

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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-015-45028		2 Pool Code 96718		3 Pool Name Loco Hills; Glorieta - Yeso	
4 Property Code 313982		5 Property Name HOBGOBLIN 7 FEDERAL COM			6 Well Number 13H
7 OGRID NO. 229137		8 Operator Name COG OPERATING, LLC			9 Elevation 3673'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet From the	East/West line	County
E	8	17S	30E		1650	NORTH	1	WEST	EDDY

11 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
2	7	17S	30E		1662	NORTH	119	WEST	EDDY

12 Dedicated Acres 157.37	13 Joint or Infill	14 Consolidation Code	15 Order No.
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No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

16
GEODETTIC DATA
NAD 83 GRID - NM EAST
SURFACE LOCATION (SL)
1650 - FNL/11 - FWL (SEC. 8)
N 673770.4 - E 642855.0
LAT: 32.8517819° N LONG: 104.0027530° W
LAT: 32.51'06.4150" N LONG: 104.00'09.9111" W
KICK OFF POINT (KOP)
1660 - FNL/238 - FWL (SEC. 8)
N 673760.7 - E 643091.9
LAT: 32.8517532° N LONG: 104.0019819° W
LAT: 32.51'06.3117" N LONG: 104.00'07.1348" W
MD = 4.037.00 / TVD = 4.024.05
FIRST TAKE POINT (FTP)
1662 - FNL/125 - FWL (SEC. 7)
N 673757.6 - E 642728.8
LAT: 32.8517478° N LONG: 104.0031647° W
LAT: 32.51'06.2922" N LONG: 104.00'11.3928" W
MD = 4.685.00 / TVD = 4.516.01
LAST TAKE POINT (LTP)
1655 - FNL/254 - FWL (SEC. 7)
N 673734.5 - E 637910.3
LAT: 32.8517247° N LONG: 104.0188549° W
LAT: 32.51'06.2091" N LONG: 104.01'07.8778" W
MD = 9.516.00 / TVD = 4.485.87
BOTTOM HOLE (BH)
1662 - FNL/119 - FWL (SEC. 7)
N 673727.3 - E 637775.6
LAT: 32.8517062° N LONG: 104.0192939° W
LAT: 32.51'06.1422" N LONG: 104.01'09.4580" W
MD = 9.651.00 / TVD = 4.483.33

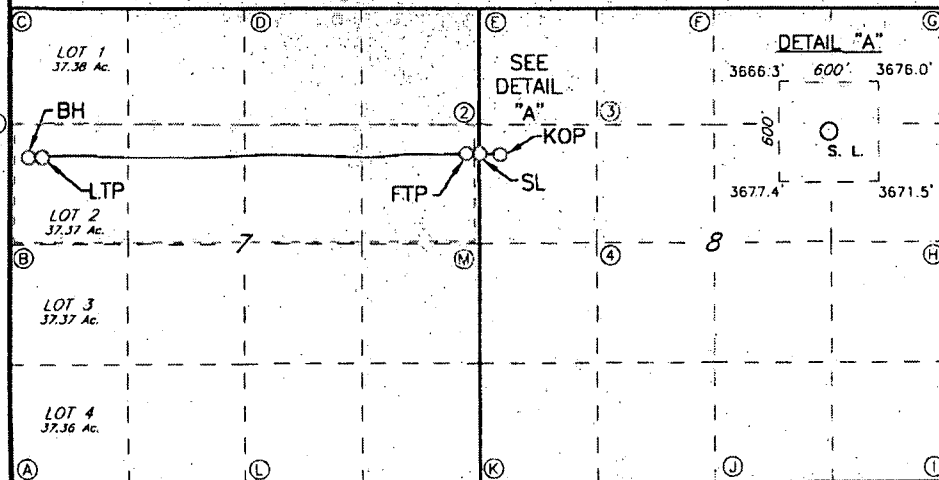
CORNER DATA
NAD 83 GRID - NM EAST
A: FOUND BRASS CAP "1914"
N 670118.1 - E 637673.2
B: FOUND BRASS CAP "1914"
N 672751.6 - E 637657.6
C: FOUND BRASS CAP "1914"
N 675387.8 - E 637653.6
D: FOUND BRASS CAP "1916"
N 675403.7 - E 640208.3
E: FOUND BRASS CAP "1916"
N 675419.9 - E 642848.2
F: FOUND BRASS CAP "1916"
N 675428.2 - E 645488.7
G: FOUND BRASS CAP "1916"
N 675436.4 - E 648128.9

