

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-ARTESIA

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DEC 12 2008

OCD-ARTESIA

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE- Other instructions on reverse side.

1 Type of Well
☒ Oil Well ☐ Gas Well ☐ Other2 Name of Operator **COG Operating LLC**3a Address
550 W. Texas Ave., Suite 1300 Midland, TX 797013b Phone No. (include area code)
432-685-4332

4. Location of Well (Footage, Sec., T, R, M, or Survey Description)

**SHL: 900 FSL & 330 FEL
Section 23, T16S, R29E, UL P****BHL: 430 FSL & 330 FWL
Section 23, T16S, R29E, UL M**FORM APPROVED
OMB No. 1004-0137
Expires: March 31, 20075 Lease Serial No.
NMNM-118710

6. If Indian, Allottee or Tribe Name

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

8 Well Name and No.
High Lonesome 23 Federal 1H9 API Well No.
30-015-3594910. Field and Pool, or Exploratory Area
Wildcat; Wolfcamp

11. County or Parish, State

Eddy County, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☒ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other <u>Location change</u>
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompletable horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletable in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Operating LLC respectfully requests permission to:

To change the proposed BHL from 900' FSL to 430' FSL (with associated azimuth change).

To change the proposed measured depth to 11,769' (due to azimuth change).

To change Field and Pool from Wolfcamp to Abo.

To change the anticipated starting date to December 8, 2008.

To change the proposed 13-3/8" Surface Casing from 48# H-40 to 54.5# J/K-55 due to availability.

COG requests a variance to test Surface stack, manifold and all valves in "one single" test with rig pump to 1000 psi (changing from 800 psi).

To change the proposed 9-5/8" Intermediate Casing from J-55 to J/K-55 due to availability.

Change Proposed Casing and Cement Program from 5-1/2" to 7" 26# P-110.

Attached is a revised plat, an updated directional plan, and revised Form 3160-3 Drill Plan with changes reflected in bold, italicized, and underlined areas.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

- 14 I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Kanicia CarrilloTitle **Regulatory Analyst**

Signature

Date

12/04/2008

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Conditions of approval, if any, are attached. Approval of this notice 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.

Title

Office

Date

DEC 4 2008**WESLEY W. INGRAM****PETROLEUM ENGINEER**

Title 18 USC Section 1001 and Title 43 USC 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.

(Instructions on page 2)

Accepted for record - NMOC

		OPERATOR CERTIFICATION <i>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 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 division.</i> 12/04/08 Date Signature Date Kanicia Carrillo Printed Name
BOTTOM HOLE LOCATION LAT.: N 32°54'03.91" LONG.: W104°03'10.76" SPC- N.: 691663.599 E.: 627380.744 (NAD-83)	SURFACE LOCATION LAT.: N 32°54'08.44" LONG.: W104°02'16.50" SPC- N.: 692133.954 E.: 632013.144 (NAD-83)	

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief

Date Surveyed: **SEPTEMBER 24, 2007**

Signature & Seal:

Professional Surveyor

GARY L. JONES

MEXICO

7977

W.C. 160627
Certificate No. Gary L. Jones 7977

BASIN SURVEYS

SUNDRY NOTES TO CHANGE APD

COG Operating, LLC
High Lonesome "23" Federal Com. #1H
SL: 900' FSL & 330' FEL, Unit P
BHL: 430' FSL & 330' FWL, Unit M
Sec 23, T16S, R29E
Eddy County, NM

see new drilling COA
REVISED 12/4/2008

CHANGES DUE TO SURFACE LOCATION MOVE FOR BLM PURPOSES

- 1 To change the proposed BHL from 900' FSL to 430' FSL (with associated azimuth change).
- 2 To change the proposed measured depth to 11,769' (due to azimuth change).

CHANGES TO UPDATE TO CURRENT DRILLING PRACTICES

- 1 COG respectfully requests permission to change Field and Pool from Wolfcamp to Abo.
- 2 To change the anticipated starting date to December 8, 2008.
- 3 To change the proposed 13-3/8" Surface Casing from 48# H-40 to 54.5# J/K-55 due to availability.
- 4 COG requests a variance to test Surface stack, manifold and all valves in "one single" test with rig pump to 1000 psi (changing from 800 psi).
- 5 To change the proposed 9-5/8" Intermediate Casing from J-55 to J/K-55 due to availability.
- 6 Change Proposed Casing and Cement Program from 5-1/2" to 7" 26# P-110.
- 7 To change pilot hole size from 8-3/4" to 6-1/8".
- 8 Run 4-1/2" 11.6# P-110 LTC Production liner with +/- 5 isolation Packers and Sliding Sleeves in un-cemented lateral.
- 9 COG requests a variance to the 200' minimum tie-back in order to set the pump as close to the formation as possible. The window and horizontal are all located in the Abo Formation.

Attached is a revised plat, an updated directional plan, and revised Form 3160-3 Drill Plan with changes reflected in **bold, italicized, and underlined** areas.

