Results of Directional Survey

API number:	30-025-39884			
OGRID:		Operator:	COG OPERATING LLC	
		Property:	MACHO STATE	# 1H

surface	ULSTR:	D	02	T	24S	R	33E
				660	FSL	190	FWL

BH Loc	ULSTR:	A	02	T	24S	R	33E
15590	MD	10997.8	TVD	975	FNL	342	FEL
						4938	FWL

Top Perf/OH	ULSTR:	D	02	T	24S	R	33E
11345	MD	11124.3	TVD	582	FNL	717	FWL

Bot Perf/OH	ULSTR:	A	02	T	24S	R	33E
15535	MD	10998.9	TVD	969	FNL	397	FEL
						4883	FWL

	MD	N/S	E/W	VD
	11313	-81.80	496.00	11115.6
TOP PERFS/OH	**11345**	-78.10	526.50	11124.30
	11345	-78.10	526.50	11124.30
	15494	304.90	4652.70	10999.70
BOT PERFS/OH	**15535**	309.00	4693.43	10998.90
	15540	309.50	4698.40	10998.80

NEXT TO LAST	15540	309.50	4698.40	10998.80
LAST READING	15590	314.50	4748.10	10997.80
TD	**15590**	314.50	4748.10	10997.80

Surface Location	660	N	190	W
Projected BHL	975	N	4938	W
Location of				
Top Perfs/OH	582	N	717	W
Bottom Perfs/OH	969	N	4883	W

SUMMARY of Subsurface Locations

Surface Location	D-02-24S-33E	660	N	190	W	Vert. Depth
Top Perfs/OH	D-02-24S-33E	582	N	717	W	11124.30
Bottom Perfs/OH	A-02-24S-33E	969	N	4883	W	10998.90
Projected TD	A-02-24S-33E	975	N	4938	W	10997.80

JUN 27 2013

Company: COG Operating, LLC (Concho)
Lease/Well: Macho State/No 001H

Rig Name: Precision 105
State/County: New Mexico/Lea
Latitude: 32.25, Longitude: -103.55
GRID North is 0.42 Degrees East of True North
VS-Azi: 85.68 Degrees

Depth Reference : RKB=26'

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: e line gyro-de_01.ut
Minimum Curvature Method
Report Date/Time: 3/25/2013 / 10:52

Vaughn Energy Services
Conway, Arkansas
501-730-0602
Surveyor: Chris Ford
Macho State No 001H / API 30-025-39884

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	0.45	9.82	100.00	0.39	0.07	0.10	0.40	9.82	0.45
200.00	0.64	29.43	199.99	1.27	0.41	0.50	1.33	17.91	0.26
300.00	0.63	23.27	299.99	2.26	0.90	1.07	2.43	21.75	0.07
400.00	0.47	8.49	399.98	3.16	1.18	1.41	3.37	20.41	0.21
500.00	0.31	31.11	499.98	3.79	1.38	1.66	4.04	19.93	0.22
600.00	0.35	34.51	599.98	4.28	1.69	2.00	4.60	21.53	0.04
700.00	0.38	23.31	699.98	4.83	1.99	2.35	5.22	22.39	0.08
800.00	0.32	23.27	799.98	5.39	2.23	2.63	5.83	22.49	0.05
900.00	0.26	30.71	899.97	5.85	2.46	2.89	6.34	22.82	0.07
1000.00	0.17	61.97	999.97	6.11	2.70	3.16	6.68	23.87	0.15
1100.00	0.12	65.77	1099.97	6.22	2.93	3.39	6.88	25.21	0.04
1200.00	0.14	60.00	1199.97	6.33	3.13	3.60	7.06	26.33	0.02
1300.00	0.16	45.86	1299.97	6.48	3.33	3.81	7.29	27.20	0.04
1400.00	0.05	27.48	1399.97	6.61	3.45	3.94	7.46	27.54	0.11
1500.00	0.37	321.41	1499.97	6.91	3.27	3.78	7.64	25.32	0.35
1600.00	1.05	325.92	1599.96	7.92	2.55	3.14	8.32	17.87	0.68
1700.00	1.42	337.59	1699.94	9.83	1.56	2.30	9.95	9.05	0.45
1800.00	1.74	346.24	1799.90	12.45	0.73	1.67	12.47	3.36	0.39

