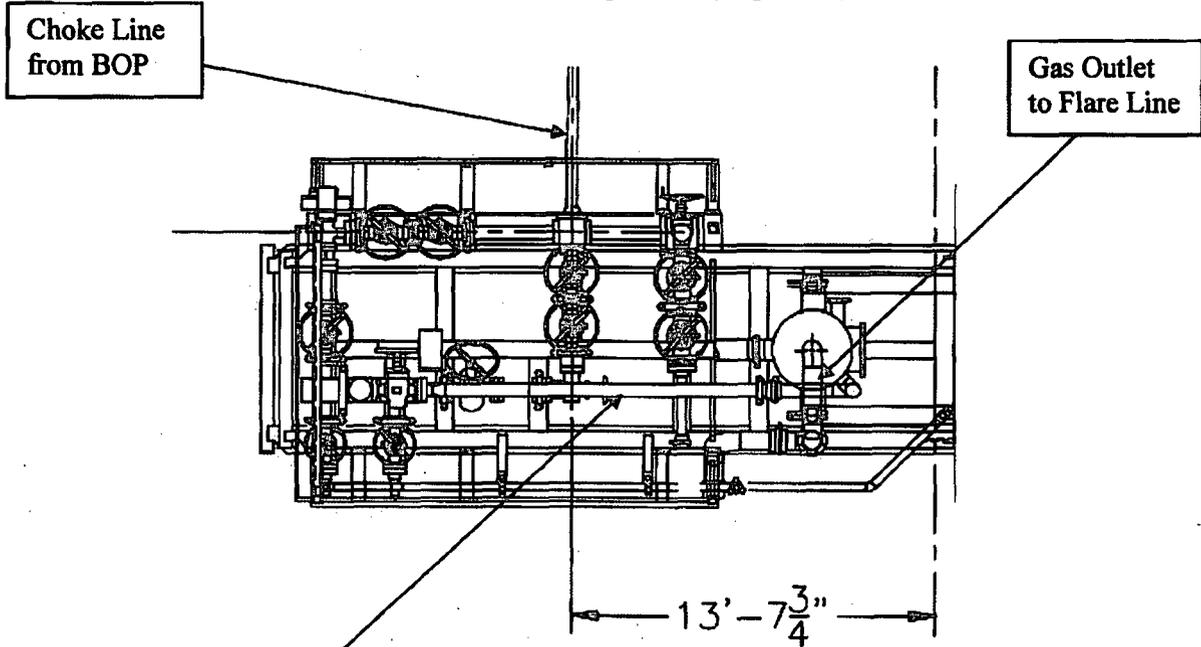
Print Name \_\_\_\_\_

Date \_\_\_\_\_

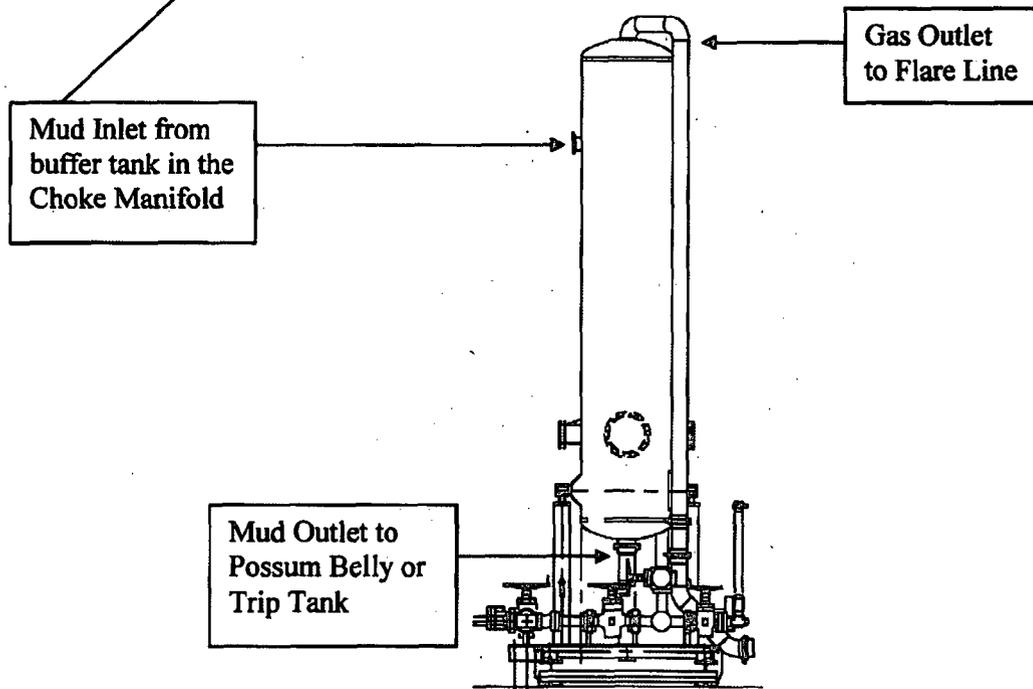
All goods remain the property of Phoenix Beattie until paid for in full. Any damage or shortage on this delivery must be advised within 6 days. Returns may be subject to a handling charge.



**Choke Manifold - Gas Separator (Top View)**



**Choke Manifold - Gas Separator (Side View)**





## **Permian Drilling Hydrogen Sulfide Drilling Operations Plan New Mexico**

### **Scope**

This contingency plan establishes guidelines for the public, all company employees, and contract employees who's work activities may involve exposure to hydrogen sulfide (H<sub>2</sub>S) gas.

While drilling this well, it is possible to encounter H<sub>2</sub>S bearing formations. At all times, the first barrier to control H<sub>2</sub>S emissions will be the drilling fluid, which will have a density high enough to control influx.

### **Objective**

1. Provide an immediate and predetermined response plan to any condition when H<sub>2</sub>S is detected. All H<sub>2</sub>S detections in excess of 10 parts per million (ppm) concentration are considered an Emergency.
2. Prevent any and all accidents, and prevent the uncontrolled release of hydrogen sulfide into the atmosphere.
3. Provide proper evacuation procedures to cope with emergencies.
4. Provide immediate and adequate medical attention should an injury occur.

## Discussion

<b>Implementation:</b>	This plan with all details is to be fully implemented before drilling to <u>commence</u> .
<b>Emergency response Procedure:</b>	This section outlines the conditions and denotes steps to be taken in the event of an emergency.
<b>Emergency equipment Procedure:</b>	This section outlines the safety and emergency equipment that will be required for the drilling of this well.
<b>Training provisions:</b>	This section outlines the training provisions that must be adhered to prior to drilling.
<b>Drilling emergency call lists:</b>	Included are the telephone numbers of all persons to be contacted should an emergency exist.
<b>Briefing:</b>	This section deals with the briefing of all people involved in the drilling operation.
<b>Public safety:</b>	Public safety personnel will be made aware of any potential evacuation and any additional support needed.
<b>Check lists:</b>	Status check lists and procedural check lists have been included to insure adherence to the plan.
<b>General information:</b>	A general information section has been included to supply support information.

## Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on the well:

1. The hazards and characteristics of H2S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H2S detection.
4. Proper use of H2S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
5. Proper techniques for first aid and rescue procedures.
6. Physical effects of hydrogen sulfide on the human body.
7. Toxicity of hydrogen sulfide and sulfur dioxide.
8. Use of SCBA and supplied air equipment.
9. First aid and artificial respiration.
10. Emergency rescue.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H2S on metal components. If high tensile strength tubular is to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling a well, blowout prevention and well control procedures.
3. The contents and requirements of the H2S Drilling Operations Plan.

H2S training refresher must have been taken within one year prior to drilling the well. Specifics on the well to be drilled will be discussed during the pre-spud meeting. H2S and well control (choke) drills will be performed while drilling the well, at least on a weekly basis. This plan shall be available in the well site. All personnel will be required to carry the documentation proving that the H2S training has been taken.

### Service company and visiting personnel

- A. Each service company that will be on this well will be notified if the zone contains H2S.
- B. Each service company must provide for the training and equipment of their employees before they arrive at the well site.
- C. Each service company will be expected to attend a well site briefing

## Emergency Equipment Requirements

### 1. Well control equipment

The well shall have hydraulic BOP equipment for the anticipated pressures. Equipment is to be tested on installation and follow Oxy Well Control standard, as well as BLM Onshore Order #2.

*Special control equipment:*

- A. Hydraulic BOP equipment with remote control on ground. Remotely operated choke.
- B. Rotating head
- C. Gas buster equipment shall be installed before drilling out of surface pipe.