REVISED 12/4/2008

- | | |
|----------------------|--------------|
| Quaternary | Surface |
| Yates | 1030' |
| Queen | 1850' |
| San Andres | 2620' |
| Tubb | 5350' |
| Abo | 6040' |
| Top Basal Abo | 7310' |

- | | | |
|----------------------|--------------|------------------|
| Water Sand | 150' | Fresh Water |
| Yates | 1040' | Oil / Gas |
| Queen | 1850' | Oil / Gas |
| San Andres | 2620' | Oil / Gas |
| Tubb | 5350' | Oil / Gas |
| Abo | 6040' | Oil / Gas |
| Top Basal Abo | 7310' | Oil / Gas |

- | <u>Hole size</u> | <u>Interval</u> | <u>OD of Casing</u> | <u>Weight</u> | <u>Cond.</u> | <u>Collar</u> | <u>Grade</u> |
|--|------------------------------|----------------------|---------------------|--------------|-------------------|----------------------|
| 17-1/2" | 0' - +/-400' | 13-3/8" | <u>54.5#</u> | New | STC | <u>J/K-55</u> |
| Collapse sf - 2.98, Burst sf – 2.33, Tension sf – 13.42 | | | | | | |
| 12 1/4" | 0' - +/-2700' | 9-5/8" | 40# | New | STC | <u>J/K-55</u> |
| Collapse sf - 2.86, Burst sf – 1.42, Tension sf – 7.22 | | | | | | |
| 8-3/4" | <u>0' – +/-6700'</u> | <u>7"</u> | <u>26#</u> | New | LTC | <u>P-110</u> |
| <u>Collapse sf - 2.18, Burst sf – 1.53, Tension sf – 4.37</u> | | | | | | |
| <u>6-1/8"</u> | <u>6600' – 11769'</u> | <u>4-1/2"</u> | <u>11.6#</u> | New | <u>LTC</u> | <u>P-110</u> |
| <u>Collapse sf – 2.47, Burst sf – 1.64, Tension sf – 4.48</u> | | | | | | |

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
High Lonesome "23" Federal Com. #1H
Page 2 of 3

7. Cement Program

13 3/8" Surf. Csg. Set at +/- 400', Circ to Surf with +/- 400 sx Class "C" w/ 2% CaCl₂, 1.35 yd.

9 5/8" Intrmd. Csg. Set at +/- 2700'. Circ to Surf with +/- 600 sx 35/65 Poz "C", 2.05 yd. & 200 sx Class "C" w/ 2% CaCl₂, 1.35 yd.

7" Production Casing set at +/- 6700' MD, Cement with +/- 500 sx. 50/50/10 "C", 2.45 yd & +/- 200 sx Class "H", 1.18 yd., Est. TOC @ 200' minimum tie back into intermediate casing.

4 1/2" Production Liner set from +/- 6600' to +/-11769' MD, 7280' TVD, Liner run with +/- 5 isolation Packers and Sliding sleeves in un-cemented Lateral.

8. Pressure Control Equipment:

See
COA →

After setting 13 3/8" casing and installing 3000 psi casing head, NU 13 5/8" 3000 psi annular BOP. Test annular BOP, casing and manifold with clear fluid to 1000 psi w/ rig pump. After setting 9 5/8" casing and installing 3000 psi casing spool, NU 3000 psi double ram BOP and 3000 psi annular BOP. Test double ram BOP and manifold to 3000# with clear fluid and annular to 1500 psi using an independent tester, this equipment will be used continuously until TD is reached. Blind rams will be operationally checked on each trip out of hole. Pipe rams will be operationally checked each 24 hour period. These checks will be noted on daily tour sheets. Other accessories to the BOP equipment include a Kelly cock and floor safety valves, choke lines and choke manifold with 3000 psi WP rating.

9. Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 400'	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
400' - 2700'	9.1	30	NC	Cut brine mud, lime for PH and paper for seepage and sweeps.
2700' - 6000'	9.1	29	NC	Drill section with fresh water/cut brine circulating the reserve utilizing periodic sweeps of paper as needed for seepage control and solids removal.
6000' - <u>11769'</u>	9.5	36	10	Drill pilot hole, curve and horizontal section with XCD polymer / cut brine / starch.

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the well site at all times.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
High Lonesome "23" Federal Com. #1H
Page 3 of 3

10. Production Hole Drilling Summary:

*see COA
pilot hole comments*

Set 7" production casing at +/- 6700'. Drill 6-1/8" pilot hole thru Top Basal Abo to +/- 7580', run open hole logs. Spot +/- 250 sx. "C" Kick off plug from +/- 7580' to +/- 6750'. Drill 6-1/8" hole and kick off at +/- 6853', building curve over +/- 450' to horizontal at 7330' TVD. Drill horizontal section in a Westerly direction for +/- 4650' lateral to TD at +/- 11769' MD, 7280' TVD. Run 4-1/2" production liner in Open hole lateral and set isolation packers and liner top packer @ +/- 6600' MD.

11. Auxiliary Well Control and Monitoring Equipment

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

12. Logging, Testing and Coring Program:

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be ran from T.D. in vertical pilot hole to 9 5/8" casing shoe.
- B. The mud logging program will consist of lagged 10' samples from intermediate casing point to T.D. in vertical pilot hole and from Kick off point to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 4 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

13. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 120 degrees and estimated maximum bottom hole pressure is 3160 psig. Low levels of Hydrogen sulfide have been monitored in producing wells in the area, so H2S may be present while drilling of the well. An H2S plan is attached to the Drilling Program. No major loss of circulation zones has been reported in offsetting wells.

14. Anticipated Starting Date

Drilling operations will commence approximately on December 8, 2008 with drilling and completion operations lasting approximately 90 days.

COG Operating LLC

Eddy County

High Lonesome 23 Fed Com #1

High Lonesome #1

OH

Plan: Plan #1

Patfinder X & Y Survey Report

03 December, 2008

COG Operating, L.L.C.