VES Survey Date: 03/21/2013

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	1.83	343.42	1899.85	15.46	-0.09	1.08	15.46	359.68	0.13
2000.00	1.93	339.21	1999.80	18.56	-1.14	0.26	18.60	356.48	0.17
2100.00	1.51	356.43	2099.76	21.45	-1.82	-0.20	21.53	355.15	0.66
2200.00	1.11	352.08	2199.73	23.73	-2.04	-0.24	23.82	355.10	0.41
2300.00	0.76	346.93	2299.72	25.33	-2.32	-0.40	25.44	354.77	0.37
2400.00	0.71	344.86	2399.71	26.57	-2.63	-0.62	26.70	354.35	0.05
2500.00	0.24	330.76	2499.70	27.35	-2.89	-0.83	27.51	353.96	0.48
2600.00	0.33	355.00	2599.70	27.83	-3.02	-0.92	27.99	353.80	0.15
2700.00	0.56	336.51	2699.70	28.56	-3.24	-1.08	28.75	353.52	0.26
2800.00	0.36	333.14	2799.70	29.29	-3.58	-1.36	29.51	353.03	0.20
2900.00	0.20	324.52	2899.70	29.71	-3.82	-1.57	29.96	352.67	0.16
3000.00	0.31	312.89	2999.69	30.04	-4.12	-1.85	30.32	352.19	0.12
3100.00	0.23	337.66	3099.69	30.41	-4.40	-2.09	30.73	351.77	0.14
3200.00	0.08	314.71	3199.69	30.64	-4.52	-2.20	30.97	351.61	0.16
3300.00	0.19	35.11	3299.69	30.83	-4.47	-2.14	31.15	351.75	0.20
3400.00	0.13	112.09	3399.69	30.92	-4.27	-1.93	31.21	352.14	0.21
3500.00	0.31	173.47	3499.69	30.61	-4.13	-1.81	30.89	352.32	0.27
3600.00	0.27	173.12	3599.69	30.11	-4.07	-1.79	30.38	352.30	0.04
3700.00	0.64	111.75	3699.69	29.67	-3.53	-1.28	29.88	353.22	0.56
3800.00	0.80	101.92	3799.68	29.32	-2.33	-0.11	29.41	355.46	0.21
3900.00	1.31	110.67	3899.66	28.77	-0.57	1.60	28.77	358.86	0.53
4000.00	1.84	114.33	3999.62	27.70	1.96	4.05	27.77	4.06	0.54
4100.00	2.17	122.05	4099.56	26.03	5.04	6.99	26.52	10.96	0.43
4200.00	1.78	119.74	4199.50	24.26	8.00	9.80	25.54	18.25	0.40
4300.00	1.41	119.95	4299.46	22.87	10.41	12.10	25.13	24.47	0.37
4400.00	1.80	121.39	4399.42	21.44	12.81	14.39	24.98	30.85	0.39
4500.00	2.04	113.01	4499.37	19.93	15.79	17.24	25.42	38.38	0.37
4600.00	2.41	109.60	4599.29	18.53	19.40	20.75	26.83	46.32	0.39
4700.00	2.25	113.10	4699.21	17.05	23.19	24.41	28.79	53.67	0.22
4800.00	2.08	104.21	4799.14	15.84	26.75	27.87	31.09	59.37	0.37
4900.00	1.93	110.38	4899.08	14.81	30.09	31.12	33.53	63.80	0.26
5000.00	1.82	110.61	4999.03	13.66	33.15	34.08	35.85	67.60	0.11
5100.00	1.66	114.59	5098.98	12.50	35.95	36.79	38.06	70.82	0.20
5200.00	1.40	117.88	5198.94	11.33	38.35	39.09	39.98	73.54	0.28
5300.00	1.15	106.36	5298.92	10.48	40.38	41.06	41.72	75.45	0.36
5400.00	1.27	119.79	5398.90	9.65	42.31	42.91	43.39	77.16	0.31
5500.00	1.20	112.67	5498.87	8.69	44.24	44.77	45.09	78.89	0.17
5600.00	1.04	98.96	5598.85	8.14	46.10	46.59	46.82	79.98	0.31
5700.00	1.01	102.09	5698.84	7.82	47.86	48.31	48.49	80.72	0.06

