Form 3160-5
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs

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.

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

5. Lease Serial No.
NMNM123528

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
SEBASTIAN FEDERAL COM 4H

2. Name of Operator
COG OPERATING LLC

Contact: MELANIE PARKER
E-Mail: mparker@concho.com

9. API Well No.
30-025-41689-00-X1

3a. Address
ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701-4287

3b. Phone No. (include area code)
Ph: 575-748-6940

10. Field and Pool, or Exploratory
RED HILLS

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 18 T24S R34E NENE 0190FNL 0380FEL
32.224179 N Lat, 103.501244 W Lon

JUL 29 2014
RECEIVED

11. County or Parish, and State
LEA 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 to Original APD
	☐ 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 recomplete 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 recompletion 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 proposes the following changes to the original APD:

After drilling the pilot hole, we propose to adjust the TD to 10,880' TVD and 15,413' MD.

We propose to drill the vertical/curve from intermediate at 5175' to 11,043' MD and 10,780' TVD with 8 3/4" hole size as originally planned. In the lateral, reduce the hole size to 7 7/8" and drill to TD (15,413' MD / 10,880' TVD).
Cement the 5 1/2" production string w/a 2-stage cement job as follows:
1st Stage:
Lead - 520 sx of Econocem HLH (12.7 ppg - 10.5 gal/sk - 2.01 cf/sk) (Lead volume based on Open Hole Integrated Log Caliper from KOP @ 10,288' to DV tool at 6,700')
Tail - 1050 sx of Versacem H (14.4 ppg - 5.66 gal/sk - 1.25 cf/sk) (Tail volume based on 35% OH

SEE ATTACHED FOR CONDITIONS OF APPROVAL

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

Electronic Submission #254153 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Hobbs
Committed to AFMSS for processing by CHRISTOPHER WALLS on 07/22/2014 (14CRW0194SE)

Name *(Printed/Typed)* ALEX R KORZENEWSKI — Title SR DRILLING ENGINEER

Signature (Electronic Submission) — Date 07/22/2014

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

APPROVED
/s/ Chris Walls
JUL 23 2014

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

BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD 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.

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

JUL 30 2014

Additional data for EC transaction #254153 that would not fit on the form

32. Additional remarks, continued

excess - No Caliper in lateral)
2nd Stage - DV tool set at 6,700':
Lead - 610 sx of Econocem C (11.9 ppg - 14.07 gal/sk - 2.51 cf/sk) (Lead volume based on OH Caliper from 5550' to intermediate casing at 5175' and casing ID from 5175' to surface)
Tail - 350 sx C (14.8 ppg - 6.35 gal/sk - 1.34 cf/sk) (Tail volume based on OH caliper from DV tool at 6700' to 5550')

Conditions of Approval

1. The minimum required fill of cement behind the 5-1/2 inch production casing is:

Operator has proposed DV tool at a depth of 6700'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

CONCHO

COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Sebastian Fed Com
Well: #4H
Wellbore: OH
Plan: Plan #2 (#4H/OH)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	10200.0	1.90	350.48	10198.6	73.4	47.9	0.00	0.00	-73.0
2	10288.7	1.90	350.48	10287.3	76.3	47.4	0.00	0.00	-75.9
3	11043.2	88.69	185.00	10780.0	-388.0	2.7	12.00	-165.48	388.0
4	11327.1	88.69	179.32	10786.5	-671.5	-8.0	2.00	-90.08	671.4
5	15413.9	88.69	179.32	10880.0	-4756.9	40.5	0.00	0.00	4757.1