Azimuths to True North
Magnetic North: 8.15°

Magnetic Field
Strength: 49279.2snT
Dip Angle: 60.81°
Date: 12/2/2008
Model: IGRF200510

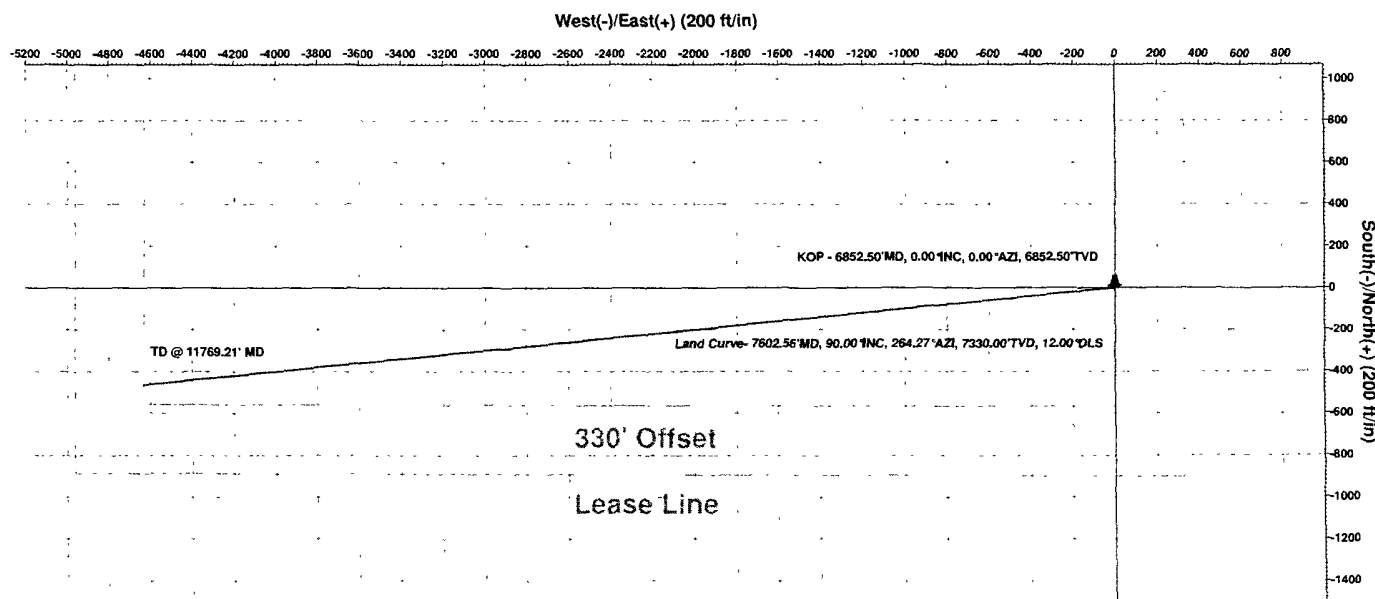
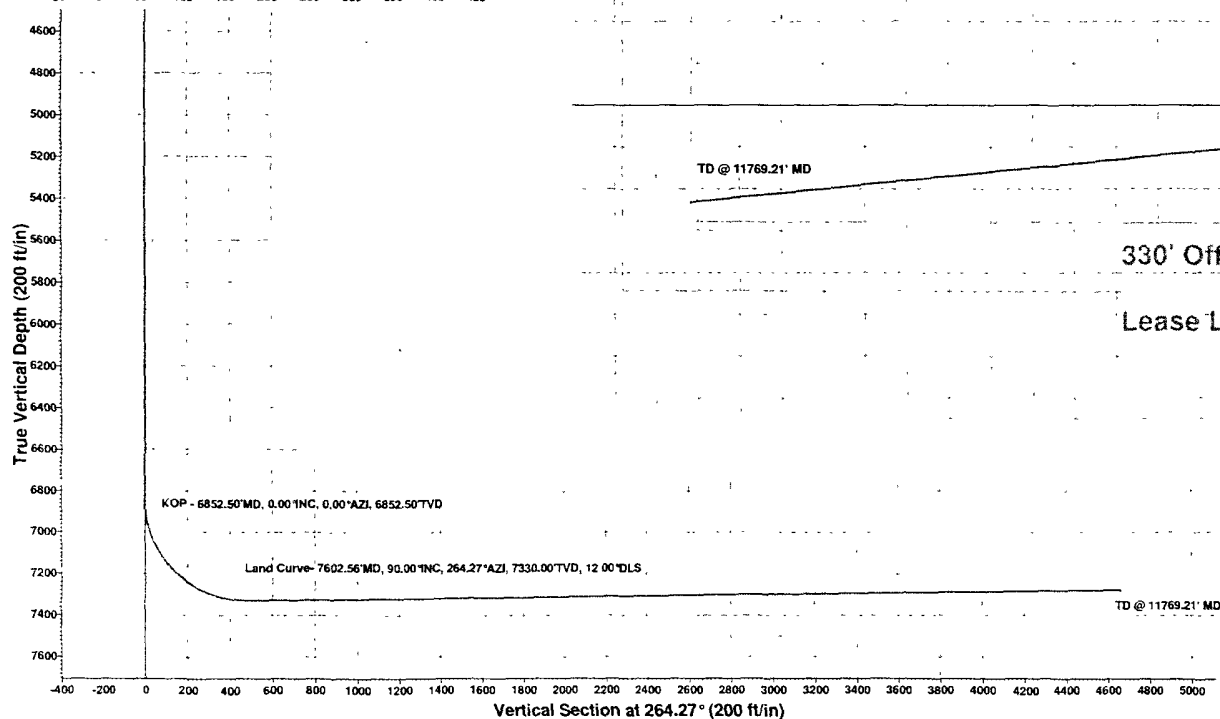
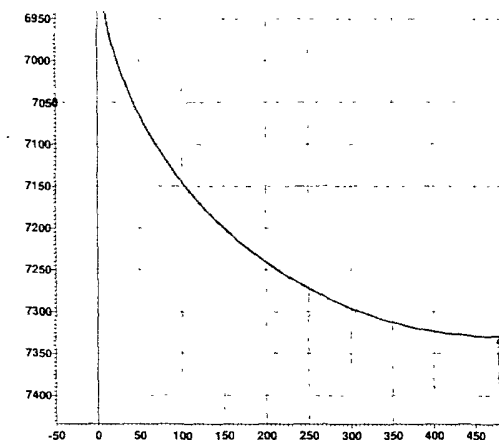
PATHFINDER ENERGY SERVICES