VES Survey Date: 03/21/2013

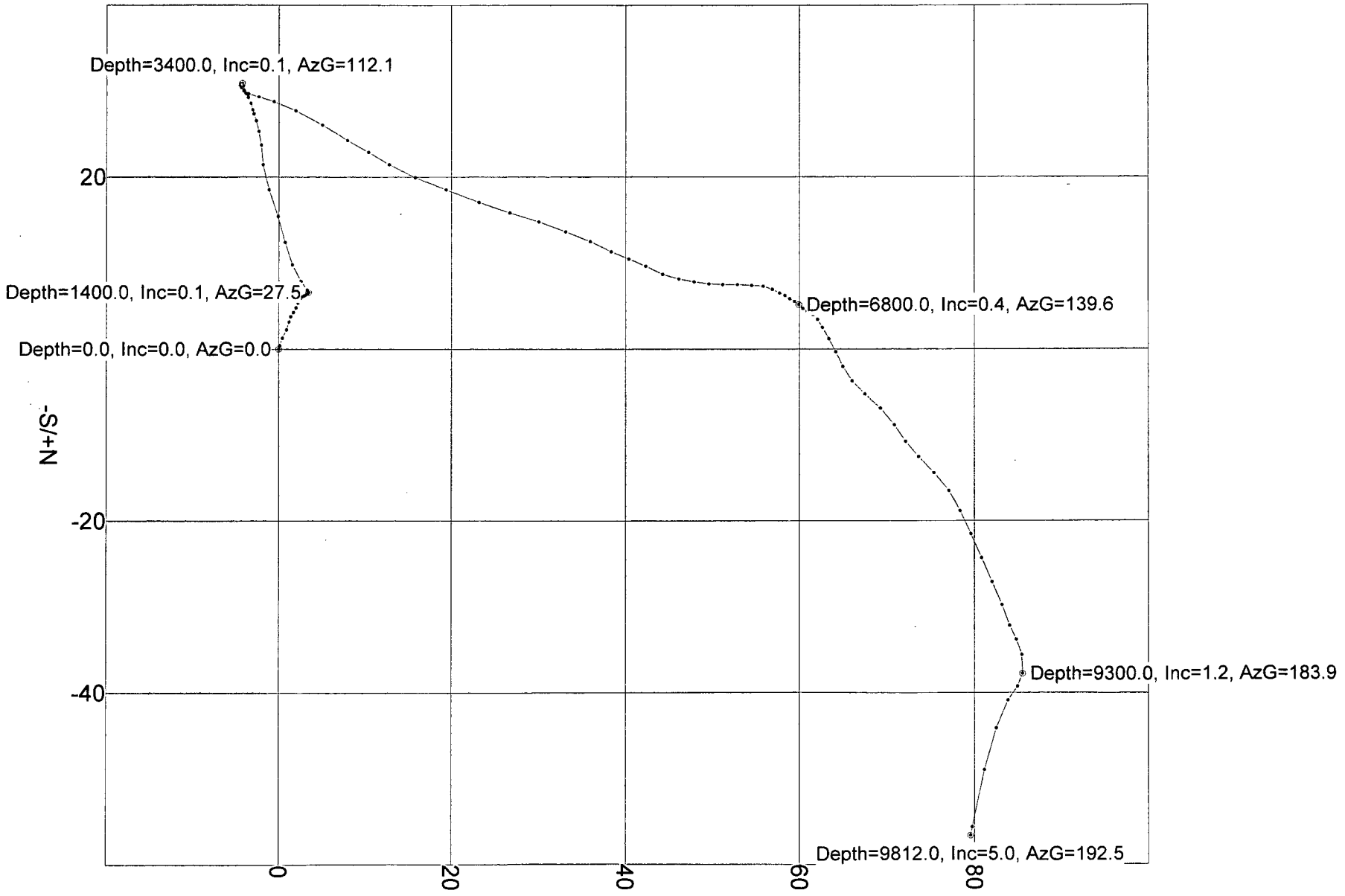
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.96	92.95	5798.82	7.59	49.55	49.98	50.13	81.29	0.16
5900.00	0.87	93.00	5898.81	7.51	51.14	51.56	51.69	81.65	0.09
6000.00	1.10	88.52	5998.80	7.49	52.85	53.27	53.38	81.93	0.24
6100.00	0.80	97.78	6098.78	7.42	54.50	54.91	55.01	82.24	0.33
6200.00	0.70	92.77	6198.77	7.30	55.81	56.20	56.28	82.55	0.12
6300.00	0.63	126.13	6298.77	6.94	56.86	57.22	57.28	83.04	0.39
6400.00	0.44	106.88	6398.76	6.50	57.68	58.01	58.05	83.57	0.26
6500.00	0.35	120.68	6498.76	6.24	58.31	58.62	58.65	83.90	0.13
6600.00	0.41	127.47	6598.76	5.86	58.86	59.14	59.16	84.32	0.08
6700.00	0.32	109.91	6698.76	5.55	59.41	59.66	59.67	84.67	0.15
6800.00	0.41	139.58	6798.75	5.18	59.91	60.13	60.13	85.06	0.21
6900.00	0.32	129.65	6898.75	4.73	60.35	60.54	60.54	85.52	0.11
7000.00	0.39	119.28	6998.75	4.38	60.87	61.02	61.02	85.88	0.10
7100.00	0.45	122.72	7098.75	4.00	61.49	61.62	61.62	86.27	0.06
7200.00	0.48	144.75	7198.74	3.45	62.06	62.14	62.16	86.81	0.18
7300.00	0.77	152.09	7298.74	2.52	62.61	62.63	62.67	87.69	0.30
7400.00	0.95	150.86	7398.73	1.20	63.33	63.24	63.35	88.91	0.18
7500.00	1.06	154.11	7498.71	-0.35	64.14	63.93	64.14	90.32	0.12
7600.00	1.08	154.86	7598.69	-2.04	64.95	64.61	64.98	91.80	0.03