### 2. Protective equipment for personnel

- A. Four (4) 30-minute positive pressure air packs (2 at each briefing area) on location.
- B. Adequate fire extinguishers shall be located at strategic locations.
- C. Radio / cell telephone communication will be available at the rig.
  - Rig floor and trailers.
  - Vehicle.

### 3. Hydrogen sulfide sensors and alarms

- A. H<sub>2</sub>S sensor with alarms will be located on the rig floor, at the bell nipple, and at the flow line. These monitors will be set to alarm at 10 ppm with strobe light, and audible alarm.
- B. Hand operated detectors with tubes.
- C. H<sub>2</sub>S monitor tester (to be provided by contract Safety Company.)
- D. There shall be one combustible gas detector on location at all times.

### 4. Visual Warning Systems

- A. One sign located at each location entrance with the following language:

**Caution – potential poison gas  
Hydrogen sulfide  
No admittance without authorization**

*Wind sock – wind streamers:*

- A. One 36" (in length) wind sock located at protection center, at height visible from rig floor.
- B. One 36" (in length) wind sock located at height visible from pit areas.

*Condition flags*

- A. One each condition flag to be displayed to denote conditions.

**green – normal conditions**  
**yellow – potential danger**  
**red – danger, H2S present**

- B. Condition flag shall be posted at each location sign entrance.

5. Mud Program

The mud program is designed to minimize the risk of having H2S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H2S scavengers will be used to minimize the hazards while drilling. Below is a summary of the drilling program.

*Mud inspection devices:*

Garrett gas train or hatch tester for inspection of sulfide concentration in mud system.

6. Metallurgy

- A. Drill string, casing, tubing, wellhead, blowout preventers, drilling spools or adapters, kill lines, choke manifold, lines and valves shall be suitable for the H2S service.
- B. All the elastomers, packing, seals and ring gaskets shall be suitable for H2S service.

7. Well Testing

No drill stem test will be performed on this well.

8. Evacuation plan

Evacuation routes should be established prior to well spud for each well and discussed with all rig personnel.

9. Designated area

- A. Parking and visitor area: all vehicles are to be parked at a predetermined safe distance from the wellhead.
- B. There will be a designated smoking area.
- C. Two briefing areas on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area.

Emergency procedures

- A. In the event of any evidence of H2S level above 10 ppm, take the following steps:
  - 1. The Driller will pick up off bottom, shut down the pumps, slow down the pipe rotation.
  - 2. Secure and don escape breathing equipment, report to the upwind designated safe briefing / muster area.
  - 3. All personnel on location will be accounted for and emergency search should begin for any missing, the Buddy System will be implemented.
  - 4. Order non-essential personnel to leave the well site, order all essential personnel out of the danger zone and upwind to the nearest designated safe briefing / muster area.
  - 5. Entrance to the location will be secured to a higher level than our usual "Meet and Greet" requirement, and the proper condition flag will be displayed at the entrance to the location.
  - 6. Take steps to determine if the H2S level can be corrected or suppressed and, if so, proceed as required.
- B. If uncontrollable conditions occur:
  - 1. Take steps to protect and/or remove any public in the down-wind area from the rig – partial evacuation and isolation. Notify necessary public safety personnel and appropriate regulatory entities (i.e. BLM) of the situation.

2. Remove all personnel to the nearest upwind designated safe briefing / muster area or off location.
3. Notify public safety personnel of safe briefing / muster area.
4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.
5. Proceed with best plan (at the time) to regain control of the well. Maintain tight security and safety procedures.

**C. Responsibility:**

1. Designated personnel.

- a. Shall be responsible for the total implementation of this plan.
- b. Shall be in complete command during any emergency.
- c. Shall designate a back-up.

**All personnel:**

1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw
2. Check status of personnel (buddy system).
3. Secure breathing equipment.
4. Await orders from supervisor.

**Drill site manager:**

1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area.
2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system).
3. Determine H2S concentrations.
4. Assess situation and take control measures.

**Tool pusher:**

1. Don escape unit Report to up nearest upwind designated safe briefing / muster area.
2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system).
3. Determine H2S concentration.
4. Assess situation and take control measures.

**Driller:**

1. Don escape unit, shut down pumps, continue

rotating DP.

2. Check monitor for point of release.
3. Report to nearest upwind designated safe briefing / muster area.
4. Check status of personnel (in an attempt to rescue, use the buddy system).
5. Assigns least essential person to notify Drill Site Manager and tool pusher by quickest means in case of their absence.
6. Assumes the responsibilities of the Drill Site Manager and tool pusher until they arrive should they be absent.

Derrick man  
Floor man #1  
Floor man #2

1. Will remain in briefing / muster area until instructed by supervisor.

Mud engineer:

1. Report to nearest upwind designated safe briefing / muster area.
2. When instructed, begin check of mud for pH and H<sub>2</sub>S level. (Garrett gas train.)

Safety personnel:

1. Mask up and check status of all personnel and secure operations as instructed by drill site manager.

### **Taking a kick**

When taking a kick during an H<sub>2</sub>S emergency, all personnel will follow standard Well control procedures after reporting to briefing area and masking up.

### **Open-hole logging**

All unnecessary personnel off floor. Drill Site Manager and safety personnel should monitor condition, advise status and determine need for use of air equipment.

### **Running casing or plugging**

Following the same "tripping" procedure as above. Drill Site Manager and safety personnel should determine if all personnel have access to protective equipment.

### Ignition procedures

The decision to ignite the well is the responsibility of the operator (Oxy Drilling Management). The decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope controlling the blowout under the prevailing conditions at the well.

### Instructions for igniting the well

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man (tool pusher or safety engineer) will check the atmosphere for explosive gases with the gas monitor. The other man is responsible for igniting the well.
2. Primary method to ignite: 25 mm flare gun with range of approximately 500 feet.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site best for protection, and which offers an easy escape route.
5. Before firing, check for presence of combustible gas.
6. After lighting, continue emergency action and procedure as before.
7. All unassigned personnel will remain in briefing area until instructed by supervisor or directed by the Drill Site Manager.

**Remember:** After well is ignited, burning hydrogen sulfide will convert to sulfur dioxide, which is also highly toxic. **Do not assume the area is safe after the well is ignited.**

**Status check list**

Note: All items on this list must be completed before drilling to production casing point.

1. H2S sign at location entrance.
2. Two (2) wind socks located as required.
3. Four (4) 30-minute positive pressure air packs (2 at each Briefing area) on location for all rig personnel and mud loggers.
4. Air packs inspected and ready for use.
5. Cascade system and hose line hook-up as needed.
6. Cascade system for refilling air bottles as needed.
7. Condition flag on location and ready for use.
8. H2S detection system hooked up and tested.
9. H2S alarm system hooked up and tested.
10. Hand operated H2S detector with tubes on location.
11. 1 – 100' length of nylon rope on location.
12. All rig crew and supervisors trained as required.
13. All outside service contractors advised of potential H2S hazard on well.
14. No smoking sign posted and a designated smoking area identified.
15. Calibration of all H2S equipment shall be noted on the IADC report.

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

### **Procedural check list during H2S events**

#### **Perform each tour:**

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to ensure that it is in proper working order.
3. Make sure all the H2S detection system is operative.

#### **Perform each week:**

1. Check each piece of breathing equipment to make sure that demand or forced air regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you receive air or feel air flow.
2. BOP skills (well control drills).
3. Check supply pressure on BOP accumulator stand by source.
4. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.
5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume. ( Air quality checked for proper air grade "D" before bringing to location)
6. Confirm pressure on all supply air bottles.
7. Perform breathing equipment drills with on-site personnel.
8. Check the following supplies for availability.
  - A. Emergency telephone list.
  - B. Hand operated H2S detectors and tubes.

### **General evacuation plan**

1. When the company approved supervisor (Drill Site Manager, consultant, rig pusher, or driller) determines the H<sub>2</sub>S gas cannot be limited to the well location and the public will be involved, he will activate the evacuation plan.
2. Drill Site Manager or designee will notify local government agency that a hazardous condition exists and evacuation needs to be implemented.
3. Company or contractor safety personnel that have been trained in the use of H<sub>2</sub>S detection equipment and self-contained breathing equipment will monitor H<sub>2</sub>S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.
4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.
5. After the discharge of gas has been controlled, company safety personnel will determine when the area is safe for re-entry.