H: FOUND BRASS CAP "1916"
N 672796.7 - E 648137.7
I: FOUND BRASS CAP "1916"
N 670156.3 - E 648146.2
J: FOUND BRASS CAP "1916"
N 670148.2 - E 645506.1
K: FOUND BRASS CAP "1916"
N 670140.1 - E 642866.3
L: FOUND BRASS CAP "1916"
N 670128.3 - E 640226.3
M: FOUND BRASS CAP "1916"
N 672779.6 - E 642857.5

CALCULATED POINTS
1: N 674069.7 - E 637655.6
2: N 674099.8 - E 642852.9
3: N 674103.9 - E 644173.0
4: N 672783.8 - E 644177.5

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

Dana King 12/19/2018
Signature Date
Dana King
Printed Name
dking@concho.com
E-mail Address



18 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.

9-20-2017
Date of Survey
Signature and Seal of Professional Surveyor
19680
Certificate Number
12/17/18 AS DRILL

19680
LS170961302

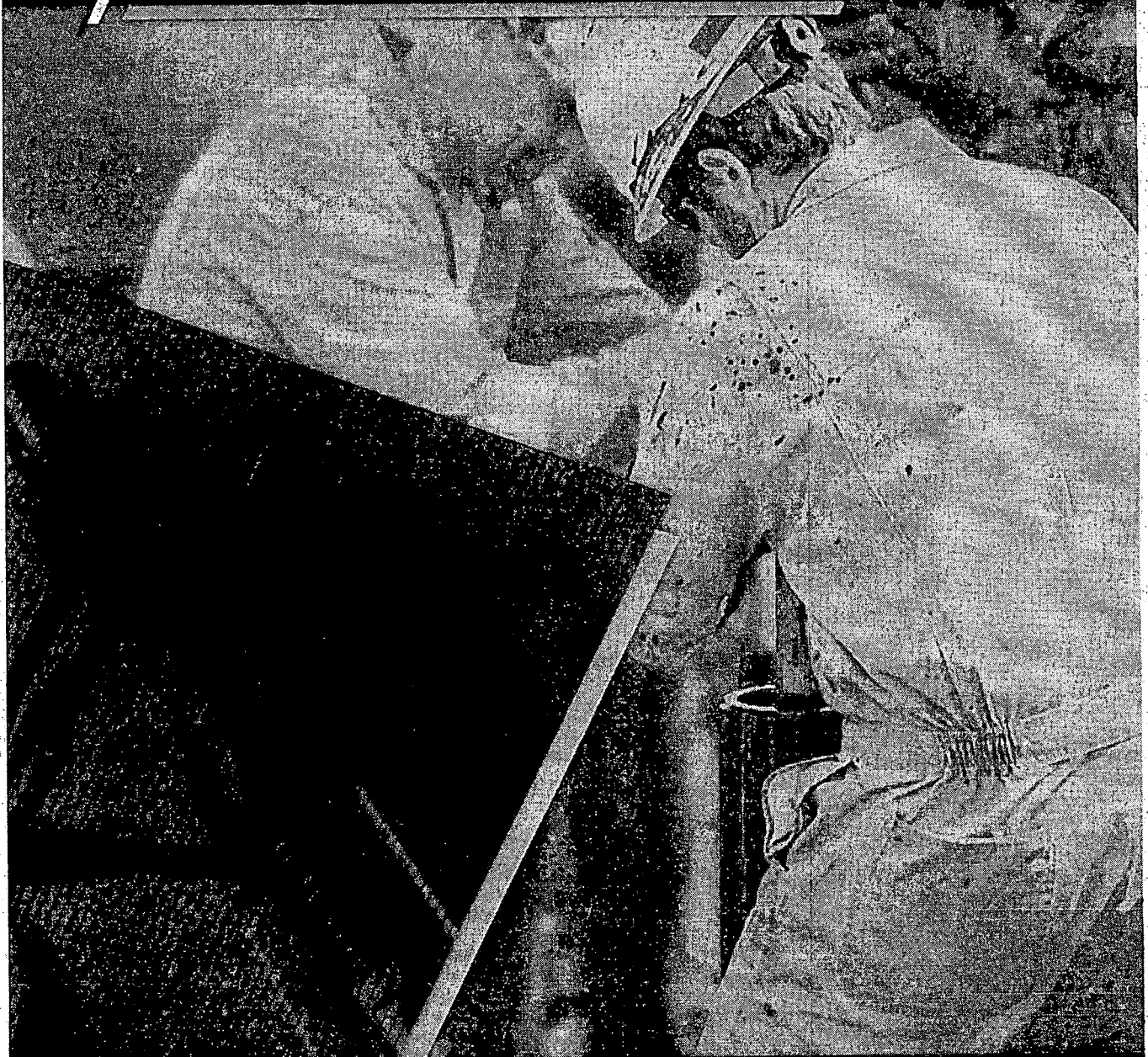
006

SURVEY REPORT

HOBGOLIN 7 FEDERAL #13H

TRINIDAD 436

9/14/2018



Scientific Drilling

The Ultimate Partner In Wellbore Placement

SURVEY REPORT

HOBGOLIN 7 FEDERAL #13H

KEEPER GYRO SURVEY

CUSTOMER COG