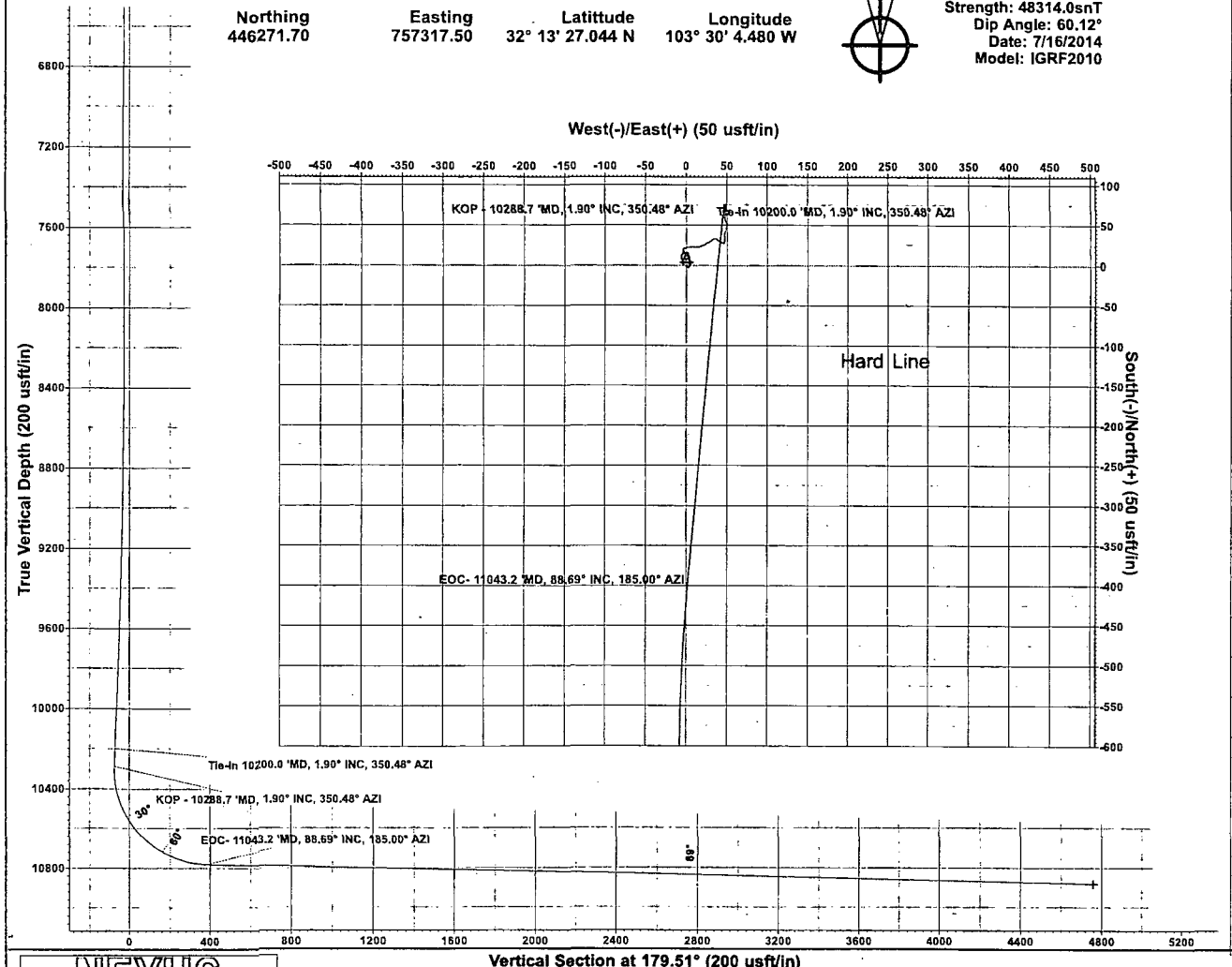
WELL DETAILS: #4H

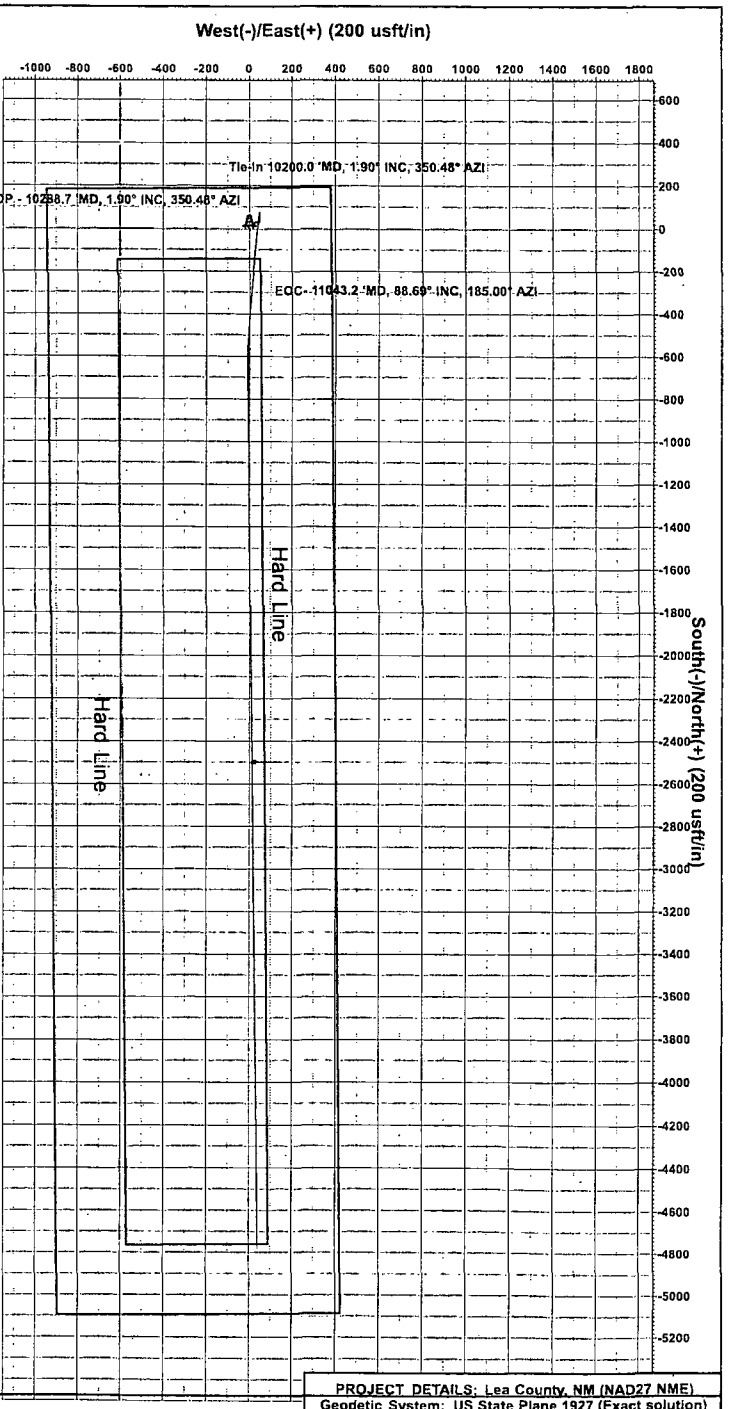
Ground Elevation:: 3580.6
RKB Elevation: WELL @ 3598.6usft (Original Well Elev)
Rig Name: Original Well Elev

Northing	Easting	Latitude	Longitude
446271.70	757317.50	32° 13' 27.044 N	103° 30' 4.480 W

Azimuths to Grid North
True North: -0.44°
Magnetic North: 6.73°

Magnetic Field
Strength: 48314.0snT
Dip Angle: 60.12°
Date: 7/16/2014
Model: IGRF2010





NEXUS DIRECTIONAL SOLUTIONS, L.P.

Nexus Directional Solutions

PROJECT DETAILS: Lea County, NM (NAD27 NME)
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

CONCHO

COG Operating LLC

Lea County, NM (NAD27 NME)
Sebastian Fed Com
#4H

OH

Plan: Plan #2

Standard Planning Report

17 July, 2014

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #4H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Site:	Sebastian Fed Com	**North Reference:**	Grid
Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Project Lea County, NM (NAD27 NME)

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Sebastian Fed Com

Site Position:		**Northing:**	446,271.70 usft	**Latitude:**	32° 13' 27.044 N
From:	Map	**Easting:**	757,317.50 usft	**Longitude:**	103° 30' 4.480 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.44 °

Well #4H

Well Position	**+N/-S**	0.0 usft	**Northing:**	446,271.70 usft	**Latitude:**	32° 13' 27.044 N
	+E/-W	0.0 usft	**Easting:**	757,317.50 usft	**Longitude:**	103° 30' 4.480 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,580.6 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/16/2014	7.17	60.12	48,314

Design Plan #2

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	10,200.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.51

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
10,200.0	1.90	350.48	10,198.6	73.4	47.9	0.00	0.00	0.00	0.00	
10,288.7	1.90	350.48	10,287.3	76.3	47.4	0.00	0.00	0.00	0.00	
11,043.2	88.69	185.00	10,780.0	-388.0	2.7	12.00	11.50	-21.93	-165.48	
11,327.1	88.69	179.32	10,786.5	-671.5	-8.0	2.00	0.00	-2.00	-90.08	
15,413.9	88.69	179.32	10,880.0	-4,756.9	40.5	0.00	0.00	0.00	0.00	PBHL(SF#4H)