**Important: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.**

### **Emergency actions**

#### **Well blowout – if emergency**

1. Evacuate all personnel to “Safe Briefing / Muster Areas” or off location if needed.
2. If sour gas – evacuate rig personnel.
3. If sour gas – evacuate public within 3000 ft radius of exposure.
4. Don SCBA and shut well in if possible using the buddy system.
5. Notify Drilling Superintendent and call 911 for emergency help (fire dept and ambulance) if needed.
6. Implement the Blowout Contingency Plan, and Drilling Emergency Action Plan.
6. Give first aid as needed.

#### **Person down location/facility**

1. If immediately possible, contact 911. Give location and wait for confirmation.
2. Don SCBA and perform rescue operation using buddy system.

### Toxic effects of hydrogen sulfide

Hydrogen sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 ppm, which is .001% by volume. Hydrogen sulfide is heavier than air (specific gravity – 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in table i. Physical effects at various hydrogen sulfide exposure levels are shown in table ii.

Table i  
Toxicity of various gases

Common name	Chemical formula	Specific gravity (sc=1)	Threshold limit (1)	Hazardous limit (2)	Lethal concentration (3)
Hydrogen Cyanide	Hcn	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	H2S	1.18	10 ppm	250 ppm/hr	600 ppm
Sulfur Dioxide	So2	2.21	5 ppm	-	1000 ppm
Chlorine	Cl2	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	Co	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	Co2	1.52	5000 ppm	5%	10%
Methane	Ch4	0.55	90,000 ppm	Combustible above 5% in air	

- 1) threshold limit – concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.
- 2) hazardous limit – concentration that will cause death with short-term exposure.
- 3) lethal concentration – concentration that will cause death with short-term exposure.

### Toxic effects of hydrogen sulfide

Table ii  
Physical effects of hydrogen sulfide

<u>Percent (%)</u>	<u>Ppm</u>	<u>Concentration</u> Grains <u>100 std. Ft3*</u>	<u>Physical effects</u>
0.001	<10	00.65	Obvious and unpleasant odor.

0.002	10	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 - 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; stings eyes and throat.
0.050	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; followed by death within minutes.

\*at 15.00 psia and 60'f.

### **Use of self-contained breathing equipment (SCBA)**

1. Written procedures shall be prepared covering safe use of SCBA's in dangerous atmosphere, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available SCBA.
2. SCBA's shall be inspected frequently at random to insure that they are properly used, cleaned, and maintained.
3. Anyone who may use the SCBA's shall be trained in how to insure proper face-piece to face seal. They shall wear SCBA's in normal air and then wear them in a test atmosphere. (note: such items as facial hair {beard or sideburns} and eyeglasses will not allow proper seal.) Anyone that may be reasonably expected to wear SCBA's should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses or contact lenses.
4. Maintenance and care of SCBA's:
  - a. A program for maintenance and care of SCBA's shall include the following:
    1. Inspection for defects, including leak checks.
    2. Cleaning and disinfecting.
    3. Repair.
    4. Storage.
  - b. Inspection, self-contained breathing apparatus for emergency use shall be inspected monthly.
    1. Fully charged cylinders.
    2. Regulator and warning device operation.
    3. Condition of face piece and connections.
    4. Rubber parts shall be maintained to keep them pliable and prevent deterioration.
  - c. Routinely used SCBA's shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.
5. Persons assigned tasks that requires use of self-contained breathing equipment shall be certified physically fit (medically cleared) for breathing equipment usage at least annually.
6. SCBA's should be worn when:
  - A. Any employee works near the top or on top of any tank unless test reveals less than 10 ppm of H<sub>2</sub>S.

- B. When breaking out any line where H2S can reasonably be expected.
- C. When sampling air in areas to determine if toxic concentrations of H2S exists.
- D. When working in areas where over 10 ppm H2S has been detected.
- E. At any time there is a doubt as to the H2S level in the area to be entered.

**Rescue**  
**First aid for H2S poisoning**

**Do not panic!**

**Remain calm – think!**

1. Don SCBA breathing equipment.
2. Remove victim(s) utilizing buddy system to fresh air as quickly as possible. (go up-wind from source or at right angle to the wind. Not down wind.)
3. Briefly apply chest pressure – arm lift method of artificial respiration to clean the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs.
4. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.
5. Hospital(s) or medical facilities need to be informed, before-hand, of the possibility of H2S gas poisoning – no matter how remote the possibility is.
6. Notify emergency room personnel that the victim(s) has been exposed to H2S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration.

Revised CM 6/27/2012



**Permian Drilling  
Hydrogen Sulfide Drilling Operations Plan  
Norma 22 Federal 2H**

Open drill site. No homes or buildings are near the proposed location.

1. Escape

Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the WEST side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction, then a secondary egress route should be taken.



Oxy U.S.A Inc.

New Mexico Staking Form

Date Staked: 6-26-14

Lease/Well Name: Norma 22 Fed #2H

Legal Description: 1970 FNL 420 FWL Sec 23 T20S R28E

Latitude: 32. 33' 39.47" NAD 83

Longitude: 104. 09' 19.97"

Move Information: 210' North Due To Buried Pipeline

County: Eddy

Surface Owner/Tenant: BLM

Nearest Residence: 3 miles?

Nearest Water Well: \_\_\_\_\_

V-Door: West

Road Description: Road into NE corner from NORTH

New Road: 1200'

Upgrade Existing Road: \_\_\_\_\_

Interim Reclamation: 50' SOUTH 80' EAST 30' West

Source of Caliche: \_\_\_\_\_

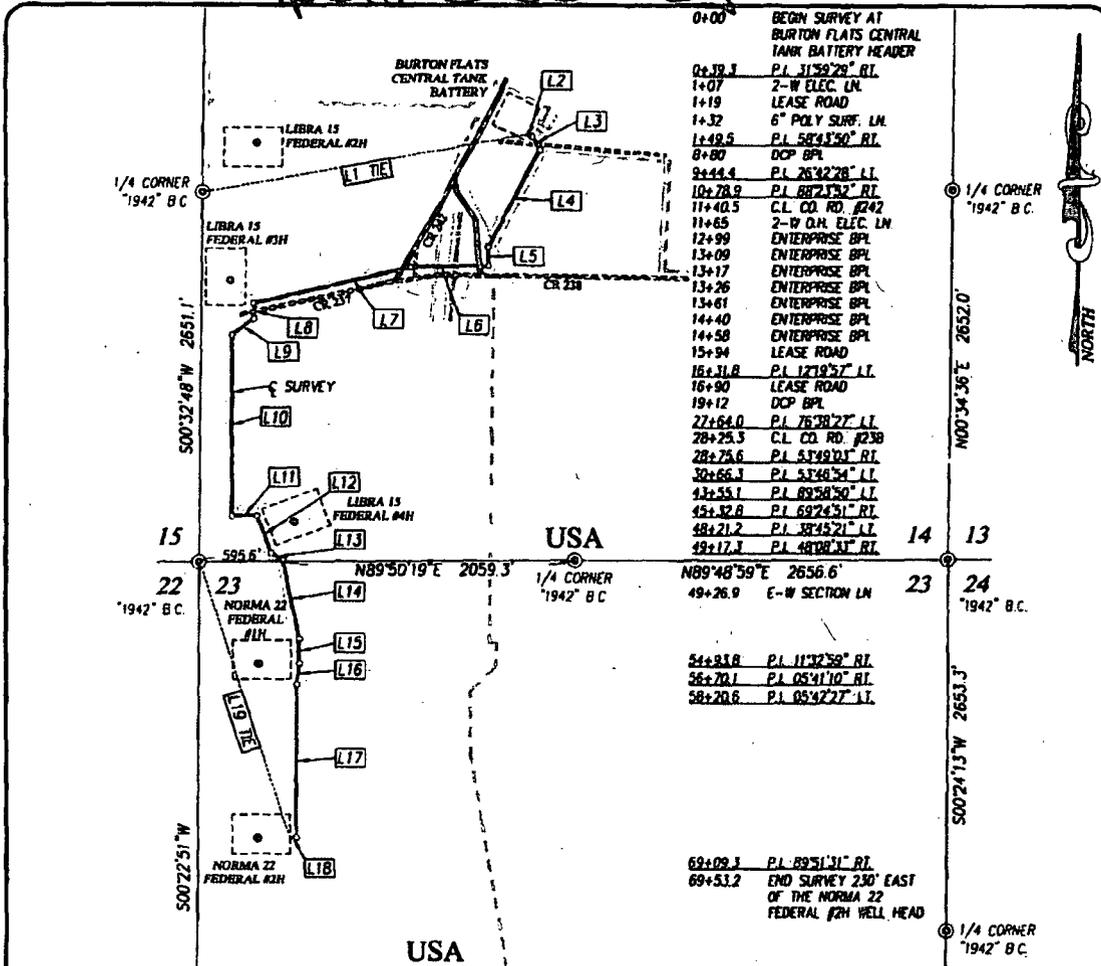
Top Soil: West

Onsite Date Performed: 8-8-14

Onsite Attendees: Indra DANAL-BLM Jim Wilson-Oxy  
Mike Wilson-Oxy Terry Hsel-Hsel Survey