PROJECT Hobgolin 7 Federal #13H
FIELD NA

SDI JOB NO. OP.013058
SDI DISTRICT Midland
SDI KIT/UNIT

SITE INFORMATION

Site Name Hobgoblin 7 Federal #13H
Lat/Long 32.85178° N, 104.0027° W
Northing
Easting

Section
Township
Range

MAP INFORMATION

North Reference Grid North
Grid Correction 0.18 deg
System US State Plane 1927
Datum North American Datum 1927 (Clarke 1866)
Map Zone New Mexico East: 3001



WELL INFORMATION

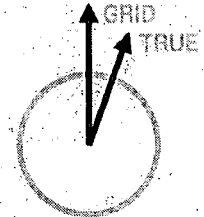
Lat/Long 32.85178° N, 104.0027° W
Northing 673,706.8 ft
Easting 601,676 ft
UWI 30-015-45028

DEPTH AND ELEVATION REFERENCE

Ground Level 3673 ft above Mean Sea Level
Reference Datum KB
Reference Height 16 ft above G.L.
Reference Elevation 3689 ft

VERTICAL SECTION REFERENCE

+N/-S 0 ft
+E/-W 0 ft
Proposal Direction 269.65°
Calculation Method Minimum Curvature



LOCAL GRAVITY REFERENCE INFORMATION

Local Gravity 998.528 mG [computed]
True to Grid add 0.18°

WELL NOTES

Keeper Gyro Survey

OPERATORS

J Mendoza

SDI Operator Name (Printed)