Project: Eddy County
Site: High Lonesome 23 Fed Com #1
Well: High Lonesome #1
Wellbore: OH
Plan: Plan #1 (High Lonesome #1/OH)

WELL DETAILS: High Lonesome #1							
Ground Elevation: 3702.00							
RKB Elevation: WELL @ 3702.00ft (Original Well Elev)							
Rig Name: Original Well Elev							
+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot	
0.00	0.00	692133.954	632013.144	32° 54' 8.438 N	104° 2' 16.406 W		

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	6852.50	0.00	0.00	6852.50	0.00	0.00	0.00	0.00	0.00
3	7602.56	90.00	264.27	7330.00	-47.67	-475.12	12.00	264.27	477.50
4	7771.12	90.70	264.27	7328.97	-64.50	-642.83	0.42	0.00	646.06
5	11781.57	90.70	264.27	7279.98	-464.88	-4632.95	0.00	0.00	4656.21 PBHL(High Lonesome #1)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)						
Name	TVD	+N-S	+E-W	Northing	Easting	Shape
PBHL(High Lonesome #1)	7280.00	-457.38	-4633.70	691663.599	627380.744	Point



PROJECT DETAILS: Eddy County
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: No north reference data is available

Plan: Plan #1 (High Lonesome #1/OH)	
Created By: Aaron Puffin	Date: 10/13/2008
Checked: _____	Date: _____

Pathfinder Energy Services

Pathfinder X & Y Survey Report

Company: COG Operating LLC
Project: Eddy County
Site: High Lonesome 23 Fed Com #1
Well: High Lonesome #1
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well High Lonesome #1
TVD Reference: WELL @ 3702.00ft (Original Well Elev)
MD Reference: WELL @ 3702.00ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Project	Eddy County
Map System:	US State Plane 1983
Geo Datum:	North American Datum 1983
Map Zone:	New Mexico Eastern Zone
System Datum:	Mean Sea Level

Site		High Lonesome 23 Fed Com #1			
Site Position:		Northing:	692,133.954 ft	Latitude:	32° 54' 8.438 N
From:	Map	Easting:	632,013.144 ft	Longitude:	104° 2' 16.406 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.16 °

Well	High Lonesome #1					
Well Position	+N/-S	0.00 ft	Northing:	692,133.954 ft	Latitude:	32° 54' 8.438 N
	+E/-W	0.00 ft	Easting:	632,013.144 ft	Longitude:	104° 2' 16.406 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,702.00 ft

Wellbore:	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/2/2008	8.15	60.81	49,279

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	264.27

Survey Tool Program	Date	12/3/2008
From	To	
(ft)	(ft)	
	Survey (Wellbore)	Tool Name
		Description
0.00	11,781.57 Plan #1 (OH)	

Pathfinder Energy Services

Pathfinder X & Y Survey Report

Company: COG Operating LLC
Project: Eddy County
Site: High Lonesome 23 Fed Com #1
Well: High Lonesome #1
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well High Lonesome #1
TVD Reference: WELL @ 3702.00ft (Original Well Elev)
MD Reference: WELL @ 3702.00ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
0.00	0.00	0.00	0.00	-3,702.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
100.00	0.00	0.00	100.00	-3,602.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
200.00	0.00	0.00	200.00	-3,502.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
300.00	0.00	0.00	300.00	-3,402.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
400.00	0.00	0.00	400.00	-3,302.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
500.00	0.00	0.00	500.00	-3,202.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
600.00	0.00	0.00	600.00	-3,102.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
700.00	0.00	0.00	700.00	-3,002.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
800.00	0.00	0.00	800.00	-2,902.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
900.00	0.00	0.00	900.00	-2,802.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,000.00	0.00	0.00	1,000.00	-2,702.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,100.00	0.00	0.00	1,100.00	-2,602.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,200.00	0.00	0.00	1,200.00	-2,502.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,300.00	0.00	0.00	1,300.00	-2,402.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,400.00	0.00	0.00	1,400.00	-2,302.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,500.00	0.00	0.00	1,500.00	-2,202.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,600.00	0.00	0.00	1,600.00	-2,102.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,700.00	0.00	0.00	1,700.00	-2,002.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,800.00	0.00	0.00	1,800.00	-1,902.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
1,900.00	0.00	0.00	1,900.00	-1,802.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,000.00	0.00	0.00	2,000.00	-1,702.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,100.00	0.00	0.00	2,100.00	-1,602.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,200.00	0.00	0.00	2,200.00	-1,502.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,300.00	0.00	0.00	2,300.00	-1,402.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,400.00	0.00	0.00	2,400.00	-1,302.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,500.00	0.00	0.00	2,500.00	-1,202.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,600.00	0.00	0.00	2,600.00	-1,102.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14