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #4H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Site:	Sebastian Fed Com	**North Reference:**	Grid
Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.15	168.97	100.0	-0.1	0.0	0.1	0.15	0.15	0.00
200.0	0.19	200.65	200.0	-0.4	0.0	0.4	0.10	0.04	31.68
300.0	0.05	214.44	300.0	-0.6	-0.1	0.6	0.14	-0.14	13.79
400.0	0.11	142.39	400.0	-0.7	-0.1	0.7	0.11	0.06	-72.05
500.0	0.11	147.14	500.0	-0.9	0.1	0.9	0.01	0.00	4.75
600.0	0.09	163.82	600.0	-1.0	0.1	1.0	0.04	-0.02	16.68
700.0	0.16	175.27	700.0	-1.2	0.2	1.2	0.07	0.07	11.45
800.0	0.19	147.70	800.0	-1.5	0.3	1.5	0.09	0.03	-27.57
900.0	0.22	193.68	900.0	-1.8	0.3	1.9	0.16	0.03	45.98
1,000.0	0.22	105.14	1,000.0	-2.1	0.4	2.1	0.31	0.00	-88.54
1,100.0	0.36	129.24	1,100.0	-2.3	0.9	2.3	0.18	0.14	24.10
1,200.0	0.37	122.80	1,200.0	-2.7	1.4	2.7	0.04	0.01	-6.44
1,300.0	0.51	79.36	1,300.0	-2.8	2.1	2.8	0.35	0.14	-43.44
1,400.0	0.15	92.67	1,400.0	-2.7	2.7	2.7	0.37	-0.36	13.31
1,500.0	0.29	27.96	1,500.0	-2.5	2.9	2.5	0.26	0.14	-64.71
1,600.0	0.35	40.55	1,600.0	-2.1	3.2	2.1	0.09	0.06	12.59
1,700.0	0.45	2.81	1,700.0	-1.4	3.4	1.5	0.28	0.10	-37.74
1,800.0	0.42	13.18	1,800.0	-0.7	3.6	0.7	0.08	-0.03	10.37
1,900.0	0.59	359.42	1,900.0	0.2	3.6	-0.2	0.21	0.17	-13.76
2,000.0	0.33	340.09	2,000.0	1.0	3.5	-0.9	0.30	-0.26	-19.33
2,100.0	0.24	317.31	2,100.0	1.4	3.3	-1.4	0.14	-0.09	-22.78
2,200.0	0.42	299.63	2,200.0	1.7	2.8	-1.7	0.20	0.18	-17.68
2,300.0	0.54	334.25	2,300.0	2.3	2.3	-2.3	0.31	0.12	34.62
2,400.0	0.55	302.75	2,400.0	3.0	1.7	-3.0	0.30	0.01	-31.50
2,500.0	0.79	308.90	2,500.0	3.7	0.8	-3.7	0.25	0.24	6.15
2,600.0	0.98	290.63	2,599.9	4.5	-0.6	-4.5	0.34	0.19	-18.27