7700.00	1.22	140.07	7698.67	-3.71	66.03	65.56	66.13	93.22	0.32
7800.00	1.22	133.15	7798.65	-5.25	67.49	66.90	67.69	94.45	0.15
7900.00	1.56	134.11	7898.62	-6.93	69.24	68.52	69.58	95.71	0.35
8000.00	1.33	147.40	7998.59	-8.85	70.84	69.97	71.39	97.12	0.41
8100.00	1.28	145.29	8098.57	-10.75	72.10	71.09	72.90	98.48	0.06
8200.00	1.37	135.84	8198.54	-12.53	73.57	72.42	74.63	99.66	0.23
8300.00	1.61	137.35	8298.50	-14.41	75.35	74.05	76.72	100.83	0.25
8400.00	1.45	144.27	8398.47	-16.47	77.04	75.58	78.79	102.07	0.24
8500.00	1.68	156.42	8498.43	-18.85	78.37	76.73	80.60	103.52	0.40
8600.00	1.73	154.03	8598.39	-21.54	79.61	77.77	82.48	105.14	0.09
8700.00	1.75	157.60	8698.34	-24.31	80.86	78.80	84.43	106.73	0.11
8800.00	1.73	155.81	8798.30	-27.10	82.06	79.78	86.42	108.28	0.06
8900.00	1.62	158.05	8898.25	-29.79	83.21	80.73	88.38	109.70	0.13
9000.00	1.29	163.12	8998.22	-32.19	84.07	81.40	90.02	110.95	0.36
9100.00	0.84	142.07	9098.20	-33.84	84.84	82.05	91.34	111.75	0.59
9200.00	1.36	171.76	9198.19	-35.59	85.46	82.54	92.58	112.61	0.75
9300.00	1.18	183.93	9298.16	-37.79	85.56	82.47	93.54	113.83	0.32
9400.00	0.80	228.70	9398.15	-39.27	84.97	81.77	93.61	114.81	0.83
9500.00	1.51	205.76	9498.13	-40.92	83.87	80.55	93.32	116.01	0.83
9600.00	2.49	201.01	9598.07	-44.13	82.52	78.97	93.58	118.13	0.99