Special Notes: \_\_\_\_\_

# Pipeline Survey



**DESCRIPTION**  
 SURVEY OF A STRIP OF LAND 50.0 FEET WIDE AND 6953.2 FEET OR 1.317 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 14 & 23, TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 25.0 FEET LEFT AND 25.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

LINE	BEARING	DISTANCE
L1 TIE	N79°41'11"E	2326.5'
L2	S63°26'41"E	39.3'
L3	S31°27'12"E	110.2'
L4	S27°16'38"W	794.9'
L5	S00°34'10"W	134.5'
L6	S88°58'02"W	552.9'
L7	S76°38'05"W	1132.2'
L8	S00°00'24"E	111.6'
L9	S53°48'39"W	190.7'
L10	S00°01'45"W	1288.8'
L11	S89°57'05"E	177.7'
L12	S20°32'14"E	288.4'
L13	S59°17'35"E	96.1'
L14	S11°09'02"E	576.5'
L15	S00°23'57"W	176.3'
L16	S06°05'07"W	150.5'
L17	S00°22'40"W	1088.7'
L18	N89°45'49"W	43.9'
L19 TIE	S17°55'31"E	2069.7'

**NOTE**  
 BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION, THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT THIS IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON  
 DATE: \_\_\_\_\_



## OXY U.S.A. INC.

SURVEY FOR A PIPELINE TO THE NORMA 22 FEDERAL #2H CROSSING SECTIONS 14 & 23, TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO HOBBS, N.M. 88240  
 (575) 393-3117 www.jwsc.biz  
 TBPLS# 10021000

Survey Date: 8/22/14	CAD Date: 9/19/14	Drawn By: ACK
W.O. No.: 14110797	Rev.:	Rel. W.O.:

Pipeline Survey

CARRIER PIPE  
CASING OR HEAVY WALL PIPE

CONTENTS:  
MATERIAL:  
OUTSIDE DIA:  
GRADE & SPEC:  
WALL THICKNESS:



NOTE:  
BEARINGS AND COORDINATE VALUES SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE", NORTH AMERICAN DATUM OF 1983. DISTANCES ARE SURFACE VALUES. ELEVATIONS ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM 1988 (GEOID 2003).

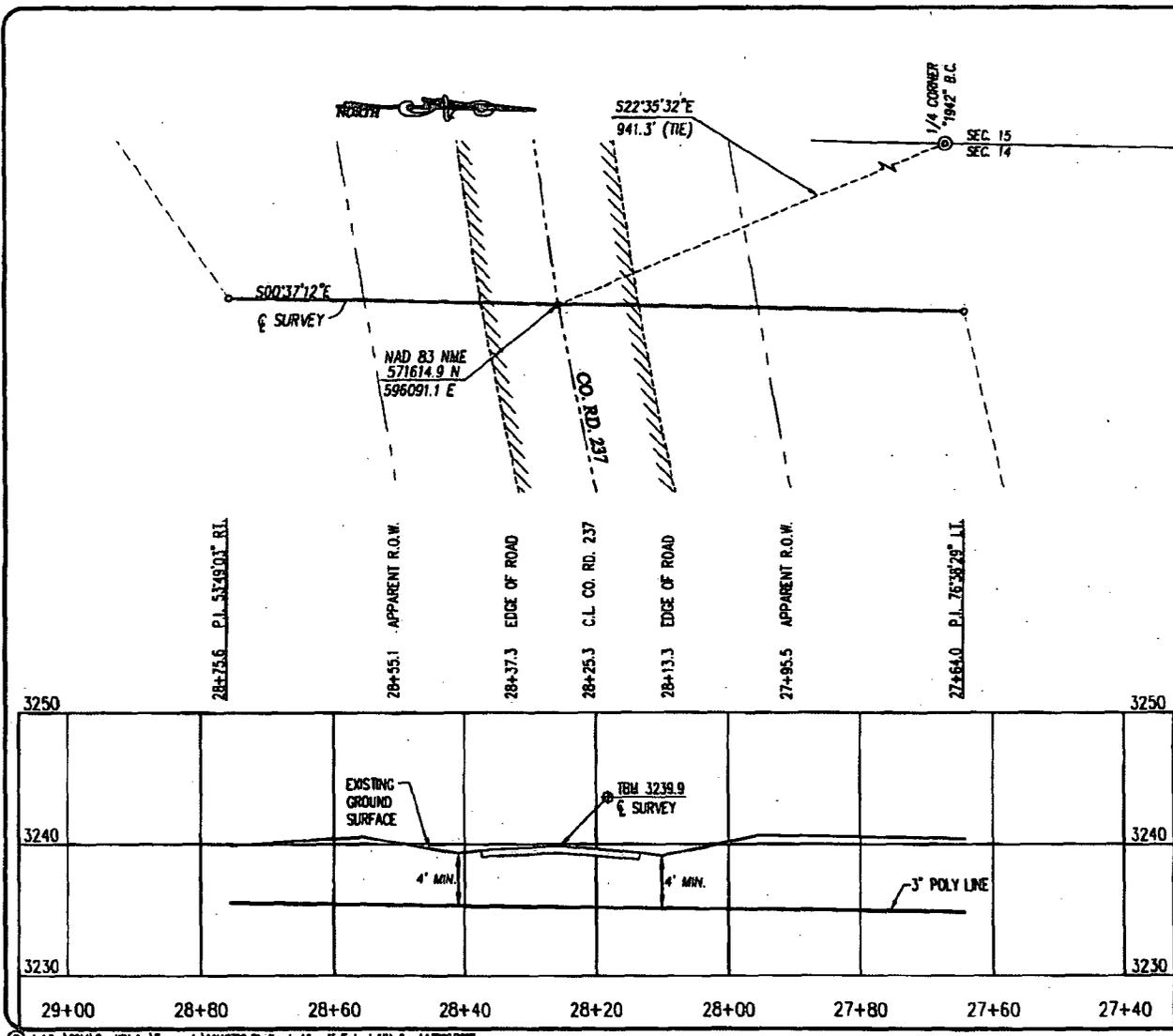
**OXY U.S.A. INC.**

NORMA 22 FEDERAL #2H PIPELINE  
CROSSING UNDER EDDY CO. RD. #237  
ANGEL RANCH ROAD IN SECTION 14,  
TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO

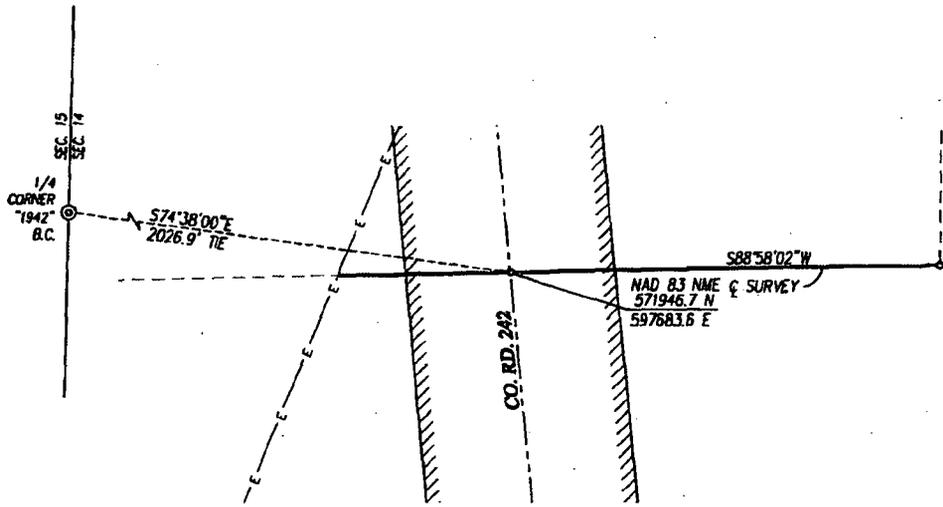
PROVIDING SURVEYING SERVICES  
SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
412 N. DAL PASO HOBBS, N.M. 88240  
(575) 393-3117 www.jwsc.biz  
TBP15# 10021000