2,700.0	0.92	293.56	2,699.9	5.1	-2.1	-5.1	0.08	-0.06	2.93
2,800.0	0.92	269.76	2,799.9	5.4	-3.7	-5.4	0.38	0.00	-23.80
2,900.0	0.56	337.71	2,899.9	5.8	-4.6	-5.9	0.88	-0.36	67.95
3,000.0	0.78	324.25	2,999.9	6.8	-5.2	-6.9	0.27	0.22	-13.46
3,100.0	0.71	338.58	3,099.9	8.0	-5.9	-8.0	0.20	-0.07	14.33
3,200.0	0.85	333.75	3,199.9	9.2	-6.4	-9.3	0.15	0.14	-4.83
3,300.0	0.66	2.33	3,299.9	10.5	-6.7	-10.5	0.42	-0.19	28.58
3,400.0	0.71	22.25	3,399.9	11.6	-6.5	-11.7	0.24	0.05	19.92
3,500.0	0.60	36.17	3,499.9	12.6	-5.9	-12.7	0.19	-0.11	13.92
3,600.0	0.80	25.27	3,599.9	13.7	-5.3	-13.7	0.24	0.20	-10.90
3,700.0	0.69	30.68	3,699.9	14.8	-4.7	-14.8	0.13	-0.11	5.41
3,800.0	0.90	29.56	3,799.8	16.0	-4.0	-16.0	0.21	0.21	-1.12
3,900.0	0.56	6.56	3,899.8	17.2	-3.6	-17.2	0.44	-0.34	-23.00
4,000.0	0.44	329.66	3,999.8	18.0	-3.7	-18.0	0.34	-0.12	-36.90
4,100.0	0.41	322.95	4,099.8	18.6	-4.1	-18.6	0.06	-0.03	-6.71
4,200.0	0.45	335.09	4,199.8	19.3	-4.5	-19.3	0.10	0.04	12.14
4,300.0	0.39	356.55	4,299.8	19.9	-4.7	-20.0	0.17	-0.06	21.46
4,400.0	0.98	64.54	4,399.8	20.7	-3.9	-20.7	0.91	0.59	67.99
4,500.0	1.74	78.70	4,499.8	21.3	-1.7	-21.3	0.83	0.76	14.16
4,600.0	1.54	70.26	4,599.7	22.1	1.1	-22.1	0.31	-0.20	-8.44
4,700.0	1.43	81.49	4,699.7	22.7	3.6	-22.7	0.31	-0.11	11.23
4,800.0	1.86	97.28	4,799.7	22.7	6.4	-22.6	0.62	0.43	15.79
4,900.0	1.91	88.51	4,899.6	22.5	9.7	-22.4	0.29	0.05	-8.77
5,000.0	1.61	91.83	4,999.6	22.5	12.8	-22.4	0.32	-0.30	3.32
5,100.0	1.25	75.18	5,099.5	22.8	15.2	-22.6	0.55	-0.36	-16.65
5,200.0	0.61	87.23	5,199.5	23.1	16.8	-22.9	0.67	-0.64	12.05
5,300.0	0.67	53.56	5,299.5	23.4	17.8	-23.3	0.38	0.06	-33.67