VES Survey Date: 03/21/2013

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	3.32	191.99	9697.94	-48.99	81.14	77.22	94.79	121.12	0.95
9800.00	4.49	191.55	9797.70	-55.66	79.76	75.34	97.26	124.91	1.16
9812.00	4.98	192.45	9809.66	-56.62	79.55	75.06	97.65	125.44	4.12

VES Survey Date: 03/21/2013

Vaughn Energy Services
Conway, Arkansas
501-730-0602
Surveyor: Chris Ford
Macho State No 001H / API 30-025-39884



VES Survey Date: 03/21/2013

The DIRECTIONAL DRILLING COMPANY

Survey Certification Sheet

Concho Operating LLC.	WT-13223	4/1/13
Company	Job Number	Date

Sec2, T24-S, R33-E	Macho State # 1H	Lea, NM
Lease	Well Name	County & State

API: 30-025-39884

Surveyed from a depth of: 9800 feet to 15590 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Clayton Keck

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The Directional Drilling Company, ou=GM of Guidance Services, email=larryw@directionaldrillers.com, c=US
Date: 2013.04.08 15:11:43 -05'00'

Larry Wright
MWD General Manager

• 11390 FM 830 • Willis, Texas 77318 •
• PH 936-856-4332 • FAX 936-856-8678 •

CONCHO

COG Operating, LLC

Lea County, NM
Sec 2, T24-S, R33-E
Macho State #1H

Wellbore #1

Survey: DDC MWD

DDC Survey Report

01 April, 2013

DDC
The DIRECTIONAL DRILLING COMPANY

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Macho State #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3649.1usft (Precision #105)
Site:	Sec 2, T24-S, R33-E	**MD Reference:**	WELL @ 3649.1usft (Precision #105)
Well:	Macho State #1H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Project	Lea 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	Sec 2, T24-S, R33-E				
Site Position:		**Northing:**	456,256.70 usft	**Latitude:**	32° 15' 6.990 N
From:	Map	**Easting:**	741,990.60 usft	**Longitude:**	103° 33' 2.044 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.42 °

Well	Macho State #1H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	456,256.70 usft	**Latitude:**	32° 15' 6.990 N
	+E/-W	0.0 usft	**Easting:**	741,990.60 usft	**Longitude:**	103° 33' 2.044 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,649.1 usft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	2/13/2013	7.37	60.18	48,467

Design	Wellbore #1				
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	85.68

Survey Program **Date** 4/1/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	9,800.0	GYRO (Wellbore #1)	Good_gyro	Good Gyro
9,887.0	15,590.0	DDC MWD (Wellbore #1)	MWD default	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)
TIE IN @ 9800' MD / 9797.7' TVD									
9,800.0	4.49	191.55	9,797.7	-55.7	79.8	75.4	0.00	0.00	0.00
9,887.0	5.40	200.90	9,884.4	-62.8	77.6	72.7	1.39	1.05	10.75
9,983.0	5.00	200.90	9,980.0	-71.0	74.5	69.0	0.42	-0.42	0.00
10,078.0	4.80	189.10	10,074.6	-78.8	72.4	66.3	1.08	-0.21	-12.42
10,173.0	4.80	184.20	10,169.3	-86.6	71.5	64.8	0.43	0.00	-5.16
10,268.0	4.80	179.10	10,264.0	-94.6	71.3	64.0	0.45	0.00	-5.37
10,363.0	4.40	180.90	10,358.7	-102.2	71.3	63.4	0.45	-0.42	1.89
10,458.0	4.20	178.60	10,453.4	-109.3	71.3	62.9	0.28	-0.21	-2.42
10,549.0	4.30	170.00	10,544.1	-116.0	72.0	63.0	0.71	0.11	-9.45