Pathfinder Energy Services

Patfinder X & Y Survey Report

Company: COG Operating LLC
Project: Eddy County
Site: High Lonesome 23 Fed Com #1
Well: High Lonesome #1
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well High Lonesome #1
TVD Reference: WELL @ 3702.00ft (Original Well Elev)
MD Reference: WELL @ 3702.00ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
2,700.00	0.00	0.00	2,700.00	-1,002.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,800.00	0.00	0.00	2,800.00	-902.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
2,900.00	0.00	0.00	2,900.00	-802.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,000.00	0.00	0.00	3,000.00	-702.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,100.00	0.00	0.00	3,100.00	-602.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,200.00	0.00	0.00	3,200.00	-502.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,300.00	0.00	0.00	3,300.00	-402.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,400.00	0.00	0.00	3,400.00	-302.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,500.00	0.00	0.00	3,500.00	-202.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,600.00	0.00	0.00	3,600.00	-102.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,700.00	0.00	0.00	3,700.00	-2.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,800.00	0.00	0.00	3,800.00	98.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
3,900.00	0.00	0.00	3,900.00	198.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,000.00	0.00	0.00	4,000.00	298.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,100.00	0.00	0.00	4,100.00	398.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,200.00	0.00	0.00	4,200.00	498.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,300.00	0.00	0.00	4,300.00	598.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,400.00	0.00	0.00	4,400.00	698.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,500.00	0.00	0.00	4,500.00	798.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,600.00	0.00	0.00	4,600.00	898.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,700.00	0.00	0.00	4,700.00	998.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,800.00	0.00	0.00	4,800.00	1,098.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
4,900.00	0.00	0.00	4,900.00	1,198.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,000.00	0.00	0.00	5,000.00	1,298.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,100.00	0.00	0.00	5,100.00	1,398.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,200.00	0.00	0.00	5,200.00	1,498.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,300.00	0.00	0.00	5,300.00	1,598.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14

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Patfinder X & Y Survey Report

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Well: High Lonesome #1
Wellbore: OH
Design: Plan #1

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Database: EDM 2003.16 Single User Db

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5,400.00	0.00	0.00	5,400.00	1,698.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,500.00	0.00	0.00	5,500.00	1,798.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,600.00	0.00	0.00	5,600.00	1,898.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,700.00	0.00	0.00	5,700.00	1,998.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,800.00	0.00	0.00	5,800.00	2,098.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
5,900.00	0.00	0.00	5,900.00	2,198.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,000.00	0.00	0.00	6,000.00	2,298.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,100.00	0.00	0.00	6,100.00	2,398.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,200.00	0.00	0.00	6,200.00	2,498.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,300.00	0.00	0.00	6,300.00	2,598.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,400.00	0.00	0.00	6,400.00	2,698.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,500.00	0.00	0.00	6,500.00	2,798.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,600.00	0.00	0.00	6,600.00	2,898.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,700.00	0.00	0.00	6,700.00	2,998.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,800.00	0.00	0.00	6,800.00	3,098.00	0.00	0.00	0.00	0.00	692,133.95	632,013.14
6,852.50	0.00	0.00	6,852.50	3,150.50	0.00	0.00	0.00	0.00	692,133.95	632,013.14
KOP - 6852.50'MD, 0.00°INC, 0.00°AZI, 6852.50'TVD										
6,875.00	2.70	264.27	6,874.99	3,172.99	-0.05	-0.53	0.53	12.00	692,133.90	632,012.62
6,900.00	5.70	264.27	6,899.92	3,197.92	-0.24	-2.35	2.36	12.00	692,133.71	632,010.80
6,925.00	8.70	264.27	6,924.72	3,222.72	-0.55	-5.47	5.49	12.00	692,133.39	632,007.68
6,950.00	11.70	264.27	6,949.32	3,247.32	-0.99	-9.87	9.92	12.00	692,132.94	632,003.28
6,975.00	14.70	264.27	6,973.66	3,271.66	-1.56	-15.55	15.63	12.00	692,132.35	631,997.60
7,000.00	17.70	264.27	6,997.67	3,295.67	-2.26	-22.49	22.60	12.00	692,131.63	631,990.66
7,025.00	20.70	264.27	7,021.27	3,319.27	-3.08	-30.67	30.82	12.00	692,130.79	631,982.49
7,050.00	23.70	264.27	7,044.42	3,342.42	-4.02	-40.06	40.27	12.00	692,129.82	631,973.09
7,075.00	26.70	264.27	7,067.04	3,365.04	-5.08	-50.65	50.91	12.00	692,128.73	631,962.51
7,100.00	29.70	264.27	7,089.07	3,387.07	-6.26	-62.41	62.72	12.00	692,127.52	631,950.76