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #4H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Site:	Sebastian Fed Com	**North Reference:**	Grid
Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	0.65	67.24	5,399.5	24.0	18.8	-23.8	0.16	-0.02	13.68
5,500.0	0.48	50.26	5,499.5	24.5	19.7	-24.3	0.24	-0.17	-16.98
5,600.0	0.55	84.43	5,599.5	24.8	20.5	-24.6	0.31	0.07	34.17
5,700.0	0.73	80.18	5,699.5	25.0	21.6	-24.8	0.19	0.18	-4.25
5,800.0	0.77	42.58	5,799.5	25.6	22.7	-25.4	0.48	0.04	-37.60
5,900.0	0.73	26.97	5,899.5	26.6	23.4	-26.4	0.21	-0.04	-15.61
6,000.0	0.77	87.85	5,999.5	27.2	24.4	-27.0	0.76	0.04	60.88
6,100.0	0.67	64.96	6,099.5	27.5	25.6	-27.3	0.30	-0.10	-22.89
6,200.0	0.78	72.40	6,199.5	27.9	26.7	-27.7	0.14	0.11	7.44
6,300.0	0.61	73.21	6,299.5	28.3	27.9	-28.1	0.17	-0.17	0.81
6,400.0	0.37	28.96	6,399.4	28.7	28.6	-28.5	0.43	-0.24	-44.25
6,500.0	0.42	52.13	6,499.4	29.3	29.0	-29.0	0.17	0.05	23.17
6,600.0	0.48	39.08	6,599.4	29.8	29.6	-29.5	0.12	0.06	-13.05
6,700.0	0.33	41.74	6,699.4	30.3	30.0	-30.1	0.15	-0.15	2.66
6,800.0	0.57	41.41	6,799.4	30.9	30.5	-30.7	0.24	0.24	-0.33
6,900.0	0.52	46.38	6,899.4	31.6	31.2	-31.3	0.07	-0.05	4.97
7,000.0	0.57	59.38	6,999.4	32.2	32.0	-31.9	0.13	0.05	13.00
7,100.0	0.89	78.23	7,099.4	32.6	33.1	-32.3	0.40	0.32	18.85
7,200.0	0.65	86.71	7,199.4	32.8	34.5	-32.5	0.27	-0.24	8.48
7,300.0	0.81	96.79	7,299.4	32.7	35.7	-32.4	0.20	0.16	10.08
7,400.0	0.63	102.16	7,399.4	32.5	37.0	-32.2	0.19	-0.18	5.37
7,500.0	0.84	150.55	7,499.4	31.8	37.9	-31.5	0.63	0.21	48.39
7,600.0	0.84	114.69	7,599.4	30.8	38.9	-30.5	0.52	0.00	-35.86
7,700.0	0.99	121.64	7,699.4	30.1	40.3	-29.7	0.19	0.15	6.95
7,800.0	0.73	126.65	7,799.4	29.2	41.5	-28.9	0.27	-0.26	5.01
7,900.0	0.64	114.63	7,899.3	28.6	42.6	-28.3	0.17	-0.09	-12.02
8,000.0	0.66	121.14	7,999.3	28.1	43.6	-27.7	0.08	0.02	6.51
8,100.0	0.51	110.50	8,099.3	27.6	44.5	-27.3	0.18	-0.15	-10.64
8,200.0	0.46	100.40	8,199.3	27.4	45.3	-27.0	0.10	-0.05	-10.10
8,300.0	0.50	91.10	8,299.3	27.3	46.1	-26.9	0.09	0.04	-9.30
8,400.0	0.69	6.96	8,399.3	27.9	46.6	-27.5	0.81	0.19	-84.14
8,500.0	0.93	16.92	8,499.3	29.3	46.9	-28.9	0.28	0.24	9.96
8,600.0	0.69	5.82	8,599.3	30.7	47.2	-30.3	0.29	-0.24	-11.10
8,700.0	0.80	349.92	8,699.3	32.0	47.2	-31.6	0.23	0.11	-15.90
8,800.0	0.90	16.64	8,799.3	33.4	47.3	-33.0	0.40	0.10	26.72
8,900.0	0.75	354.50	8,899.3	34.8	47.4	-34.4	0.35	-0.15	-22.14
9,000.0	0.77	337.10	8,999.3	36.1	47.1	-35.7	0.23	0.02	-17.40
9,100.0	0.87	352.54	9,099.3	37.4	46.8	-37.0	0.24	0.10	15.44
9,200.0	1.39	28.37	9,199.2	39.3	47.2	-38.9	0.85	0.52	35.83
9,300.0	1.87	9.32	9,299.2	41.9	48.1	-41.5	0.72	0.48	-19.05
9,400.0	1.78	12.70	9,399.1	45.1	48.7	-44.7	0.14	-0.09	3.38
9,500.0	1.55	9.49	9,499.1	47.9	49.2	-47.5	0.25	-0.23	-3.21
9,600.0	1.80	359.58	9,599.1	50.8	49.5	-50.4	0.38	0.25	-9.91
9,700.0	1.94	333.67	9,699.0	53.9	48.7	-53.5	0.85	0.14	-25.91
9,800.0	2.10	347.24	9,798.9	57.2	47.5	-56.8	0.50	0.16	13.57
9,900.0	2.42	2.01	9,898.9	61.1	47.2	-60.7	0.66	0.32	14.77
10,000.0	2.49	9.73	9,998.8	65.4	47.6	-65.0	0.34	0.07	7.72
10,100.0	2.43	1.71	10,098.7	69.6	48.1	-69.2	0.35	-0.06	-8.02
10,200.0	1.90	350.48	10,198.6	73.4	47.9	-73.0	0.68	-0.53	-11.23
Tie-In 10200.0 'MD, 1.90° INC, 350.48° AZI									
10,288.7	1.90	350.48	10,287.3	76.3	47.4	-75.9	0.00	0.00	0.00
KOP - 10288.7 'MD, 1.90° INC, 350.48° AZI									
10,300.0	0.68	320.43	10,298.6	76.5	47.3	-76.1	12.00	-10.81	-265.89

