

**UNORTHODOX  
LOCATION**

OCD Artesia

ATS-14-120

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

**HIGH CAVEKARST**

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		7. If Unit or CA Agreement, Name and No.
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		8. Lease Name and Well No. Derringer 18 LI Fedal #1H
2. Name of Operator Mewbourne Oil Company		9. API Well No. 30-015-41951
3a. Address PO Box 5270 Hobbs, NM 88241	3b. Phone No. (include area code) 575-393-5905	10. Field and Pool, or Exploratory Russel Bone Spring (52805)
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 1800' FSL & 150' FWL, Sec. 18 T20S R29E At proposed prod. zone 1800' FSL & 330' FEL, Sec. 18 T20S R29E		11. Sec., T. R. M. or Blk. and Survey or Area Sec. 18 T20S R29E
14. Distance in miles and direction from nearest town or post office* 13 miles NE of Carlsbad, NM		12. County or Parish Eddy
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)		13. State NM
16. No. of acres in lease NM-01165 - 2,494.41	17. Spacing Unit dedicated to this well 100 153.20	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 180' - Marathon Yates Federal #6	19. Proposed Depth 12,025' - MD 7,729' - TVD	20. BLM/BIA Bond No. on file NM-1693 nationwide, NMB-000919
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3245' - GL	22. Approximate date work will start* 12/25/2013	23. Estimated duration 60 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.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification   |
| 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). | 6. Such other site specific information and/or plans as may be required by the BLM.             |

25. Signature <i>Bradley Bishop</i>	Name (Printed/Typed) Bradley Bishop	Date 10/25/2013
Title		

Approved by (Signature)	Name (Printed/Typed)	Date
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

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.

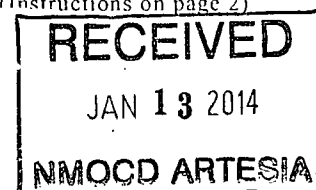
(Continued on page 2)

\*(Instructions on page 2)

**CAPITAN CONTROLLED WATER BASIN**

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

**APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED**



## Mewbourne Oil Company

PO Box 5270  
Hobbs, NM 88241  
(575) 393-5905

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 which currently 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 25 day of October, 2013.

Name: NM Young

Signature: B. B. Young FOR NM Young

Position Title: Hobbs District Manager

Address: PO Box 5270, Hobbs NM 88241

Telephone: 575-393-5905

E-mail: myoung@mewbourne.com

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
DISTRICT II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
DISTRICT III  
1000 Rio Brazos Rd., 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, New Mexico 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 <b>30-015-41951</b>	Pool Code <b>52805</b>	Pool Name <b>RUSSEL BONE SPRING</b>
Property Code <b>40324</b>	Property Name <b>DERRINGER 18 LI FEDERAL</b>	Well Number <b>1.H</b>
OGRID No. <b>14744</b>	Operator Name <b>MEWBOURNE OIL COMPANY</b>	Elevation <b>3254'</b>

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
3	18	20 S	29 E		1800	SOUTH	150	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
1	18	20 S	29 E		1800	SOUTH	330	EAST	EDDY

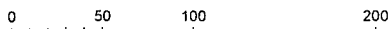
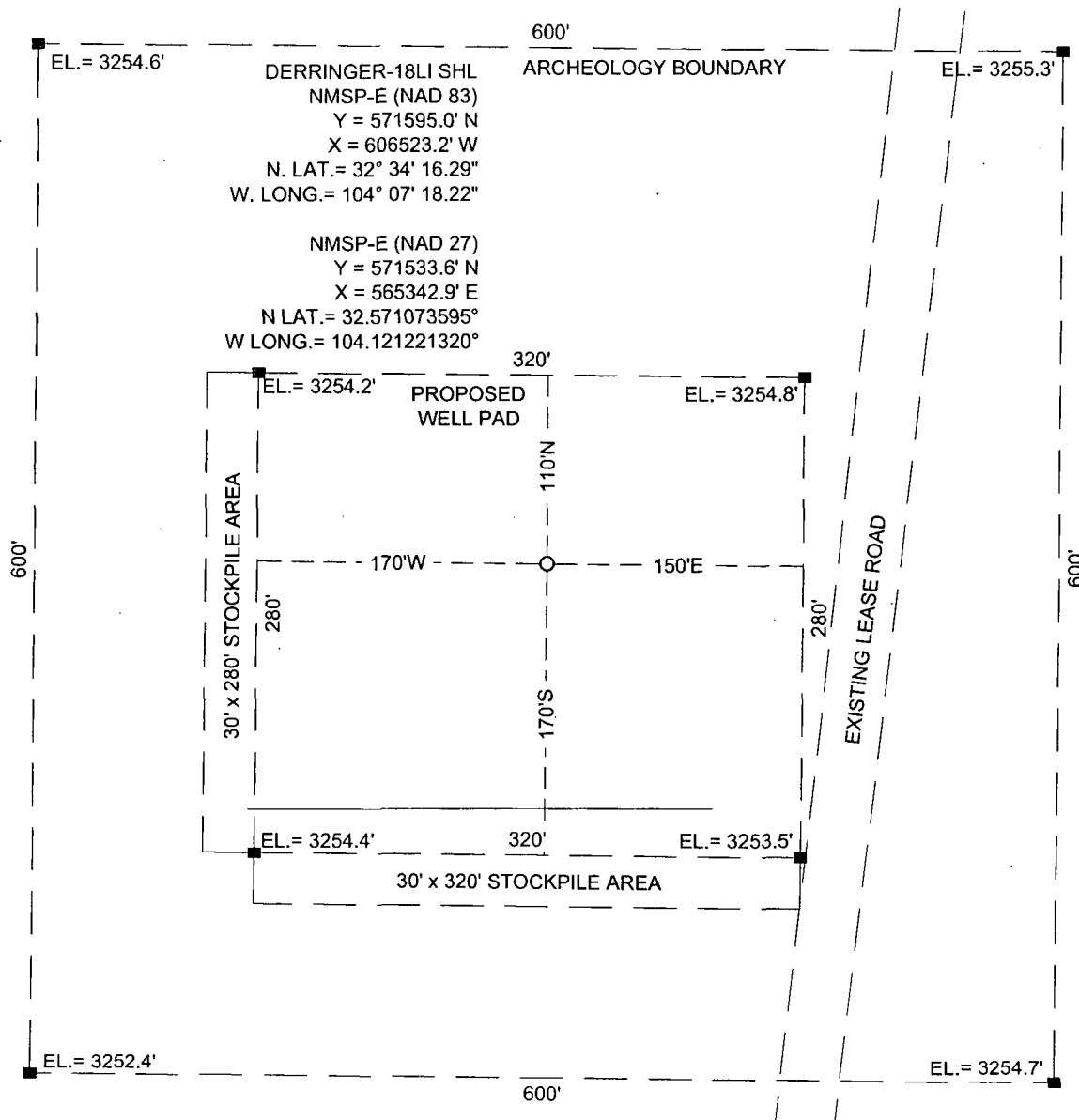
Dedicated Acres	Joint or Infill	Consolidated Code	Order No.
160			

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.

<p>NW COR SEC 18 NMSP-E (NAD 83) Y = 575080.5' N X = 606409.4' E</p>		<p>NE COR SEC 18 NMSP-E (NAD 83) Y = 575088.0' N X = 611425.2' E</p>	<p><b>OPERATOR CERTIFICATION</b> 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 voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Bradley Bishop</i> 10-26-13 Signature Date <b>BRADLEY BISHOP</b> Print Name E-mail Address</p>
<p>DERRINGER 18LI SHL NMSP-E (NAD 83) Y = 571595.0' N X = 606523.2' E N LAT. = 32° 34' 16.29" W LONG. = 104° 07' 18.22" NMSP-E (NAD 27) Y = 571533.6' N X = 565342.9' E N LAT. = 32.571073595° W LONG. = 104.121221320°</p>	<p>Project Area</p>	<p>DERRINGER 18LI BHL NMSP-E (NAD 83) Y = 571603.9' N X = 611103.5' E N LAT. = 32° 34' 16.28" W LONG. = 104° 06' 24.69" NMSP-E (NAD 27) Y = 571542.4' N X = 569923.1' E N LAT. = 32.571071868° W LONG. = 104.106353245°</p>	
<p>150' 330' 1800' 1800'</p> <p>N 87°53'21" E 4,580.3'</p> <p>WELL PATH</p>			<p><b>SURVEYORS CERTIFICATION</b> I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>February 08, 2013 Date of Survey Signature and Seal of Professional Surveyor</p> <p><i>James E. Tompkins</i> <b>JAMES E. TOMPKINS</b> REGISTERED PROFESSIONAL LAND SURVEYOR NEW MEXICO 14729</p> <p>Job No. WTC48907 JAMES E. TOMPKINS 14729 Certificate Number</p>
<p>SW COR SEC 18 NMSP-E (NAD 83) Y = 569794.8' N X = 606355.0' E</p>		<p>SE COR SEC 18 NMSP-E (NAD 83) Y = 569804.4' N X = 611437.8' E</p>	

3'

# SITE LOCATION



GRAPHIC SCALE 1" = 100'

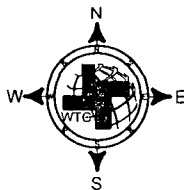
SECTION 18, T 20 S, R 29 E, N.M.P.M.

COUNTY: EDDY STATE: NM

DESCRIPTION: 1800' FSL & 150' FWL

OPERATOR: MEWBOURNE OIL COMPANY

WELL NAME: DERRINGER-18LI



## DRIVING DIRECTIONS:

From intersection of Hwy. 62-180 and County Road 238, go north on County Road 238 approximately 7.1 miles. Turn right and go approximately 0.5 mile and the location is on the left.



