

Results of Directional Survey

API number:	30-025-41573		
OGRID:		Operator:	COG OPERATING LLC
		Property:	TUSK FEDERAL # 3H

surface	ULSTR:	N	25	T 19S	R 34E
				170 FSL	1820 FWL

BH Loc	ULSTR:	C	25	T 19S	R 34E
15311	MD	10838.6	TVD	335 FNL	1971 FWL
				4945 FSL	

Top Perf/OH	ULSTR:	N	25	T 19S	R 34E
11125	MD	10887.7	TVD	769 FSL	1780 FWL

Bot Perf/OH	ULSTR:	C	25	T 19S	R 34E
15145	MD	10837.5	TVD	499 FNL	1956 FWL
				4781 FSL	

	MD	N/S	E/W	VD
	11093	567.90	-37.30	10878.4
TOP PERFS/OH	11125	598.50	-39.90	10887.70
	11125	598.50	-39.90	10887.70
	15101	4565.90	132.20	10837.00
BOT PERFS/OH	15145	4611.14	136.00	10837.50
	15197	4664.60	140.50	10838.10

NEXT TO LAST	15267	4731.30	147.20	10838.50
LAST READING	15311	4775.00	151.40	10838.60
TD	15311	4775.00	151.40	10838.60

Surface Location	170	FS	1820	FW
Projected BHL	4945	FS	1971	FW
Location of				
Top Perfs/OH	769	FS	1780	FW
Bottom Perfs/OH	4781	FS	1956	FW

SUMMARY of Subsurface Locations

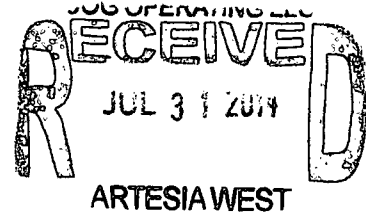
Surface Location	N-25-19S-34E	170	FS	1820	FW	Vert. Depth
Top Perfs/OH	N-25-19S-34E	769	FS	1780	FW	10887.70
Bottom Perfs/OH	C-25-19S-34E	4781	FS	1956	FW	10837.50
Projected TD	C-25-19S-34E	4945	FS	1971	FW	10838.60

OCT 20 2010



McVAY DRILLING COMPANY
P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

Well Name and Num: Tusk Federal #3H
Location: Sec 25, T19S, R34E
Operator: COG
Drilling Contractor: McVay Drilling Company



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

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.10	404	0.80	6737	90.00	13586
0.70	814	0.20	7247	91.40	13681
0.70	1193	0.90	7657	90.50	14155
0.80	1573	0.60	8162	93.50	14630
0.90	1863	1.80	8611	89.90	15292
1.00	2100	1.60	8983		
1.00	2353	0.40	9374		
0.40	2731	1.00	9723		
1.10	3110	1.70	10300		
0.90	3681	29.10	10592		
2.30	4204	44.40	10751		
2.00	4488	58.70	10909		
1.70	4863	90.40	11316		
1.60	5248	91.70	11693		
1.40	5658	91.90	12162		
0.60	5974	90.40	12635		
1.60	6356	92.20	13111		

HOBBS OCD

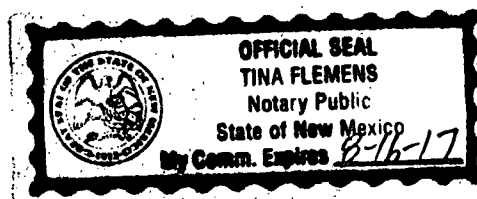
OCT 02 2014

RECEIVED

By: *[Signature]*

Subscribed and sworn to before me this 30th day of July, 2014

Tina Flemens
Notary Public, Lea County, New Mexico





July 25, 2014

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

HOBBS OCD

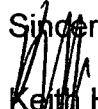
OCT 02 2014

RECEIVED

Attn: Kanicia Castillo

RE: Tusk Federal 3H

Please find enclosed a copy of the survey from 0.00' to 10,247.00' ran on the above referenced well.