SIGNATURE

DATE

MD	INC	AZIM	TVD	VS	NVS	TE/W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
100.00	0.72	265.27	100.00	0.62	-0.05	-0.62	0.72	0.63	265.27
125.00	0.72	274.55	125.00	0.94	-0.05	-0.94	0.46	0.94	266.81
150.00	0.64	278.60	149.99	1.23	-0.02	-1.23	0.36	1.23	269.12
175.00	0.59	267.89	174.99	1.50	0.00	-1.50	0.51	1.50	269.90
200.00	0.67	272.91	199.99	1.77	0.00	-1.77	0.39	1.77	270.00
225.00	0.80	270.88	224.99	2.09	0.01	-2.09	0.55	2.09	270.28
250.00	0.82	275.20	249.99	2.44	0.03	-2.44	0.26	2.44	270.68
275.00	0.77	274.34	274.98	2.79	0.06	-2.79	0.21	2.79	271.19
300.00	0.74	283.50	299.98	3.11	0.11	-3.11	0.50	3.12	272.00
325.00	0.65	276.50	324.98	3.41	0.16	-3.41	0.49	3.42	272.73
350.00	0.57	262.68	349.98	3.68	0.16	-3.68	0.68	3.68	272.54
375.00	0.76	262.89	374.98	3.97	0.13	-3.97	0.76	3.97	271.83
400.00	0.93	262.60	399.97	4.33	0.08	-4.33	0.68	4.33	271.06
425.00	1.11	267.88	424.97	4.77	0.05	-4.77	0.81	4.77	270.55
450.00	0.97	263.37	449.97	5.22	0.01	-5.22	0.63	5.22	270.13
475.00	0.99	258.73	474.96	5.65	-0.05	-5.65	0.33	5.65	269.45
500.00	1.07	255.12	499.96	6.09	-0.16	-6.08	0.42	6.09	268.52
525.00	1.17	260.69	524.95	6.57	-0.26	-6.56	0.59	6.57	267.74
550.00	1.05	268.43	549.95	7.05	-0.31	-7.05	0.78	7.05	267.51
575.00	0.98	269.38	574.94	7.49	-0.32	-7.49	0.30	7.49	267.59
600.00	0.94	257.73	599.94	7.90	-0.36	-7.90	0.79	7.91	267.39
625.00	1.05	258.21	624.94	8.33	-0.45	-8.32	0.46	8.33	266.90
650.00	1.12	264.46	649.93	8.79	-0.52	-8.79	0.56	8.81	266.61
675.00	0.98	272.67	674.93	9.25	-0.54	-9.25	0.82	9.26	266.69
700.00	0.95	268.61	699.93	9.67	-0.53	-9.67	0.31	9.69	266.86
725.00	0.93	262.55	724.92	10.08	-0.56	-10.08	0.41	10.09	266.81
750.00	0.94	255.22	749.92	10.48	-0.64	-10.48	0.48	10.50	266.51
775.00	1.01	258.18	774.92	10.90	-0.74	-10.89	0.36	10.92	266.13
800.00	0.93	267.44	799.91	11.32	-0.79	-11.31	0.71	11.34	266.00
825.00	0.67	266.26	824.91	11.66	-0.81	-11.66	1.03	11.69	266.02
850.00	0.48	258.66	849.91	11.91	-0.84	-11.91	0.82	11.94	265.96

COG Operating LLC

Eddy County, NM (NAD27 NME)

Hobgoblin 7 Federal Com

13H

OH / 63499

Survey: Phoenix MWD Surveys

Standard Survey Report

20 September, 2018

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 13H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 3689.50usft (Trinidad 436)
Site:	Hobgoblin 7 Federal Com	MD Reference:	RKB @ 3689.50usft (Trinidad 436)
Well:	13H	North Reference:	Grid
Wellbore:	OH / 63499	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Trinidad 436)	Database:	USA Compass

Project	Eddy 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	Hobgoblin 7 Federal Com		
Site Position:	Northing:	673,706.80 usft	Latitude: 32° 51' 5.99860 N
From: Map	Easting:	601,676.00 usft	Longitude: 104° 0' 8.08061 W
Position Uncertainty:	0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.18 °

Well	13H		
Well Position	+N/-S	0.00 usft	Northing: 673,706.80 usft
	+E/-W	0.00 usft	Easting: 601,676.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
			Ground Level: 3,673.00 usft

Wellbore	OH / 63499				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	9/4/2018	7.49	60.65	48,192.10945583

Design	Surveys (Trinidad 436)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	269.65	

Survey Program	Date 9/20/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,483.00	Scientific Gyros (OH / 63499)	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
1,483.00	9,651.00	Phoenix MWD Surveys (OH / 63499)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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)	
1,483.00	3.79	105.43	1,482.62	-5.30	-0.10	0.14	0.00	0.00	0.00	
Tie In										
1,558.00	5.43	89.44	1,557.38	-5.92	5.83	-5.80	2.76	2.19	-21.32	
First Phoenix MWD Survey										
1,621.00	6.46	88.75	1,620.04	-5.82	12.36	-12.32	1.64	1.63	-1.10	
1,684.00	7.41	91.08	1,682.58	-5.82	19.96	-19.93	1.57	1.51	3.70	
1,810.00	7.83	89.85	1,807.47	-5.95	36.67	-36.63	0.36	0.33	-0.98	
1,936.00	6.52	90.09	1,932.48	-5.93	52.41	-52.37	1.04	-1.04	0.19	
2,082.00	5.29	96.65	2,077.70	-6.73	67.38	-67.34	0.96	-0.84	4.49	

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 13H
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	RKB @ 3689.50usft (Trinidad 436)
Sits:	Hobgoblin 7 Federal Com	MD Reference:	RKB @ 3689.50usft (Trinidad 436)
Well:	13H	North Reference:	Grid
Wellbore:	OH / 63499	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Trinidad 436)	Database:	USA Compass

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)
2,209.00	5.69	96.82	2,204.12	-8.15	79.45	-79.40	0.32	0.31	0.13
2,334.00	5.72	93.90	2,328.50	-9.31	91.82	-91.76	0.23	0.02	-2.34
2,460.00	5.94	76.38	2,453.86	-8.20	104.42	-104.37	1.42	0.17	-13.90
2,587.00	5.74	87.86	2,580.21	-6.42	117.15	-117.11	0.93	-0.16	9.04
2,713.00	6.51	91.95	2,705.49	-6.43	130.59	-130.55	0.70	0.61	3.25
2,839.00	7.55	92.48	2,830.54	-7.03	146.00	-145.95	0.83	0.83	0.42
2,965.00	9.03	93.58	2,955.22	-8.00	164.14	-164.08	1.18	1.17	0.87
3,092.00	6.06	91.70	3,081.10	-8.83	180.79	-180.73	2.35	-2.34	-1.48
3,218.00	3.85	88.03	3,206.62	-8.88	191.66	-191.61	1.77	-1.75	-2.91
3,344.00	3.86	91.09	3,332.34	-8.81	200.13	-200.07	0.16	0.01	2.43
3,470.00	4.09	97.24	3,458.04	-9.46	208.83	-208.77	0.38	0.18	4.88
3,533.00	4.28	100.48	3,520.87	-10.17	213.37	-213.30	0.48	0.30	5.14
3,596.00	4.59	103.43	3,583.68	-11.18	218.13	-218.06	0.61	0.49	4.68
3,659.00	4.84	106.12	3,646.47	-12.51	223.14	-223.06	0.53	0.40	4.27
3,722.00	3.88	89.08	3,709.29	-13.21	227.82	-227.74	2.54	-1.52	-27.05
3,785.00	3.42	82.16	3,772.16	-12.92	231.82	-231.73	1.01	-0.73	-10.98
3,848.00	1.46	59.83	3,835.10	-12.26	234.37	-234.29	3.40	-3.11	-35.44
3,911.00	1.51	54.38	3,898.08	-11.37	235.74	-235.67	0.24	0.08	-8.65
3,974.00	1.51	50.10	3,961.06	-10.36	237.05	-236.98	0.18	0.00	-6.79
4,037.00	1.51	276.92	4,024.05	-9.72	236.87	-236.80	4.40	0.00	-211.40
4,068.00	4.78	271.54	4,055.00	-9.64	235.17	-235.10	10.58	10.55	-17.35
4,100.00	8.36	274.33	4,086.78	-9.43	231.51	-231.45	11.23	11.19	8.72
4,131.00	12.68	275.98	4,117.25	-8.90	225.88	-225.82	13.97	13.94	5.32
4,162.00	16.58	276.94	4,147.24	-8.02	218.10	-218.05	12.60	12.58	3.10
4,194.00	20.43	277.54	4,177.58	-6.73	208.03	-207.99	12.05	12.03	1.88
4,225.00	22.76	276.01	4,206.40	-5.39	196.70	-196.66	7.73	7.52	-4.94
4,256.00	25.20	271.89	4,234.73	-4.55	184.14	-184.11	9.54	7.87	-13.29
4,288.00	28.24	268.94	4,263.31	-4.46	169.76	-169.73	10.36	9.50	-9.22
4,351.00	36.80	265.20	4,316.39	-6.32	135.99	-135.94	13.95	13.59	-5.94
4,414.00	45.11	265.45	4,363.93	-9.68	94.86	-94.80	13.19	13.19	0.40
4,477.00	50.36	267.47	4,406.28	-12.52	48.35	-48.27	8.66	8.33	3.21
4,509.00	52.27	268.01	4,426.28	-13.50	23.39	-23.31	6.11	5.97	1.69
4,540.00	55.22	268.64	4,444.62	-14.23	-1.59	1.68	9.66	9.52	2.03
4,572.00	57.70	269.70	4,462.29	-14.61	-28.26	28.35	8.23	7.75	3.31
4,603.00	59.81	270.39	4,478.37	-14.59	-54.76	54.85	7.07	6.81	2.23
4,635.00	62.04	271.15	4,493.92	-14.21	-82.72	82.81	7.27	6.97	2.38
4,666.00	63.89	272.02	4,508.01	-13.45	-110.33	110.41	6.47	5.97	2.81
4,698.00	66.34	272.53	4,521.48	-12.29	-139.33	139.40	7.79	7.66	1.59
4,730.00	68.19	272.56	4,533.84	-10.98	-168.81	168.88	5.78	5.78	0.09
4,761.00	72.04	272.27	4,544.39	-9.76	-197.93	197.99	12.45	12.42	-0.94
4,793.00	76.26	271.81	4,553.12	-8.72	-228.69	228.74	13.34	13.19	-2.06
4,824.00	80.97	271.45	4,559.24	-7.91	-259.06	259.11	15.20	15.19	-0.52
4,855.00	84.92	272.13	4,563.05	-6.94	-289.81	289.84	12.93	12.74	2.19

Survey Report

Company: COG Operating LLC	Local Co-ordinate Reference: Well 13H
Project: Eddy County, NM (NAD27 NME)	TVD Reference: RKB @ 3689.50usft (Trinidad 436)
Site: Hobgoblin 7 Federal Com	MD Reference: RKB @ 3689.50usft (Trinidad 436)
Well: 13H	North Reference: Grid
Wellbore: OH / 63499	Survey Calculation Method: Minimum Curvature
Design: Surveys (Trinidad 436)	Database: USA Compass

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)	
4,887.00	86.41	272.41	4,565.47	-5.68	-321.69	321.72	4.74	4.66	0.88	
4,918.00	87.20	272.39	4,567.20	-4.38	-352.61	352.63	2.55	2.55	-0.06	
4,950.00	90.31	272.40	4,567.89	-3.05	-384.57	384.58	9.72	9.72	0.03	
4,981.00	91.65	272.55	4,567.36	-1.71	-415.54	415.54	4.35	4.32	-0.48	
5,044.00	93.14	272.12	4,564.73	0.86	-478.43	478.42	2.46	2.37	-0.68	
5,108.00	95.24	271.82	4,560.05	3.05	-542.22	542.19	3.31	3.28	-0.47	
5,170.00	95.11	270.75	4,554.46	4.44	-603.95	603.91	1.73	-0.21	-1.73	
5,233.00	91.01	269.74	4,551.10	4.70	-666.84	666.80	6.70	-6.51	-1.60	
5,296.00	92.04	269.31	4,549.42	4.18	-729.82	729.78	1.77	1.63	-0.68	
5,360.00	90.28	268.19	4,548.13	2.79	-793.79	793.75	3.26	-2.75	-1.75	
5,423.00	87.37	266.50	4,549.42	-0.13	-856.70	856.68	5.34	-4.62	-2.68	
5,487.00	85.34	262.80	4,553.49	-6.08	-920.27	920.29	6.58	-3.17	-5.78	
5,550.00	86.61	264.11	4,557.91	-13.25	-982.71	982.77	2.89	2.02	2.08	
5,613.00	88.49	265.01	4,560.60	-19.21	-1,045.36	1,045.46	3.31	2.98	1.43	
5,676.00	90.50	265.95	4,561.16	-24.18	-1,108.16	1,108.29	3.52	3.19	1.49	
5,739.00	91.79	267.39	4,559.90	-27.84	-1,171.04	1,171.19	3.07	2.05	2.29	
5,801.00	93.33	268.14	4,557.13	-30.25	-1,232.93	1,233.09	2.76	2.48	1.21	
5,865.00	92.97	270.73	4,553.61	-30.88	-1,296.82	1,296.99	4.08	-0.56	4.05	
5,896.00	91.15	271.29	4,552.50	-30.33	-1,327.80	1,327.96	6.14	-5.87	1.81	
5,928.00	91.23	272.39	4,551.83	-29.31	-1,359.77	1,359.93	3.45	0.25	3.44	
5,991.00	92.21	272.48	4,549.94	-26.63	-1,422.69	1,422.82	1.56	1.56	0.14	
6,054.00	93.02	272.11	4,547.07	-24.11	-1,485.57	1,485.69	1.41	1.29	-0.59	
6,117.00	93.64	272.29	4,543.41	-21.70	-1,548.42	1,548.52	1.02	0.98	0.29	
6,180.00	91.46	271.87	4,540.61	-19.41	-1,611.31	1,611.40	3.52	-3.46	-0.67	
6,243.00	92.32	271.88	4,538.53	-17.35	-1,674.24	1,674.31	1.37	1.37	0.02	
6,307.00	89.91	271.63	4,537.28	-15.39	-1,738.19	1,738.25	3.79	-3.77	-0.39	
6,369.00	90.25	271.37	4,537.20	-13.77	-1,800.17	1,800.22	0.69	0.55	-0.42	
6,433.00	90.98	271.40	4,536.51	-12.22	-1,864.15	1,864.19	1.14	1.14	0.05	
6,496.00	91.93	271.64	4,534.91	-10.55	-1,927.10	1,927.13	1.56	1.51	0.38	
6,559.00	89.97	271.32	4,533.86	-8.93	-1,990.07	1,990.09	3.15	-3.11	-0.51	
6,622.00	90.95	271.64	4,533.36	-7.30	-2,053.05	2,053.05	1.64	1.56	0.51	
6,685.00	91.57	271.44	4,531.97	-5.61	-2,116.01	2,116.00	1.03	0.98	-0.32	
6,748.00	90.19	270.52	4,531.01	-4.53	-2,178.99	2,178.98	2.63	-2.19	-1.46	
6,811.00	90.56	270.10	4,530.59	-4.19	-2,241.99	2,241.97	0.89	0.59	-0.67	
6,874.00	89.83	269.28	4,530.38	-4.53	-2,304.99	2,304.97	1.74	-1.16	-1.30	
6,937.00	90.34	269.22	4,530.29	-5.35	-2,367.98	2,367.97	0.82	0.81	-0.10	
7,000.00	91.07	269.18	4,529.51	-6.23	-2,430.97	2,430.96	1.16	1.16	-0.06	
7,062.00	92.24	268.90	4,527.72	-7.27	-2,492.93	2,492.93	1.94	1.89	-0.45	
7,125.00	90.45	267.24	4,526.24	-9.39	-2,555.88	2,555.88	3.87	-2.84	-2.63	
7,188.00	91.30	267.19	4,525.28	-12.45	-2,618.79	2,618.82	1.35	1.35	-0.08	
7,251.00	90.09	266.59	4,524.52	-15.87	-2,681.69	2,681.74	2.14	-1.92	-0.95	
7,314.00	87.81	266.18	4,525.67	-19.84	-2,744.55	2,744.62	3.68	-3.62	-0.65	
7,377.00	88.41	265.78	4,527.75	-24.26	-2,807.36	2,807.46	1.14	0.95	-0.63	
7,439.00	88.15	267.61	4,529.61	-27.83	-2,869.23	2,869.35	2.98	-0.42	2.95	

Survey Report

Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Hobgoblin 7 Federal Com
Well: 13H
Wellbore: OH / 83499
Design: Surveys (Trinidad 436)

Local Co-ordinate Reference: Well 13H
TVD Reference: RKB @ 3689.50usft (Trinidad 436)
MD Reference: RKB @ 3689.50usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

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)	
7,502.00	88.96	267.87	4,531.20	-30.31	-2,932.16	2,932.29	1.35	1.29	0.41	
7,566.00	89.52	267.79	4,532.05	-32.74	-2,996.11	2,996.25	0.88	0.88	-0.13	
7,629.00	89.89	267.72	4,532.37	-35.20	-3,059.06	3,059.22	0.60	0.59	-0.11	
7,692.00	90.36	268.93	4,532.23	-37.05	-3,122.03	3,122.20	2.06	0.75	1.92	
7,755.00	90.70	269.05	4,531.65	-38.16	-3,185.02	3,185.19	0.57	0.54	0.19	
7,818.00	91.23	269.30	4,530.59	-39.06	-3,248.00	3,248.18	0.93	0.84	0.40	
7,881.00	92.10	269.52	4,528.76	-39.71	-3,310.97	3,311.15	1.42	1.38	0.35	
7,944.00	92.99	269.80	4,525.96	-40.09	-3,373.91	3,374.09	1.48	1.41	0.44	
8,007.00	94.12	269.56	4,522.05	-40.44	-3,436.79	3,436.97	1.83	1.79	-0.38	
8,070.00	91.34	269.37	4,519.05	-41.02	-3,499.71	3,499.89	4.42	-4.41	-0.30	
8,133.00	92.04	269.16	4,517.20	-41.83	-3,562.67	3,562.86	1.16	1.11	-0.33	
8,196.00	93.20	269.57	4,514.32	-42.53	-3,625.60	3,625.79	1.95	1.84	0.65	
8,259.00	94.51	269.63	4,510.08	-42.97	-3,688.46	3,688.65	2.08	2.08	0.10	
8,321.00	92.10	270.34	4,506.51	-42.98	-3,750.35	3,750.54	4.05	-3.89	1.15	
8,384.00	90.87	270.51	4,504.87	-42.52	-3,813.32	3,813.51	1.97	-1.95	0.27	
8,447.00	89.30	270.44	4,504.78	-41.99	-3,876.32	3,876.50	2.49	-2.49	-0.11	
8,510.00	89.81	270.53	4,505.27	-41.46	-3,939.31	3,939.50	0.82	0.81	0.14	
8,573.00	88.66	271.32	4,506.11	-40.44	-4,002.30	4,002.47	2.21	-1.83	1.25	
8,637.00	89.39	271.94	4,507.20	-38.62	-4,066.26	4,066.42	1.50	1.14	0.97	
8,699.00	90.14	271.87	4,507.45	-36.56	-4,128.23	4,128.38	1.21	1.21	-0.11	
8,762.00	90.67	271.74	4,507.01	-34.58	-4,191.20	4,191.33	0.87	0.84	-0.21	
8,826.00	91.46	271.71	4,505.82	-32.65	-4,255.15	4,255.28	1.24	1.23	-0.05	
8,889.00	91.99	271.70	4,503.92	-30.78	-4,318.10	4,318.21	0.84	0.84	-0.02	
8,952.00	91.82	270.82	4,501.83	-29.39	-4,381.05	4,381.15	1.42	-0.27	-1.40	
9,014.00	92.72	271.11	4,499.37	-28.35	-4,442.99	4,443.08	1.52	1.45	0.47	
9,078.00	91.07	270.17	4,497.26	-27.64	-4,506.95	4,507.03	2.97	-2.58	-1.47	
9,141.00	91.57	270.01	4,495.81	-27.54	-4,569.93	4,570.01	0.83	0.79	-0.25	
9,204.00	92.38	269.55	4,493.63	-27.78	-4,632.89	4,632.97	1.48	1.29	-0.73	
9,267.00	90.59	268.71	4,492.00	-28.74	-4,695.86	4,695.95	3.14	-2.84	-1.33	
9,330.00	91.85	269.06	4,490.66	-29.96	-4,758.83	4,758.93	2.08	2.00	0.56	
9,393.00	92.58	268.70	4,488.23	-31.19	-4,821.77	4,821.87	1.29	1.16	-0.57	
9,456.00	90.48	267.68	4,486.54	-33.18	-4,884.71	4,884.83	3.71	-3.33	-1.62	
9,520.00	90.79	267.15	4,485.83	-36.07	-4,948.65	4,948.77	0.96	0.48	-0.83	
9,577.00	91.18	266.88	4,484.85	-39.04	-5,005.56	5,005.71	0.83	0.68	-0.47	
Final Phoenix MWD Survey										
9,651.00	91.18	266.88	4,483.33	-43.06	-5,079.43	5,079.60	0.00	0.00	0.00	
Projection to TD										

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 13H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 3689.50usft (Trinidad 436)
Site:	Hobgoblin 7 Federal Com	MD Reference:	RKB @ 3689.50usft (Trinidad 436)
Well:	13H	North Reference:	Grid
Wellbore:	OH / 63499	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Trinidad 436)	Database:	USA Compass

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,483.00	1,482.62	-5.30	-0.10	Tie In
1,558.00	1,557.38	-5.92	5.83	First Phoenix MWD Survey
9,577.00	4,484.85	-39.04	-5,005.56	Final Phoenix MWD Survey
9,651.00	4,483.33	-43.06	-5,079.43	Projection to TD