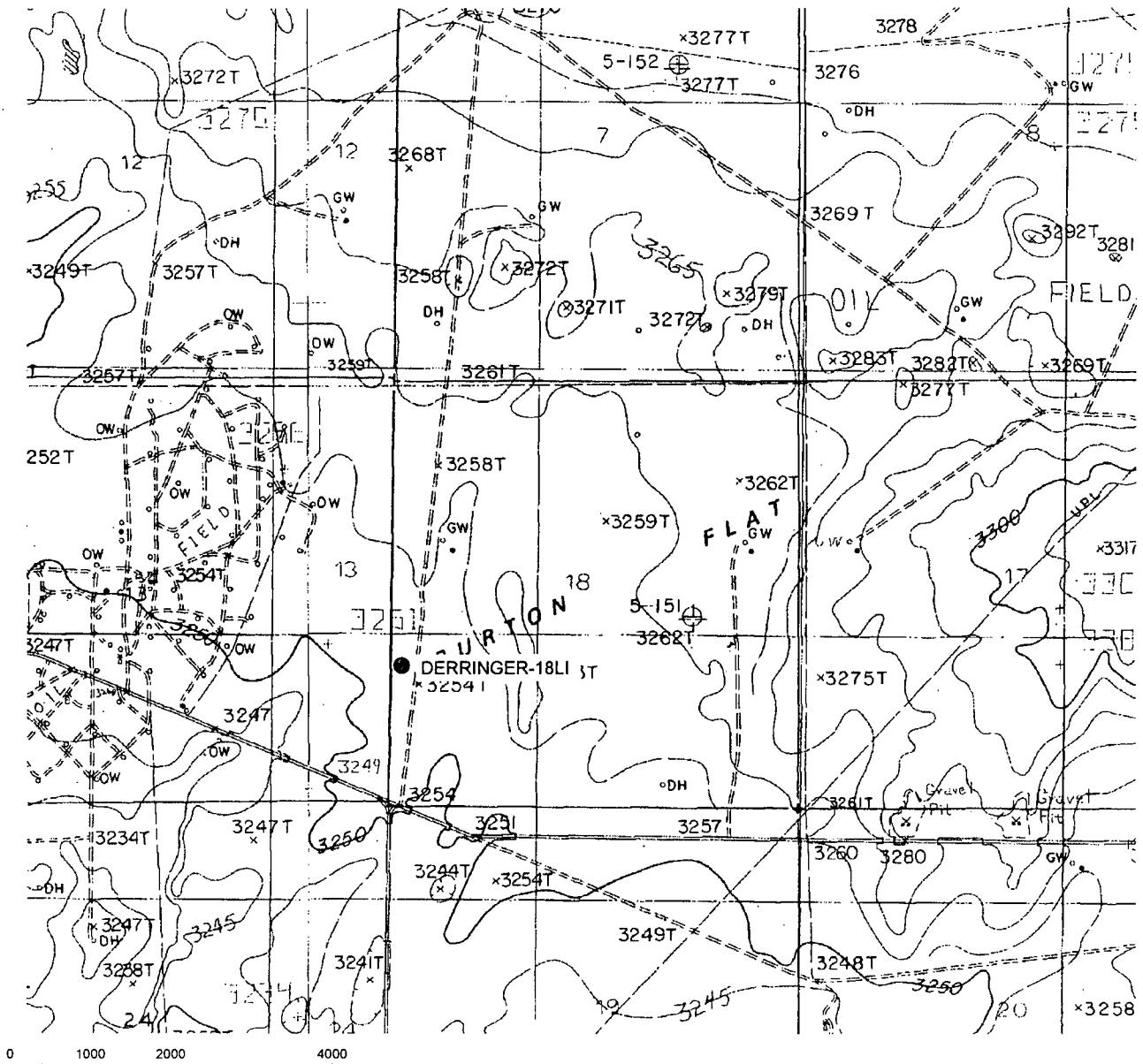
WEST TEXAS CONSULTANTS, INC.  
 ENGINEERS PLANNERS SURVEYORS  
 405 S.W. 1st STREET  
 ANDREWS, TEXAS 79714  
 (432) 523-2181

MEWBOURNE OIL COMPANY

JOB No.: WTC48907

Z:\Projects\108 & Son Survey\Meawbourne Oil Company\48907-Meawbourne Oil Company\Site & Map 3 DERRINGER WELL LOCATION.dwg User: C:\Program Files\Autodesk\AutoCAD 2007\AutoCAD 2007 - DERRINGER 18LI.dwg

# LOCATION VERIFICATION MAP



GRAPHIC SCALE 1" = 2000'

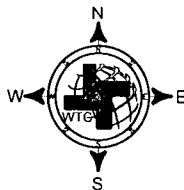
SECTION 18, T 20 S, R 29 E, N.M.P.M.

COUNTY: EDDY                      STATE: NM

DESCRIPTION: 1800' FSL & 150' FWL

OPERATOR: MEWBOURNE OIL COMPANY

WELL NAME: DERRINGER-18LI



DRIVING DIRECTIONS:

From intersection of Hwy. 62-180 and County Road 238, go north on County Road 238 approximately 7.1 miles. Turn right and go approximately 0.5 mile and the location is on the left.



**WEST TEXAS CONSULTANTS, INC.**  
ENGINEERS PLANNERS SURVEYORS  
405 S.W. 1st. STREET  
ANDREWS, TEXAS 79714  
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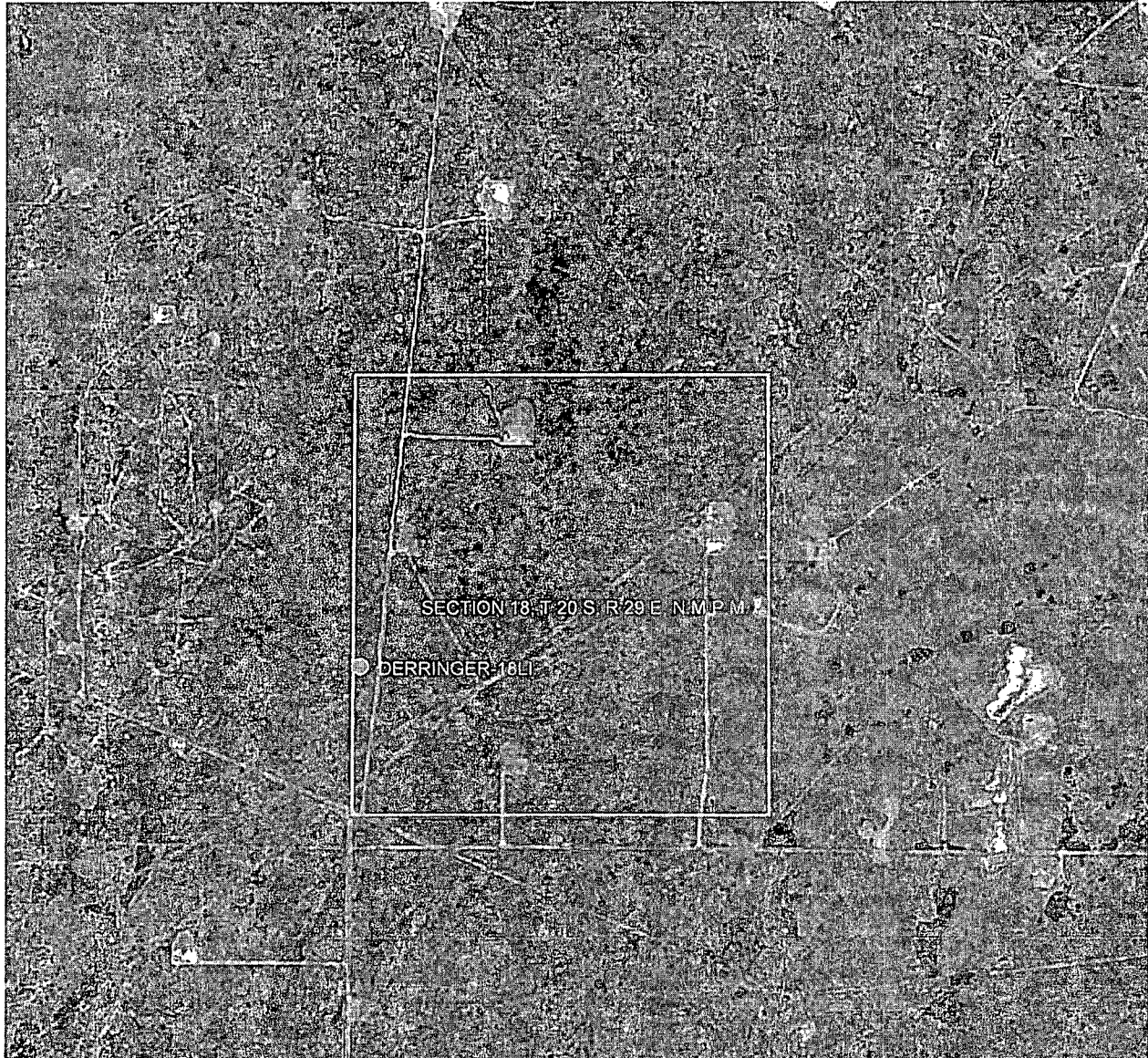
MEWBOURNE OIL COMPANY

JOB No.: WTC48907

\\Projects\Oil & Gas Survey\Wesbourne Oil Company\48907-Wesbourne Oil Company\State & Plat 3 DEFRANGER WELL LOCATIONS, Early Co\Drawings\48907- DEFRANGER 18U.dwg

"3B"

# AERIAL MAP



0 1000 2000 4000

GRAPHIC SCALE 1" = 2000'

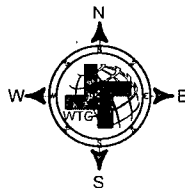
SECTION 18, T 20 S, R 29 E, N.M.P.M.

COUNTY: EDDY STATE: NM

DESCRIPTION: 1800' FSL & 150' FWL

OPERATOR: MEWBOURNE OIL COMPANY

WELL NAME: DERRINGER-18LI



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From intersection of Hwy. 62-180 and County Road 238, go north on County Road 238 approximately 7.1 miles. Turn right and go approximately 0.5 mile and the location is on the left.



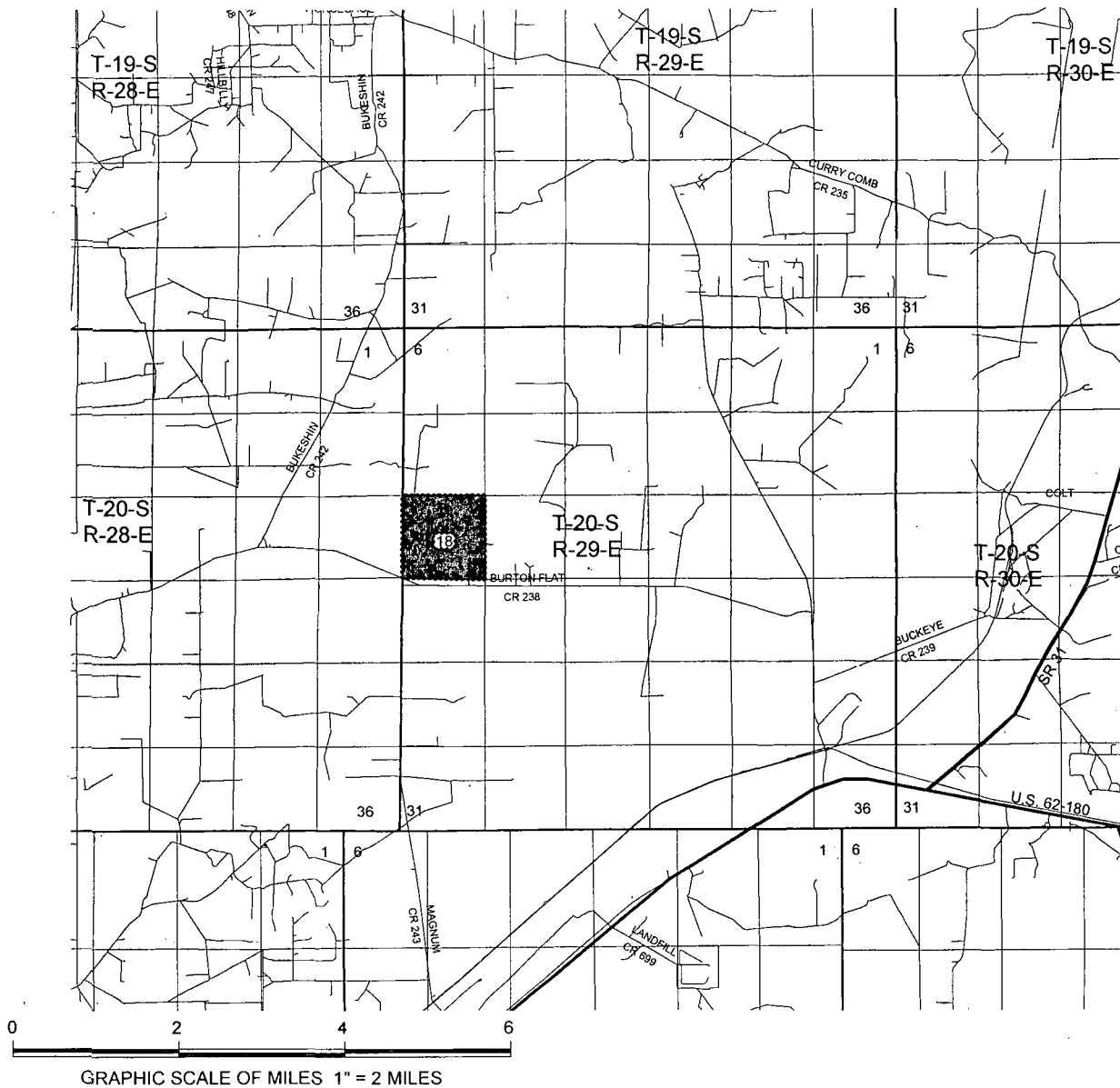
WEST TEXAS CONSULTANTS, INC.  
ENGINEERS, PLANNERS, SURVEYORS  
405 S.W. 1st STREET  
ANDREWS, TEXAS 79714  
(432) 523-2181

MEWBOURNE OIL COMPANY

JOB No.: WTC48907

30"

# VICINITY MAP



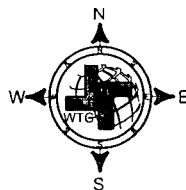
SECTION 18, T 20 S, R 29 E, N.M.P.M.