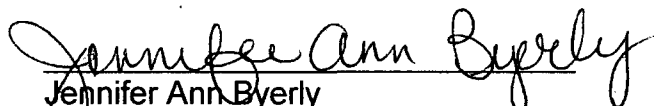
Sincerely,

Keith Havelka
Operations

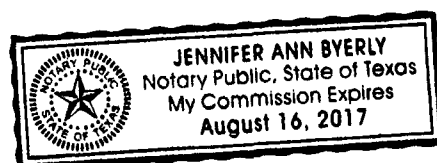
STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 25 day of July,
A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Tusk Federal/3H

Rig Name: McVay 7
State/County: New Mexico/Lea
Latitude: 32.62, Longitude: -103.52
GRID North is 0.44 Degrees East of True North
VS-Azi: 0.00 Degrees



HOBBS OCD
OCT 02 2014
RECEIVED

Depth Reference : R.K.B.: 17 Feet
DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 7/25/2014 / 15:23
VES Survey International
Midland,Tx
(432)-563-5444
Surveyor: Tim Dillon
Tusk Federal 3H / API 30-025-41573

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	0.18	208.93	100.00	-0.14	-0.08	-0.14	0.16	208.93	0.18
200.00	0.27	151.53	200.00	-0.48	-0.04	-0.48	0.48	184.39	0.23
300.00	0.24	98.27	300.00	-0.72	0.29	-0.72	0.78	158.43	0.23
400.00	0.42	84.55	400.00	-0.72	0.86	-0.72	1.12	129.93	0.19
500.00	0.20	44.59	500.00	-0.56	1.35	-0.56	1.46	112.44	0.29
600.00	0.35	27.35	599.99	-0.16	1.61	-0.16	1.62	95.71	0.16
700.00	0.28	349.81	699.99	0.34	1.71	0.34	1.74	78.57	0.21
800.00	0.35	40.21	799.99	0.82	1.86	0.82	2.03	66.27	0.28
900.00	0.56	48.75	899.99	1.38	2.43	1.38	2.79	60.46	0.22
1000.00	0.24	310.17	999.99	1.83	2.63	1.83	3.21	55.20	0.64
1100.00	0.12	300.95	1099.99	2.02	2.38	2.02	3.12	49.73	0.12
1200.00	0.39	256.18	1199.98	1.99	1.96	1.99	2.80	44.55	0.32
1300.00	0.39	252.96	1299.98	1.81	1.31	1.81	2.23	35.77	0.02
1400.00	0.27	174.82	1399.98	1.48	1.00	1.48	1.78	34.14	0.43
1500.00	0.43	236.05	1499.98	1.03	0.71	1.03	1.25	34.55	0.39
1600.00	0.54	226.92	1599.98	0.50	0.05	0.50	0.50	5.96	0.13
1700.00	0.29	221.85	1699.97	-0.01	-0.46	-0.01	0.46	268.81	0.25
1800.00	0.26	359.34	1799.97	0.03	-0.63	0.03	0.63	272.79	0.51

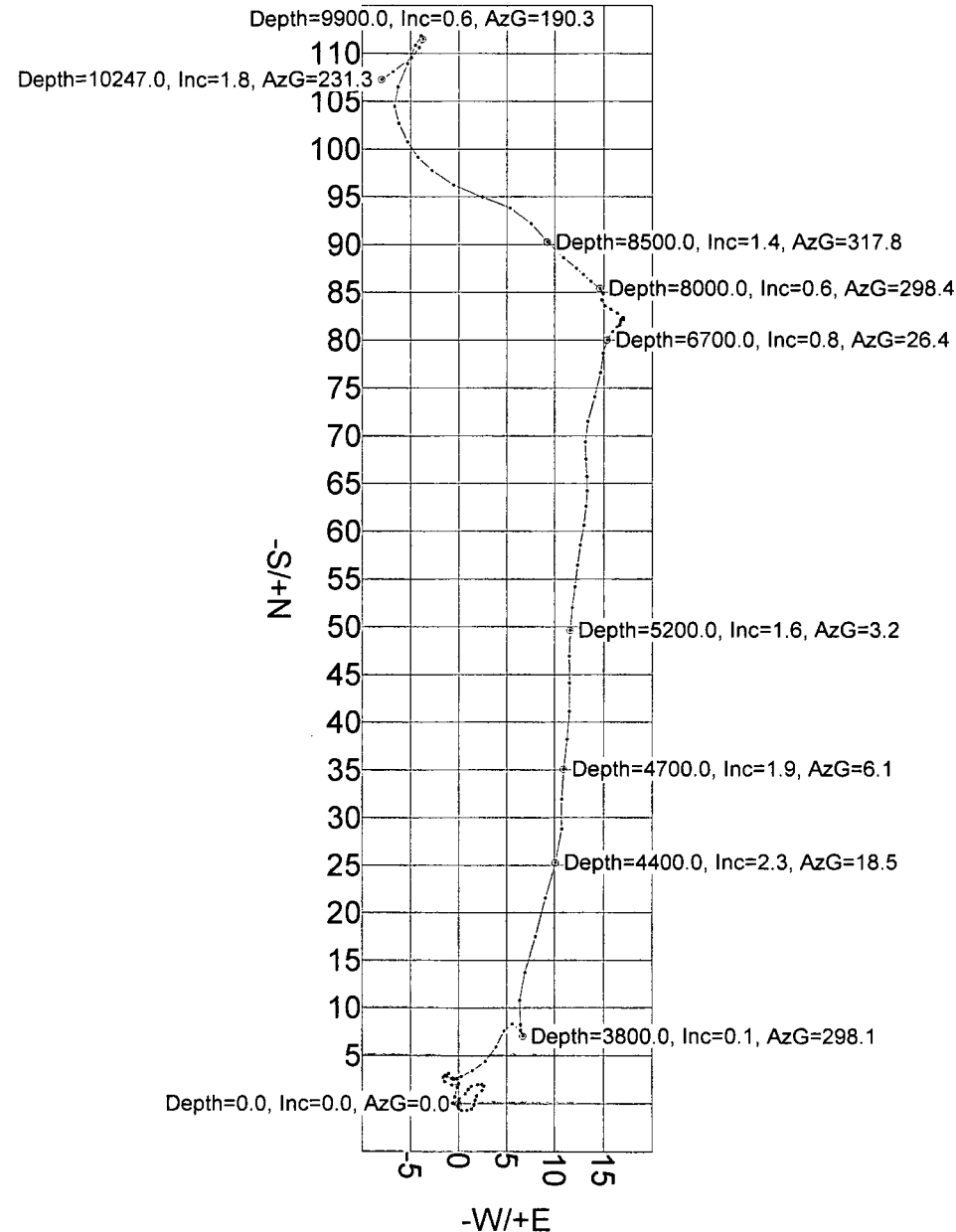
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.58	24.29	1899.97	0.72	-0.42	0.72	0.83	329.41	0.36
2000.00	0.60	5.11	1999.96	1.70	-0.17	1.70	1.71	354.31	0.20
2100.00	0.60	309.99	2099.96	2.56	-0.53	2.56	2.62	348.41	0.56
2200.00	0.34	259.99	2199.96	2.85	-1.23	2.85	3.10	336.74	0.46
2300.00	0.13	255.26	2299.96	2.77	-1.63	2.77	3.21	329.49	0.22
2400.00	0.57	148.44	2399.95	2.32	-1.48	2.32	2.75	327.40	0.62
2500.00	0.56	84.52	2499.95	1.94	-0.74	1.94	2.08	339.25	0.60
2600.00	0.28	69.53	2599.95	2.07	-0.02	2.07	2.07	359.41	0.30
2700.00	0.70	315.72	2699.95	2.59	-0.22	2.59	2.60	355.20	0.85
2800.00	0.52	290.39	2799.94	3.19	-1.07	3.19	3.36	341.51	0.32
2900.00	0.43	164.96	2899.94	2.98	-1.39	2.98	3.29	334.99	0.84
3000.00	0.62	91.08	2999.93	2.61	-0.75	2.61	2.72	343.94	0.65
3100.00	0.63	62.93	3099.93	2.85	0.28	2.85	2.87	5.56	0.30
3200.00	0.86	61.97	3199.92	3.45	1.43	3.45	3.74	22.44	0.23
3300.00	1.04	47.07	3299.91	4.43	2.76	4.43	5.21	31.90	0.31
3400.00	1.14	27.93	3399.89	5.93	3.89	5.93	7.09	33.27	0.38
3500.00	0.99	23.91	3499.87	7.60	4.71	7.60	8.94	31.77	0.17
3600.00	0.59	94.42	3599.86	8.35	5.57	8.35	10.04	33.69	0.97
3700.00	0.86	150.85	3699.86	7.66	6.44	7.66	10.01	40.08	0.72
3800.00	0.13	298.13	3799.85	7.05	6.71	7.05	9.74	43.58	0.97
3900.00	1.34	350.88	3899.84	8.26	6.43	8.26	10.47	37.87	1.27
4000.00	1.60	4.38	3999.81	10.81	6.35	10.81	12.54	30.42	0.43
4100.00	1.85	16.46	4099.77	13.75	6.91	13.75	15.39	26.69	0.44
4200.00	2.62	16.36	4199.69	17.50	8.02	17.50	19.24	24.61	0.77
4300.00	2.18	12.12	4299.60	21.55	9.06	21.55	23.38	22.80	0.47
4400.00	2.26	18.50	4399.53	25.29	10.09	25.29	27.23	21.74	0.26
4500.00	1.89	359.88	4499.46	28.81	10.71	28.81	30.74	20.39	0.77
4600.00	1.71	0.86	4599.41	31.95	10.73	31.95	33.70	18.56	0.18
4700.00	1.90	6.10	4699.36	35.09	10.93	35.09	36.75	17.30	0.25
4800.00	1.69	6.88	4799.31	38.20	11.28	38.20	39.83	16.45	0.21
4900.00	1.72	2.01	4899.27	41.16	11.51	41.16	42.74	15.62	0.15
5000.00	1.66	357.52	4999.23	44.11	11.50	44.11	45.58	14.61	0.15
5100.00	1.57	1.74	5099.19	46.92	11.48	46.92	48.30	13.74	0.15
5200.00	1.55	3.16	5199.15	49.64	11.59	49.64	50.98	13.15	0.04
5300.00	1.15	7.11	5299.12	51.99	11.79	51.99	53.31	12.78	0.41
5400.00	1.39	7.87	5399.10	54.20	12.08	54.20	55.53	12.57	0.24
5500.00	1.20	4.54	5499.07	56.45	12.33	56.45	57.78	12.33	0.20
5600.00	1.23	11.25	5599.05	58.55	12.63	58.55	59.89	12.17	0.15
5700.00	1.16	8.40	5699.03	60.60	12.98	60.60	61.98	12.09	0.09

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
5800.00	1.16	5.66	5799.01	62.61	13.23	62.61	64.00	11.93	0.06
5900.00	0.72	0.17	5898.99	64.25	13.33	64.25	65.62	11.72	0.45
6000.00	0.97	357.37	5998.98	65.72	13.30	65.72	67.05	11.44	0.25
6100.00	1.14	357.41	6098.96	67.56	13.21	67.56	68.84	11.07	0.17
6200.00	0.94	358.74	6198.95	69.37	13.15	69.37	70.60	10.73	0.21
6300.00	1.56	11.48	6298.92	71.52	13.40	71.52	72.76	10.62	0.68
6400.00	1.51	18.91	6398.89	74.10	14.10	74.10	75.43	10.77	0.21
6500.00	1.48	7.13	6498.85	76.62	14.69	76.62	78.02	10.85	0.31
6600.00	0.87	7.71	6598.83	78.66	14.95	78.66	80.06	10.76	0.61
6700.00	0.82	26.36	6698.82	80.05	15.37	80.05	81.51	10.87	0.28
6800.00	0.36	48.69	6798.82	80.90	15.92	80.90	82.45	11.14	0.50
6900.00	0.39	37.25	6898.81	81.38	16.37	81.38	83.01	11.37	0.08
7000.00	0.11	110.30	6998.81	81.62	16.66	81.62	83.30	11.54	0.37
7100.00	0.35	355.78	7098.81	81.88	16.73	81.88	83.58	11.55	0.40
7200.00	0.10	100.46	7198.81	82.17	16.79	82.17	83.87	11.55	0.38
7300.00	0.22	84.95	7298.81	82.17	17.07	82.17	83.93	11.73	0.13
7400.00	0.36	307.53	7398.81	82.38	17.01	82.38	84.12	11.67	0.55
7500.00	0.49	308.16	7498.81	82.84	16.43	82.84	84.45	11.22	0.13
7600.00	0.44	294.62	7598.81	83.26	15.74	83.26	84.73	10.71	0.12
7700.00	0.36	306.72	7698.80	83.61	15.14	83.61	84.97	10.26	0.12
7800.00	0.50	349.44	7798.80	84.22	14.81	84.22	85.51	9.97	0.34
7900.00	0.37	35.98	7898.80	84.91	14.92	84.91	86.21	9.96	0.36
8000.00	0.62	298.36	7998.80	85.42	14.63	85.42	86.67	9.72	0.76
8100.00	0.77	316.26	8098.79	86.17	13.69	86.17	87.25	9.03	0.26
8200.00	0.42	311.22	8198.78	86.89	12.95	86.89	87.85	8.48	0.36
8300.00	0.70	310.12	8298.78	87.52	12.21	87.52	88.37	7.94	0.28
8400.00	1.26	310.82	8398.76	88.63	10.91	88.63	89.30	7.02	0.56
8500.00	1.45	317.81	8498.73	90.29	9.23	90.29	90.76	5.84	0.25
8600.00	1.47	317.86	8598.70	92.18	7.52	92.18	92.48	4.67	0.02
8700.00	1.71	298.45	8698.66	93.84	5.35	93.84	93.99	3.27	0.58
8800.00	1.93	284.72	8798.61	94.97	2.42	94.97	95.00	1.46	0.49
8900.00	1.83	301.93	8898.56	96.24	-0.56	96.24	96.24	359.67	0.57
9000.00	1.25	307.62	8998.53	97.75	-2.77	97.75	97.79	358.37	0.60
9100.00	1.07	319.41	9098.51	99.12	-4.24	99.12	99.21	357.55	0.30
9200.00	1.17	332.46	9198.49	100.74	-5.32	100.74	100.88	356.98	0.27
9300.00	1.27	338.44	9298.46	102.67	-6.20	102.67	102.86	356.54	0.16
9400.00	0.86	357.65	9398.45	104.46	-6.64	104.46	104.67	356.36	0.53
9500.00	1.54	17.40	9498.42	106.49	-6.27	106.49	106.67	356.63	0.78
9600.00	1.46	25.67	9598.39	108.91	-5.32	108.91	109.04	357.20	0.23

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
9700.00	0.97	18.11	9698.37	110.86	-4.50	110.86	110.95	357.67	0.52
9800.00	0.43	57.67	9798.36	111.86	-3.92	111.86	111.93	357.99	0.69
9900.00	0.64	190.32	9898.36	111.52	-3.71	111.52	111.58	358.10	0.98
10000.00	0.54	220.25	9998.35	110.62	-4.11	110.62	110.69	357.87	0.32
10100.00	0.98	216.88	10098.34	109.57	-4.93	109.57	109.68	357.43	0.45
10200.00	1.77	239.70	10198.32	108.11	-6.77	108.11	108.32	356.42	0.94
10247.00	1.77	231.25	10245.29	107.29	-7.96	107.29	107.58	355.75	0.55



VES Survey International
Midland, Tx
(432)-563-5444
Surveyor: Tim Dillon
Tusk Federal 3H / API 30-025-41573



VES Survey Date: 07/17/2014



COG Operating LLC

Lea County, NM (NAD27 NME)

Tusk Federal

#3H

OH

Survey: MWD #1

Standard Survey Report

24 July, 2014

HOBBS OCD

OCT 02 2014

RECEIVED



Wellplanning Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	Well1 @ 3749.5usft
Site:	Tusk Federal	MD Reference:	Well1 @ 3749.5usft
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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		Tusk Federal			
Site Position:		Northing:	0.00 usft	Latitude:	30° 59' 24.512 N
From:	Map	Easting:	0.00 usft	Longitude:	105° 55' 44.137 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.82 °

Well	#3H					
Well Position	+N/-S	0.0 usft	Northing:	591,834.00 usft	Latitude:	32° 37' 27.820 N
	+E/-W	0.0 usft	Easting:	751,663.90 usft	Longitude:	103° 30' 57.328 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,732.5 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/17/2014	7.21	60.49	48,551

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	1.42	

Survey Program	Date 7/24/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,247.0	GYRO (OH)	MWD	MWD - Standard
10,304.0	15,311.0	MWD #1 (OH)	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)	
10,247.0	1.77	231.25	10,245.3	107.3	-8.0	107.1	0.00	0.00	0.00	
10,304.0	2.10	236.80	10,302.3	106.2	-9.6	105.9	0.67	0.58	9.74	
10,336.0	1.70	294.10	10,334.2	106.0	-10.5	105.8	5.80	-1.25	179.06	
10,368.0	5.60	1.00	10,366.2	107.8	-10.9	107.5	16.17	12.19	209.06	
10,400.0	10.60	4.30	10,397.9	112.3	-10.6	112.0	15.69	15.63	10.31	
10,432.0	15.90	1.40	10,429.0	119.6	-10.3	119.3	16.69	16.56	-9.06	
10,464.0	20.70	2.50	10,459.4	129.7	-10.0	129.4	15.04	15.00	3.44	
10,496.0	23.50	4.30	10,489.0	141.7	-9.2	141.4	9.00	8.75	5.63	
10,528.0	26.80	6.00	10,518.0	155.2	-8.0	155.0	10.56	10.31	5.31	
10,560.0	28.00	2.60	10,546.4	169.9	-6.9	169.7	6.16	3.75	-10.63	



Wellplanning Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	Well1 @ 3749.5usft
Site:	Tusk Federal	MD Reference:	Well1 @ 3749.5usft
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
10,592.0	29.10	359.20	10,574.5	185.2	-6.7	185.0	6.13	3.44	-10.63
10,624.0	32.60	358.40	10,602.0	201.6	-7.0	201.3	11.01	10.94	-2.50
10,656.0	35.50	0.60	10,628.5	219.5	-7.2	219.3	9.84	9.06	6.88
10,688.0	37.40	358.60	10,654.2	238.5	-7.3	238.3	7.00	5.94	-6.25
10,719.0	40.60	358.50	10,678.3	258.0	-7.8	257.7	10.32	10.32	-0.32
10,751.0	44.40	358.00	10,701.9	279.6	-8.5	279.3	11.92	11.88	-1.56
10,783.0	47.70	356.30	10,724.1	302.6	-9.6	302.3	11.00	10.31	-5.31
10,813.0	50.90	356.00	10,743.7	325.3	-11.1	324.9	10.69	10.67	-1.00
10,845.0	54.60	356.30	10,763.0	350.7	-12.9	350.3	11.59	11.56	0.94
10,877.0	57.10	356.20	10,781.0	377.1	-14.6	376.7	7.82	7.81	-0.31
10,909.0	58.70	354.90	10,798.0	404.2	-16.7	403.6	6.07	5.00	-4.06
10,941.0	59.80	352.60	10,814.4	431.5	-19.7	430.9	7.07	3.44	-7.19
10,966.0	62.50	352.50	10,826.4	453.2	-22.5	452.5	10.81	10.80	-0.40
10,998.0	62.70	352.40	10,841.1	481.4	-26.3	480.6	0.68	0.63	-0.31
11,030.0	65.50	351.90	10,855.1	509.9	-30.2	509.0	8.86	8.75	-1.56
11,061.0	68.10	352.80	10,867.3	538.1	-34.0	537.1	8.80	8.39	2.90
11,093.0	71.30	354.50	10,878.4	567.9	-37.3	566.8	11.17	10.00	5.31
11,125.0	75.00	355.80	10,887.7	598.5	-39.9	597.3	12.20	11.56	4.06
11,157.0	79.20	356.80	10,894.8	629.6	-41.9	628.3	13.47	13.13	3.13
11,189.0	81.20	357.30	10,900.3	661.1	-43.5	659.8	6.44	6.25	1.56
11,221.0	82.40	357.10	10,904.9	692.7	-45.1	691.4	3.80	3.75	-0.63
11,253.0	84.80	357.00	10,908.4	724.5	-46.7	723.1	7.51	7.50	-0.31
11,285.0	87.70	357.60	10,910.5	756.3	-48.2	754.9	9.25	9.06	1.88
11,316.0	90.40	359.00	10,911.0	787.3	-49.1	785.9	9.81	8.71	4.52
11,410.0	91.30	0.90	10,909.6	881.3	-49.2	879.8	2.24	0.96	2.02
11,504.0	91.40	2.10	10,907.4	975.2	-46.7	973.8	1.28	0.11	1.28
11,599.0	90.90	1.80	10,905.5	1,070.2	-43.5	1,068.8	0.61	-0.53	-0.32
11,693.0	91.70	2.30	10,903.4	1,164.1	-40.2	1,162.7	1.00	0.85	0.53
11,786.0	91.10	1.70	10,901.1	1,257.0	-36.9	1,255.7	0.91	-0.65	-0.65
11,879.0	91.30	1.80	10,899.2	1,349.9	-34.1	1,348.7	0.24	0.22	0.11
11,972.0	91.30	1.50	10,897.1	1,442.9	-31.4	1,441.7	0.32	0.00	-0.32
12,067.0	91.30	2.60	10,894.9	1,537.8	-28.0	1,536.6	1.16	0.00	1.16
12,162.0	91.90	2.60	10,892.2	1,632.7	-23.7	1,631.6	0.63	0.63	0.00
12,257.0	92.60	2.00	10,888.5	1,727.5	-19.9	1,726.5	0.97	0.74	-0.63
12,351.0	93.10	2.00	10,883.8	1,821.3	-16.6	1,820.4	0.53	0.53	0.00
12,446.0	91.60	4.00	10,879.9	1,916.1	-11.6	1,915.2	2.63	-1.58	2.11
12,541.0	91.70	4.40	10,877.2	2,010.8	-4.7	2,010.1	0.43	0.11	0.42
12,635.0	90.40	4.00	10,875.5	2,104.5	2.2	2,104.0	1.45	-1.38	-0.43
12,730.0	90.90	3.90	10,874.4	2,199.3	8.7	2,198.9	0.54	0.53	-0.11
12,825.0	91.40	3.70	10,872.5	2,294.1	15.0	2,293.8	0.57	0.53	-0.21
12,920.0	91.60	4.00	10,870.0	2,388.8	21.4	2,388.6	0.38	0.21	0.32
13,016.0	91.70	4.70	10,867.3	2,484.5	28.7	2,484.5	0.74	0.10	0.73
13,111.0	92.20	5.50	10,864.0	2,579.1	37.1	2,579.2	0.99	0.53	0.84



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Site:	Tusk Federal	MD Reference:	Well1 @ 3749.5usft
Well:	#3H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)	
13,206.0	89.90	2.60	10,862.3	2,673.8	43.8	2,674.1	3.90	-2.42	-3.05	
13,301.0	89.80	2.60	10,862.5	2,768.7	48.2	2,769.1	0.11	-0.11	0.00	
13,396.0	90.10	3.20	10,862.6	2,863.6	53.0	2,864.0	0.71	0.32	0.63	
13,491.0	90.20	3.30	10,862.4	2,958.4	58.3	2,959.0	0.15	0.11	0.11	
13,586.0	90.00	3.50	10,862.2	3,053.3	64.0	3,053.9	0.30	-0.21	0.21	
13,681.0	91.40	1.60	10,861.0	3,148.2	68.2	3,148.9	2.48	1.47	-2.00	
13,776.0	91.80	1.50	10,858.4	3,243.1	70.8	3,243.9	0.43	0.42	-0.11	
13,871.0	92.00	1.50	10,855.2	3,338.0	73.3	3,338.8	0.21	0.21	0.00	
13,965.0	92.60	2.10	10,851.5	3,431.9	76.2	3,432.7	0.90	0.64	0.64	
14,060.0	90.50	1.40	10,848.9	3,526.8	79.1	3,527.7	2.33	-2.21	-0.74	
14,155.0	90.50	2.30	10,848.1	3,621.8	82.2	3,622.7	0.95	0.00	0.95	
14,250.0	89.80	1.50	10,847.8	3,716.7	85.3	3,717.7	1.12	-0.74	-0.84	
14,345.0	89.60	2.40	10,848.3	3,811.6	88.6	3,812.7	0.97	-0.21	0.95	
14,440.0	90.70	2.00	10,848.1	3,906.6	92.2	3,907.7	1.23	1.16	-0.42	
14,535.0	93.40	2.80	10,844.7	4,001.4	96.2	4,002.6	2.96	2.84	0.84	
14,630.0	93.50	3.20	10,838.9	4,096.1	101.1	4,097.4	0.43	0.11	0.42	
14,725.0	91.70	4.10	10,834.6	4,190.8	107.2	4,192.2	2.12	-1.89	0.95	
14,819.0	90.00	3.80	10,833.2	4,284.6	113.7	4,286.1	1.84	-1.81	-0.32	
14,912.0	89.10	3.50	10,834.0	4,377.4	119.6	4,379.0	1.02	-0.97	-0.32	
15,007.0	89.00	3.60	10,835.5	4,472.2	125.5	4,473.9	0.15	-0.11	0.11	
15,101.0	89.20	4.60	10,837.0	4,565.9	132.2	4,567.8	1.08	0.21	1.06	
15,197.0	89.50	5.40	10,838.1	4,661.6	140.5	4,663.6	0.89	0.31	0.83	
15,267.0	89.90	5.50	10,838.5	4,731.3	147.2	4,733.4	0.59	0.57	0.14	
15,311.0	89.90	5.50	10,838.6	4,775.0	151.4	4,777.3	0.00	0.00	0.00	
PBHL(TF#3H)										

Checked By: _____	Approved By: _____	Date: _____
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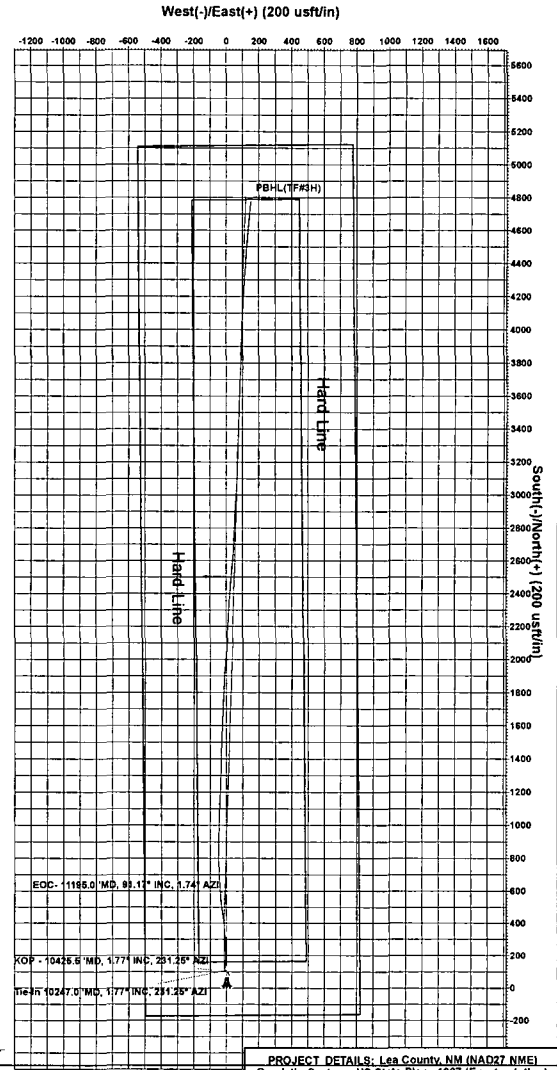
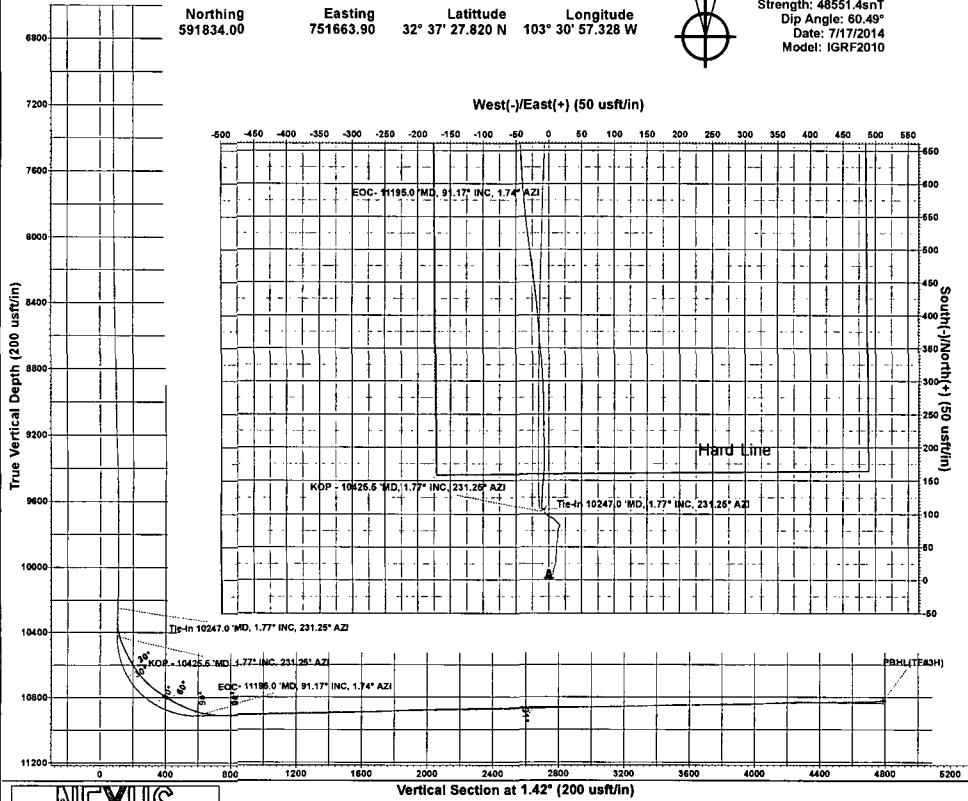
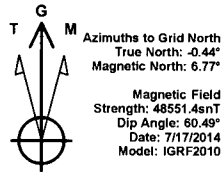


COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Tusk Federal
Well: #3H
Wellbore: OH
Plan: Plan #2 (#3H/OH)

Section Details									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	10247.0	1.77	231.25	10245.3	107.3	-8.0	0.00	0.00	107.1
2	10425.5	1.77	231.25	10423.7	103.8	-12.3	0.00	0.00	103.5
3	11195.0	91.17	1.74	10910.6	591.2	-9.2	12.00	130.45	590.8
4	15392.7	91.17	1.74	10824.9	4786.1	118.3	0.00	0.00	4787.6

WELL DETAILS: #3H
Ground Elevation: 3732.5
RKB Elevation: Well1 @ 3749.5usft
Rig Name:

Northing 591834.00 Easting 751663.90 Latitude 32° 37' 27.820 N Longitude 103° 30' 57.328 W



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