

May 29, 2015

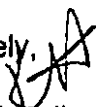
Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

NM OIL CONSERVATION
ARTESIA DISTRICT
JAN 14 2016
RECEIVED

Attn: Kanicia Castillo

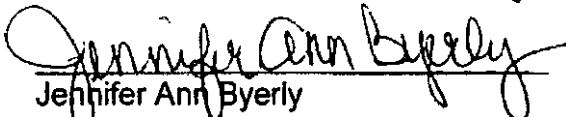
RE: Puckett 13 Federal Com 38H

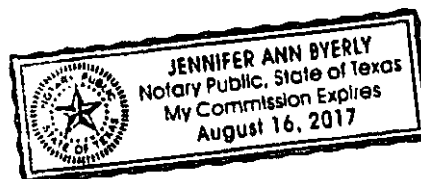
Please find enclosed a copy of the survey from 0' to 4833' ran on the above referenced well.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 29 day of May, A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho

Lease/Well: Puckett 13 Federal Com/38H

Location: S12 T17S R31E

Rig Name: United 43

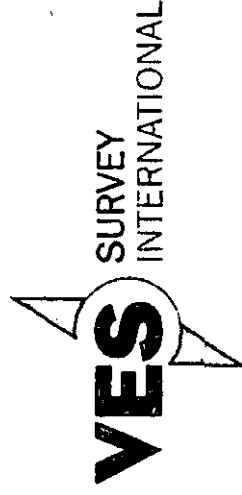
State/County: New Mexico/Eddy

VS-Azi: 0.00 Degrees

Latitude: 32.84507, Longitude: -103.81553

Grid Convergence Applied = -0.28 degs

Grid North = True North -0.28 degs



Depth Reference : RKB = 12.5 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 5/29/2015 / 08:26

VES Survey International

Midland, TX

432-563-6444

Surveyor: Andrew Askew

Puckett 13 Federal Com 38H / API 30-015-43074

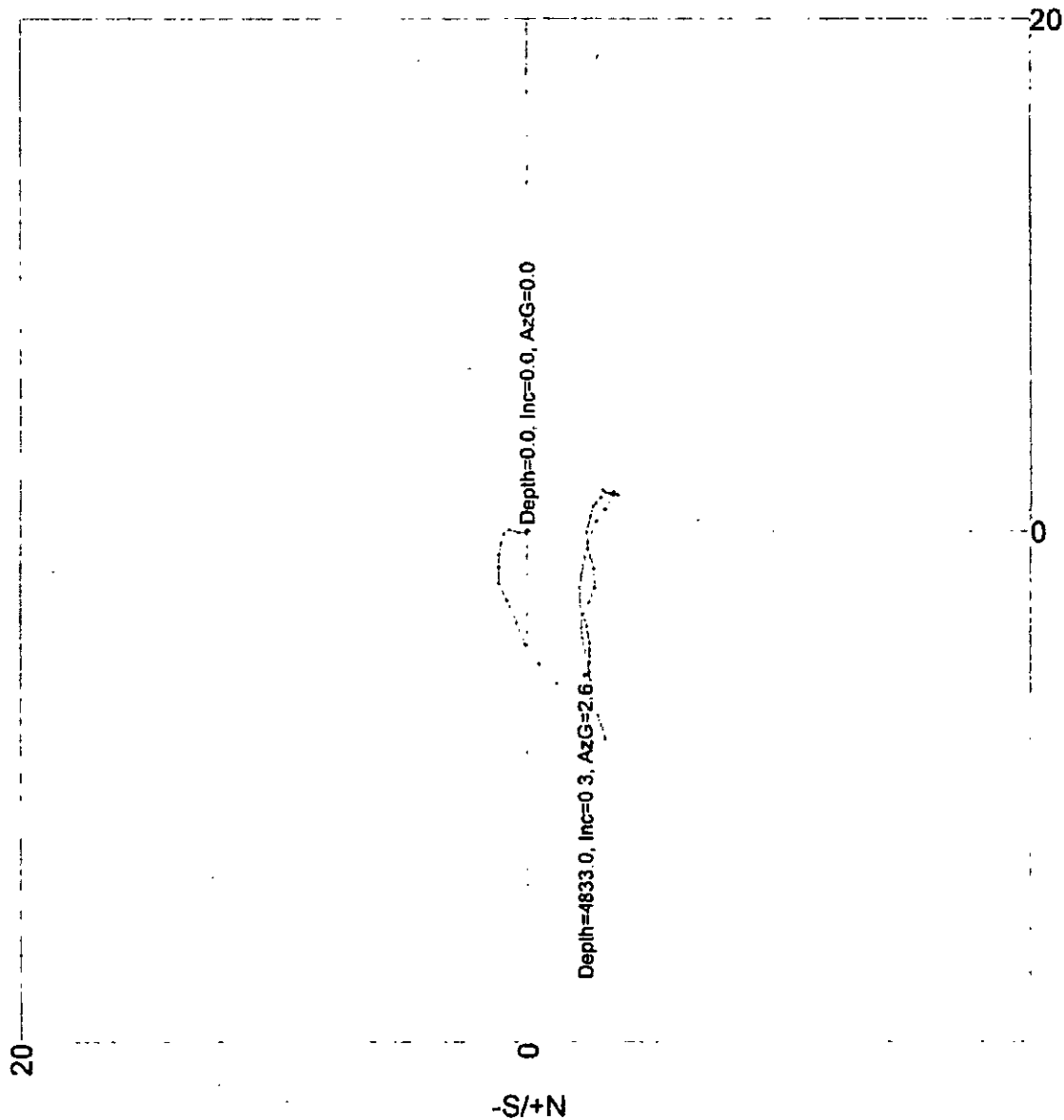
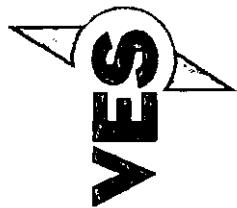
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N-S FT	+E-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.11	318.50	100.00	0.07	-0.06	0.07	0.10	318.50	0.11
200.00	0.25	23.59	200.00	0.35	-0.04	0.35	0.35	353.04	0.23
300.00	0.21	8.08	300.00	0.73	0.06	0.73	0.73	5.08	0.08
400.00	0.22	279.16	400.00	0.94	-0.10	0.94	0.94	353.73	0.29
500.00	0.24	296.14	500.00	1.06	-0.48	1.06	1.16	335.82	0.07
600.00	0.28	266.70	600.00	1.14	-0.90	1.14	1.45	321.56	0.14
700.00	0.32	273.94	700.00	1.14	-1.42	1.14	1.82	308.78	0.06
800.00	0.37	265.58	799.99	1.13	-2.02	1.13	2.32	299.31	0.07
900.00	0.50	229.86	899.99	0.83	-2.68	0.83	2.80	287.23	0.29
1000.00	0.64	256.67	999.99	0.42	-3.55	0.42	3.57	276.80	0.30
1100.00	0.45	240.06	1099.98	0.10	-4.43	0.10	4.43	271.29	0.24
1200.00	0.62	228.12	1199.98	-0.46	-5.17	-0.46	5.19	264.96	0.20
1300.00	0.57	226.65	1299.97	-1.16	-5.93	-1.16	6.04	258.97	0.05
1400.00	0.57	219.30	1399.97	-1.88	-6.61	-1.88	6.87	254.09	0.07
1500.00	0.70	236.16	1499.96	-2.61	-7.43	-2.61	7.88	250.64	0.22
1600.00	0.27	232.50	1599.96	-3.09	-8.12	-3.09	8.69	249.15	0.43