COUNTY: EDDY STATE: NM

DESCRIPTION: 1800' FSL & 150' FWL

OPERATOR: MEWBOURNE OIL COMPANY

WELL NAME: DERRINGER-18LI



## DRIVING DIRECTIONS:

From intersection of Hwy. 62-180 and County Road 238, go north on County Road 238 approximately 7.1 miles. Turn right and go approximately 0.5 mile and the location is on the left.



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ANDREWS, TEXAS 79714  
(432) 523-2181

MEWBOURNE OIL COMPANY

JOB No.: WTC48907

**Drilling Program**  
**Mewbourne Oil Company**  
Derringer 18 LI Fed Com #1H  
1800' FSL & 150' FWL (SHL)  
Sec 18-T20S-R29E  
Eddy County, New Mexico

**1. The estimated tops of geological markers are as follows:**

Rustler	260'
Top Salt	400'
Base Salt	720'
*Yates	890'
Seven Rivers	NP
Queen	NP
Capitan	1090'
Grayburg	NP
San Andres	NP
Glorieta	NP
Yeso	NP
*Lamar	3200'
*Bone Springs	5490'
*1 <sup>st</sup> Bone Spring Sand	6910'
*2 <sup>nd</sup> Bone Spring Sand	7310'
3 <sup>rd</sup> Bone Spring Sand	Will Not Penetrate
Wolfcamp	Will Not Penetrate

**2. Estimated depths of anticipated fresh water, oil, or gas:**

Water	Fresh water is anticipated @ 45' & will be protected by setting surface casing at <del>285'</del> <sup>350'</sup> and cementing to surface.
Hydrocarbons	Oil and gas are anticipated in the above (*) formations. These zones will be protected by casing as necessary.

**3. Pressure control equipment:**

MOC requests a variance to for a 2M diverter to be installed after running 20" casing. A 2000# WP Annular will be installed after running 13 3/8" casing. A 3000# WP Double Ram BOP and 3000# WP Annular will be installed after running 9 5/8" & 7" casing strings. Pressure tests will be conducted prior to drilling out under all casing strings. BOP controls will be installed prior to drilling under surface casing and will remain in use until completion of drilling operations. BOPE will be inspected and operated as recommended in Onshore Order #2. A kelly cock and a sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position when the kelly is not in use. Will test the 7" & 9 5/8" BOPE to 3000# and both Annular BOPs to 1500# with a third party testing company before drilling below each shoe, but will test again, if needed, in 30 days from the 1<sup>st</sup> test as per BLM Onshore Oil and Gas Order #2.

- 4.** MOC proposes to drill a vertical wellbore to 7171' & kick off to horizontal @ 7649' TVD. The well will be drilled to 12025' MD (7729' TVD). See attached directional plan.



## 5. Proposed casing and cementing program:

### A. Casing Program:

Hole Size	Casing	Wt/Ft.	Grade	Depth	Jt Type
26"	20" (new)	94#	K55	0'-285' <sup>350'</sup>	BT&C
17 1/2"	13 3/8" (new)	48#	H40	0'-1000'	ST&C
12 1/4"	9 5/8" (new)	36#	J55	0'-3100' <sup>2950'</sup>	LT&C
8 3/4"	7" (new)	26#	P110	0'-7171' MD	LT&C
8 3/4"	7" (new)	26#	P110	7171'-7912' MD	BT&C
6 1/8"	4 1/2" (new)	13.5#	P110	7712'-12025' MD	LT&C

Minimum casing design factors: Collapse 1.125, Burst 1.0, Tensile strength 1.8.

\*Subject to availability of casing.

### B. Cementing Program:

- Surface Casing: 340 sacks Class "C" (35:65:4) light cement w/ 2% CaCl<sub>2</sub> & LCM additives. Yield at 2.0 cuft/sk. 200 sacks Class "C" cement w/ 2% CaCl<sub>2</sub>. Yield at 1.34 cuft/sk. Mix water 120 bbls of FW. Cmt circulated to surface w/100% excess.
- 1<sup>st</sup> Intermediate Casing: 330 sacks Class "C" (35:65:4) light cement w/ salt and LCM additives. Yield at 2.0 cuft/sk. 200 sacks Class "C" cement w/2% CaCl<sub>2</sub>. Yield at 1.34 cuft/sk. Mix water 118 bbls of FW. Cmt circulated to surface w/25% excess.
- 2<sup>nd</sup> Intermediate Casing: 475 sacks Class "C" (35:65:4) light cement w/ salt and LCM additives. Yield at 2.0 cuft/sk. 200 sacks Class "C" cement w/2% CaCl<sub>2</sub>. Yield at 1.34 cuft/sk. Mix water 156 bbls of FW. Cmt circulated to surface w/25% excess.
- Production Casing: 260 sacks Class H light cement (35:65:4) with fluid loss, LCM, & salt additives. Yield at 2.12 cuft/sk. 400 sacks Class H cement containing fluid loss additives. Yield at 1.18 cuft/sk. Mix water 120 bbls of FW. Cmt calculated to tie into 9 5/8" casing at 900' w/25% excess.
- Production Liner: This will be a Packer/Port completion from TD up inside 7" casing with packer type liner hanger.

\*Referring to above blends of light cement: (wt% fly ash : wt% cement : wt% bentonite of the total of first two numbers). Generic names of additives are used since the availability of specific company and products are unknown at this time.

## 6. Mud Program:

Interval	Type System	Weight	Viscosity	Fluid Loss
0' - 285' <sup>350'</sup>	FW spud mud	8.6-9.0	32-34	NA
285' - 1000'	Brine water	10.0-10.2	28-30	NA
1000' - 7171' (KOP)	FW	8.5-8.7	28-30	NA
7171' - TD	FW w/Polymer	8.5-8.7	32-35	15

\*\*Visual mud monitoring system shall be in place to detect volume changes indicating loss or gain of circulation fluid volume. Sufficient mud materials will be kept on location at all times to combat abnormal conditions.

## 7. Evaluation Program:

Samples: 10' samples from surface casing to TD  
Logging: GR & Gyro from KOP -100' (7071') to surface. GR from 7071' to TD.

## 8. Downhole Conditions

Zones of abnormal pressure: None anticipated  
Zones of lost circulation: Anticipated in surface and intermediate holes  
Maximum bottom hole temperature: 120 degree F  
Maximum bottom hole pressure: 8.3 lbs/gal gradient or less ( $.43368 \times 7729' = 3351$  psi)

See  
COA

## 9. Anticipated Starting Date:

Mewbourne Oil Company intends to drill this well as soon as possible after receiving approval with approximately 40 days involved in drilling operations and an additional 10 days involved in completion operations on the project.

# **Mewbourne Oil Co**

Lea County, New Mexico (Nad 83)

Sec 18, R20S, T29E

Derringer 18 LI Federal #1H

Wellbore #1

Plan: Design #1

## **DDC Well Planning Report**

01 October, 2013



**DDC**  
Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Derringer 18 LI Federal #1H
Company:	Mewbourne Oil Co.	TVD Reference:	WELL @ 3274.0usft (Patterson #46)
Project:	Lea County, New Mexico (Nad 83)	MD Reference:	WELL @ 3274.0usft (Patterson #46)
Site:	Sec 18, R20S, T29E	North Reference:	Grid
Well:	Derringer 18 LI Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project:	Lea County, New Mexico (Nad 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	Sec 18, R20S, T29E		
Site Position:		Northing:	571,595.00 usft
From:	Map	Easting:	606,523.20 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 34' 16.290 N
		Longitude:	104° 7' 18.216 W
		Grid Convergence:	0.11 °

Well	Derringer 18 LI Federal #1H					
Well Position	+N-S	0.0 usft	Northing:	571,595.00 usft	Latitude:	32° 34' 16.290 N
	+E-W	0.0 usft	Easting:	606,523.20 usft	Longitude:	104° 7' 18.216 W
Position Uncertainty	0.0 usft	Wellhead Elevation:		Ground Level:	3,254.0 usft	

Wellbore						Wellbore #1									
Magnetics						Model Name		Sample Date		Declination		Dip Angle		Field Strength	
										(°)		(°)		(nT)	
						IGRF2010		10/1/2013		7.58		60.36		48,536	

Design:	Design #1			
Audit Notes:				
Version:	Phase:	PLAN		Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	89.89

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-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	
7,171.6	0.00	0.00	7,171.6	0.0	0.0	0.00	0.00	0.00	0.00	
7,912.3	88.89	89.89	7,649.0	0.9	468.2	12.00	12.00	12.14	89.89	
12,025.2	88.89	89.89	7,729.0	8.9	4,580.3	0.00	0.00	0.00	0.00	PBHL - Derringer 18 l