SCALE  
HORZ: 1"=20'  
VERT: 1"=10'

Drawn By: ACK  
Date: 9/19/14  
W.O. No.: 14110797



© Arjdon\2014\Dry ISA for Encasement\14110799 Pipeline to Libre 15 Federal P.M. Sec 14, 1205, 02E

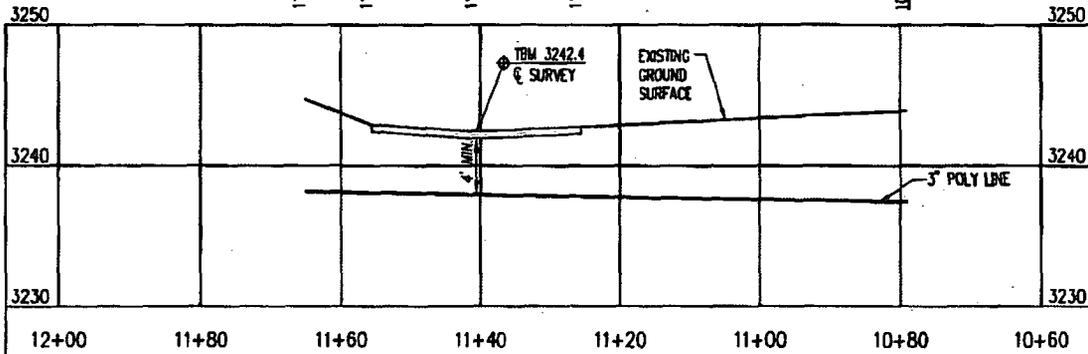


CARRIER PIPE  
CASING  
OR HEAVY  
WALL PIPE

CONTENTS:  
MATERIAL:  
OUTSIDE DIA:  
GRADE & SPEC:  
WALL THICKNESS:



11+65.2 2-W ELEC. LN.  
11+55.5 EDGE OF ROAD  
11+40.5 C.L. CO. RD. 242  
11+25.5 EDGE OF ROAD  
10+78.9 P.I. 882352' RT.



NOTE:  
BEARINGS AND COORDINATE VALUES SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE", NORTH AMERICAN DATUM OF 1983. DISTANCES ARE SURFACE VALUES. ELEVATIONS ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM 1988 (GEOID 2003).

**OXY U.S.A. INC.**

**NORMA 22 FEDERAL #2H PIPELINE  
CROSSING UNDER EDDY CO. RD. #242  
BUCKSKIN ROAD IN SECTION 14,  
TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO**

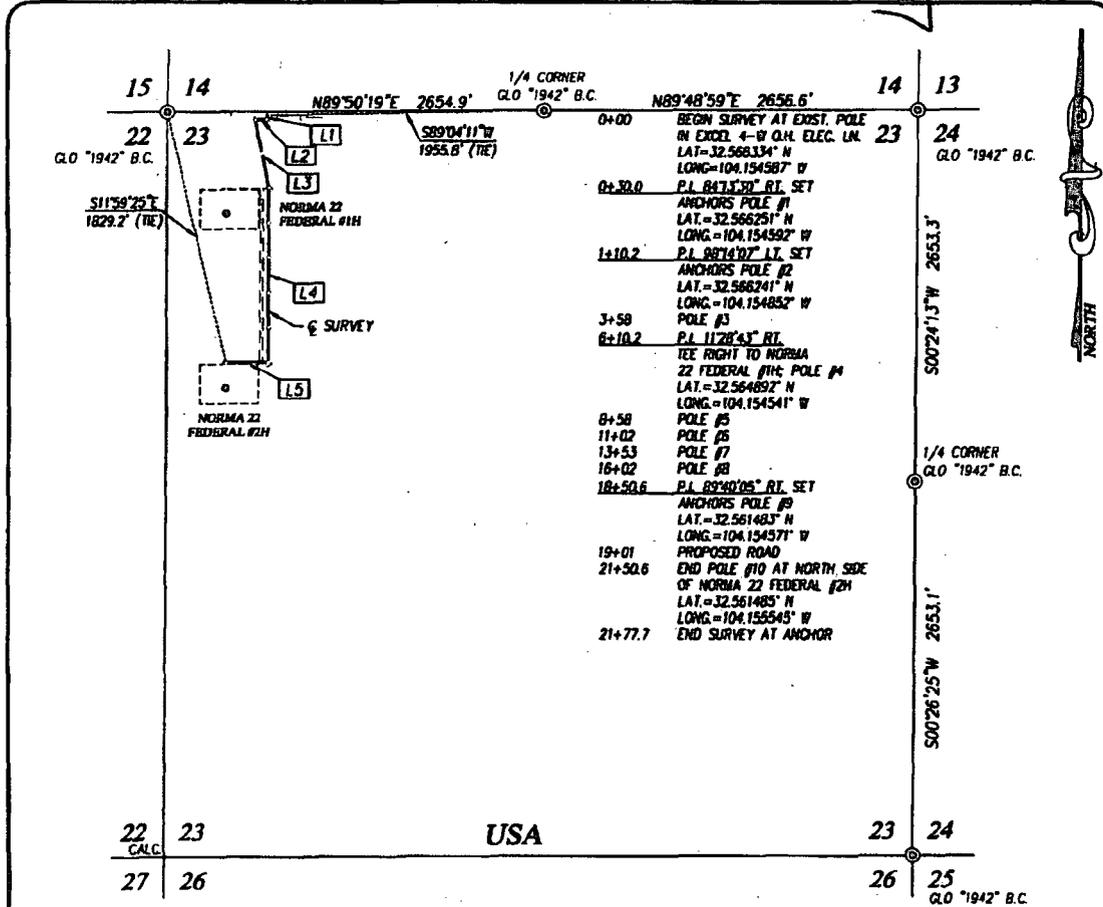


PROVIDING SURVEYING SERVICES  
SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
412 N. DAL PASO HOBBS, N.M. 88240  
(575) 393-3117 www.jwsc.biz  
TBPLSP 10021000

SCALE  
HORZ.: 1"=20'  
VERT.: 1"=10'  
Drawn By: ACK  
Date: 9/19/14  
W.O. No.: 14110797

Pipeline Survey

# Electric Line Survey



### DESCRIPTION

SURVEY OF A STRIP OF LAND 50.0 FEET WIDE AND 2177.7 FEET OR 0.412 MILES IN LENGTH CROSSING USA LAND IN SECTION 23, TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 25.0 FEET LEFT AND 25.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

### NOTE

- 1) BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.
- 2) LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983 (NAD83).

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY, PLAN AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED, WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION, THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO, AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON

DATE: 10/14/14

LINE	BEARING	DISTANCE
L1	S02°52'05"W	30.0'
L2	S87°05'35"W	80.2'
L3	S117°08'32"E	500.0'
L4	S00°20'11"W	1240.4'
L5	N89°59'44"W	327.1'

### LEGEND

© DENOTES FOUND CORNER AS NOTED



## OXY U.S.A. INC.

SURVEY FOR AN ELECTRIC LINE TO THE NORMA 22 FEDERAL #2H CROSSING SECTION 23, TOWNSHIP 20 SOUTH, RANGE 28 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