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7,125.00	32.70	264.27	7,110.45	3,408.45	-7.55	-75.29	75.67	12.00	692,126.19	631,937.88
7,150.00	35.70	264.27	7,131.12	3,429.12	-8.96	-89.27	89.72	12.00	692,124.75	631,923.90
7,175.00	38.70	264.27	7,151.04	3,449.04	-10.47	-104.31	104.83	12.00	692,123.20	631,908.87
7,200.00	41.70	264.27	7,170.13	3,468.13	-12.08	-120.36	120.96	12.00	692,121.54	631,892.82
7,225.00	44.70	264.27	7,188.35	3,486.35	-13.79	-137.38	138.07	12.00	692,119.78	631,875.80
7,250.00	47.70	264.27	7,205.65	3,503.65	-15.59	-155.33	156.11	12.00	692,117.93	631,857.85
7,275.00	50.70	264.27	7,221.99	3,519.99	-17.48	-174.16	175.04	12.00	692,115.99	631,839.03
7,300.00	53.70	264.27	7,237.31	3,535.31	-19.45	-193.81	194.79	12.00	692,113.96	631,819.39
7,325.00	56.70	264.27	7,251.58	3,549.58	-21.50	-214.24	215.31	12.00	692,111.86	631,798.97
7,350.00	59.70	264.27	7,264.75	3,562.75	-23.62	-235.37	236.56	12.00	692,109.68	631,777.84
7,375.00	62.69	264.27	7,276.80	3,574.80	-25.80	-257.17	258.46	12.00	692,107.43	631,756.05
7,400.00	65.69	264.27	7,287.68	3,585.68	-28.05	-279.56	280.96	12.00	692,105.12	631,733.66
7,425.00	68.69	264.27	7,297.37	3,595.37	-30.35	-302.49	304.01	12.00	692,102.75	631,710.74
7,450.00	71.69	264.27	7,305.84	3,603.84	-32.70	-325.89	327.53	12.00	692,100.34	631,687.35
7,475.00	74.69	264.27	7,313.07	3,611.07	-35.09	-349.70	351.45	12.00	692,097.89	631,663.54
7,500.00	77.69	264.27	7,319.03	3,617.03	-37.51	-373.85	375.73	12.00	692,095.39	631,639.40
7,525.00	80.69	264.27	7,323.72	3,621.72	-39.96	-398.28	400.28	12.00	692,092.87	631,614.97
7,550.00	83.69	264.27	7,327.11	3,625.11	-42.44	-422.93	425.05	12.00	692,090.33	631,590.34
7,575.00	86.69	264.27	7,329.21	3,627.21	-44.92	-447.71	449.96	12.00	692,087.78	631,565.56
7,600.00	89.69	264.27	7,330.00	3,628.00	-47.42	-472.57	474.94	12.00	692,085.21	631,540.71
7,602.56	90.00	264.27	7,330.00	3,628.00	-47.67	-475.12	477.50	12.00	692,084.95	631,538.16
Land Curve- 7602.56°MD, 90.00°INC, 264.27°AZI, 7330.00°TVD, 12.00°DLS										
7,700.00	90.40	264.27	7,329.66	3,627.66	-57.40	-572.07	574.94	0.42	692,074.95	631,441.24
7,771.12	90.70	264.27	7,328.97	3,626.97	-64.50	-642.83	646.06	0.42	692,067.65	631,370.50
7,800.00	90.70	264.27	7,328.62	3,626.62	-67.39	-671.56	674.94	0.00	692,064.69	631,341.77
7,900.00	90.70	264.27	7,327.40	3,625.40	-77.37	-771.06	774.93	0.00	692,054.42	631,242.31
8,000.00	90.70	264.27	7,326.18	3,624.18	-87.35	-870.55	874.92	0.00	692,044.16	631,142.84

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Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
8,100.00	90.70	264.27	7,324.96	3,622.96	-97.34	-970.04	974.91	0.00	692,033.90	631,043.38
8,200.00	90.70	264.27	7,323.73	3,621.73	-107.32	-1,069.54	1,074.91	0.00	692,023.64	630,943.91
8,300.00	90.70	264.27	7,322.51	3,620.51	-117.30	-1,169.03	1,174.90	0.00	692,013.38	630,844.45
8,400.00	90.70	264.27	7,321.29	3,619.29	-127.29	-1,268.52	1,274.89	0.00	692,003.11	630,744.98
8,500.00	90.70	264.27	7,320.07	3,618.07	-137.27	-1,368.01	1,374.88	0.00	691,992.85	630,645.52
8,600.00	90.70	264.27	7,318.85	3,616.85	-147.25	-1,467.51	1,474.88	0.00	691,982.59	630,546.05
8,700.00	90.70	264.27	7,317.63	3,615.63	-157.24	-1,567.00	1,574.87	0.00	691,972.33	630,446.59
8,800.00	90.70	264.27	7,316.40	3,614.40	-167.22	-1,666.49	1,674.86	0.00	691,962.07	630,347.13
8,900.00	90.70	264.27	7,315.18	3,613.18	-177.20	-1,765.99	1,774.85	0.00	691,951.80	630,247.66
9,000.00	90.70	264.27	7,313.96	3,611.96	-187.19	-1,865.48	1,874.85	0.00	691,941.54	630,148.20
9,100.00	90.70	264.27	7,312.74	3,610.74	-197.17	-1,964.97	1,974.84	0.00	691,931.28	630,048.73
9,200.00	90.70	264.27	7,311.52	3,609.52	-207.15	-2,064.47	2,074.83	0.00	691,921.02	629,949.27
9,300.00	90.70	264.27	7,310.30	3,608.30	-217.14	-2,163.96	2,174.82	0.00	691,910.76	629,849.80
9,400.00	90.70	264.27	7,309.07	3,607.07	-227.12	-2,263.45	2,274.82	0.00	691,900.49	629,750.34
9,500.00	90.70	264.27	7,307.85	3,605.85	-237.10	-2,362.94	2,374.81	0.00	691,890.23	629,650.87
9,600.00	90.70	264.27	7,306.63	3,604.63	-247.09	-2,462.44	2,474.80	0.00	691,879.97	629,551.41
9,700.00	90.70	264.27	7,305.41	3,603.41	-257.07	-2,561.93	2,574.79	0.00	691,869.71	629,451.94
9,800.00	90.70	264.27	7,304.19	3,602.19	-267.05	-2,661.42	2,674.79	0.00	691,859.45	629,352.48
9,900.00	90.70	264.27	7,302.96	3,600.96	-277.04	-2,760.92	2,774.78	0.00	691,849.18	629,253.02
10,000.00	90.70	264.27	7,301.74	3,599.74	-287.02	-2,860.41	2,874.77	0.00	691,838.92	629,153.55
10,100.00	90.70	264.27	7,300.52	3,598.52	-297.00	-2,959.90	2,974.77	0.00	691,828.66	629,054.09
10,200.00	90.70	264.27	7,299.30	3,597.30	-306.99	-3,059.39	3,074.76	0.00	691,818.40	628,954.62
10,300.00	90.70	264.27	7,298.08	3,596.08	-316.97	-3,158.89	3,174.75	0.00	691,808.14	628,855.16
10,400.00	90.70	264.27	7,296.86	3,594.86	-326.95	-3,258.38	3,274.74	0.00	691,797.87	628,755.69
10,500.00	90.70	264.27	7,295.63	3,593.63	-336.94	-3,357.87	3,374.74	0.00	691,787.61	628,656.23
10,600.00	90.70	264.27	7,294.41	3,592.41	-346.92	-3,457.37	3,474.73	0.00	691,777.35	628,556.76
10,700.00	90.70	264.27	7,293.19	3,591.19	-356.90	-3,556.86	3,574.72	0.00	691,767.09	628,457.30