**DDC**  
Well Planning Report



Database:	EDM5000.1 Single User Db	Local Co-ordinate Reference:	Well Derringer 18 LI Federal #1H
Company:	Mewbourne Oil Co	TVD Reference:	WELL @ 3274.0usft (Patterson #46)
Project:	Lea County New Mexico (Nad83)	MD Reference:	WELL @ 3274.0usft (Patterson #46)
Site:	Sec 18, R20S, T29E	North Reference:	Grid
Well:	Derringer 18 LI Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
<b>Build @ 12°/100'</b>									
7,171.6	0.00	0.00	7,171.6	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	3.41	89.89	7,200.0	0.0	0.8	0.8	12.00	12.00	0.00
7,300.0	15.41	89.89	7,298.5	0.0	17.2	17.2	12.00	12.00	0.00
7,400.0	27.41	89.89	7,391.4	0.1	53.6	53.6	12.00	12.00	0.00
7,500.0	39.41	89.89	7,474.7	0.2	108.6	108.6	12.00	12.00	0.00
7,600.0	51.41	89.89	7,544.8	0.3	179.6	179.6	12.00	12.00	0.00
7,700.0	63.41	89.89	7,598.6	0.5	263.7	263.7	12.00	12.00	0.00
7,800.0	75.41	89.89	7,633.7	0.7	357.2	357.2	12.00	12.00	0.00
7,900.0	87.41	89.89	7,648.6	0.9	455.9	455.9	12.00	12.00	0.00
<b>EOB @ 88.89° Inc / 89.89° Azm</b>									
7,912.3	88.89	89.89	7,649.0	0.9	468.2	468.2	12.00	12.00	0.00
8,000.0	88.89	89.89	7,650.7	1.1	555.8	555.8	0.00	0.00	0.00
8,100.0	88.89	89.89	7,652.6	1.3	655.8	655.8	0.00	0.00	0.00
8,200.0	88.89	89.89	7,654.6	1.5	755.8	755.8	0.00	0.00	0.00
8,300.0	88.89	89.89	7,656.5	1.7	855.8	855.8	0.00	0.00	0.00
8,400.0	88.89	89.89	7,658.5	1.9	955.8	955.8	0.00	0.00	0.00
8,500.0	88.89	89.89	7,660.4	2.1	1,055.8	1,055.8	0.00	0.00	0.00
8,600.0	88.89	89.89	7,662.4	2.2	1,155.7	1,155.7	0.00	0.00	0.00
8,700.0	88.89	89.89	7,664.3	2.4	1,255.7	1,255.7	0.00	0.00	0.00
8,800.0	88.89	89.89	7,666.2	2.6	1,355.7	1,355.7	0.00	0.00	0.00
8,900.0	88.89	89.89	7,668.2	2.8	1,455.7	1,455.7	0.00	0.00	0.00
9,000.0	88.89	89.89	7,670.1	3.0	1,555.7	1,555.7	0.00	0.00	0.00
9,100.0	88.89	89.89	7,672.1	3.2	1,655.6	1,655.6	0.00	0.00	0.00
9,200.0	88.89	89.89	7,674.0	3.4	1,755.6	1,755.6	0.00	0.00	0.00
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9,800.0	88.89	89.89	7,685.7	4.6	2,355.5	2,355.5	0.00	0.00	0.00
9,900.0	88.89	89.89	7,687.6	4.8	2,455.5	2,455.5	0.00	0.00	0.00
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11,900.0	88.89	89.89	7,726.6	8.7	4,455.1	4,455.1	0.00	0.00	0.00
12,000.0	88.89	89.89	7,728.5	8.9	4,555.1	4,555.1	0.00	0.00	0.00

**DDC**  
Well Planning Report



<b>Database:</b>	EDM:5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Derringer 18 LI Federal #1H
<b>Company:</b>	Mewbourne Oil Co	<b>TVD Reference:</b>	WELL @ 3274.0usft (Patterson #46)
<b>Project:</b>	Lea County, New Mexico (Nad 83)	<b>MD Reference:</b>	WELL @ 3274.0usft (Patterson #46)
<b>Site:</b>	Sec 18, R20S, T29E	<b>North Reference:</b>	Grid
<b>Well:</b>	Derringer 18 LI Federal #1H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

**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)
<b>TD @ 12025' MD / 7729' TVD</b>									
12,025.2	88.89	89.89	7,729.0	8.9	4,580.3	4,580.3	0.00	0.00	0.00

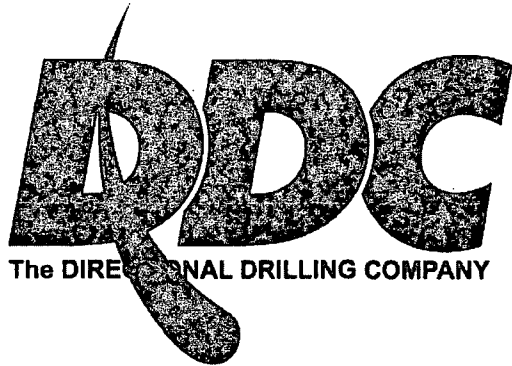
**Design Targets**

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL - Derringer 18 LI F	0.00	0.00	7,729.0	8.9	4,580.3	571,603.90	611,103.50	32° 34' 16.285 N	104° 6' 24.689 W
- plan hits target center									
- Point									

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,171.6	7,171.6	0.0	0.0	Build @ 12°/100'
7,912.3	7,649.0	0.9	468.2	EOB @ 88.89° Inc / 89.89° Azm
12,025.2	7,729.0	8.9	4,580.3	TD @ 12025' MD / 7729' TVD

# Mewbourne Oil Company

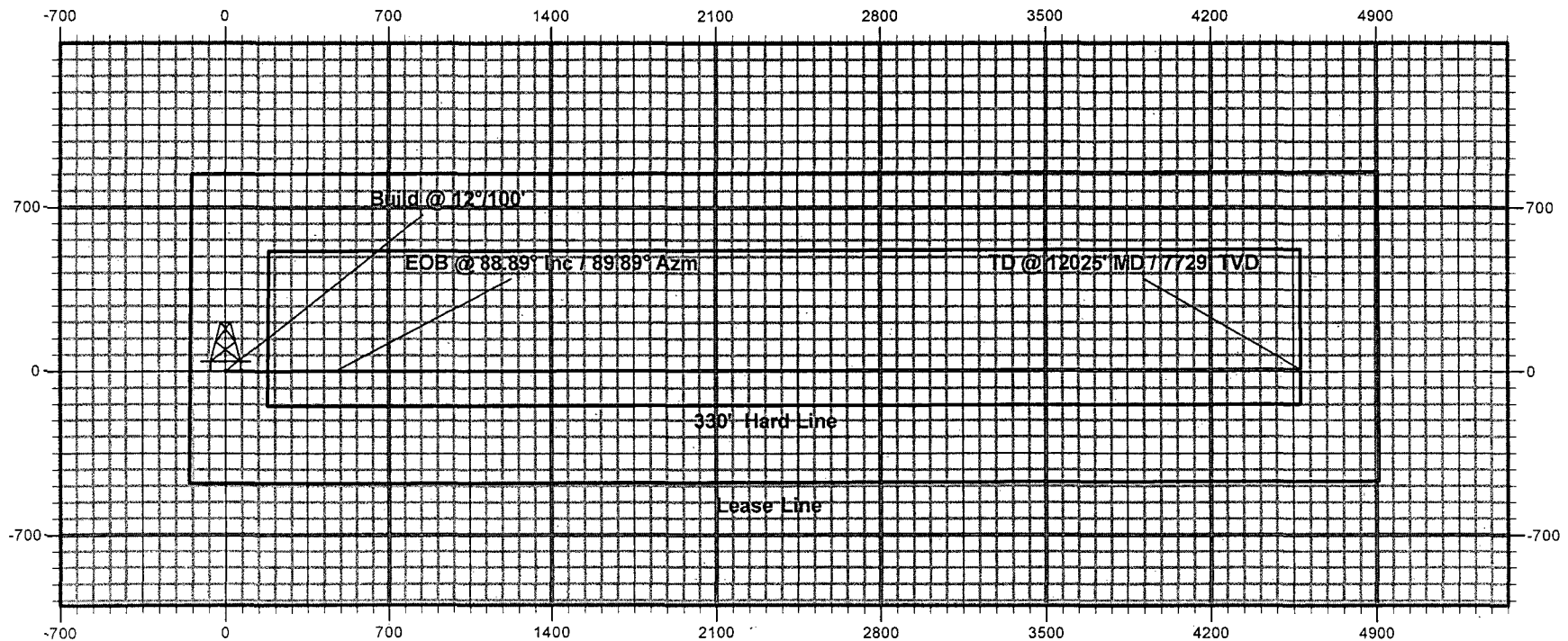


Lea County, New Mexico (Nad 83)

Derringer 18 LI Federal #1H

Quote 130839

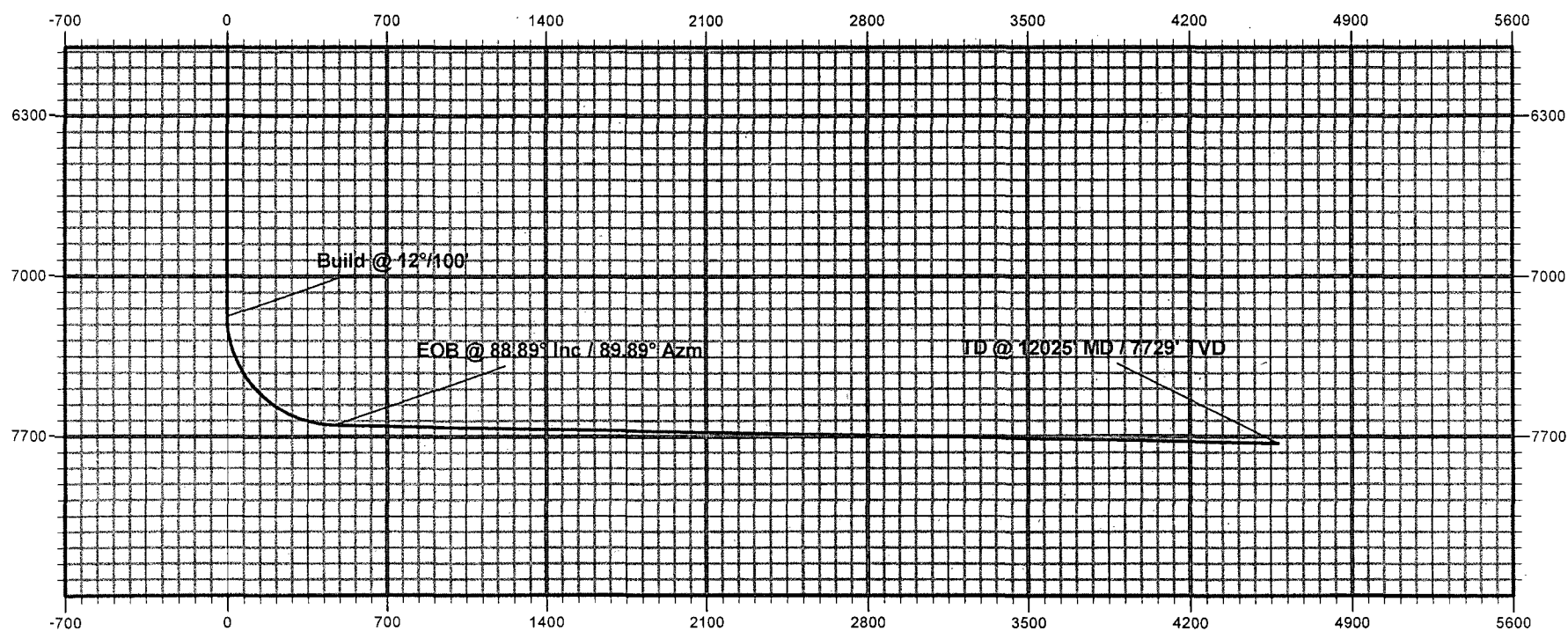
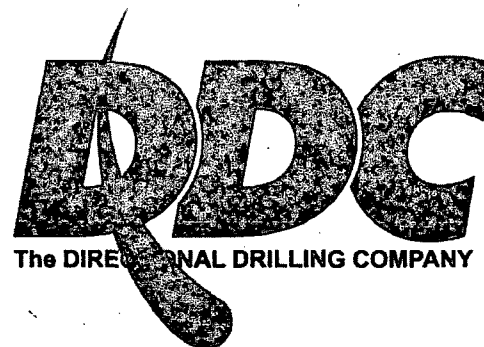
Design #1





# Mewbourne Oil Company

Lea County, New Mexico (Nad 83)  
Derringer 18 LI Federal #1H  
Quote 130839  
Design #1



Vertical Section at 89.89° (700 usft/in)



**Notes Regarding Blowout Preventer**

**Mewbourne Oil Company**

Derringer 18 LI Fed Com #1H

1800' FSL & 150' FWL (SHL)