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #4H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Site:	Sebastian Fed Com	**North Reference:**	Grid
Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,325.0	2.56	195.70	10,323.6	76.1	47.1	-75.7	12.00	7.53	-498.94
10,350.0	5.54	189.91	10,348.5	74.4	46.7	-74.0	12.00	11.90	-23.17
10,375.0	8.53	188.17	10,373.3	71.3	46.2	-70.9	12.00	11.97	-6.97
10,400.0	11.52	187.33	10,397.9	67.0	45.6	-66.6	12.00	11.98	-3.36
10,425.0	14.52	186.83	10,422.3	61.4	45.0	-61.1	12.00	11.99	-1.99
10,450.0	17.52	186.50	10,446.3	54.6	44.2	-54.2	12.00	11.99	-1.32
10,475.0	20.52	186.26	10,469.9	46.5	43.3	-46.1	12.00	11.99	-0.94
10,500.0	23.52	186.08	10,493.1	37.2	42.2	-36.8	12.00	11.99	-0.71
10,525.0	26.52	185.94	10,515.8	26.7	41.1	-26.3	12.00	12.00	-0.56
10,550.0	29.51	185.83	10,537.8	15.0	39.9	-14.6	12.00	12.00	-0.45
10,575.0	32.51	185.74	10,559.2	2.2	38.6	-1.8	12.00	12.00	-0.38
10,600.0	35.51	185.66	10,580.0	-11.7	37.3	12.1	12.00	12.00	-0.32
10,625.0	38.51	185.59	10,599.9	-26.7	35.8	27.0	12.00	12.00	-0.28
10,650.0	41.51	185.53	10,619.1	-42.7	34.2	43.0	12.00	12.00	-0.24
10,675.0	44.51	185.47	10,637.4	-59.7	32.6	60.0	12.00	12.00	-0.21
10,700.0	47.51	185.43	10,654.7	-77.6	30.9	77.9	12.00	12.00	-0.19
10,725.0	50.51	185.38	10,671.1	-96.4	29.1	96.6	12.00	12.00	-0.18
10,750.0	53.51	185.34	10,686.5	-116.0	27.3	116.2	12.00	12.00	-0.16
10,775.0	56.51	185.30	10,700.8	-136.4	25.4	136.6	12.00	12.00	-0.15
10,800.0	59.51	185.27	10,714.1	-157.5	23.4	157.7	12.00	12.00	-0.14
10,825.0	62.51	185.24	10,726.2	-179.3	21.4	179.4	12.00	12.00	-0.13
10,850.0	65.51	185.21	10,737.1	-201.6	19.4	201.8	12.00	12.00	-0.12
10,875.0	68.51	185.18	10,746.9	-224.6	17.3	224.7	12.00	12.00	-0.12
10,900.0	71.50	185.15	10,755.5	-248.0	15.2	248.1	12.00	12.00	-0.11
10,925.0	74.50	185.12	10,762.8	-271.8	13.0	271.9	12.00	12.00	-0.11
10,950.0	77.50	185.09	10,768.8	-295.9	10.9	296.0	12.00	12.00	-0.11
10,975.0	80.50	185.07	10,773.6	-320.4	8.7	320.4	12.00	12.00	-0.10
11,000.0	83.50	185.04	10,777.1	-345.0	6.5	345.1	12.00	12.00	-0.10
11,025.0	86.50	185.02	10,779.2	-369.8	4.3	369.9	12.00	12.00	-0.10
11,043.2	88.69	185.00	10,780.0	-388.0	2.7	388.0	12.00	12.00	-0.10
EOC- 11043.2 MD, 88.69° INC, 185.00° AZI									
11,100.0	88.69	183.86	10,781.3	-444.6	-1.6	444.5	2.00	0.00	-2.00
11,200.0	88.69	181.86	10,783.6	-544.4	-6.6	544.3	2.00	0.00	-2.00
11,300.0	88.69	179.86	10,785.9	-644.4	-8.1	644.3	2.00	0.00	-2.00
11,327.1	88.69	179.32	10,786.5	-671.5	-8.0	671.4	2.00	0.00	-2.00
11,400.0	88.69	179.32	10,788.2	-744.3	-7.1	744.2	0.00	0.00	0.00
11,500.0	88.69	179.32	10,790.5	-844.3	-5.9	844.2	0.00	0.00	0.00
11,600.0	88.69	179.32	10,792.7	-944.3	-4.7	944.2	0.00	0.00	0.00
11,700.0	88.69	179.32	10,795.0	-1,044.2	-3.5	1,044.2	0.00	0.00	0.00
11,800.0	88.69	179.32	10,797.3	-1,144.2	-2.3	1,144.1	0.00	0.00	0.00
11,900.0	88.69	179.32	10,799.6	-1,244.2	-1.2	1,244.1	0.00	0.00	0.00
12,000.0	88.69	179.32	10,801.9	-1,344.1	0.0	1,344.1	0.00	0.00	0.00
12,100.0	88.69	179.32	10,804.2	-1,444.1	1.2	1,444.1	0.00	0.00	0.00