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/S FT	+E/W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	0.31	59.47	1699.98	-3.10	-8.08	-3.10	8.66	249.00	0.58
1800.00	0.79	76.86	1799.95	-2.81	-7.18	-2.81	7.71	248.64	0.50
1900.00	0.86	77.52	1899.94	-2.49	-6.78	-2.49	6.30	246.69	0.08
2000.00	1.03	79.63	1999.93	-2.17	-4.16	-2.17	4.69	242.49	0.18
2100.00	1.24	83.19	2099.91	-2.06	-2.19	-2.06	3.01	228.68	0.34
2200.00	0.82	111.60	2199.89	-2.39	-0.44	-2.39	2.43	190.45	0.63
2300.00	0.23	120.60	2299.89	-2.75	0.40	-2.75	2.78	171.78	0.59
2400.00	0.43	129.88	2399.89	-3.10	0.86	-3.10	3.21	164.49	0.21
2500.00	0.31	104.99	2499.88	-3.41	1.41	-3.41	3.69	157.49	0.20
2600.00	0.15	298.81	2599.88	-3.42	1.57	-3.42	3.76	155.40	0.46
2700.00	0.25	175.36	2699.88	-3.57	1.47	-3.57	3.86	157.84	0.35
2800.00	0.24	340.90	2799.88	-3.59	1.42	-3.59	3.86	158.44	0.48
2900.00	0.20	50.95	2899.88	-3.28	1.49	-3.28	3.60	155.64	0.25
3000.00	0.19	3.88	2999.88	-3.00	1.83	-3.00	3.42	151.45	0.16
3100.00	0.24	193.89	3099.88	-3.04	1.60	-3.04	3.43	152.32	0.44
3200.00	0.14	347.12	3199.88	-3.13	1.52	-3.13	3.48	154.13	0.37
3300.00	0.21	300.32	3299.88	-2.92	1.33	-2.92	3.20	155.49	0.16
3400.00	0.13	324.39	3399.88	-2.73	1.10	-2.73	2.94	168.02	0.11
3500.00	0.06	298.60	3499.88	-2.61	0.99	-2.61	2.79	159.26	0.08
3600.00	0.39	280.55	3599.88	-2.52	0.80	-2.52	2.59	166.52	0.34
3700.00	0.38	290.20	3699.88	-2.34	-0.05	-2.34	2.34	181.18	0.07
3800.00	0.42	239.88	3799.87	-2.41	-0.68	-2.41	2.50	195.76	0.34
3900.00	0.53	262.53	3899.87	-2.65	-1.46	-2.65	3.03	208.78	0.22
4000.00	0.33	274.40	3999.87	-2.69	-2.21	-2.69	3.48	219.34	0.22
4100.00	0.40	310.39	4099.87	-2.45	-2.76	-2.45	3.68	228.42	0.23
4200.00	0.23	277.01	4199.88	-2.20	-3.22	-2.20	3.90	235.66	0.24
4300.00	0.38	237.25	4299.88	-2.35	-3.70	-2.35	4.38	237.51	0.25
4400.00	0.43	279.61	4399.86	-2.47	-4.35	-2.47	5.00	240.39	0.30
4500.00	0.44	263.32	4499.86	-2.45	-5.10	-2.45	5.55	244.32	0.12
4600.00	0.07	13.69	4599.86	-2.44	-5.47	-2.44	5.98	245.98	0.47
4700.00	0.10	209.88	4699.86	-2.45	-5.50	-2.45	6.03	245.96	0.17
4800.00	0.14	337.40	4799.86	-2.42	-5.80	-2.42	6.09	246.65	0.22
4833.00	0.27	2.57	4832.86	-2.30	-5.61	-2.30	6.06	247.70	0.45



VES Survey International
Midland, TX
432-563-5444

Surveyor: Andrew Askew
Puckett 13 Federal Com 38H / API 30-015-43074



-W/+E
V.E.S. Survey Date: 5/16/2015



6/30/15

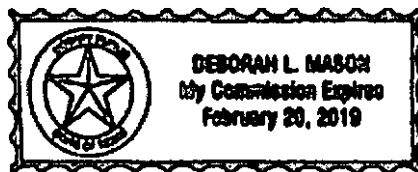
State of New Mexico
County of Eddy

I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 05/17/2015 through 06/24/2015 conduct or supervise the taking of a MWD survey from a depth of 4916 feet to a depth of 10463 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho Oil & Gas for the Puckett 13 Federal Com #38H Well API 30-015-43074 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D. Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.



Notary Public's Signature



Customer Name: COG
 Well Name: Puckett 13 Federal Com #38H
 API Number: 30-015-43074
 County / Parish: Eddy Co, NM

M.W.D. Operator: Justin Campos
 Directional Driller: John Overton
 Total Magnetic Correction: 6.98
 Job #: NM-536

Vertical Section: 178.56

Tie In Survey(s) Provided By:

	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS
Tie - In										
0	4833.00	0.27	2.57	4832.86	2.16	-2.30	-5.61	6.06	247.70	0.45
1	4916.00	0.10	296.50	4915.86	1.93	-2.07	-5.67	6.03	249.91	0.30
2	4948.00	0.10	293.40	4947.86	1.90	-2.05	-5.72	6.07	250.28	0.02
3	4979.00	0.20	176.30	4978.86	1.95	-2.09	-5.74	6.11	249.97	0.84
4	5011.00	2.10	179.30	5010.85	2.59	-2.73	-5.73	6.35	244.48	5.94
5	5042.00	4.50	186.40	5041.80	4.36	-4.51	-5.86	7.39	232.39	7.84
6	5074.00	7.50	183.00	5073.62	7.69	-7.84	-6.11	9.94	217.89	9.44
7	5105.00	11.00	178.20	5104.21	12.66	-12.82	-6.12	14.21	205.51	11.55
8	5137.00	14.90	178.10	5135.39	19.83	-19.99	-5.89	20.84	196.41	12.19
9	5168.00	19.00	178.10	5165.04	28.87	-29.02	-5.59	29.55	190.90	13.23
10	5200.00	22.70	178.60	5194.94	40.26	-40.40	-5.26	40.74	187.42	11.58
11	5232.00	26.00	179.40	5224.09	53.45	-53.59	-5.04	53.83	185.37	10.36
12	5263.00	29.30	181.30	5251.54	67.82	-67.97	-5.14	68.17	184.32	11.02
13	5295.00	32.50	182.80	5279.00	84.22	-84.39	-5.74	84.59	183.89	10.28
14	5327.00	35.60	182.70	5305.51	102.09	-102.29	-6.60	102.50	183.69	9.69
15	5358.00	39.10	183.10	5330.15	120.84	-121.07	-7.55	121.30	183.57	11.32
16	5390.00	43.10	183.80	5354.26	141.79	-142.06	-8.82	142.33	183.55	12.58
17	5421.00	46.60	183.60	5376.23	163.57	-163.87	-10.23	164.19	183.57	11.30
18	5453.00	49.70	184.40	5397.58	187.29	-187.65	-11.90	188.03	183.63	9.86
19	5484.00	52.70	185.10	5417.00	211.31	-211.72	-13.90	212.18	183.76	9.84
20	5516.00	55.60	185.10	5435.74	237.07	-237.56	-16.21	238.11	183.90	9.06
21	5547.00	58.70	184.50	5452.56	262.96	-263.50	-18.38	264.14	183.99	10.13
22	5578.00	62.20	184.30	5467.84	289.78	-290.39	-20.45	291.11	184.03	11.30
23	5610.00	65.50	183.80	5481.94	318.37	-319.04	-22.48	319.83	184.03	10.41
24	5641.00	68.40	184.00	5494.08	346.77	-347.49	-24.42	348.35	184.02	9.37
25	5673.00	71.20	184.20	5505.13	376.66	-377.44	-26.56	378.38	184.03	8.77
26	5704.00	74.50	184.40	5514.27	406.13	-406.98	-28.79	408.00	184.05	10.66
27	5736.00	78.00	185.30	5521.87	437.02	-437.95	-31.41	439.07	184.10	11.27
28	5767.00	80.60	186.20	5527.63	467.24	-468.25	-34.47	469.52	184.21	8.86
29	5798.00	84.00	186.50	5531.78	497.67	-498.78	-37.87	500.21	184.34	11.01
30	5829.00	87.60	187.10	5534.05	528.26	-529.47	-41.53	531.10	184.48	11.77
31	5861.00	89.00	186.60	5535.00	559.91	-561.23	-45.34	563.06	184.62	4.65
32	5892.00	89.60	184.70	5535.38	590.67	-592.07	-48.39	594.05	184.67	6.43
33	5987.00	88.70	181.10	5536.79	685.37	-686.92	-53.20	688.98	184.43	3.91
34	6082.00	89.00	177.80	5538.70	780.33	-781.89	-52.29	783.63	183.83	3.49
35	6176.00	88.60	177.70	5540.66	874.30	-875.79	-48.60	877.14	183.18	0.44
36	6271.00	88.40	177.70	5543.15	969.25	-970.69	-44.78	971.72	182.64	0.21
37	6365.00	87.90	177.90	5546.19	1063.20	-1064.57	-41.18	1065.36	182.22	0.57
38	6459.00	89.40	178.30	5548.40	1157.16	-1158.49	-38.06	1159.11	181.88	1.65
39	6553.00	89.40	178.40	5549.38	1251.16	-1252.44	-35.36	1252.94	181.62	0.11
40	6648.00	89.20	177.90	5550.55	1346.15	-1347.39	-32.29	1347.77	181.37	0.57

41	6743.00	89.50	177.70	5551.62	1441.13	-1442.31	-28.64	1442.59	181.14	0.38
42	6838.00	89.50	178.20	5552.45	1536.12	-1537.24	-25.24	1537.45	180.94	0.53
43	6932.00	88.60	178.50	5554.01	1630.11	-1631.19	-22.54	1631.35	180.79	1.01
44	7027.00	90.20	177.70	5555.01	1725.10	-1726.13	-19.39	1726.24	180.64	1.88
45	7121.00	89.90	177.50	5554.92	1819.08	-1820.05	-15.45	1820.11	180.49	0.38
46	7215.00	89.70	177.40	5555.25	1913.07	-1913.95	-11.27	1913.99	180.34	0.24
47	7310.00	91.20	177.60	5554.51	2008.04	-2008.86	-7.13	2008.87	180.20	1.59
48	7404.00	91.00	177.60	5552.70	2102.01	-2102.76	-3.19	2102.76	180.09	0.21
49	7499.00	90.70	177.60	5551.29	2196.99	-2197.66	0.79	2197.66	179.98	0.32
50	7533.00	89.80	177.70	5551.14	2230.98	-2231.63	2.18	2231.64	179.94	2.66
51	7566.00	88.80	178.70	5551.55	2263.98	-2264.62	3.22	2264.62	179.92	4.29
52	7597.00	89.10	178.60	5552.11	2294.98	-2295.60	3.95	2295.60	179.90	1.02
53	7629.00	89.30	178.90	5552.56	2326.97	-2327.59	4.65	2327.60	179.89	1.13
54	7660.00	89.80	179.60	5552.80	2357.97	-2358.59	5.05	2358.59	179.88	2.77
55	7692.00	90.50	179.40	5552.72	2389.96	-2390.58	5.33	2390.59	179.87	2.28
56	7724.00	90.60	179.20	5552.41	2421.96	-2422.58	5.72	2422.59	179.86	0.70
57	7756.00	91.30	178.90	5551.88	2453.95	-2454.57	6.25	2454.58	179.85	2.38
58	7788.00	91.80	179.10	5551.02	2485.94	-2486.56	6.81	2486.56	179.84	1.68
59	7821.00	91.60	179.10	5550.04	2518.93	-2519.54	7.33	2519.55	179.83	0.61
60	7853.00	90.80	179.90	5549.37	2550.91	-2551.53	7.61	2551.54	179.83	3.54
61	7885.00	90.20	180.00	5549.09	2582.90	-2583.53	7.64	2583.54	179.83	1.90
62	7917.00	90.50	180.20	5548.89	2614.89	-2615.53	7.58	2615.54	179.83	1.13
63	7949.00	90.70	180.30	5548.56	2646.87	-2647.52	7.44	2647.53	179.84	0.70
64	7981.00	90.70	181.00	5548.17	2678.85	-2679.52	7.08	2679.53	179.85	2.19
65	8014.00	90.60	179.90	5547.79	2711.83	-2712.52	6.82	2712.52	179.86	3.35
66	8047.00	90.80	179.40	5547.39	2744.82	-2745.51	7.02	2745.52	179.85	1.63
67	8080.00	91.30	179.90	5546.79	2777.81	-2778.51	7.22	2778.52	179.85	2.14
68	8112.00	91.80	179.70	5545.92	2809.79	-2810.49	7.33	2810.50	179.85	1.68
69	8143.00	92.40	179.90	5544.78	2840.76	-2841.47	7.44	2841.48	179.85	2.04
70	8175.00	91.10	180.20	5543.81	2872.74	-2873.46	7.41	2873.47	179.85	4.17
71	8206.00	91.30	180.40	5543.16	2903.71	-2904.45	7.25	2904.46	179.86	0.91
72	8238.00	91.70	180.50	5542.32	2935.69	-2936.44	7.00	2936.45	179.86	1.29
73	8269.00	92.20	180.30	5541.26	2966.65	-2967.42	6.78	2967.43	179.87	1.74
74	8301.00	90.90	180.30	5540.40	2998.63	-2999.41	6.62	2999.41	179.87	4.06
75	8332.00	90.60	180.10	5539.99	3029.61	-3030.40	6.51	3030.41	179.88	1.16
76	8365.00	89.00	179.80	5540.11	3062.60	-3063.40	6.54	3063.41	179.88	4.93
77	8397.00	88.50	179.60	5540.81	3094.58	-3095.39	6.70	3095.40	179.88	1.68
78	8428.00	88.50	179.60	5541.62	3125.57	-3126.38	6.92	3126.39	179.87	0.00
79	8460.00	88.70	179.60	5542.40	3157.55	-3158.37	7.14	3158.38	179.87	0.63
80	8492.00	89.00	179.70	5543.04	3189.54	-3190.37	7.34	3190.37	179.87	0.99
81	8524.00	88.90	179.70	5543.63	3221.53	-3222.36	7.51	3222.37	179.87	0.31
82	8556.00	88.90	179.60	5544.24	3253.52	-3254.35	7.70	3254.36	179.86	0.31
83	8587.00	89.10	179.40	5544.78	3284.51	-3285.35	7.97	3285.36	179.86	0.91
84	8618.00	89.20	179.50	5545.24	3315.50	-3316.34	8.27	3316.35	179.86	0.46
85	8650.00	89.50	179.50	5545.61	3347.50	-3348.34	8.55	3348.35	179.85	0.94
86	8682.00	89.60	179.60	5545.86	3379.49	-3380.34	8.80	3380.35	179.85	0.44
87	8713.00	89.60	179.60	5546.07	3410.48	-3411.34	9.02	3411.35	179.85	0.00
88	8745.00	89.80	179.80	5546.24	3442.48	-3443.33	9.18	3443.35	179.85	0.88
89	8776.00	90.00	179.20	5546.30	3473.47	-3474.33	9.45	3474.35	179.84	2.04
90	8808.00	90.20	178.40	5546.24	3505.47	-3506.33	10.12	3506.34	179.83	2.58
91	8803.00	90.90	178.60	5545.33	3600.47	-3601.29	12.61	3601.31	179.80	0.77
92	8997.00	90.10	177.80	5544.51	3694.46	-3695.24	15.56	3695.27	179.76	1.20
93	9094.00	90.40	177.80	5544.09	3791.45	-3792.16	19.29	3792.21	179.71	0.31
94	9189.00	89.70	177.80	5544.00	3886.44	-3887.09	22.93	3887.16	179.66	0.74
95	9285.00	88.60	176.80	5545.43	3982.41	-3982.97	27.46	3983.07	179.61	1.55

96	9382.00	89.40	176.30	5547.12	4079.33	-4079.78	33.29	4079.92	179.53	0.97
97	9479.00	89.80	176.30	5547.80	4176.25	-4176.58	39.55	4176.76	179.46	0.41
98	9575.00	90.30	176.30	5547.71	4272.18	-4272.38	45.75	4272.62	179.39	0.52
99	9608.00	90.70	176.30	5547.42	4305.15	-4305.31	47.88	4305.57	179.36	1.21
100	9640.00	90.50	176.40	5547.09	4337.12	-4337.24	49.91	4337.53	179.34	0.70
101	9672.00	90.50	176.50	5546.81	4369.10	-4369.18	51.89	4369.49	179.32	0.31
102	9704.00	90.50	176.30	5546.53	4401.08	-4401.11	53.90	4401.44	179.30	0.62
103	9736.00	90.90	176.40	5546.14	4433.05	-4433.05	55.94	4433.40	179.28	1.29
104	9768.00	90.70	176.40	5545.69	4465.03	-4464.98	57.95	4465.36	179.26	0.63
105	9863.00	88.70	176.30	5546.19	4559.95	-4559.78	64.00	4560.23	179.20	2.11
106	9957.00	89.00	175.90	5548.08	4653.84	-4653.54	70.39	4654.08	179.13	0.53
107	10053.00	89.50	176.10	5549.33	4749.74	-4749.30	77.09	4749.93	179.07	0.56
108	10149.00	89.80	176.30	5549.92	4845.65	-4845.09	83.45	4845.81	179.01	0.38
109	10246.00	90.30	176.40	5549.84	4942.58	-4941.89	89.62	4942.70	178.96	0.53
110	10343.00	90.90	176.30	5548.82	5039.50	-5038.69	95.80	5039.60	178.91	0.63
111	10463.00	90.90	176.30	5546.94	5159.40	-5158.42	103.54	5159.46	178.85	0.00

WELL NAME AND NUMBER Puckett 13 Federal Com No. 38H
 LOCATION Section 12, T17S, R31E, Unit P, 1180 FSL, 470 FEL, Eddy Cty
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
.4° @ 350'	22.7° @ 5200'	89.6° @ 5892'
.2° @ 798'	26.0° @ 5232'	88.7° @ 5987'
.7° @ 1048'	29.3° @ 5263'	89.0° @ 6082'
.8° @ 1348'	32.5° @ 5295'	88.6° @ 6176'
.3° @ 1679'	35.7° @ 5327'	88.4° @ 6271'
1.1° @ 2066'	39.1° @ 5358'	89.4° @ 6553'
.4° @ 2433'	43.1° @ 5390'	89.2° @ 6648'
.2° @ 2844'	46.6° @ 5421'	89.5° @ 6838'
.0° @ 3251'	49.7° @ 5453'	88.6° @ 6932'
.1° @ 3641'	52.7° @ 5510'	90.2° @ 7027'
.5° @ 4072'	58.7° @ 5547'	89.9° @ 7121'
.3° @ 4415'	62.2° @ 5578'	89.7° @ 7215'
.3° @ 4793'	65.5° @ 5610'	90.7° @ 7499'
.3° @ 4883'	68.4° @ 5641'	90.5° @ 7593'
.1° @ 4948'	71.2° @ 5673'	90.5° @ 7688'
4.5° @ 5042'	80.6° @ 5767'	90.5° @ 7782'
14.9° @ 5137'	84.0° @ 5798'	89.9° @ 7876'
19.0° @ 5168'	87.6° @ 5829'	89.5° @ 7971'

Drilling Contractor- UNITED DRILLING, INC.

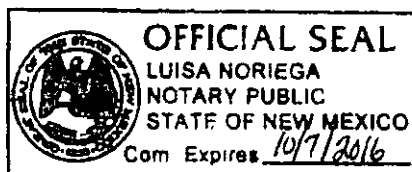
By: Angel Salazar
 (Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 29th day of June 2015.

Luisa Noriega
 Notary Public

My Commission Expires:



Chaves NM
 County State

WELL NAME AND NUMBER Puckett 13 Federal Com No. 38H
 LOCATION Section 12, T17S, R31E, Unit P, 1180 FSL, 470 FEL, Eddy Cty
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
90.7° @ 8065'	90.5° @ 7917'	90.1° @ 8997'
90.6° @ 8159'	90.7° @ 7949'	90.4° @ 9094'
90.5° @ 8254'	90.7° @ 7981'	89.7° @ 9189'
90.2° @ 8349'	90.6° @ 8014'	88.6° @ 9258'
90.0° @ 8443'	90.8° @ 8047'	89.4° @ 9382'
89.6° @ 8538'	91.3° @ 8080'	89.8° @ 9479'
89.4° @ 8632'	92.4° @ 8143'	90.3° @ 9575'
89.3° @ 8727'	91.3° @ 8706'	90.7° @ 9608'
90.5° @ 7501'	91.7° @ 8238'	90.5° @ 9640'
89.8° @ 7533'	92.2° @ 8269'	90.5° @ 9704'
88.8° @ 7566'	90.9° @ 8301'	90.7° @ 9768'
89.1° @ 7597'	90.6° @ 8332'	88.7° @ 9863'
89.3° @ 7629'	88.5° @ 8452'	89.0° @ 9957'
89.8° @ 7660'	88.5° @ 8483'	89.5° @ 10053'
90.5° @ 7692'	88.7° @ 8515'	89.8° @ 10149'
91.6° @ 7821'	89.6° @ 8682'	90.9° @ 10343'
90.8° @ 7853'	89.6° @ 8713'	
90.2° @ 7885'	89.8° @ 8745'	

Drilling Contractor- UNITED DRILLING, INC.

By: Angel Salazar
 (Angel Salazar)

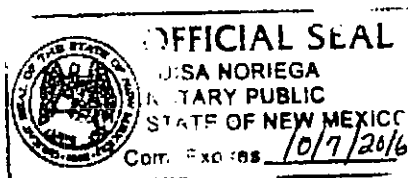
Title: Vice President

Subscribed and sworn to before me this 29th day of June, 2015.

Rosa Noriega
 Notary Public

Chavez NM
 County State

My Commission Expires:





COG Operating LLC

Eddy County, NM

Puckett 13 Federal Com #38H

SHL: 1180' FSL, 470' FEL, Sec 12, T17S, R31E, Unit P

EOC: 659.2' FSL, 514.7' FEL, Sec 13, T17S, R31E, Unit P

BHL: 350' FSL, 350' FEL, Sec 13, T17S, R31E, Unit P

Design: BHL: 350' FSL, 350' FEL, Sec 13, T17S, R31E, Unit P

Standard Survey Report

25 June, 2015





TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Federal Com #38H
Project:	Eddy County, NM	TVD Reference:	KB @ 3989 0usft (United 43)
Site:	Puckett 13 Federal Com #38H	MD Reference:	KB @ 3989 0usft (United 43)
Well:	SHL 1180' FSL 470' FEL Sec 12, T17S, R31E, Unit P	North Reference:	Grid
Wellbore:	BHL 350' FSL 350' FEL Sec 13, T17S, R31E, Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL 350' FSL 350' FEL Sec 13, T17S, R31E, Unit P	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, NM		
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:		Puckett 13 Federal Com #38H			
Site Position:		Northing:	671,536.90 usft	Latitude:	32° 50' 42.247 N
From:	Map	Easting:	659,026.90 usft	Longitude:	103° 48' 55.916 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.28 '

Well:	SHL 1180' FSL 470' FEL Sec 12, T17S, R31E, Unit P					
Well Position	+N-S	0.0 usft	Northing:	671 536.90 usft	Latitude:	32° 50' 42.247 N
	+E-W	0.0 usft	Easting:	659 026.90 usft	Longitude:	103° 48' 55.916 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3 977.0 usft	

Wellbore:	BHL 350' FSL 350' FEL Sec 13, T17S, R31E, Unit P
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Magnetics	Model Name:	Sample Date	Declination:	Dip Angle:	Field Strength:
	IGRF2010	5/5/2015	(°)	(°)	(nT)
			7.27	60.62	48,569

Design:	BHL 350' FSL 350' FEL Sec 13, T17S, R31E, Unit P
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Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	178.55

Survey Program:		Date: 8/25/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	4,833.0	Gyro #1 (BHL 350' FSL 350' FEL Sec 13	NS-GYRO-SS	NS Gyro single shots
4,918.0	7,499.0	MWD #2 (BHL 350' FSL 350' FEL Sec 13	MWD	MWD - Standard
7,533.0	10,463.0	MWD #3 (BHL 350' FSL 350' FEL Sec 13	MWD	MWD - Standard

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	0.11	318.50	100.0	0.1	-0.1	-0.1	0.11	0.11	0.00
	200.0	0.25	23.69	200.0	0.3	0.0	-0.3	0.23	0.14	65.19
	300.0	0.21	6.08	300.0	0.7	0.1	-0.7	0.08	-0.04	-17.61
	400.0	0.22	279.16	400.0	0.9	-0.1	-0.9	0.30	0.01	-86.92
	500.0	0.24	296.14	500.0	1.1	-0.5	-1.1	0.07	0.02	16.98



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Federal Com #38H
Project:	Eddy County, NM	TVD Reference:	KB @ 3989.0usft (United 43)
Site:	Puckett 13 Federal Com #38H	MD Reference:	KB @ 3989.0usft (United 43)
Well:	SHL: 1180' FSL: 470' FEL: Sec 12, T17S, R31E: Unit P	North Reference:	Grid:
Wellbore:	BHL: 350' FSL: 350' FEL: Sec 13, T17S, R31E: Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 350' FSL: 350' FEL: Sec 13, T17S, R31E: Unit P	Database:	EDM 5000.1 Single User Db

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)
600.0	0.28	266.70	600.0	1.1	-0.9	-1.2	0.14	0.04	-29.44
700.0	0.32	273.94	700.0	1.1	-1.4	-1.2	0.06	0.04	7.24
800.0	0.37	265.58	800.0	1.1	-2.0	-1.2	0.07	0.05	-8.38
900.0	0.50	228.86	900.0	0.8	-2.7	-0.9	0.29	0.13	-35.72
1,000.0	0.64	256.67	1,000.0	0.4	-3.6	-0.5	0.30	0.14	26.81
1,100.0	0.45	240.08	1,100.0	0.1	-4.5	-0.2	0.25	-0.19	-16.61
1,200.0	0.62	228.12	1,200.0	-0.5	-5.2	0.3	0.20	0.17	-11.94
1,300.0	0.57	226.66	1,300.0	-1.2	-6.0	1.0	0.05	-0.05	-1.46
1,400.0	0.57	219.30	1,400.0	-1.9	-6.6	1.7	0.07	0.00	-7.36
1,500.0	0.70	236.16	1,500.0	-2.6	-7.5	2.4	0.23	0.13	16.88
1,600.0	0.27	232.50	1,600.0	-3.1	-8.2	2.9	0.43	-0.43	-3.68
1,700.0	0.31	59.47	1,700.0	-3.1	-8.1	2.9	0.58	0.04	-173.03
1,800.0	0.79	76.85	1,800.0	-2.8	-7.2	2.6	0.50	0.48	17.38
1,900.0	0.86	77.52	1,899.9	-2.5	-5.8	2.3	0.07	0.07	0.67
2,000.0	1.03	79.83	1,999.9	-2.2	-4.2	2.1	0.17	0.17	2.11
2,100.0	1.24	93.19	2,099.9	-2.1	-2.2	2.0	0.34	0.21	13.56
2,200.0	0.82	111.60	2,199.9	-2.4	-0.5	2.4	0.53	-0.42	18.41
2,300.0	0.23	120.60	2,299.9	-2.8	0.4	2.8	0.59	-0.59	9.00
2,400.0	0.43	129.88	2,399.9	-3.1	0.8	3.1	0.21	0.20	9.28
2,500.0	0.31	104.99	2,499.9	-3.4	1.4	3.4	0.20	-0.12	-24.89
2,600.0	0.15	298.81	2,599.9	-3.4	1.5	3.5	0.48	-0.16	-166.18
2,700.0	0.25	175.38	2,699.9	-3.6	1.4	3.6	0.36	0.10	-123.45
2,800.0	0.24	340.90	2,799.9	-3.6	1.4	3.6	0.49	-0.01	165.54
2,900.0	0.20	50.95	2,899.9	-3.3	1.4	3.3	0.25	-0.04	70.05
3,000.0	0.19	3.88	2,999.9	-3.0	1.6	3.0	0.16	-0.01	-47.07
3,100.0	0.24	193.89	3,099.9	-3.0	1.6	3.1	0.43	0.05	-169.99
3,200.0	0.14	347.12	3,199.9	-3.1	1.5	3.2	0.37	-0.10	153.23
3,300.0	0.21	300.32	3,299.9	-2.9	1.3	2.9	0.15	0.07	-46.80
3,400.0	0.13	324.39	3,399.9	-2.7	1.1	2.8	0.11	-0.08	24.07
3,500.0	0.06	298.60	3,499.9	-2.6	1.0	2.6	0.08	-0.07	-25.79
3,600.0	0.39	280.55	3,599.9	-2.5	0.6	2.5	0.33	0.33	-18.05
3,700.0	0.38	290.20	3,699.9	-2.3	-0.1	2.3	0.07	-0.01	9.65
3,800.0	0.42	239.88	3,799.9	-2.4	-0.7	2.4	0.34	0.04	-50.32
3,900.0	0.53	262.53	3,899.9	-2.7	-1.5	2.6	0.22	0.11	22.65
4,000.0	0.33	274.40	3,999.9	-2.7	-2.2	2.6	0.22	-0.20	11.87
4,100.0	0.40	310.39	4,099.9	-2.5	-2.8	2.4	0.24	0.07	35.99
4,200.0	0.23	277.01	4,199.9	-2.2	-3.2	2.1	0.24	-0.17	-33.38
4,300.0	0.38	237.25	4,299.9	-2.4	-3.7	2.3	0.25	0.15	-39.76
4,400.0	0.43	279.61	4,399.9	-2.5	-4.4	2.4	0.30	0.05	42.36
4,500.0	0.44	263.32	4,499.9	-2.5	-5.1	2.3	0.12	0.01	-16.29
4,600.0	0.07	13.69	4,599.9	-2.4	-5.5	2.3	0.47	-0.37	110.37
4,700.0	0.10	209.88	4,699.9	-2.5	-5.5	2.3	0.17	0.03	-163.81



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Federal Com #38H
Project:	Eddy County, NM	TVD Reference:	KB @ 3989.0usft (United 43)
Site:	Puckett 13 Federal Com #38H	MD Reference:	KB @ 3989.0usft (United 43)
Well:	SHL: 1180' FSL: 470' FEL: Sec 12, T17S, R31E, Unit P	North Reference:	Grid:
Wellbore:	BHL: 350' FSL: 350' FEL: Sec 13, T17S, R31E, Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 350' FSL: 350' FEL: Sec 13, T17S, R31E, Unit P	Database:	EDM 5000.1 Single User Db

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)
4,800.0	0.14	337.40	4,799.9	-2.4	-5.6	2.3	0.22	0.04	127.52
4,833.0	0.27	2.57	4,832.9	-2.3	-5.6	2.2	0.47	0.39	76.27
TIE-IN to VES Gyro									
4,916.0	0.10	296.50	4,915.9	-2.1	-5.7	1.9	0.30	-0.20	-79.60
4,948.0	0.10	293.40	4,947.9	-2.1	-5.7	1.9	0.02	0.00	-9.69
4,979.0	0.20	176.30	4,978.9	-2.1	-5.7	2.0	0.84	0.32	-377.74
5,011.0	2.10	179.30	5,010.8	-2.7	-5.7	2.6	5.94	5.94	9.38
5,042.0	4.50	186.40	5,041.8	-4.5	-5.9	4.4	7.84	7.74	22.90
5,074.0	7.50	183.00	5,073.6	-7.8	-6.1	7.7	9.44	9.38	-10.63
5,105.0	11.00	178.20	5,104.2	-12.8	-6.1	12.7	11.55	11.29	-15.48
5,137.0	14.90	178.10	5,135.4	-20.0	-5.9	19.8	12.19	12.19	-0.31
5,168.0	19.00	178.10	5,165.0	-29.0	-5.6	28.9	13.23	13.23	0.00
5,200.0	22.70	178.60	5,194.9	-40.4	-5.3	40.3	11.58	11.56	1.56
5,232.0	26.00	179.40	5,224.1	-53.8	-5.0	53.5	10.36	10.31	2.50
5,263.0	29.30	181.30	5,251.5	-68.0	-5.1	67.8	11.02	10.65	6.13
5,295.0	32.50	182.80	5,279.0	-84.4	-5.7	84.2	10.28	10.00	4.69
5,327.0	35.60	182.70	5,305.5	-102.3	-6.6	102.1	9.69	9.69	-0.31
5,358.0	39.10	183.10	5,330.1	-121.1	-7.6	120.8	11.32	11.29	1.29
5,390.0	43.10	183.80	5,354.3	-142.1	-8.8	141.8	12.58	12.50	2.19
5,421.0	46.60	183.60	5,378.2	-163.9	-10.2	163.6	11.30	11.29	-0.65
5,453.0	49.70	184.40	5,397.6	-187.7	-11.9	187.3	9.86	9.69	2.50
5,484.0	52.70	185.10	5,417.0	-211.7	-13.9	211.3	9.84	9.68	2.26
5,516.0	55.60	185.10	5,435.7	-237.6	-16.2	237.1	9.06	9.06	0.00
5,547.0	58.70	184.50	5,452.6	-263.5	-18.4	263.0	10.13	10.00	-1.94
5,578.0	62.20	184.30	5,467.8	-290.4	-20.5	289.8	11.30	11.29	-0.65
5,610.0	65.50	183.80	5,481.9	-319.0	-22.5	318.4	10.41	10.31	-1.58
5,641.0	68.40	184.00	5,494.1	-347.5	-24.4	346.8	9.37	9.35	0.65
5,673.0	71.20	184.20	5,505.1	-377.4	-26.6	376.7	8.77	8.75	0.63
5,704.0	74.50	184.40	5,514.3	-407.0	-28.8	406.1	10.66	10.65	0.65
5,736.0	78.00	185.30	5,521.9	-437.9	-31.4	437.0	11.27	10.94	2.81
5,767.0	80.60	186.20	5,527.6	-468.3	-34.5	467.2	8.86	8.39	2.90
5,798.0	84.00	186.50	5,531.8	-498.8	-37.9	497.7	11.01	10.97	0.97
5,829.0	87.60	187.10	5,534.0	-529.5	-41.5	528.3	11.77	11.61	1.94
5,861.0	89.00	186.60	5,535.0	-561.2	-45.3	559.9	4.65	4.38	-1.56
5,892.0	89.60	184.70	5,535.4	-592.1	-48.4	590.7	6.43	1.94	-6.13
5,987.0	88.70	181.10	5,538.8	-686.9	-53.2	685.4	3.91	-0.95	-3.79
6,082.0	89.00	177.80	5,538.7	-781.9	-52.3	780.3	3.49	0.32	-3.47
6,176.0	88.60	177.70	5,540.7	-875.8	-48.8	874.3	0.44	-0.43	-0.11
6,271.0	88.40	177.70	5,543.1	-970.7	-44.8	969.2	0.21	-0.21	0.00
6,365.0	87.90	177.90	5,546.2	-1,064.6	-41.2	1,063.2	0.57	-0.53	0.21
6,459.0	89.40	178.30	5,548.4	-1,158.5	-38.1	1,157.2	1.65	1.60	0.43
6,553.0	89.40	178.40	5,549.4	-1,252.4	-35.4	1,251.2	0.11	0.00	0.11



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Federal Com #38H
Project:	Eddy County, NM	TVD Reference:	KB @ 3989.0usft (United 43)
Site:	Puckett 13 Federal Com #38H	MD Reference:	KB @ 3989.0usft (United 43)
Well:	SHL 1180' FSL, 470' FEL, Sec 12, T17S, R31E, Unit P	North Reference:	Grid
Wellbore:	BHL 350' FSL, 350' FEL, Sec 13, T17S, R31E, Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL 350' FSL, 350' FEL, Sec 13, T17S, R31E, Unit P	Database:	EDM 5000.1 Single User Db

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)
6,648.0	89.20	177.90	5,550.5	-1,347.4	-32.3	1,348.1	0.57	-0.21	-0.53
6,743.0	89.50	177.70	5,551.6	-1,442.3	-28.7	1,441.1	0.38	0.32	-0.21
6,838.0	89.50	178.20	5,552.4	-1,537.2	-25.3	1,536.1	0.53	0.00	0.53
6,932.0	88.60	178.90	5,554.0	-1,631.2	-22.5	1,630.1	1.01	-0.96	0.32
7,027.0	90.20	177.70	5,555.0	-1,728.1	-19.4	1,725.1	1.88	1.68	-0.84
7,121.0	89.90	177.50	5,554.9	-1,820.1	-15.5	1,819.1	0.38	-0.32	-0.21
7,215.0	89.70	177.40	5,555.2	-1,914.0	-11.3	1,913.1	0.24	-0.21	-0.11
7,310.0	91.20	177.60	5,554.5	-2,008.9	-7.1	2,008.0	1.59	1.58	0.21
7,404.0	91.00	177.60	5,552.7	-2,102.8	-3.2	2,102.0	0.21	-0.21	0.00
7,499.0	90.70	177.60	5,551.3	-2,197.7	0.8	2,197.0	0.32	-0.32	0.00
7,533.0	89.80	177.70	5,551.1	-2,231.6	2.2	2,231.0	2.66	-2.65	0.29
7,566.0	88.80	178.70	5,551.5	-2,264.6	3.2	2,264.0	4.29	-3.03	3.03
7,597.0	89.10	178.60	5,552.1	-2,295.6	3.9	2,295.0	1.02	0.97	-0.32
7,629.0	89.30	178.90	5,552.6	-2,327.6	4.6	2,327.0	1.13	0.63	0.84
7,660.0	89.80	179.60	5,552.8	-2,358.6	5.0	2,358.0	2.77	1.81	2.26
7,692.0	90.50	179.40	5,552.7	-2,390.6	5.3	2,390.0	2.28	2.19	-0.63
7,724.0	90.60	179.20	5,552.4	-2,422.6	5.7	2,422.0	0.70	0.31	-0.63
7,756.0	91.30	178.90	5,551.9	-2,454.6	6.2	2,453.9	2.38	2.19	-0.94
7,788.0	91.80	179.10	5,551.0	-2,486.6	6.8	2,485.9	1.88	1.56	0.63
7,821.0	91.60	179.10	5,550.0	-2,519.5	7.3	2,518.9	0.61	-0.61	0.00
7,853.0	90.80	179.90	5,549.4	-2,551.5	7.6	2,550.9	3.54	-2.50	2.50
7,885.0	90.20	180.00	5,549.1	-2,583.5	7.6	2,582.9	1.90	-1.88	0.31
7,917.0	90.50	180.20	5,548.9	-2,615.5	7.6	2,614.9	1.13	0.94	0.63
7,949.0	90.70	180.30	5,548.6	-2,647.5	7.4	2,646.9	0.70	0.63	0.31
7,981.0	90.70	181.00	5,548.2	-2,679.5	7.1	2,678.8	2.19	0.00	2.19
8,014.0	90.60	179.90	5,547.8	-2,712.5	6.8	2,711.8	3.35	-0.30	-3.33
8,047.0	90.80	179.40	5,547.4	-2,745.5	7.0	2,744.8	1.63	0.61	-1.52
8,080.0	91.30	179.90	5,546.8	-2,778.5	7.2	2,777.8	2.14	1.52	1.52
8,112.0	91.80	179.70	5,545.9	-2,810.5	7.3	2,809.8	1.68	1.56	-0.63
8,143.0	92.40	179.90	5,544.8	-2,841.5	7.4	2,840.8	2.04	1.94	0.65
8,175.0	91.10	180.20	5,543.8	-2,873.5	7.4	2,872.7	4.17	-4.06	0.94
8,206.0	91.30	180.40	5,543.2	-2,904.5	7.2	2,903.7	0.91	0.65	0.65
8,238.0	91.70	180.50	5,542.3	-2,936.4	7.0	2,935.7	1.29	1.25	0.31
8,269.0	92.20	180.30	5,541.3	-2,967.4	6.8	2,966.6	1.74	1.61	-0.65
8,301.0	90.90	180.30	5,540.4	-2,999.4	6.6	2,998.6	4.06	-4.06	0.00
8,332.0	90.60	180.10	5,540.0	-3,030.4	6.5	3,029.6	1.16	-0.97	-0.65
8,365.0	89.00	179.80	5,540.1	-3,063.4	6.5	3,062.6	4.93	-4.85	-0.91
8,397.0	88.50	179.60	5,540.8	-3,095.4	6.7	3,094.6	1.68	-1.56	-0.63
8,428.0	86.50	179.60	5,541.6	-3,126.4	6.9	3,125.6	0.00	0.00	0.00
8,460.0	88.70	179.60	5,542.4	-3,156.4	7.1	3,157.5	0.63	0.63	0.00
8,492.0	89.00	179.70	5,543.0	-3,190.4	7.3	3,189.5	0.99	0.94	0.31



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Federal Com #38H
Project:	Eddy County, NM	TVD Reference:	KB @ 3989 0usft (United 43)
Site:	Puckett 13 Federal Com #38H	MD Reference:	KB @ 3989 0usft (United 43)
Well:	SHL: 1180' FSL: 470' FEL: Sec 12, T17S, R31E, Unit P	North Reference:	Grid
Wellbore:	BHL: 350' FSL: 350' FEL: Sec 13, T17S, R31E, Unit P	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 350' FSL: 350' FEL: Sec 13, T17S, R31E, Unit P	Database:	EDM 5000.1 Single User Db

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)
8 524.0	88.90	179.70	5,543.8	-3 222.4	7.5	3,221.5	0.31	-0.31	0.00
8 556.0	88.90	179.60	5,544.2	-3 254.4	7.7	3,253.5	0.31	0.00	-0.31
8 587.0	89.10	179.40	5,544.8	-3 285.4	8.0	3,284.5	0.91	0.85	-0.65
8 618.0	89.20	179.50	5,545.2	-3 316.3	8.3	3,315.5	0.46	0.32	0.32
8 650.0	89.50	179.50	5,545.6	-3,348.3	8.5	3,347.5	0.94	0.94	0.00
8 682.0	89.60	179.60	5,545.9	-3,380.3	8.8	3,379.5	0.44	0.31	0.31
8,713.0	89.60	179.60	5,546.1	-3,411.3	9.0	3,410.5	0.00	0.00	0.00
8,745.0	89.80	179.80	5,546.2	-3,443.3	9.2	3,442.5	0.88	0.63	0.63
8,776.0	90.00	179.20	5,546.3	-3,474.3	9.4	3,473.5	2.04	0.85	-1.94
8,808.0	90.20	178.40	5,546.2	-3,506.3	10.1	3,505.5	2.58	0.63	-2.50
8,903.0	90.90	178.60	5,545.3	-3,601.3	12.6	3,600.5	0.77	0.74	0.21
8,997.0	90.10	177.80	5,544.5	-3,695.2	15.6	3,694.5	1.20	-0.85	-0.85
9,094.0	90.40	177.80	5,544.1	-3,782.2	19.3	3,791.4	0.31	0.31	0.00
9,189.0	89.70	177.80	5,544.0	-3,887.1	22.9	3,886.4	0.74	-0.74	0.00
9,285.0	88.60	176.80	5,545.4	-3,983.0	27.4	3,982.4	1.55	-1.15	-1.04
9,382.0	89.40	176.30	5,547.1	-4,079.8	33.3	4,079.3	0.97	0.82	-0.52
9,479.0	89.80	176.30	5,547.8	-4,176.6	39.5	4,176.2	0.41	0.41	0.00
9,575.0	90.30	176.30	5,547.7	-4,272.4	45.7	4,272.2	0.52	0.52	0.00
9,608.0	90.70	176.30	5,547.4	-4,305.3	47.9	4,305.1	1.21	1.21	0.00
9,640.0	90.50	176.40	5,547.1	-4,337.2	49.9	4,337.1	0.70	-0.63	0.31
9,672.0	90.50	176.50	5,548.8	-4,369.2	51.9	4,369.1	0.31	0.00	0.31
9,704.0	90.50	176.30	5,548.5	-4,401.1	53.9	4,401.1	0.62	0.00	-0.63
9,736.0	90.90	176.40	5,548.1	-4,433.0	55.9	4,433.0	1.29	1.25	0.31
9,768.0	90.70	176.40	5,545.7	-4,465.0	57.9	4,465.0	0.83	-0.63	0.00
9,863.0	88.70	176.30	5,548.2	-4,559.8	64.0	4,559.9	2.11	-2.11	-0.11
9,957.0	88.00	175.90	5,548.1	-4,653.5	70.4	4,653.8	0.53	0.32	-0.43
10,053.0	89.50	176.10	5,549.3	-4,749.3	77.1	4,749.7	0.58	0.52	0.21
10,149.0	89.80	176.30	5,549.9	-4,845.1	83.4	4,845.7	0.38	0.31	0.21
10,246.0	90.30	176.40	5,549.8	-4,941.9	89.6	4,942.6	0.53	0.52	0.10
10,343.0	90.90	176.30	5,548.8	-5,038.7	95.8	5,039.5	0.63	0.62	-0.10
Final MWD Survey									
10,463.0	90.90	176.30	5,548.9	-5,158.4	103.5	5,159.4	0.00	0.00	0.00
Projection to Bit/TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Comment
4,833.0	4,832.9	-2.3	-5.6	TIE-IN to VES Gyro
10,343.0	5,548.8	-5,038.7	95.8	Final MWD Survey
10,463.0	5,548.9	-5,158.4	103.5	Projection to Bit/TD