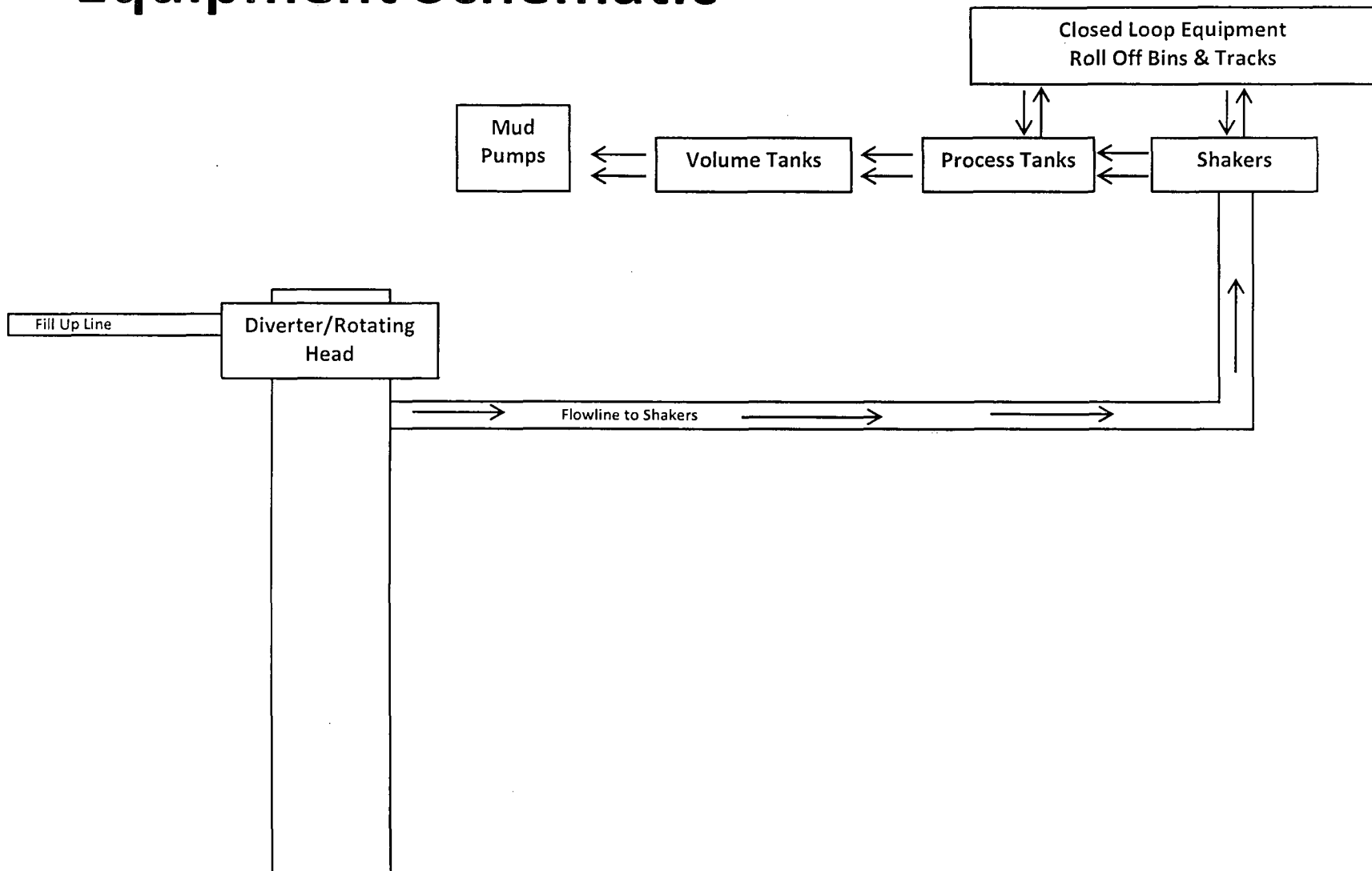
Sec 18-T20S-R29E

Eddy County, New Mexico

- I. Drilling nipple (bell nipple) to be constructed so that it can be removed without the use of a welder through the opening of the rotary table, with minimum internal diameter equal to blowout preventer bore.
- II. Blowout preventer and all fittings must be in good condition with a minimum 2000 psi working pressure on 13 3/8" casing and 3000 psi working pressure on 9 5/8" & 7" casing.
- III. Safety valve must be available on the rig floor at all times with proper connections to install in the drill string. Valve must be full bore with minimum 3000 psi working pressure.
- IV. Equipment through which bit must pass shall be at least as large as internal diameter of the casing.
- V. A kelly cock shall be installed on the kelly at all times.

Blowout preventer closing equipment to include and accumulator of at least 40 gallon capacity, two independent sources of pressure on closing unit, and meet all other API specifications.

# 20" Diverter & Closed Loop Equipment Schematic



# 13 5/8" 2M BOPE & Closed Loop Equipment Schematic

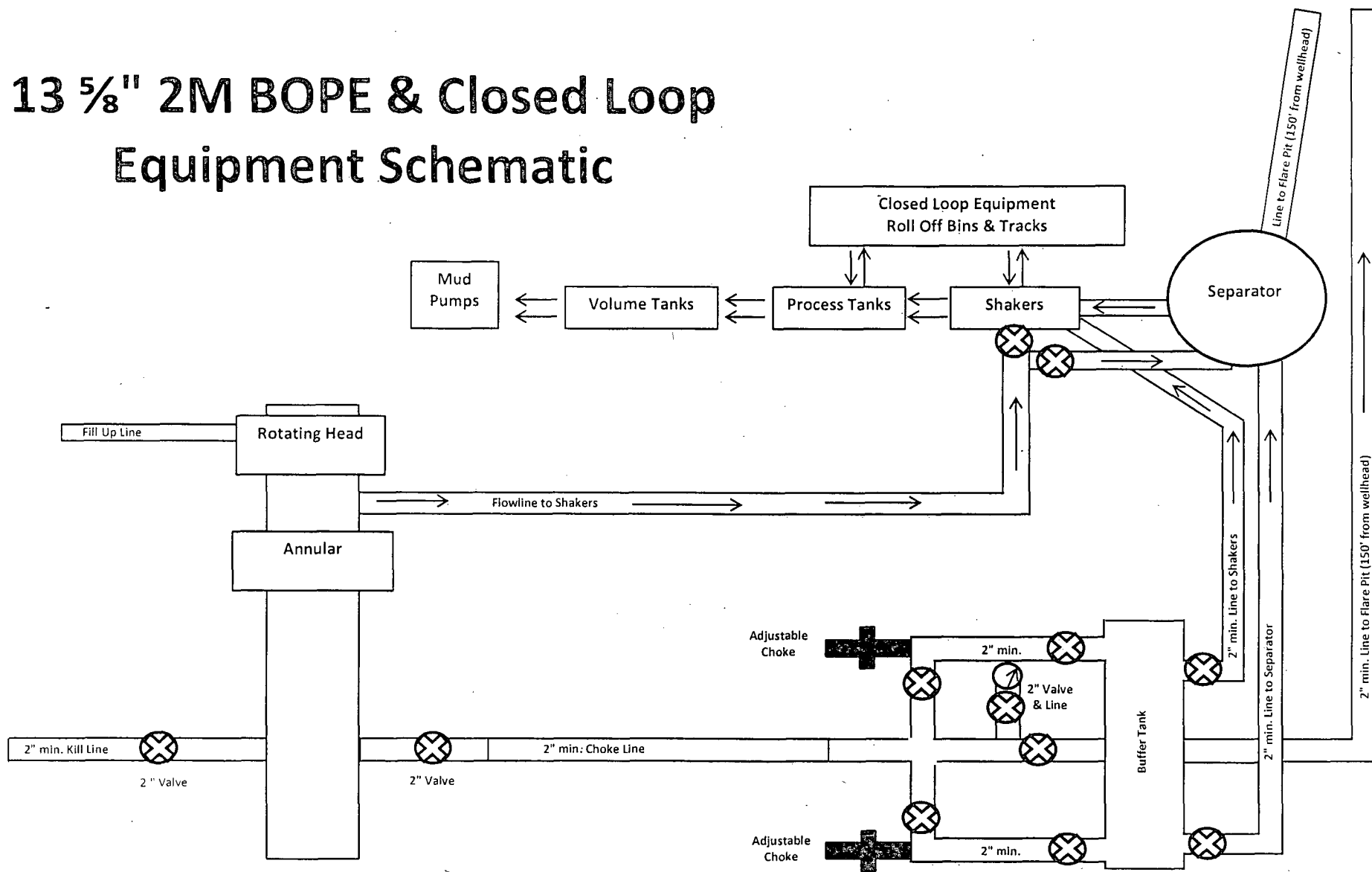
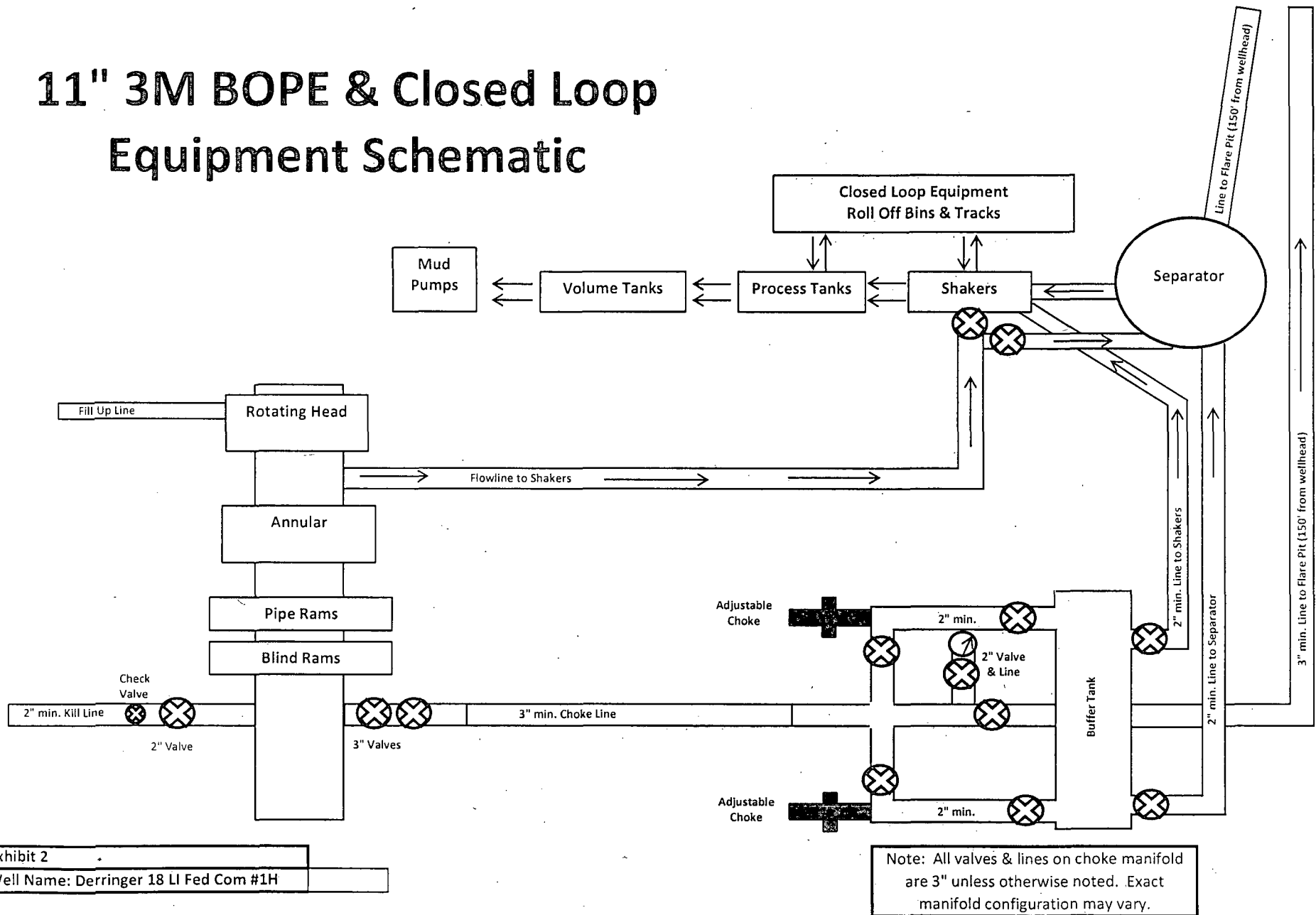