12,200.0	88.69	179.32	10,806.5	-1,544.1	2.4	1,544.0	0.00	0.00	0.00
12,300.0	88.69	179.32	10,808.8	-1,644.0	3.6	1,644.0	0.00	0.00	0.00
12,400.0	88.69	179.32	10,811.0	-1,744.0	4.8	1,744.0	0.00	0.00	0.00
12,500.0	88.69	179.32	10,813.3	-1,844.0	6.0	1,843.9	0.00	0.00	0.00
12,600.0	88.69	179.32	10,815.6	-1,943.9	7.1	1,943.9	0.00	0.00	0.00
12,700.0	88.69	179.32	10,817.9	-2,043.9	8.3	2,043.9	0.00	0.00	0.00
12,800.0	88.69	179.32	10,820.2	-2,143.9	9.5	2,143.9	0.00	0.00	0.00
12,900.0	88.69	179.32	10,822.5	-2,243.8	10.7	2,243.8	0.00	0.00	0.00
13,000.0	88.69	179.32	10,824.8	-2,343.8	11.9	2,343.8	0.00	0.00	0.00
13,100.0	88.69	179.32	10,827.1	-2,443.8	13.1	2,443.8	0.00	0.00	0.00
13,200.0	88.69	179.32	10,829.3	-2,543.7	14.3	2,543.8	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #4H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3598.6usft (Original Well Elev)
Site:	Sebastian Fed Com	**North Reference:**	Grid
Well:	#4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,300.0	88.69	179.32	10,831.6	-2,643.7	15.4	2,643.7	0.00	0.00	0.00
13,400.0	88.69	179.32	10,833.9	-2,743.7	16.6	2,743.7	0.00	0.00	0.00
13,500.0	88.69	179.32	10,836.2	-2,843.6	17.8	2,843.7	0.00	0.00	0.00
13,600.0	88.69	179.32	10,838.5	-2,943.6	19.0	2,943.7	0.00	0.00	0.00
13,700.0	88.69	179.32	10,840.8	-3,043.6	20.2	3,043.6	0.00	0.00	0.00
13,800.0	88.69	179.32	10,843.1	-3,143.5	21.4	3,143.6	0.00	0.00	0.00
13,900.0	88.69	179.32	10,845.4	-3,243.5	22.6	3,243.6	0.00	0.00	0.00
14,000.0	88.69	179.32	10,847.7	-3,343.5	23.7	3,343.5	0.00	0.00	0.00
14,100.0	88.69	179.32	10,849.9	-3,443.4	24.9	3,443.5	0.00	0.00	0.00
14,200.0	88.69	179.32	10,852.2	-3,543.4	26.1	3,543.5	0.00	0.00	0.00
14,300.0	88.69	179.32	10,854.5	-3,643.4	27.3	3,643.5	0.00	0.00	0.00
14,400.0	88.69	179.32	10,856.8	-3,743.3	28.5	3,743.4	0.00	0.00	0.00
14,500.0	88.69	179.32	10,859.1	-3,843.3	29.7	3,843.4	0.00	0.00	0.00
14,600.0	88.69	179.32	10,861.4	-3,943.3	30.8	3,943.4	0.00	0.00	0.00
14,700.0	88.69	179.32	10,863.7	-4,043.2	32.0	4,043.4	0.00	0.00	0.00
14,800.0	88.69	179.32	10,866.0	-4,143.2	33.2	4,143.3	0.00	0.00	0.00
14,900.0	88.69	179.32	10,868.2	-4,243.2	34.4	4,243.3	0.00	0.00	0.00
15,000.0	88.69	179.32	10,870.5	-4,343.1	35.6	4,343.3	0.00	0.00	0.00
15,100.0	88.69	179.32	10,872.8	-4,443.1	36.8	4,443.2	0.00	0.00	0.00
15,200.0	88.69	179.32	10,875.1	-4,543.1	38.0	4,543.2	0.00	0.00	0.00
15,300.0	88.69	179.32	10,877.4	-4,643.0	39.1	4,643.2	0.00	0.00	0.00
15,400.0	88.69	179.32	10,879.7	-4,743.0	40.3	4,743.2	0.00	0.00	0.00
15,413.9	88.69	179.32	10,880.0	-4,756.9	40.5	4,757.1	0.00	0.00	0.00
TD at 15413.9 - PBHL(SF#4H)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL(SF#4H) - plan hits target center - Point	0.00	0.00	10,880.0	-4,756.9	40.5	441,514.80	757,358.00	32° 12' 39.970 N	103° 30' 4.438 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,200.0	10,198.6	73.4	47.9	Tie-In 10200.0 'MD, 1.90° INC, 350.48° AZI
10,288.7	10,287.3	76.3	47.4	KOP - 10288.7 'MD, 1.90° INC, 350.48° AZI
11,043.2	10,780.0	-388.0	2.7	EOC- 11043.2 'MD, 88.69° INC, 185.00° AZI
15,413.9	10,880.0	-671.5	-8.0	TD at 15413.9