Survey Date: 10/14/14

CAD Date: 11/6/14

Drawn By: ACK

W.O. No.: 14111079

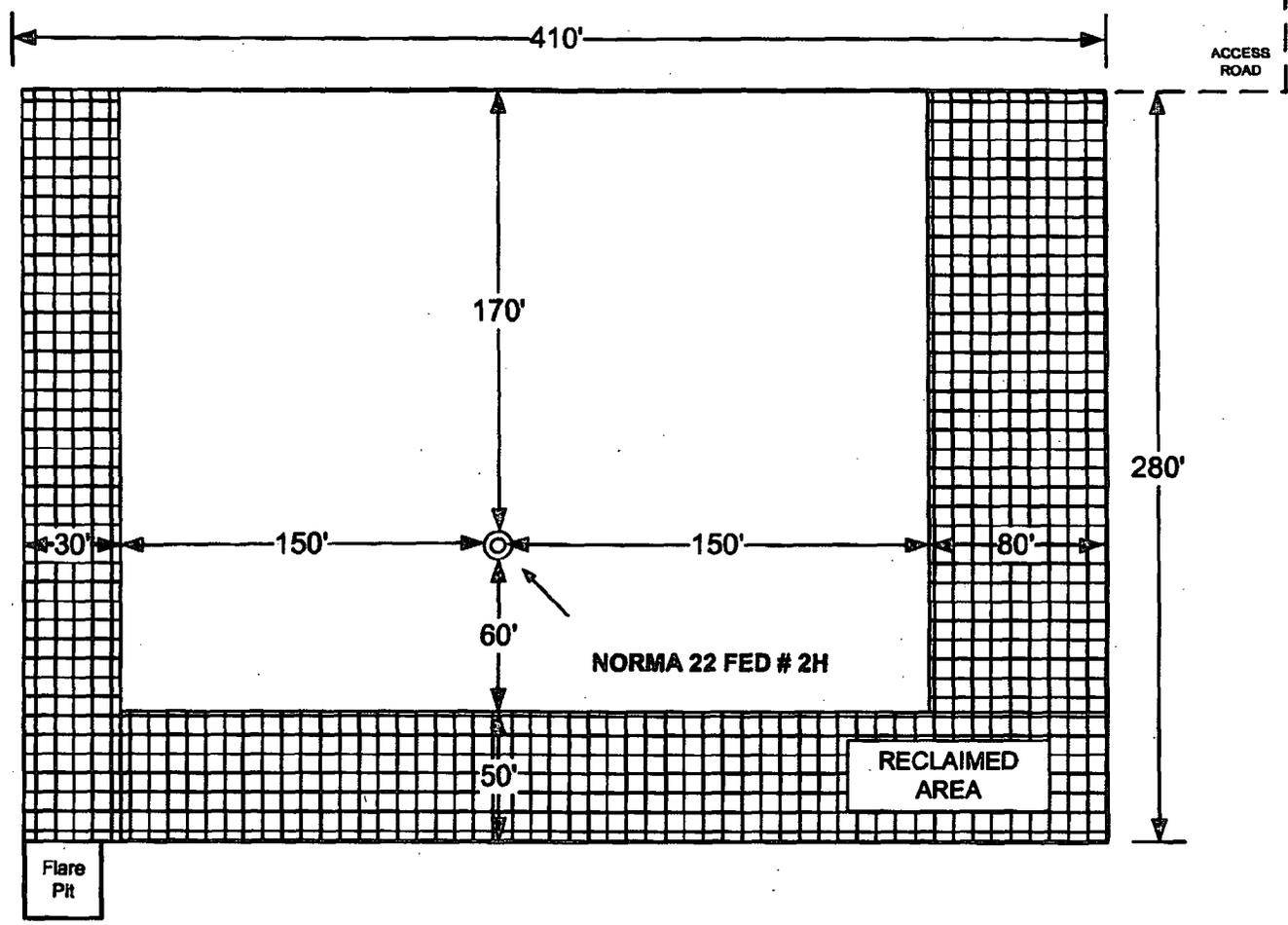
Rev.:

Rel. W.O.:

Sheet 1 of 1



Wellsite Reclamation



NORTH ↑

8' Diameter x 8' Deep Tinhorn Cellar

REVISION BLOCK					ENGINEERING RECORD		
NO.	DATE	DESCRIPTION	BY	CHK	APP	BY	DATE

**FLEX 3 RIG DIAGRAM**  
NORMA 22 FED # 2H

EDDY COUNTY, NEW MEXICO

## Surface Use Plan of Operations

### Introduction

The following surface use plan of operations will be followed and carried out once the APD is approved. No other disturbance will be created other than what was submitted in this surface use plan. If any other surface disturbance is needed after the APD is approved, a BLM approved sundry notice or right of way application will be acquired prior to any new surface disturbance.

Before any surface disturbance is created, stakes or flagging will be installed to mark boundaries of permitted areas of disturbance, including soils, storage areas. As necessary, slope, grade, and other construction control stakes will be placed to ensure construction in accordance with the surface use plan. All boundary markers will be maintained in place until final construction cleanup is completed. If disturbance boundary markers are disturbed or knocked down, they will be replaced before construction proceeds.

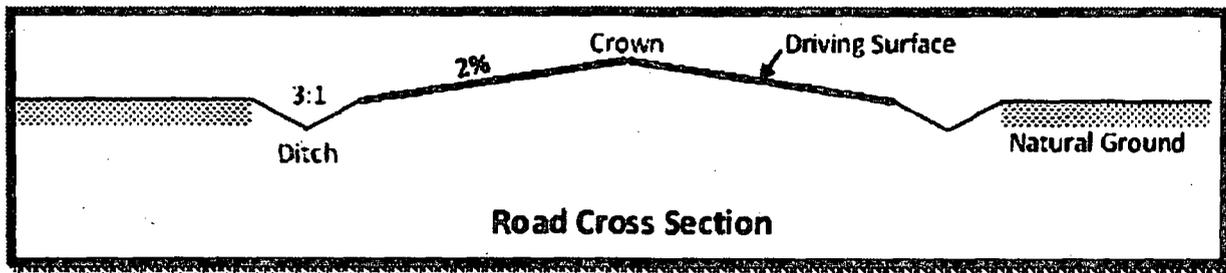
If terms and conditions are attached to the approved APD and amend any of the proposed actions in this surface use plan, we will adhere to the terms and conditions.

### 1. Existing Roads

- a. The existing access road route to the proposed project is depicted on VICINITY MAP. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of this surface use plan..
- b. The existing access road route to the proposed project does not cross lease or unit boundaries, so a BLM right-of-way grant will not be acquired for this proposed road route.
- c. The operator will improve or maintain existing roads in a condition the same as or better than before operations begin. The operator will repair pot holes, clear ditches, repair the crown, etc. All existing structures on the entire access route such as cattleguards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.
- d. We will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or wind events. BLM written approval will be acquired before application of surfactants, binding agents, or other dust suppression chemicals on roadways.

### 2. New or Reconstructed Access Roads

- a. An access road will be needed for this proposed project. See the survey plat for the location of the access road.
- b. The length of access road needed to be constructed for this proposed project is about 2460 feet.
- c. The maximum driving width of the access road will be 15 feet. The maximum width of surface disturbance when constructing the access road will not exceed 25 feet. All areas outside of the driving surface will be revegetated.
- d. CALICHE
- e. When the road travels on fairly level ground, the road will be crowned and ditched with a 2% slope from the tip of the road crown to the edge of the driving surface. The ditches will be 3 feet wide with 3:1 slopes. See Road Cross Section diagram below.



- f. The access road will be constructed with a ditch on each side of the road.
- g. The maximum grade for the access road will be 1 percent.
- h. No turnouts will be constructed on the proposed access road.
- i. No cattleguards will be installed for this proposed access road.
- j. Since the proposed access road crosses lease boundaries, a right-of-way will be required for this access road. A right-of-way grant will be applied for through the BLM. The access road will not be constructed until an approved BLM right-of-way grant is acquired.
- k. No culverts will be constructed for this proposed access road.
- l. No low water crossings will be constructed for the access road.
- m. Since the access road is on level ground, no lead-off ditches will be constructed for the proposed access road.
- n. Newly constructed or reconstructed roads, on surface under the jurisdiction of the Bureau of Land Management, will be constructed as outlined in the BLM "Gold Book" and to meet the standards of the anticipated traffic flow and all anticipated weather requirements as needed. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.
- o. Waterbars will be installed every 200' on the proposed new road.

### 3. Location of Existing Wells

- a. ONE MILE RADIUS MAP of the APD depicts all known wells within a one mile radius of the proposed well.
- b. There is no other information regarding wells within a one mile radius.

### 4. Location of Existing and/or Proposed Production Facilities

- a. All permanent, lasting more than 6 months, above ground structures including but not limited to pumpjacks, storage tanks, barrels, pipeline risers, meter housing, etc. that are not subject to safety requirements will be painted a non-reflective paint color, Shale Green, from the BLM Standard Environmental Colors chart, unless another color is required in the APD Conditions of Approval.
- b. If any type of production facilities are located on the well pad, they will be strategically placed to allow for maximum interim reclamation, recontouring, and revegetation of the well location.
- c. Production from the proposed well will be transported to the production facility named BURTON FLATS CENTRAL TANK BATTERY. The location of the facility is as follows: NW/4 of Section 14, T20S, R28E, N.M.P.M. Eddy County, N.M..
- d. A pipeline to transport production will be installed from the proposed well to the existing production facility.

i. We plan to install a 4 inch buried POLYETHYLENE pipeline from the proposed well to the offsite production facility. The proposed length of the pipeline will be 6960 feet. The working pressure of the pipeline will be about 125 psi. A 50 feet wide work area will be needed to install the buried pipeline. In areas where blading is allowed, topsoil will be stockpiled and separated from the excavated trench mineral material. Final reclamation procedures will match the procedures in Plans for Surface Reclamation. When the excavated soil is backfilled, it will be compacted to prevent subsidence. No berm over the pipeline will be evident.

ii. PIPELINE SURVEY depicts the proposed production pipeline route from the well to the existing production facility.

iii. Since the proposed pipeline crosses lease boundaries, a right of way grant will be acquired prior to installation of the proposed pipeline.