Exhibit 2A  
Well Name: Derringer 18 LI Fed Com #1H

# 11" 3M BOPE & Closed Loop Equipment Schematic



H2S Diagram  
Closed Loop Pad Dimensions 260' x 320'

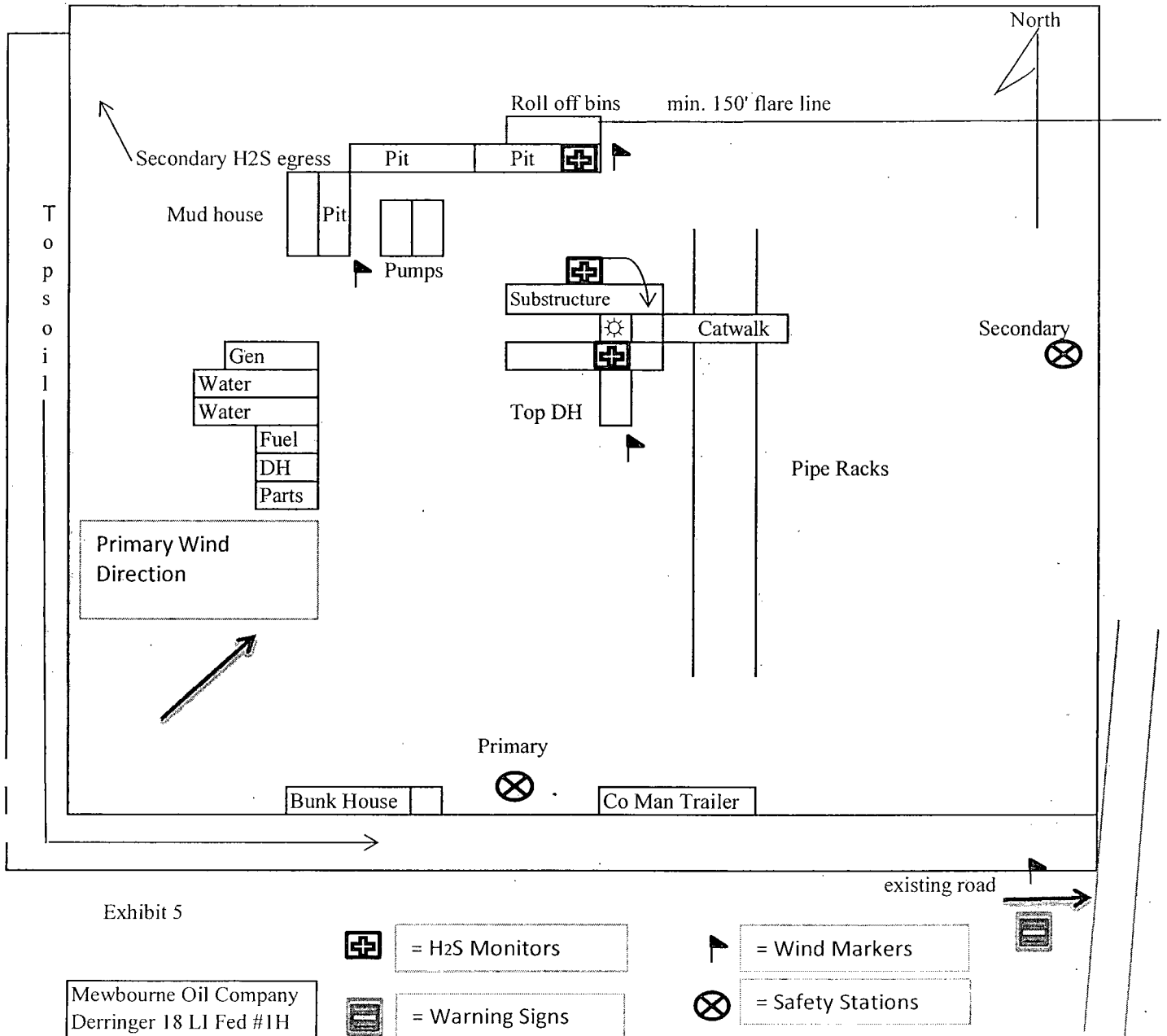


Exhibit 5

Mewbourne Oil Company  
Derringer 18 LI Fed #1H  
1800' FSL & 150' FWL  
Sec. 18 T20S R29E  
Eddy County, NM

- |   |                 |   |                   |
|---|-----------------|---|-------------------|
|  | = H2S Monitors  |  | = Wind Markers    |
|  | = Warning Signs |  | = Safety Stations |

Hydrogen Sulfide Drilling Operations Plan  
**Mewbourne Oil Company**  
Derringer 18 LI Fed Com #1H  
1800' FSL & 150' FWL  
Sec 18-T20S-R29E  
Eddy County, New Mexico

**1. General Requirements**

Rule 118 does not apply to this well because MOC has researched this area and no high concentrations of H<sub>2</sub>S were found. MOC will have on location and working all H<sub>2</sub>S safety equipment before the Delaware formation for purposes of safety and insurance requirements.

**2. Hydrogen Sulfide Training**

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will have received training from a qualified instructor in the following areas prior to entering the drilling pad area of the well:

1. The hazards and characteristics of hydrogen sulfide gas.
2. The proper use of personal protective equipment and life support systems.
3. The proper use of hydrogen sulfide detectors, alarms, warning systems, briefing areas, evacuation procedures.
4. The proper techniques for first aid and rescue operations.

Additionally, supervisory personnel will be trained in the following areas:

- 1 The effects of hydrogen sulfide on metal components. If high tensile tubular systems are utilized, supervisory personnel will be trained in their special maintenance requirements.
- 2 Corrective action and shut in procedures, blowout prevention, and well control procedures while drilling a well.
- 3 The contents of the Hydrogen Sulfide Drilling Operations Plan.

There will be an initial training session prior to encountering a known hydrogen sulfide source. The initial training session shall include a review of the site specific Hydrogen Sulfide Drilling Operations Plan.

**3. Hydrogen Sulfide Safety Equipment and Systems**

All hydrogen sulfide safety equipment and systems will be installed, tested, and operational prior to drilling below the intermediate casing.

1. Well Control Equipment
  - A. Choke manifold with minimum of one adjustable choke/remote choke.
  - B. Blowout preventers equipped with blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
  - C. Auxiliary equipment including annular type blowout preventer.
2. Protective Equipment for Essential Personnel

Thirty minute self contained work unit located in the dog house and at briefing areas.

Additionally: If H<sub>2</sub>S is encountered in concentrations less than 10 ppm, fans will be placed in work areas to prevent the accumulation of hazardous amounts of poisonous gas. If higher concentrations of H<sub>2</sub>S are detected the well will be shut in and a rotating head, mud/gas separator, remote choke and flare line with igniter will be installed.

3. Hydrogen Sulfide Protection and Monitoring Equipment

Two portable hydrogen sulfide monitors positioned on location for optimum coverage and detection. The units shall have audible sirens to notify personnel when hydrogen sulfide levels exceed 20 PPM.

4. Visual Warning Systems

A. Wind direction indicators as indicated on the wellsite diagram.

B. Caution signs shall be posted on roads providing access to location. Signs shall be painted a high visibility color with lettering of sufficient size to be readable at reasonable distances from potentially contaminated areas.

4. **Mud Program**

The mud program has been designed to minimize the amount of hydrogen sulfide entrained in the mud system. Proper mud weight, safe drilling practices, and the use of hydrogen sulfide scavengers will minimize hazards while drilling the well.

5. **Metallurgy**

All tubular systems, wellheads, blowout preventers, drilling spools, kill lines, choke manifolds, and valves shall be suitable for service in a hydrogen sulfide environment when chemically treated.

6. **Communications**

State & County Officials phone numbers are posted on rig floor and supervisors trailer. Communications in company vehicles and toolpushers are either two way radios or cellular phones.

7. **Well Testing**

Drill stem testing is not an anticipated requirement for evaluation of this well. If a drill stem test is required, it will be conducted with a minimum number of personnel in the immediate vicinity. The test will be conducted during daylight hours only.

8. **Emergency Phone Numbers**

Eddy County Sheriff's Office	911 or 575-887-7551
Ambulance Service	911 or 575-885-2111
Carlsbad Fire Dept	911 or 575-885-2111
Loco Hills Volunteer Fire Dept.	911 or 575-677-3266
Closest Medical Facility - Columbia Medical Center of Carlsbad	575-492-5000

Mewbourne Oil Company	Hobbs District Office	575-393-5905
	Fax	575-397-6252
	2 <sup>nd</sup> Fax	575-393-7259

District Manager	Micky Young	575-390-0999
Drilling Superintendent	Frosty Lathan	575-390-4103
	Bradley Bishop	575-390-6838
Drilling Foreman	Wesley Noseff	575-441-0729

Closed Loop Pad Dimensions 280' x 320'

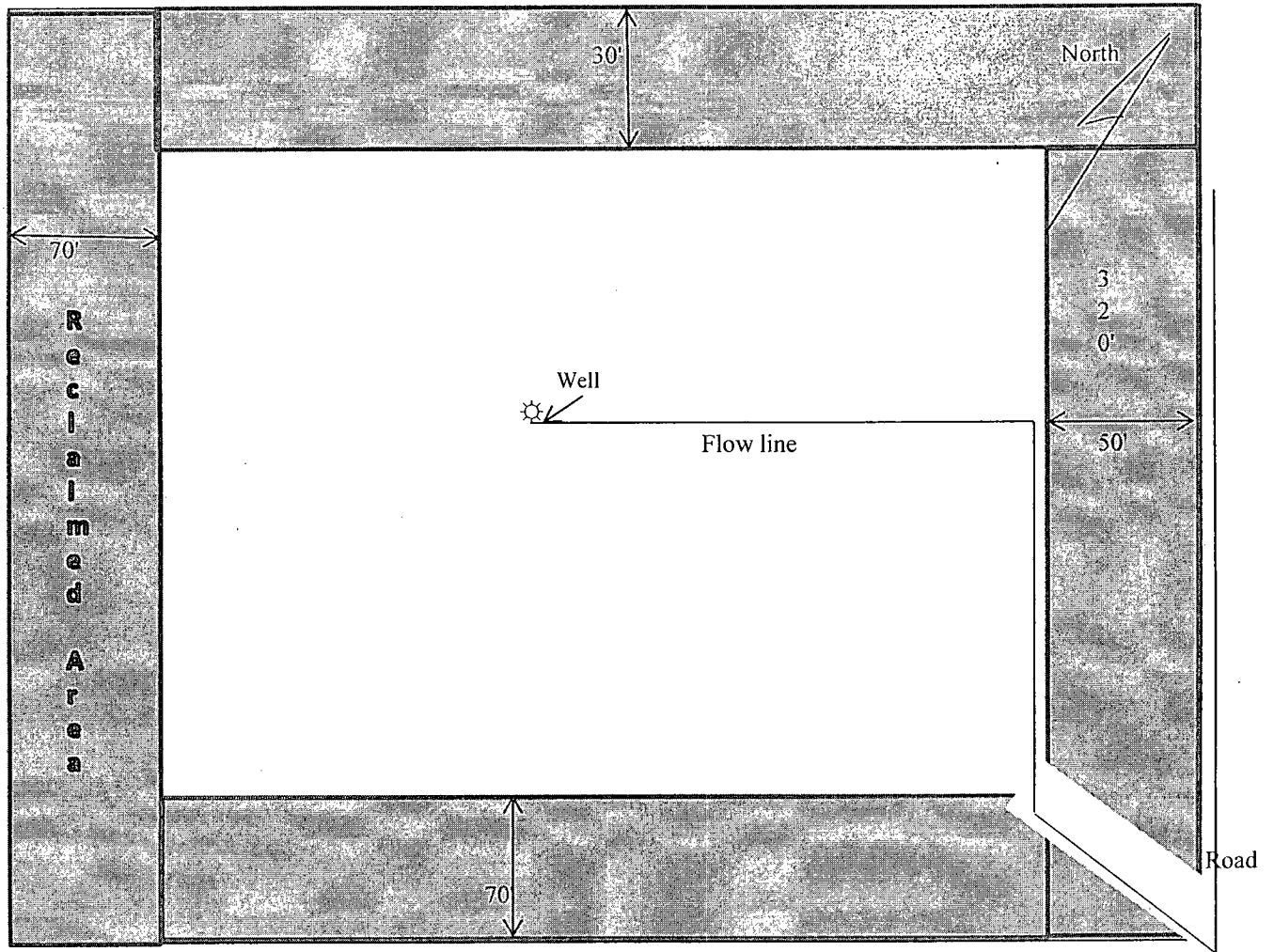
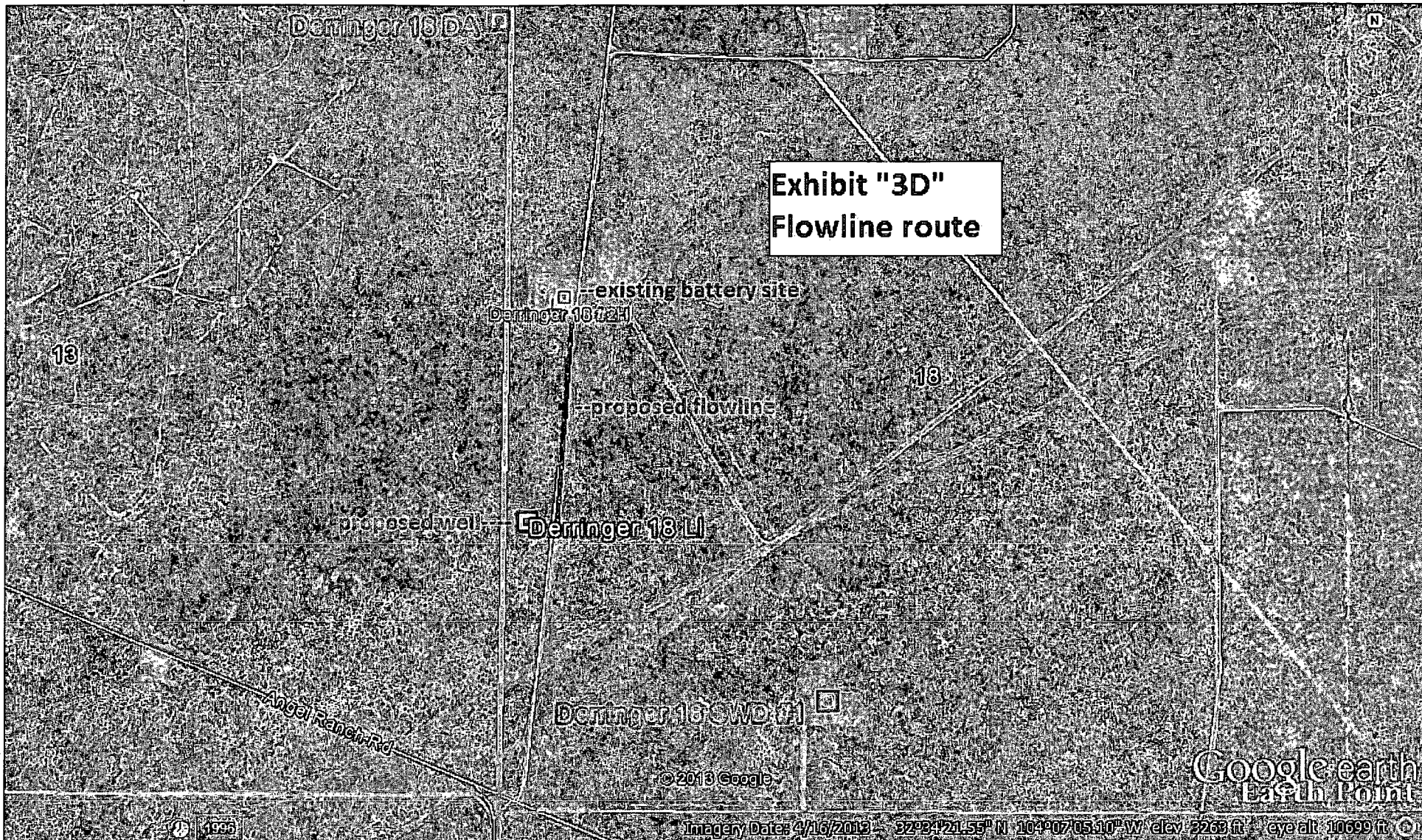


Exhibit 6

Mewbourne Oil Company  
Derringer 18 LI Fed Com #1H  
1800' FSL & 150' FWL  
Sec. 18 T20S R29E  
Eddy County, NM





**Exhibit "3D"**  
**Flowline route**

existing battery site  
Derringer 18 CWD #1

proposed flowline

proposed well  
Derringer 18 LI

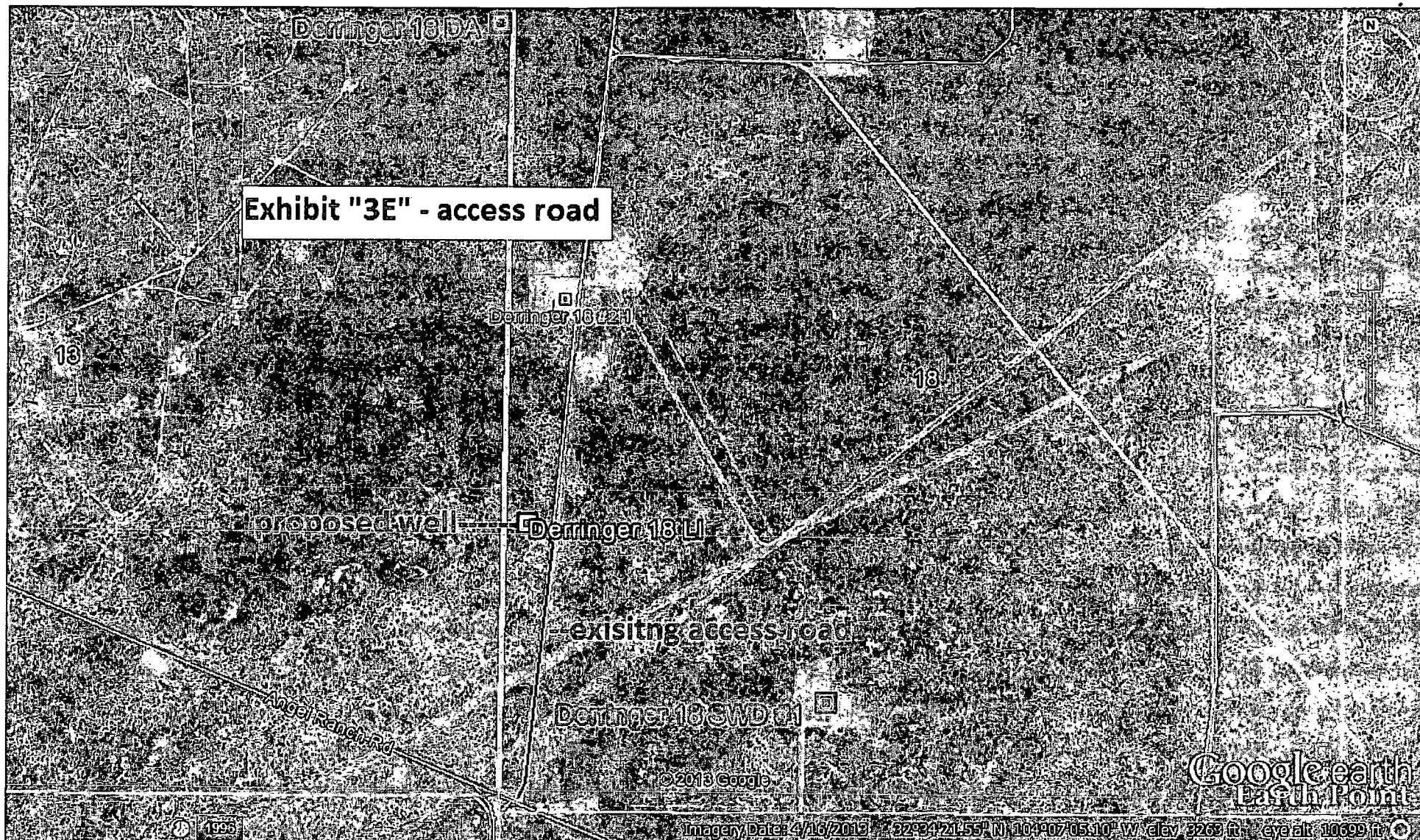
Derringer 18 CWD #1

Angel Ranch Rd

Google earth  
Earth Point

Imagery Date: 4/16/2013 32°23'22.55" N 104°07'05.10" W elev 3263 ft eye alt 10699 ft

2013



**MULTI-POINT SURFACE USE AND OPERATIONS PLAN**  
**MEWBOURNE OIL COMPANY**

Derringer 18 LI Federal #1H  
1800' FSL & 150' FWL (SHL)  
Sec 18-T20S-R29E  
Eddy County, New Mexico

This plan is submitted with Form 3160-3, Application for Permit to Drill, Covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved, and the procedures to be followed in restoring the surface so that a complete appraisal can be made of the environmental impact associated with the proposed operations.

**1. Existing Roads:**

- A. Exhibit #3 is a road map showing the location of the proposed well. Existing roads are highlighted in black. Exhibits #3-#3C are maps showing the location of the proposed well and access road. Existing and proposed roads are highlighted in black.
- B. Directions to location from the intersection of HWY 62-180 and CR 238, go north on CR 238 approximately 7.1 miles. Turn right and go approximately .5 miles and the location on left.
- C. Existing roads will be maintained in a condition the same as or better than before operations begin.