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10,800.00	90.70	264.27	7,291.97	3,589.97	-366.89	-3,656.35	3,674.71	0.00	691,756.83	628,357.83
10,900.00	90.70	264.27	7,290.75	3,588.75	-376.87	-3,755.84	3,774.71	0.00	691,746.56	628,258.37
11,000.00	90.70	264.27	7,289.53	3,587.53	-386.85	-3,855.34	3,874.70	0.00	691,736.30	628,158.91
11,100.00	90.70	264.27	7,288.30	3,586.30	-396.84	-3,954.83	3,974.69	0.00	691,726.04	628,059.44
11,200.00	90.70	264.27	7,287.08	3,585.08	-406.82	-4,054.32	4,074.68	0.00	691,715.78	627,959.98
11,300.00	90.70	264.27	7,285.86	3,583.86	-416.80	-4,153.82	4,174.68	0.00	691,705.52	627,860.51
11,400.00	90.70	264.27	7,284.64	3,582.64	-426.79	-4,253.31	4,274.67	0.00	691,695.26	627,761.05
11,500.00	90.70	264.27	7,283.42	3,581.42	-436.77	-4,352.80	4,374.66	0.00	691,684.99	627,661.58
11,600.00	90.70	264.27	7,282.20	3,580.20	-446.75	-4,452.30	4,474.65	0.00	691,674.73	627,562.12
11,700.00	90.70	264.27	7,280.97	3,578.97	-456.74	-4,551.79	4,574.65	0.00	691,664.47	627,462.65
11,769.21	90.70	264.27	7,280.13	3,578.13	-463.65	-4,620.65	4,643.85	0.00	691,657.37	627,393.81
TD @ 11769.21' MD										
11,781.57	90.70	264.27	7,279.98	3,577.98	-464.88	-4,632.95	4,656.21	0.00	691,656.10	627,381.52
PBHL(High Lonesome #1)										

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Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL(High Lonesome - plan misses by 7.54ft at 11781.57ft MD (7279.98 TVD, -464.88 N, -4632.95 E) - Point	0.00	0 00	7,280.00	-457.38	-4,633.70	691,663.599	627,380.744	32° 54' 3.909 N	104° 3' 10.757 W

Plan Annotations.

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,852.50	6,852.50	0.00	0.00	KOP - 6852.50'MD, 0.00°INC, 0.00°AZI, 6852.50'TVD
7,602.56	7,330.00	-47.67	-475.12	Land Curve- 7602.56'MD, 90.00°INC, 264.27°AZI, 7330.00'TVD, 12.00
11,769.21	7,280.13	-463.65	-4,620.65	TD @ 11769.21' MD

Checked By: _____ Approved By: _____ Date: _____

COG Operating, L.L.C.



Azimuths to True North
Magnetic North: 8.15°

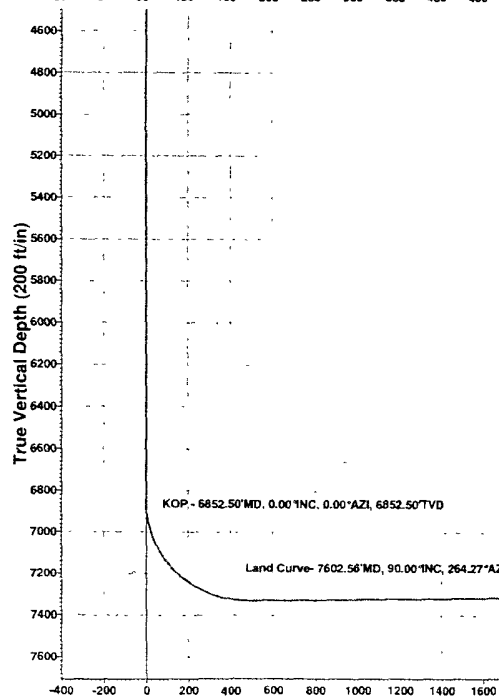
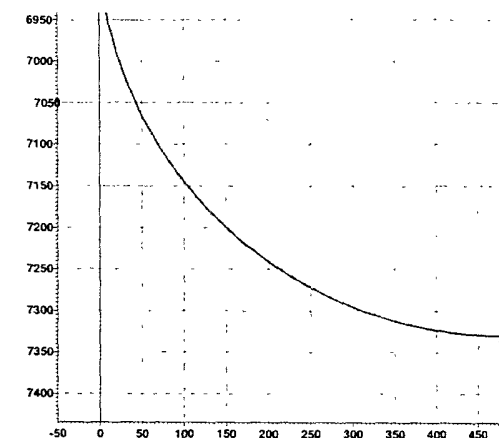
Magnetic Field
Strength: 49279.2snT
Dip Angle: 60.81°
Date: 12/2/2008
Model: IGRF200510

PATHFINDER ENERGY SERVICES

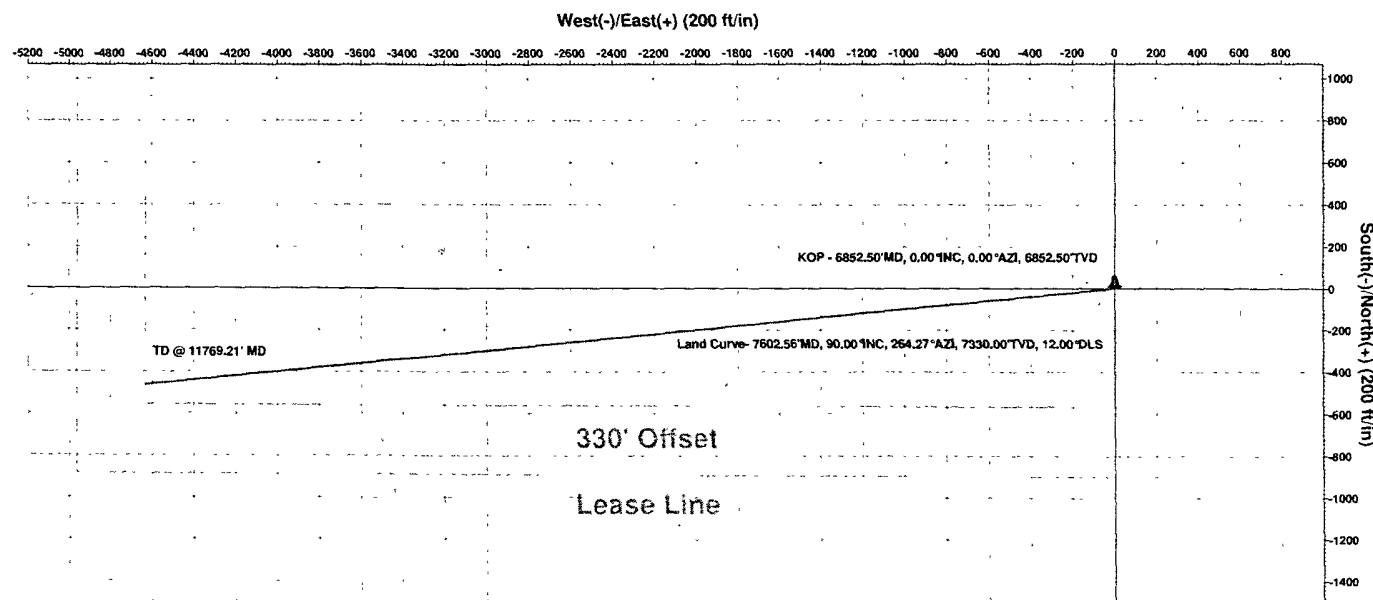
Project: Eddy County
Site: High Lonesome 23 Fed Com #1
Well: High Lonesome #1
Wellbore: OH
Plan: Plan #1 (High Lonesome #1/OH)

WELL DETAILS: High Lonesome #1									
Ground Elevation: 3702.00									
RKB Elevation: WELL @ 3702.00ft (Original Well Elev)									
Rig Name: Original Well Elev									
+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot			
0.00	0.00	692133.954	632013.144	32° 54' 8.438 N	104° 2' 16.406 W				
SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	6852.50	0.00	0.00	6852.50	0.00	0.00	0.00	0.00	0.00
3	7602.56	90.00	264.27	7330.00	-47.67	-475.12	12.00	264.27	477.50
4	7771.12	90.70	264.27	7328.97	-64.50	-642.83	0.42	0.00	646.06
5	11781.57	90.70	264.27	7279.98	-64.88	-632.95	0.00	0.00	4656.21 PBHL(High Lonesome #1)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)						
Name	TVD	+N-S	+E-W	Northing	Easting	Shape
PBHL(High Lonesome #1)	7280.00	-457.38	-463.70	691663.599	627380.744	Point



Vertical Section at 264.27° (200 ft/in)



PROJECT DETAILS: Eddy County
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: No north reference data is available

Plan: Plan #1 (High Lonesome #1/OH)	
Created By: Aaron Pultin	Date: 10/13, December 03/2008
Checked: _____	Date: _____

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMNM118710
WELL NAME & NO.:	High Lonesome 23 Federal 1H
SURFACE HOLE FOOTAGE:	0900' FSL & 0330' FEL
BOTTOM HOLE FOOTAGE	0430' FSL & 0330' FWL
LOCATION:	Section 23, T. 16 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

I. 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. **Although Hydrogen Sulfide has not been reported in this section, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts 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.
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.

B. CASING

Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.

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

Wait on cement (WOC) time 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. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. 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.

Possible lost circulation in the Grayburg and San Andres formations.

Possible high pressure from the Wolfcamp formation – applicable to pilot hole.

1. The 13-3/8 inch surface casing shall be set **at approximately 400 feet (a minimum of 25 feet into the Rustler Anhydrite and 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 a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.
 - b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry. This is not applicable if the proposed cementing program is used.**
 - 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 9-5/8 inch intermediate casing is:
☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

3. The minimum required fill of cement behind the 7 inch production casing is:
 - ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.
4. The minimum required fill of cement behind the 4-1/2 inch production casing is:
 - ☒ Cement not required as packer system is being used.
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. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. The tests shall be done by an independent service company.
 - b. The results of the test shall be reported to the appropriate BLM office.
 - c. 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.
 - d. 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.
 - e. **Applicable to pilot hole.** BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.
 - f. **Effective November 1, 2008, no variances will be granted on reduced pressure tests on the surface casing and BOP/BOPE. Onshore Order 2 requirements will be in effect.**

D. DRILLING MUD

Applicable to pilot hole. Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

E. DRILL STEM TEST

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

WWI 120508