**If any plans change regarding the production facility or other infrastructure (pipeline, electric line, etc.), we will submit a sundry notice or right of way (if applicable) prior to installation or construction.**

#### **Electric Line(s)**

a. We plan to install an overhead electric line for the proposed well. The proposed length of the electric line will be 2180 feet. ELECTRIC LINE SURVEY depicts the location of the proposed electric line route. The electric line will be construction to provide protection from raptor electrocution.

b. The proposed electric line does not cross lease boundaries, so a right of way grant will not need to be acquired from the BLM.

#### **5. Location and Types of Water**

a. The source and location of the water supply are as follows: This well will be drilled using a combination of water mud systems It will obtained from commercial water stations in the area.

b. The operator will use established or constructed oil and gas roads to transport water to the well site. The operator will try to utilize the identified access route in the surface use plan.

#### **6. Construction Material**

a. CALICHE

#### **7. Methods for Handling Waste**

a. Drilling fluids and produced oil and water from the well during drilling and completion operations will be stored safely and disposed of properly in an NMOCD approved disposal facility.

b. Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility. All trash on and around the well site will be collected for disposal.

c. Human waste and grey water will be properly contained and disposed of properly at a state approved disposal facility.

d. After drilling and completion operations, trash, chemicals, salts, frac sand and other waste material will be removed and disposed of properly at a state approved disposal facility.

e. The well will be drilled utilizing a closed loop system. Drill cutting will be properly disposed of into steel tanks and taken to an NMOCD approved disposal facility.

## 8. Ancillary Facilities

- a. No ancillary facilities will be needed for this proposed project.

## 9. Well Site Layout

- a. The following information is presented in the well site survey plat or diagram:
  - i. reasonable scale (near 1":50')
  - ii. well pad dimensions
  - iii. well pad orientation
  - iv. drilling rig components
  - v. proposed access road
  - vi. elevations of all points
  - vii. topsoil stockpile
  - viii. reserve pit location/dimensions if applicable
  - ix. other disturbances needed (flare pit, stinger, frac farm pad, etc.)
  - x. existing structures within the 600' x 600' archaeological surveyed area (pipelines, electric lines, well pads, etc)
- b. The proposed drilling pad was staked and surveyed by a professional surveyor. The attached survey plat of the well site depicts the drilling pad layout as staked.
- c. A title of a well site diagram is WELLSITE LAYOUT. This diagram depicts the SIZE OF WELL PAD AND RECLAMATION.
- d. Topsoil Salvaging
  - i. Grass, forbs, and small woody vegetation, such as mesquite will be excavated as the topsoil is removed. Large woody vegetation will be stripped and stored separately and respread evenly on the site following topsoil respreading. Topsoil depth is defined as the top layer of soil that contains 80% of the roots. In areas to be heavily disturbed, the top 6 inches of soil material, will be stripped and stockpiled on the perimeter of the well location and along the perimeter of the access road to control run-on and run-off, to keep topsoil viable, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil should include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils. Contaminated soil will not be stockpiled, but properly treated and handled prior to topsoil salvaging.

## 10. Plans for Surface Reclamation

### Reclamation Objectives

- i. The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat and forage loss, visual impact, and weed infestation, during the life of the well or facilities.
- ii. The long-term objective of final reclamation is to return the land to a condition similar to what existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.
- iii. The BLM will be notified at least 3 days prior to commencement of any reclamation procedures.

iv. If circumstances allow, interim reclamation and/or final reclamation actions will be completed no later than 6 months from when the final well on the location has been completed or plugged. We will gain written permission from the BLM if more time is needed.

v. Interim reclamation will be performed on the well site after the well is drilled and completed. WELLSITE RECLAMATION depicts the location and dimensions of the planned interim reclamation for the well site.

#### **Interim Reclamation Procedures (If performed)**

1. Within 30 days of well completion, the well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production.
2. In areas planned for interim reclamation, all the surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.
3. The areas planned for interim reclamation will then be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.
4. Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including cuts & fills. To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
5. Proper erosion control methods will be used on the area to control erosion, runoff and siltation of the surrounding area.
6. The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion is controlled.

#### **Final Reclamation (well pad, buried pipelines, etc.)**

1. Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment.
2. All surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.
3. All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.
4. After all the disturbed areas have been properly prepared, the areas will be seeded with the proper BLM seed mixture, free of noxious weeds. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
5. Proper erosion control methods will be used on the entire area to control erosion, runoff and siltation

of the surrounding area.

6. All unused equipment and structures including pipelines, electric line poles, tanks, etc. that serviced the well will be removed.

7. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, and that erosion is controlled.

## **11. Surface Ownership**

- a. The surface ownership of the proposed project is FEDERAL.

## **12. Other Information**

- a. No other information is needed at this time.

## **13. Maps and Diagrams**

VICINITY MAP - Existing Road  
ONE MILE RADIUS MAP - Wells Within One Mile  
PIPELINE SURVEY - Production Pipeline  
ELECTRIC LINE SURVEY - Electric Line  
WELLSITE LAYOUT - Well Site Diagram  
WELLSITE RECLAMATION - Interim Reclamation

# PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	OXY USA WTP LP
LEASE NO.:	NM17220
WELL NAME & NO.:	2H-Norma 22 Federal
SURFACE HOLE FOOTAGE:	1970'/N & 420'/W
BOTTOM HOLE FOOTAGE	2250'/N & 180'/W, sec. 22
LOCATION:	Section 23, T. 22 S., R.28 E., NMPM
COUNTY:	Eddy County, New Mexico

## TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- General Provisions**
- Permit Expiration**
- Archaeology, Paleontology, and Historical Sites**
- Noxious Weeds**
- Special Requirements**
  - Communitization Agreement
  - Cave/Karst
- Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- Road Section Diagram**
- Drilling**
  - High Cave/Karst
  - Capitan Reef
  - Logging Requirements
  - Waste Material and Fluids
- Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
  - Electric Lines
- Interim Reclamation**
- Final Abandonment & Reclamation**

## **I. GENERAL PROVISIONS**

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## **II. PERMIT EXPIRATION**

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## **IV. NOXIOUS WEEDS**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

### **Communitization Agreement**

A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign. Submit a name change request via Sundry Notice to include "Com".

### **CAVE AND KARST**

\*\* Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

### **Cave/Karst Surface Mitigation**

The following stipulations will be applied to minimize impacts during construction, drilling and production.

#### **Construction:**

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

#### **No Blasting:**

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

#### **Tank Battery Liners and Berms:**

Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

#### **Leak Detection System:**

A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

#### **Automatic Shut-off Systems:**

Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

### **Cave/Karst Subsurface Mitigation**

The following stipulations will be applied to protect cave/karst and ground water concerns:

#### **Rotary Drilling with Fresh Water:**

Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

**Directional Drilling:**

Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

**Lost Circulation:**

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

**Abandonment Cementing:**

Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

**Pressure Testing:**

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

**Stipulations For Roads:**

Roads will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems. Turnout ditches and drainage leadoffs will not be constructed in such a manner as to increase or decrease the natural flow of water into or out of cave or karst features. The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction and no further construction will be done until clearance has been issued by the Authorized Officer. Special restoration stipulations or realignment may be required.

All spills or leaks should be reported to the BLM immediately for their immediate and proper treatment.

**Stipulations For Buried Pipelines:**

To avoid or lessen the potential of subsidence or collapse of karst features, toxic or combustible gas buildup, or other possible impacts to cave and karst resources from buried pipelines or cables, alignments may be rerouted to avoid karst features. The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels,

passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer. Special restoration stipulations or realignment may be required at such intersections, if any. Leak detection systems, back flow eliminators, and differential pressure shut-off valves may be required to minimize the impacts of leaking or ruptured pipelines. To eliminate these extreme possibilities, good record keeping is needed to quickly identify leaks for their immediate and proper treatment.

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### **B. TOPSOIL**

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

### **C. CLOSED LOOP SYSTEM**

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### **D. FEDERAL MINERAL MATERIALS PIT**

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

### **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

### **F. EXCLOSURE FENCING (CELLARS & PITS)**

**Exclosure Fencing**

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

**G. ON LEASE ACCESS ROADS****Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

**Surfacing**

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

**Crowning**

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

**Ditching**

Ditching shall be required on both sides of the road.