**2. Proposed Access Road:**

- A. no new road construction will be needed.
- B. The maximum width of the driving surface will be 14 feet. The road will be crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches will be 1 foot deep with 3:1 slopes. The road will be surfaced with rolled and compacted caliche.
- C. Mewbourne Oil Co. will cooperate with other operators in the maintenance of lease roads.

**3. Location of Existing Wells:**

There are producing wells within the immediate vicinity of the well site. Exhibit #4 shows the proposed well and existing wells within a one mile radius.

**4. Location of Existing and/or Proposed Facilities:**

- A. There are no production facilities on this lease at the present time.
- B. In the event that the well is productive, production facilities will be located at MOC's Derringer 18 Federal #2 battery. Flow line will follow exiting lease road within 5' and will be a low pressure (under 150 #) 2 7/8" steel line carrying all well bore fluids. See Exhibit 3D.
- C. Production vessels that will remain on this location will be painted to conform to BLM painting stipulations within 180 days of installation.

**5. Location and Type of Water Supply**

The well will be drilled with a combination of fresh water and brine water based mud systems. The water will be obtained from commercial suppliers in the area and/or hauled to the location by transport trucks over existing and proposed roads as indicated in Exhibit #3.

**6. Source of Construction Materials**

All material required for construction of the drill pad and access roads will be obtained from private, state, or federal pits. The construction contractor will be solely responsible for securing construction materials required for this operation and paying any royalties that may be required on those materials.

**7. Methods of Handling Waste Disposal:**

- A. Drill cuttings not retained for evaluation purposed will be hauled to a permitted off-site facility.
- B. Water produced during operations will be hauled to an off-site permitted SWD in the area.
- C. If any liquid hydrocarbons are produced during operations, those liquids will be stored in suitable tanks until sold.
- D. Sewage and gray water will be safely contained on-site, and then waste will be disposed at an approved off-site facility.
- E. All trash, junk, and other waste materials will be stored in proper containers to prevent dispersal and will be removed to an appropriate facility within one week of cessation of drilling and completion activities.

**8. Ancillary Facilities**

There are no ancillary facilities within the immediate vicinity of the proposed well site.

**9. Well Site Layout**

- A. A diagram of the drill pad is shown in Exhibit #5. Dimensions of the pad and location of major rig components are shown.
- B. The pad dimension of 280' x 320' has been staked and flagged.
- C. An archaeological survey has been conducted on the proposed well pad.

**10. Plans for Restoration of Surface**

- A. Within 90 days of cessation of drilling and completion operations, all equipment not necessary for production operations will be removed. The location will be cleaned of all trash and junk to assure the well site is left as aesthetically pleasing as reasonably possible.
- B. Interim reclamation:
  - i. All areas not needed for production operations will be reclaimed.
  - ii. Caliche will be removed, the land will be recontoured, the top soil from stockpile will be spread over these areas.



- iii. The disturbed area will be restored by re-seeding during the proper growing season.

*MULTI-POINT SURFACE USE AND OPERATIONS PLAN  
MEWBOURNE OIL COMPANY  
Derringer 18 LI Federal #1H  
Page 3*

- iv. Any additional caliche required for production facilities will be obtained from the area shown in exhibit #6 as interim reclamation.

**C. Final Reclamation:**

- i. Upon cessation of the proposed operations, if the well is abandoned, all equipment and trash will be removed and taken to a proper facility.
- ii. The location and road surfacing material will be removed and used to patch area lease roads. The entire location will be restored to the original contour as much as reasonable possible. The top soil used for interim reclamation will be spread over the entire location. All restoration work will be completed within 180 days of cessation of activities.

**11. Surface Ownership:**

Surface ownership is owned by BLM.

**12. Other Information:**

- A. The primary use of the surface at the location is for grazing of livestock.

**13. Operator's Representative:**

- A. Through APD approval, drilling, completion and production operations:

**N.M. Young, District Manager**  
Mewbourne Oil Company  
PO Box 5270  
Hobbs, NM 88241  
575-393-5905

# PECOS DISTRICT CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>Mewbourne Oil Company</b>
<b>LEASE NO.:</b>	<b>NMNM-01165</b>
<b>WELL NAME &amp; NO.:</b>	<b>Derringer 18 LI Federal 1H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>1800' FSL &amp; 0150' FWL</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>1800' FSL &amp; 0330' FEL</b>
<b>LOCATION:</b>	<b>Section 18, T. 20 S., R 29 E., NMPM</b>
<b>COUNTY:</b>	<b>Eddy County, New Mexico</b>

## 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**
  - Berm Well Pad
  - Cave/Karst
- ☐ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
  - Cement Requirements
  - H2S Requirements
  - High Cave/Karst
  - Capitan Reef
  - Logging Requirements
  - Waste Material and Fluids
- ☒ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
- ☐ **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)**

### **Berm Well Pad:**

The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.

- The berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g. caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)

### **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.

#### **Pad Berming:**

The pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the pad. All sides will be bermed.



**Tank Battery Liners and Berms:**

Tank battery locations 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.

## **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**

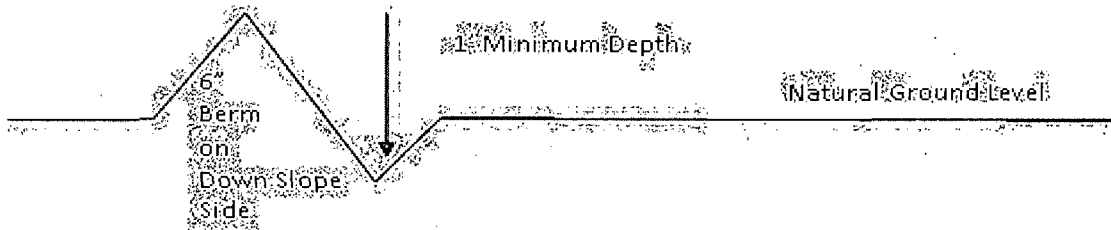
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping 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.

#### **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

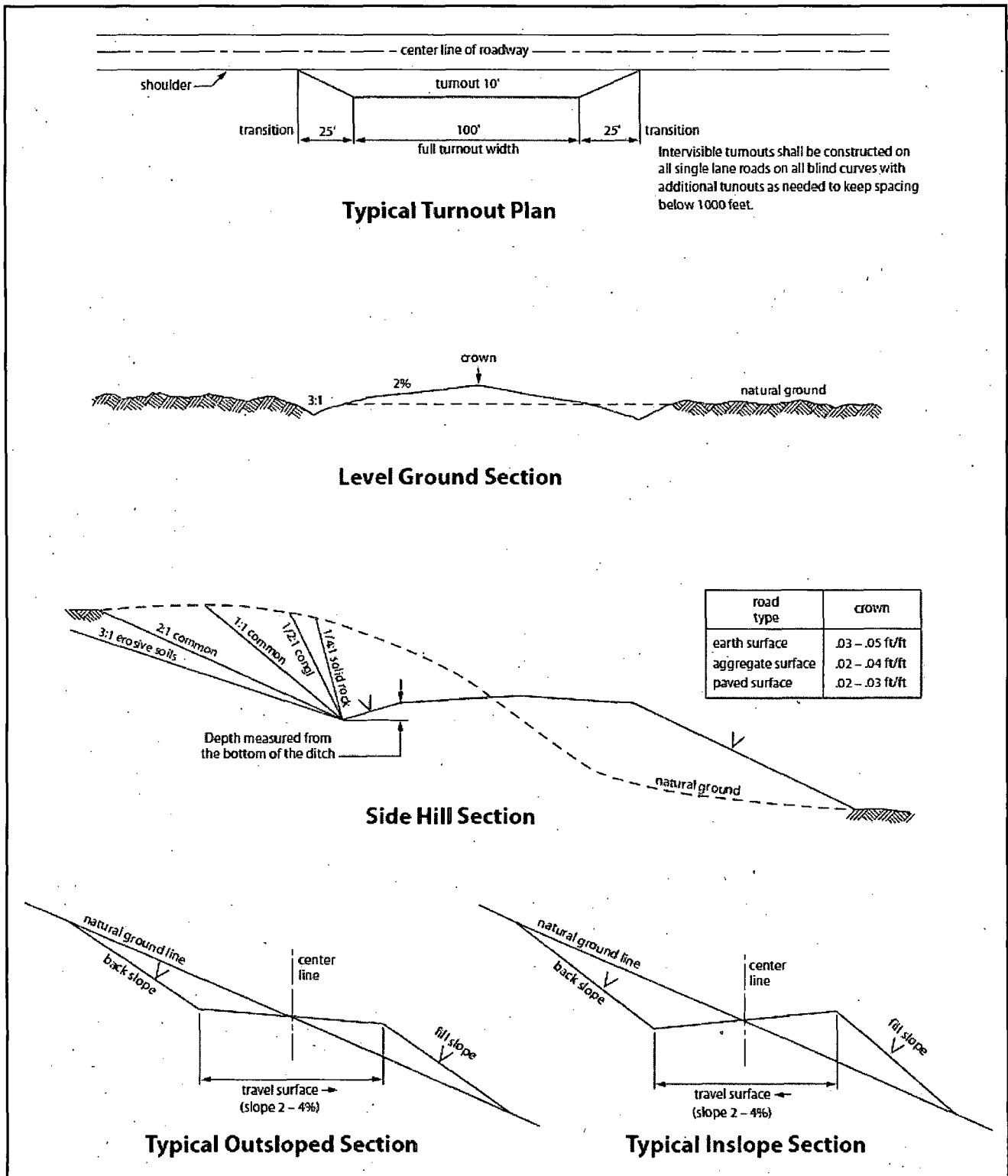


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## I. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

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

1. A Hydrogen Sulfide (H<sub>2</sub>S) Drilling Plan shall be activated 500 feet prior to drilling into the Yates formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please 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 is 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. 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) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. 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**

**Capitan Reef**

**Possible water flows in the Artesia Group and Salado.**

**Possibility of lost circulation in the Artesia Group, Rustler, Capitan Reef, and Delaware.**

- 1. The 20 inch surface casing shall be set at approximately 350 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. If salt is encountered, set casing at least 25 feet above the salt.**
  - 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 13-3/8 inch 1<sup>st</sup> intermediate casing, which shall be set at approximately 1000 feet, 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 cave/karst. Excess calculates to 10% - Additional cement may be required.**
3. The minimum required fill of cement behind the 9-5/8 inch 2<sup>nd</sup> intermediate casing, which shall be set at approximately 2950 feet, 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 Capitan Reef. Excess calculates to 21% - Additional cement may be required.**

**Centralizers required through the curve and a minimum of one every other joint.**

4. The minimum required fill of cement behind the 7 inch production casing is:
- ☒ Cement as proposed by operator. Operator shall provide method of verification. **Excess calculates to negative 7% - Additional cement will be required.**
5. Cement not required on the 4-1/2" casing. **Packer system being used.**
6. 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 20" surface casing.**

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M)** psi.
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**.
  - 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.
  - 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.

**JAM 010314**

## **II. 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 exclosure 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**

### **STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES**

**A copy of the application (Grant, Sundry Notice, APD) 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 activity of 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. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
  - (1) Land clearing.
  - (2) Earth-disturbing and earth-moving work.
  - (3) Blasting.
  - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, 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, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the 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 the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. 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.

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. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. 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. Signs will be maintained in a legible condition for the life of the pipeline.

14. 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. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. 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 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.

16. 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, powerline 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.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

### **III. 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:

<u>Species</u>	<u>lb/acre</u>
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