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Macho State #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3649.1usft (Precision #105)
Site:	Sec 2, T24-S, R33-E	**MD Reference:**	WELL @ 3649.1usft (Precision #105)
Well:	Macho State #1H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**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)
10,616.0	5.50	132.50	10,610.9	-120.7	74.8	65.5	4.99	1.79	-55.97
10,648.0	9.30	108.60	10,642.7	-122.5	78.4	68.9	15.04	11.88	-74.69
10,679.0	14.10	98.10	10,673.0	-123.8	84.5	74.9	16.88	15.48	-33.87
10,711.0	18.90	96.10	10,703.7	-124.9	93.5	83.8	15.10	15.00	-6.25
10,743.0	20.40	91.90	10,733.8	-125.7	104.2	94.5	6.44	4.69	-13.13
10,774.0	22.00	82.90	10,762.7	-125.1	115.4	105.7	11.68	5.16	-29.03
10,806.0	25.00	75.60	10,792.1	-122.7	127.9	118.3	13.05	9.38	-22.81
10,838.0	27.70	75.40	10,820.7	-119.2	141.7	132.3	8.44	8.44	-0.63
10,870.0	30.60	80.10	10,848.7	-115.9	156.9	147.7	11.54	9.06	14.69
10,901.0	33.50	85.90	10,875.0	-113.9	173.2	164.1	13.63	9.35	18.71
10,933.0	36.10	87.90	10,901.2	-112.9	191.4	182.4	8.87	8.13	6.25
10,965.0	39.60	86.30	10,926.5	-111.9	211.0	202.0	11.36	10.94	-5.00
10,996.0	43.30	83.50	10,949.7	-110.1	231.5	222.5	13.35	11.94	-9.03
11,028.0	46.80	81.40	10,972.4	-107.1	253.9	245.1	11.88	10.94	-6.56
11,060.0	49.30	81.50	10,993.7	-103.6	277.4	268.9	7.82	7.81	0.31
11,091.0	52.10	82.20	11,013.4	-100.2	301.2	292.8	9.20	9.03	2.26
11,123.0	55.00	83.80	11,032.4	-97.0	326.7	318.5	9.91	9.06	5.00
11,155.0	59.30	85.60	11,049.7	-94.6	353.5	345.4	14.24	13.44	5.63
11,187.0	60.50	86.10	11,065.8	-92.6	381.1	373.0	3.99	3.75	1.56
11,218.0	62.50	85.90	11,080.6	-90.7	408.3	400.3	6.48	6.45	-0.65
11,250.0	66.40	84.70	11,094.4	-88.3	437.0	429.2	12.65	12.19	-3.75
11,282.0	70.90	83.50	11,106.0	-85.2	466.7	458.9	14.49	14.06	-3.75
11,313.0	73.00	83.10	11,115.6	-81.8	496.0	488.4	6.88	6.77	-1.29
11,345.0	75.40	83.30	11,124.3	-78.1	526.5	519.1	7.52	7.50	0.63
11,377.0	79.20	84.30	11,131.4	-74.8	557.6	550.3	12.26	11.88	3.13
11,408.0	81.60	84.30	11,136.5	-71.7	588.0	580.9	7.74	7.74	0.00
11,440.0	84.50	84.30	11,140.4	-68.6	619.6	612.6	9.06	9.06	0.00
11,472.0	88.60	84.00	11,142.3	-65.3	651.3	644.6	12.85	12.81	-0.94
11,503.0	90.50	84.20	11,142.6	-62.1	682.2	675.6	6.16	6.13	0.65
11,600.0	91.50	85.60	11,140.9	-53.5	778.8	772.5	1.77	1.03	1.44
11,695.0	90.90	86.10	11,138.9	-46.6	873.5	867.5	0.82	-0.63	0.53
11,790.0	90.60	86.80	11,137.7	-40.8	968.3	962.5	0.80	-0.32	0.74
11,885.0	91.00	85.90	11,136.3	-34.7	1,063.1	1,057.5	1.04	0.42	-0.95
11,980.0	91.50	85.20	11,134.3	-27.4	1,157.8	1,152.4	0.91	0.53	-0.74
12,075.0	92.30	85.10	11,131.1	-19.3	1,252.4	1,247.4	0.85	0.84	-0.11
12,170.0	91.70	85.20	11,127.8	-11.3	1,347.0	1,342.3	0.64	-0.63	0.11
12,265.0	91.00	85.40	11,125.6	-3.5	1,441.7	1,437.3	0.77	-0.74	0.21
12,360.0	92.20	85.60	11,122.9	3.9	1,536.3	1,532.3	1.28	1.26	0.21
12,455.0	93.20	84.30	11,118.4	12.3	1,630.9	1,627.1	1.73	1.05	-1.37
12,550.0	92.70	84.50	11,113.5	21.5	1,725.3	1,722.0	0.57	-0.53	0.21
12,645.0	92.60	83.30	11,109.1	31.6	1,819.6	1,816.8	1.27	-0.11	-1.26
12,739.0	94.10	83.50	11,103.7	42.4	1,912.8	1,910.6	1.61	1.60	0.21
12,835.0	94.30	83.30	11,096.6	53.4	2,008.0	2,006.3	0.29	0.21	-0.21