**Turnouts**

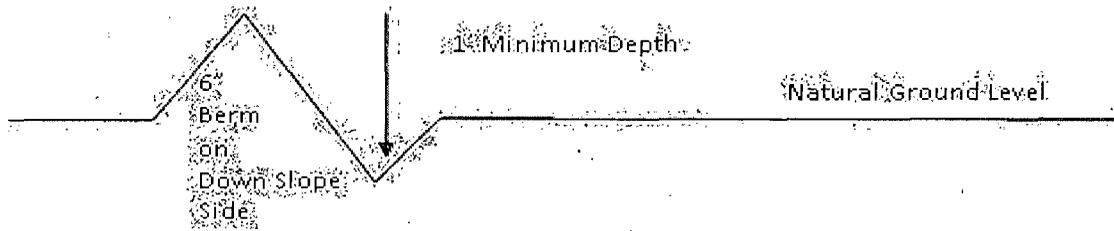
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outcropping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

### Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

### Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

### Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

### Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

### Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

**Construction Steps**

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

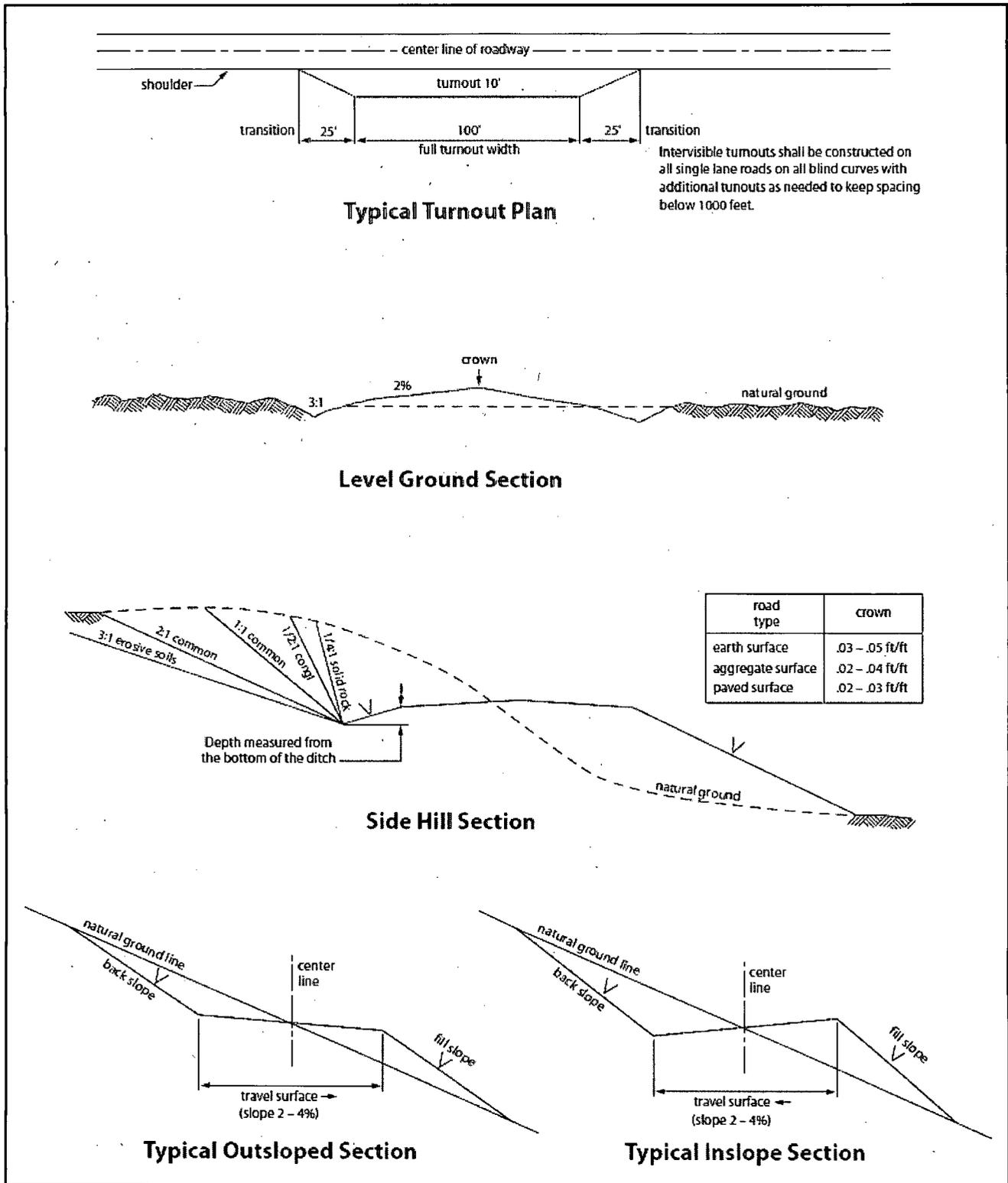


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## VII. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

**Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

1. **Hydrogen Sulfide (H<sub>2</sub>S) monitors shall be installed prior to drilling out the surface shoe. If H<sub>2</sub>S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. Also if present the Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

### B. CASING

**Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-**

55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

**Wait on cement (WOC) for Water Basin:**

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

**High cave/karst.**

**A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH.**

**Possible lost circulation in the Rustler, San Andres, Delaware, Bone Springs and Capitan Reef formations.**

**Possible brine and water flows in the Salado Group, Artesia Group and the Capitan Reef if present.**

1. The 16 inch surface casing shall be set at approximately 360 feet (in a competent bed and if salt is encountered, set casing at least 25 feet above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength.

whichever is greater.

- d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **11-3/4** inch intermediate casing is:
    - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to high cave/karst.**
  3. The minimum required fill of cement behind the **8-5/8** inch 2<sup>nd</sup> intermediate casing **which is to be set in the base of the Capitan Reef at approximately 3000 feet**, is:
    - a. First stage to DV tool:
      - Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

**Operator has proposed a contingency DV tool at 1250 feet. If operator circulates cement on the first stage, operator is approved to inflate the ACP and run the DV tool cancellation plug and cancel the second stage of the proposed cement plan. If cement does not circulate, operator will inflate ACP and proceed with the second stage.**

    - b. Second stage above DV tool:
      - Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to high cave/karst and Capitan Reef.**
  4. The minimum required fill of cement behind the **5-1/2** inch production casing is:
    - Cement should tie-back at least **50 feet above the Capitan Reef** (Top of Capitan Reef estimated at 1240 feet). Operator shall provide method of verification.
  5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

### C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. **A variance is granted for the use of a diverter on the 16" surface casing.**
3. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
4. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 5000 (5M) psi.**
  - a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
  - b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
  - c. **Manufacturer representative shall install the test plug for the initial BOP test.**
  - d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
  - e. **If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**

**5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after

installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

#### **D. DRILL STEM TEST**

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

#### **E. WASTE MATERIAL AND FLUIDS**

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**CRW 072115**

## **VIII. PRODUCTION (POST DRILLING)**

### **A. WELL STRUCTURES & FACILITIES**

#### **Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

#### **Exclosure Netting (Open-top Tanks)**

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

#### **Chemical and Fuel Secondary Containment and Exclosure Screening**

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

#### **Open-Vent Exhaust Stack Exclosures**

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended enclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

#### **Containment Structures**

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

#### **Painting Requirement**

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

## **B. PIPELINES**

### **BURIED PIPELINE STIPULATIONS**

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 *et seq.* (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless

the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> seed mixture 1 | <input type="checkbox"/> seed mixture 3          |
| <input type="checkbox"/> seed mixture 2            | <input type="checkbox"/> seed mixture 4          |
| <input type="checkbox"/> seed mixture 2/LPC        | <input type="checkbox"/> Aplomado Falcon Mixture |

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches that are not otherwise fenced, screened, or netted to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or

other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

### **C. ELECTRIC LINES**

#### **STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES**

**A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant

cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:

- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

## **IX. INTERIM RECLAMATION**

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

## **X. FINAL ABANDONMENT & RECLAMATION**

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by

drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

#### Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed\* per acre:

Species	lb/acre
Plains lovegrass ( <i>Eragrostis intermedia</i> )	0.5
Sand dropseed ( <i>Sporobolus cryptandrus</i> )	1.0
Sideoats grama ( <i>Bouteloua curtipendula</i> )	5.0
Plains bristlegrass ( <i>Setaria macrostachya</i> )	2.0

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed