

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010**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.*5. Lease Serial No.
NMNM121474 ✓

6. If Indian, Allottee or Tribe Name

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

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator

✓ COG PRODUCTION LLC

Contact: DEBORA WILBOURN

E-Mail: dwilbourn@concho.com

8. Well Name and No
COPPERHEAD 31 FEDERAL COM 2H ✓

9. API Well No

30-015-39791 ✓

3a. Address:

2208 W MAIN ST
ARTESIA, NM 88210

3b. Phone No. (include area code)

Ph: 575-748-6958

10. Field and Pool, or Exploratory
DELAWARE RIVER, BS ✓

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

✓ Sec 31 T26S R29E SWSE 480FSL 2140FEL

11. County or Parish, and 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
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

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 recompleat 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 recompleat 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 TO MAKE THE FOLLOWING CHGS TO THE ORIGINAL APD:

CHG DEPTH

FROM: 10300 MD & 6700 TVD

TO: 12286 MD & 7050 TVD

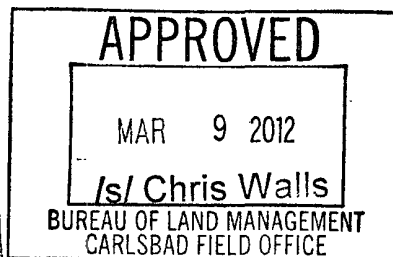
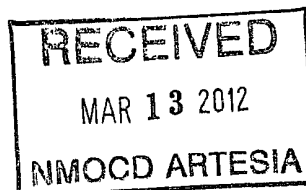
SEE ATTACHED DIRECTIONAL PLAN

CHG INTMD CSG

FROM: 11" HOLE, 8 5/8" 32# J-55 ST&C CSG

TO: 12 1/4" HOLE, 9 5/8" 36# J-55 ST&C CSG

CMT AS FOLLOWS:

RDade 03/15/12
Accepted for record
NMOCD

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #132109 verified by the BLM Well Information System
For COG PRODUCTION LLC, sent to the Carlsbad

Name (Printed/Typed) DEBORA WILBOURN

Title DRLG ENGINEERING TECH

Signature (Electronic Submission)

Date 03/02/2012

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By _____	Title _____	Date _____
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.		Office _____

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.

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

Additional data for EC transaction #132109 that would not fit on the form

32. Additional remarks, continued

LEAD - 600 SX CLASS C, 13.5 PPG, 1.75 YLD
TAIL - 250 SX CLASS C, 14.8 PPG, 1.34 YLD



COG Operating LLC

Eddy County(NAD27)

Copperhead 31 Fed Com

#2H

OH

Plan: Plan #1

Pathfinder X & Y Report

27 February, 2012



A Schlumberger Company



Pathfinder
Pathfinder X & Y Report



A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD27)
Site: Copperhead 31 Fed Com
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: KB = 18' @ 2919.0usft (Original Well Elev)
MD Reference: KB = 18' @ 2919.0usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project: Eddy County(NAD27)
Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site: Copperhead 31 Fed Com

Site Position:	Map	Northing:	364,332.500 usft	Latitude:	32° 0' 4.611 N
From:		Easting:	596,592.300 usft	Longitude:	104° 1' 18.251 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.17 °

Well: #2H

Well Position	+N/-S	0.0 usft	Northing:	364,332.500 usft	Latitude:	32° 0' 4.611 N
	+E/-W	0.0 usft	Easting:	596,592.300 usft	Longitude:	104° 1' 18.251 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	2,901.0 usft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/23/2012	7.69	59.88	48,366

Design: Plan #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	0.10

Survey Tool Program Date 2/23/2012

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	12,285.3	Plan #1 (OH)		



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-2,919.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
100.0	0.00	0.00	100.0	-2,819.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
200.0	0.00	0.00	200.0	-2,719.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
300.0	0.00	0.00	300.0	-2,619.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
400.0	0.00	0.00	400.0	-2,519.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
500.0	0.00	0.00	500.0	-2,419.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
600.0	0.00	0.00	600.0	-2,319.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
700.0	0.00	0.00	700.0	-2,219.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
800.0	0.00	0.00	800.0	-2,119.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
900.0	0.00	0.00	900.0	-2,019.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,000.0	0.00	0.00	1,000.0	-1,919.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,100.0	0.00	0.00	1,100.0	-1,819.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,200.0	0.00	0.00	1,200.0	-1,719.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,300.0	0.00	0.00	1,300.0	-1,619.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,400.0	0.00	0.00	1,400.0	-1,519.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,500.0	0.00	0.00	1,500.0	-1,419.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,600.0	0.00	0.00	1,600.0	-1,319.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,700.0	0.00	0.00	1,700.0	-1,219.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,800.0	0.00	0.00	1,800.0	-1,119.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
1,900.0	0.00	0.00	1,900.0	-1,019.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,000.0	0.00	0.00	2,000.0	-919.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,100.0	0.00	0.00	2,100.0	-819.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,200.0	0.00	0.00	2,200.0	-719.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,300.0	0.00	0.00	2,300.0	-619.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,400.0	0.00	0.00	2,400.0	-519.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,500.0	0.00	0.00	2,500.0	-419.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,600.0	0.00	0.00	2,600.0	-319.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30



Pathfinder
Pathfinder X & Y Report



A Schlumberger Company

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Wellbore: OH
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2,700.0	0.00	0.00	2,700.0	-219.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,800.0	0.00	0.00	2,800.0	-119.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
2,900.0	0.00	0.00	2,900.0	-19.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,000.0	0.00	0.00	3,000.0	81.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,100.0	0.00	0.00	3,100.0	181.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,200.0	0.00	0.00	3,200.0	281.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,300.0	0.00	0.00	3,300.0	381.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,400.0	0.00	0.00	3,400.0	481.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,500.0	0.00	0.00	3,500.0	581.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,600.0	0.00	0.00	3,600.0	681.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,700.0	0.00	0.00	3,700.0	781.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,800.0	0.00	0.00	3,800.0	881.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
3,900.0	0.00	0.00	3,900.0	981.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,000.0	0.00	0.00	4,000.0	1,081.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,100.0	0.00	0.00	4,100.0	1,181.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,200.0	0.00	0.00	4,200.0	1,281.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,300.0	0.00	0.00	4,300.0	1,381.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,400.0	0.00	0.00	4,400.0	1,481.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,500.0	0.00	0.00	4,500.0	1,581.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,600.0	0.00	0.00	4,600.0	1,681.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,700.0	0.00	0.00	4,700.0	1,781.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,800.0	0.00	0.00	4,800.0	1,881.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
4,900.0	0.00	0.00	4,900.0	1,981.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,000.0	0.00	0.00	5,000.0	2,081.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,100.0	0.00	0.00	5,100.0	2,181.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,200.0	0.00	0.00	5,200.0	2,281.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,300.0	0.00	0.00	5,300.0	2,381.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30



Pathfinder Pathfinder X & Y Report



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5,400.0	0.00	0.00	5,400.0	2,481.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,500.0	0.00	0.00	5,500.0	2,581.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,600.0	0.00	0.00	5,600.0	2,681.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,700.0	0.00	0.00	5,700.0	2,781.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,800.0	0.00	0.00	5,800.0	2,881.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
5,900.0	0.00	0.00	5,900.0	2,981.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,000.0	0.00	0.00	6,000.0	3,081.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,100.0	0.00	0.00	6,100.0	3,181.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,200.0	0.00	0.00	6,200.0	3,281.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,300.0	0.00	0.00	6,300.0	3,381.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,400.0	0.00	0.00	6,400.0	3,481.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,500.0	0.00	0.00	6,500.0	3,581.0	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,572.5	0.00	0.00	6,572.5	3,653.5	0.0	0.0	0.0	0.00	364,332.50	596,592.30
6,575.0	0.30	0.10	6,575.0	3,656.0	0.0	0.0	0.0	12.00	364,332.51	596,592.30
6,600.0	3.30	0.10	6,600.0	3,681.0	0.8	0.0	0.8	12.00	364,333.29	596,592.30
6,625.0	6.30	0.10	6,624.9	3,705.9	2.9	0.0	2.9	12.00	364,335.38	596,592.31
6,650.0	9.30	0.10	6,649.7	3,730.7	6.3	0.0	6.3	12.00	364,338.78	596,592.31
6,675.0	12.30	0.10	6,674.2	3,755.2	11.0	0.0	11.0	12.00	364,343.46	596,592.32
6,700.0	15.30	0.10	6,698.5	3,779.5	16.9	0.0	16.9	12.00	364,349.42	596,592.33
6,725.0	18.30	0.10	6,722.4	3,803.4	24.1	0.0	24.1	12.00	364,356.65	596,592.34
6,750.0	21.30	0.10	6,745.9	3,826.9	32.6	0.1	32.6	12.00	364,365.11	596,592.36
6,775.0	24.30	0.10	6,769.0	3,850.0	42.3	0.1	42.3	12.00	364,374.80	596,592.38
6,800.0	27.30	0.10	6,791.5	3,872.5	53.2	0.1	53.2	12.00	364,385.68	596,592.40
6,825.0	30.30	0.10	6,813.4	3,894.4	65.2	0.1	65.2	12.00	364,397.72	596,592.42
6,850.0	33.30	0.10	6,834.6	3,915.6	78.4	0.1	78.4	12.00	364,410.90	596,592.44
6,875.0	36.30	0.10	6,855.2	3,936.2	92.7	0.2	92.7	12.00	364,425.16	596,592.47
6,900.0	39.30	0.10	6,874.9	3,955.9	108.0	0.2	108.0	12.00	364,440.48	596,592.49



Pathfinder Pathfinder X & Y Report



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6,925.0	42.30	0.10	6,893.8	3,974.8	124.3	0.2	124.3	12.00	364,456.82	596,592.52
6,950.0	45.30	0.10	6,911.9	3,992.9	141.6	0.3	141.6	12.00	364,474.12	596,592.56
6,975.0	48.30	0.10	6,929.0	4,010.0	159.8	0.3	159.8	12.00	364,492.34	596,592.59
7,000.0	51.30	0.10	6,945.1	4,026.1	178.9	0.3	178.9	12.00	364,511.43	596,592.62
7,025.0	54.30	0.10	6,960.2	4,041.2	198.8	0.4	198.8	12.00	364,531.34	596,592.66
7,050.0	57.30	0.10	6,974.3	4,055.3	219.5	0.4	219.5	12.00	364,552.02	596,592.70
7,075.0	60.30	0.10	6,987.2	4,068.2	240.9	0.4	240.9	12.00	364,573.40	596,592.73
7,100.0	63.30	0.10	6,999.1	4,080.1	262.9	0.5	262.9	12.00	364,595.43	596,592.77
7,125.0	66.30	0.10	7,009.7	4,090.7	285.5	0.5	285.5	12.00	364,618.05	596,592.81
7,150.0	69.30	0.10	7,019.1	4,100.1	308.7	0.6	308.7	12.00	364,641.19	596,592.86
7,175.0	72.30	0.10	7,027.4	4,108.4	332.3	0.6	332.3	12.00	364,664.80	596,592.90
7,200.0	75.30	0.10	7,034.3	4,115.3	356.3	0.6	356.3	12.00	364,688.80	596,592.94
7,225.0	78.30	0.10	7,040.0	4,121.0	380.6	0.7	380.6	12.00	364,713.14	596,592.99
7,250.0	81.30	0.10	7,044.5	4,125.5	405.2	0.7	405.2	12.00	364,737.74	596,593.03
7,275.0	84.30	0.10	7,047.6	4,128.6	430.0	0.8	430.0	12.00	364,762.54	596,593.07
7,300.0	87.30	0.10	7,049.4	4,130.4	455.0	0.8	455.0	12.00	364,787.47	596,593.12
7,322.5	90.00	0.10	7,050.0	4,131.0	477.5	0.9	477.5	12.00	364,809.96	596,593.16
7,400.0	90.00	0.10	7,050.0	4,131.0	555.0	1.0	555.0	0.00	364,887.46	596,593.30
7,500.0	90.00	0.10	7,050.0	4,131.0	655.0	1.2	655.0	0.00	364,987.46	596,593.48
7,600.0	90.00	0.10	7,050.0	4,131.0	755.0	1.4	755.0	0.00	365,087.46	596,593.66
7,700.0	90.00	0.10	7,050.0	4,131.0	855.0	1.5	855.0	0.00	365,187.46	596,593.84
7,800.0	90.00	0.10	7,050.0	4,131.0	955.0	1.7	955.0	0.00	365,287.46	596,594.02
7,900.0	90.00	0.10	7,050.0	4,131.0	1,055.0	1.9	1,055.0	0.00	365,387.46	596,594.20
8,000.0	90.00	0.10	7,050.0	4,131.0	1,155.0	2.1	1,155.0	0.00	365,487.46	596,594.38
8,100.0	90.00	0.10	7,050.0	4,131.0	1,255.0	2.3	1,255.0	0.00	365,587.46	596,594.56
8,200.0	90.00	0.10	7,050.0	4,131.0	1,355.0	2.4	1,355.0	0.00	365,687.46	596,594.74
8,300.0	90.00	0.10	7,050.0	4,131.0	1,455.0	2.6	1,455.0	0.00	365,787.46	596,594.92



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD27)
Site: Copperhead 31 Fed Com
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: KB = 18' @ 2919.0usft (Original Well Elev)
MD Reference: KB = 18' @ 2919.0usft (Original Well Elev)
North Reference: Gnd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Eastings (usft)
8,400.0	90.00	0.10	7,050.0	4,131.0	1,555.0	2.8	1,555.0	0.00	365,887.46	596,595.10
8,500.0	90.00	0.10	7,050.0	4,131.0	1,655.0	3.0	1,655.0	0.00	365,987.46	596,595.28
8,600.0	90.00	0.10	7,050.0	4,131.0	1,755.0	3.2	1,755.0	0.00	366,087.46	596,595.46
8,700.0	90.00	0.10	7,050.0	4,131.0	1,855.0	3.3	1,855.0	0.00	366,187.46	596,595.64
8,800.0	90.00	0.10	7,050.0	4,131.0	1,955.0	3.5	1,955.0	0.00	366,287.46	596,595.82
8,900.0	90.00	0.10	7,050.0	4,131.0	2,055.0	3.7	2,055.0	0.00	366,387.46	596,596.00
9,000.0	90.00	0.10	7,050.0	4,131.0	2,155.0	3.9	2,155.0	0.00	366,487.46	596,596.18
9,100.0	90.00	0.10	7,050.0	4,131.0	2,255.0	4.1	2,255.0	0.00	366,587.46	596,596.36
9,200.0	90.00	0.10	7,050.0	4,131.0	2,355.0	4.2	2,355.0	0.00	366,687.46	596,596.54
9,300.0	90.00	0.10	7,050.0	4,131.0	2,455.0	4.4	2,455.0	0.00	366,787.46	596,596.72
9,400.0	90.00	0.10	7,050.0	4,131.0	2,555.0	4.6	2,555.0	0.00	366,887.46	596,596.90
9,500.0	90.00	0.10	7,050.0	4,131.0	2,655.0	4.8	2,655.0	0.00	366,987.46	596,597.08
9,600.0	90.00	0.10	7,050.0	4,131.0	2,755.0	5.0	2,755.0	0.00	367,087.46	596,597.26
9,700.0	90.00	0.10	7,050.0	4,131.0	2,855.0	5.1	2,855.0	0.00	367,187.46	596,597.44
9,800.0	90.00	0.10	7,050.0	4,131.0	2,955.0	5.3	2,955.0	0.00	367,287.46	596,597.62
9,900.0	90.00	0.10	7,050.0	4,131.0	3,055.0	5.5	3,055.0	0.00	367,387.46	596,597.80
10,000.0	90.00	0.10	7,050.0	4,131.0	3,155.0	5.7	3,155.0	0.00	367,487.46	596,597.98
10,100.0	90.00	0.10	7,050.0	4,131.0	3,255.0	5.9	3,255.0	0.00	367,587.46	596,598.16
10,200.0	90.00	0.10	7,050.0	4,131.0	3,355.0	6.0	3,355.0	0.00	367,687.46	596,598.34
10,300.0	90.00	0.10	7,050.0	4,131.0	3,455.0	6.2	3,455.0	0.00	367,787.46	596,598.52
10,400.0	90.00	0.10	7,050.0	4,131.0	3,555.0	6.4	3,555.0	0.00	367,887.46	596,598.70
10,500.0	90.00	0.10	7,050.0	4,131.0	3,655.0	6.6	3,655.0	0.00	367,987.46	596,598.88
10,600.0	90.00	0.10	7,050.0	4,131.0	3,755.0	6.8	3,755.0	0.00	368,087.46	596,599.06
10,700.0	90.00	0.10	7,050.0	4,131.0	3,855.0	6.9	3,855.0	0.00	368,187.46	596,599.24
10,800.0	90.00	0.10	7,050.0	4,131.0	3,955.0	7.1	3,955.0	0.00	368,287.46	596,599.42
10,900.0	90.00	0.10	7,050.0	4,131.0	4,055.0	7.3	4,055.0	0.00	368,387.46	596,599.60
11,000.0	90.00	0.10	7,050.0	4,131.0	4,155.0	7.5	4,155.0	0.00	368,487.46	596,599.78



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Eddy County(NAD27)
Site: Copperhead 31 Fed Com
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #2H
KB = 18' @ 2919.0usft (Original Well Elev)
KB = 18' @ 2919.0usft (Original Well Elev)
Grid
Minimum Curvature
EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	NS (usft)	E/W (usft)	V. Sec (usft)	Dleg (°/100usft)	Northing (usft)	Easting (usft)
11,100.0	90.00	0.10	7,050.0	4,131.0	4,255.0	7.7	4,255.0	0.00	368,587.46	596,599.96
11,200.0	90.00	0.10	7,050.0	4,131.0	4,355.0	7.8	4,355.0	0.00	368,687.46	596,600.14
11,300.0	90.00	0.10	7,050.0	4,131.0	4,455.0	8.0	4,455.0	0.00	368,787.46	596,600.33
11,400.0	90.00	0.10	7,050.0	4,131.0	4,555.0	8.2	4,555.0	0.00	368,887.46	596,600.51
11,500.0	90.00	0.10	7,050.0	4,131.0	4,655.0	8.4	4,655.0	0.00	368,987.46	596,600.69
11,600.0	90.00	0.10	7,050.0	4,131.0	4,755.0	8.6	4,755.0	0.00	369,087.46	596,600.87
11,700.0	90.00	0.10	7,050.0	4,131.0	4,855.0	8.7	4,855.0	0.00	369,187.46	596,601.05
11,800.0	90.00	0.10	7,050.0	4,131.0	4,955.0	8.9	4,955.0	0.00	369,287.46	596,601.23
11,900.0	90.00	0.10	7,050.0	4,131.0	5,055.0	9.1	5,055.0	0.00	369,387.46	596,601.41
12,000.0	90.00	0.10	7,050.0	4,131.0	5,155.0	9.3	5,155.0	0.00	369,487.46	596,601.59
12,100.0	90.00	0.10	7,050.0	4,131.0	5,255.0	9.5	5,255.0	0.00	369,587.46	596,601.77
12,200.0	90.00	0.10	7,050.0	4,131.0	5,355.0	9.6	5,355.0	0.00	369,687.46	596,601.95
12,285.3	90.00	0.10	7,050.0	4,131.0	5,440.3	9.8	5,440.3	0.00	369,772.80	596,602.10

Checked By: _____

Approved By: _____

Date: _____



Project: Eddy County(NAD27)
Site: Copperhead 31 Fed C
Well: #2H
Wellbore: OH
Plan: Plan #1 (#2H/OH)

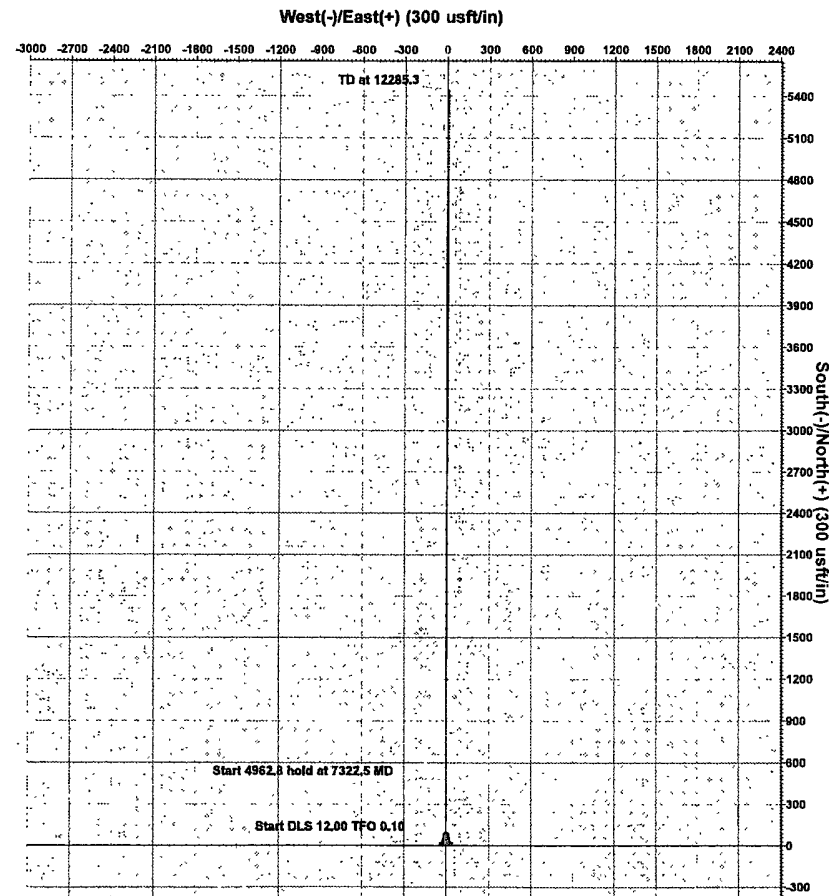
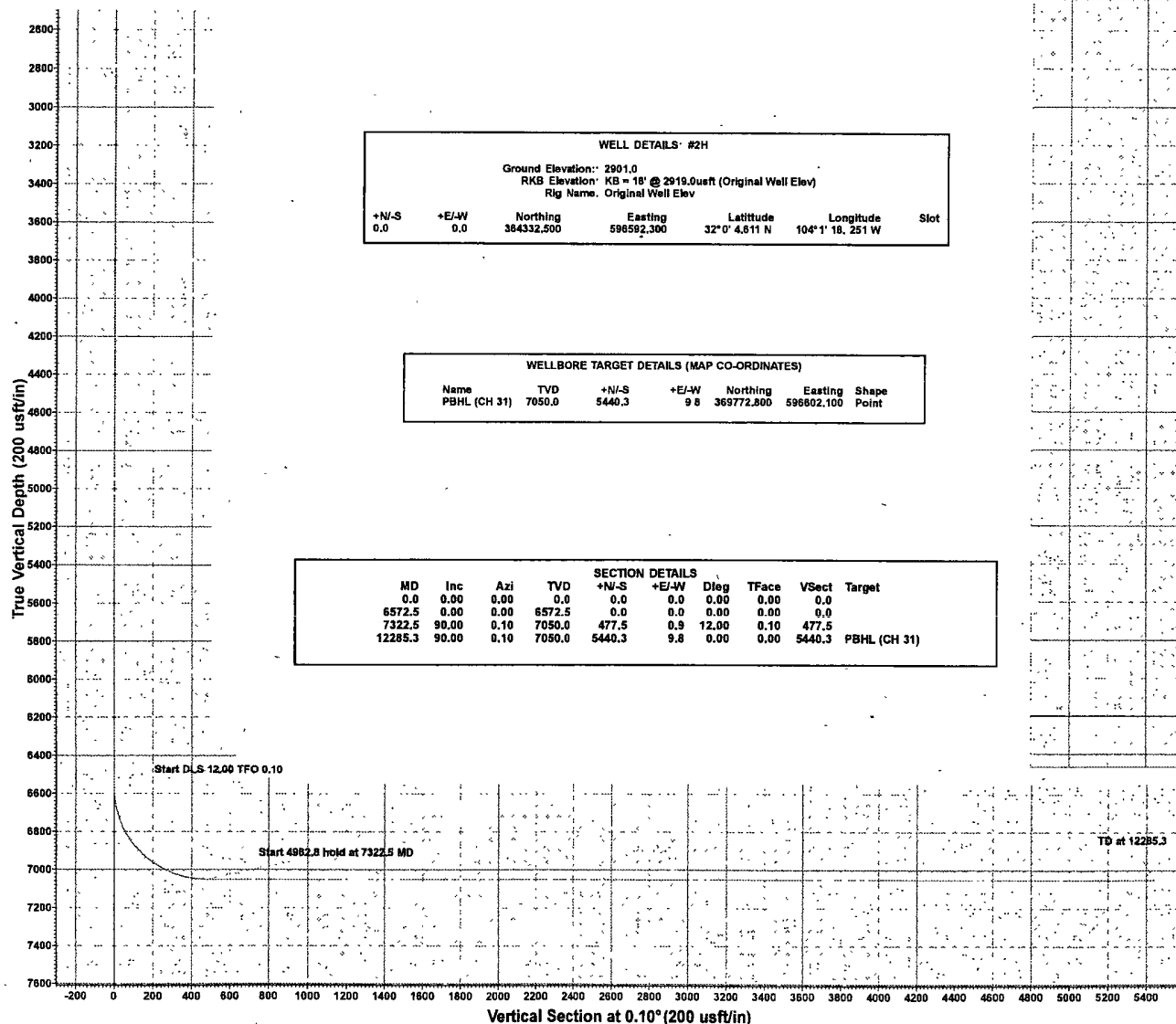


Azimuths to Grid North
True North: -0.17°
Magnetic North: 7.53°

Magnetic Field
Strength: 48366.1nT
Dip Angle: 59.88°
Date: 2/23/2012
Model: IGRF2010

PATHFINDER®

A Schlumberger Company



PROJECT DETAILS: Eddy County(NAD27)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

Plan: Plan #1 (#2H/OH)

Created By: Michael Trout Date: 13:24, February 27 2012

Checked: _____ Date: _____