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Macho State #1H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3649.1usft (Precision #105)
Site:	Sec 2, T24-S, R33-E	**MD Reference:**	WELL @ 3649.1usft (Precision #105)
Well:	Macho State #1H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**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)
12,930.0	94.70	84.20	11,089.2	63.7	2,102.1	2,100.9	1.03	0.42	0.95
13,025.0	93.30	84.70	11,082.5	72.9	2,196.4	2,195.7	1.56	-1.47	0.53
13,120.0	93.20	85.20	11,077.2	81.2	2,290.9	2,290.5	0.54	-0.11	0.53
13,215.0	91.10	85.20	11,073.6	89.2	2,385.5	2,385.4	2.21	-2.21	0.00
13,310.0	90.10	85.20	11,072.6	97.1	2,480.2	2,480.4	1.05	-1.05	0.00
13,406.0	90.80	84.90	11,071.8	105.4	2,575.8	2,576.4	0.79	0.73	-0.31
13,501.0	90.00	84.70	11,071.2	114.0	2,670.4	2,671.4	0.87	-0.84	-0.21
13,596.0	91.20	84.50	11,070.2	123.0	2,765.0	2,766.4	1.28	1.26	-0.21
13,691.0	91.20	84.50	11,068.2	132.1	2,859.5	2,861.3	0.00	0.00	0.00
13,785.0	92.70	85.20	11,065.0	140.5	2,953.1	2,955.3	1.76	1.60	0.74
13,881.0	92.20	85.60	11,060.9	148.2	3,048.7	3,051.2	0.67	-0.52	0.42
13,976.0	92.10	85.60	11,057.3	155.5	3,143.3	3,146.1	0.11	-0.11	0.00
14,071.0	91.60	85.80	11,054.3	162.6	3,238.0	3,241.1	0.57	-0.53	0.21
14,166.0	92.20	85.10	11,051.1	170.1	3,332.7	3,336.0	0.97	0.63	-0.74
14,261.0	91.90	84.90	11,047.7	178.4	3,427.2	3,430.9	0.38	-0.32	-0.21
14,355.0	91.40	84.70	11,045.0	186.9	3,520.8	3,524.9	0.57	-0.53	-0.21
14,450.0	92.40	84.30	11,041.9	196.0	3,615.3	3,619.8	1.13	1.05	-0.42
14,545.0	92.60	84.30	11,037.7	205.4	3,709.8	3,714.7	0.21	0.21	0.00
14,640.0	93.00	84.30	11,033.1	214.9	3,804.2	3,809.6	0.42	0.42	0.00
14,734.0	92.90	83.80	11,028.2	224.6	3,897.5	3,903.4	0.54	-0.11	-0.53
14,829.0	93.10	84.00	11,023.3	234.7	3,991.9	3,998.2	0.30	0.21	0.21
14,924.0	93.20	83.80	11,018.0	244.8	4,086.2	4,093.0	0.24	0.11	-0.21
15,019.0	92.90	83.50	11,013.0	255.3	4,180.5	4,187.8	0.45	-0.32	-0.32
15,114.0	92.60	83.50	11,008.4	266.0	4,274.8	4,282.7	0.32	-0.32	0.00
15,209.0	91.60	84.20	11,005.0	276.2	4,369.2	4,377.5	1.28	-1.05	0.74
15,304.0	90.90	84.20	11,002.9	285.8	4,463.6	4,472.5	0.74	-0.74	0.00
15,399.0	90.80	84.20	11,001.5	295.4	4,558.1	4,567.4	0.11	-0.11	0.00
15,494.0	91.30	84.30	10,999.7	304.9	4,652.7	4,662.4	0.54	0.53	0.11
15,540.0	91.10	84.20	10,998.8	309.5	4,698.4	4,708.4	0.49	-0.43	-0.22
TD @ 15590' MD / 10997.8' TVD									
15,590.0	91.10	84.20	10,997.8	314.5	4,748.1	4,758.3	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,800.0	9,797.7	-55.7	79.8	TIE IN @ 9800' MD / 9797.7' TVD
15,590.0	10,997.8	314.5	4,748.1	TD @ 15590' MD / 10997.8' TVD

Checked By: _____ Approved By: _____ Date: _____