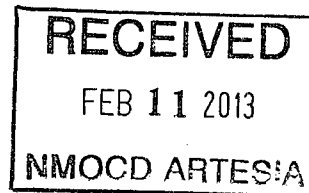


15-40346



COG Operating LLC

Eddy County, NM

Dodd Federal Unit 911H

Dodd Federal Unit 911H

Wellbore #1

Survey: MWD Surveys

Standard Survey Report

11 September, 2012

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Dodd Federal Unit 911H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3638.00ft (UDI #40)
Site:	Dodd Federal Unit 911H	MD Reference:	WELL @ 3638.00ft (UDI #40)
Well:	Dodd Federal Unit 911H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

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: Dodd Federal Unit 911H					
Site Position:		Northing:	672,875.00 ft	Latitude:	32.849501
From:	Map	Easting:	586,049.40 ft	Longitude:	-104.053140
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.15 °

Well:	Dodd Federal Unit 911H					
Well Position	+N/-S	0.00 ft	Northing:	672,875.00 ft	Latitude:	32.849501
	+E/-W	0.00 ft	Easting:	586,049.40 ft	Longitude:	-104.053140
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,624.00 ft	

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/24/2012	7.71	60.65	48,819

Design:		Wellbore #1			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	89.85	

Survey Program		Date	9/11/2012	
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	4,213.00	Gyro1 (Wellbore #1)	CB-GYRO-MS	Camera based gyro multishot
4,213.00	9,109.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,213.00	0.35	147.93	4,212.61	1.01	39.28	39.28	0.00	0.00	0.00
4,256.00	0.30	91.80	4,255.61	0.89	39.46	39.46	0.72	-0.12	-130.53
4,287.00	2.60	70.80	4,286.60	1.12	40.20	40.21	7.49	7.42	-67.74
4,319.00	6.40	74.40	4,318.49	1.84	42.61	42.61	11.90	11.88	11.25
4,351.00	10.70	73.00	4,350.13	3.19	47.17	47.18	13.45	13.44	-4.38
4,382.00	14.80	73.50	4,380.36	5.16	53.72	53.73	13.23	13.23	1.61
4,414.00	18.80	74.20	4,410.99	7.72	62.60	62.62	12.52	12.50	2.19
4,446.00	22.50	77.00	4,440.93	10.50	73.54	73.56	11.96	11.56	8.75
4,478.00	26.20	79.10	4,470.08	13.22	86.44	86.48	11.87	11.56	6.56
4,509.00	29.30	81.20	4,497.51	15.67	100.66	100.70	10.48	10.00	6.77

Survey Report

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Site: Dodd Federal Unit 911H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3638.00ft (UDI #40)
Site:	Dodd Federal Unit 911H	MD Reference:	WELL @ 3638.00ft (UDI #40)
Well:	Dodd Federal Unit 911H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston R5000 Database

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,541.00	32.50	81.60	4,524.96	18.13	116.91	116.96	10.02	10.00	1.25
4,573.00	35.90	82.60	4,551.43	20.59	134.72	134.78	10.77	10.63	3.13
4,604.00	39.00	81.90	4,576.03	23.14	153.40	153.46	10.09	10.00	-2.26
4,636.00	43.00	82.60	4,600.18	25.96	174.20	174.26	12.58	12.50	2.19
4,668.00	47.10	83.50	4,622.78	28.70	196.67	196.75	12.97	12.81	2.81
4,700.00	50.40	84.90	4,643.88	31.12	220.60	220.68	10.82	10.31	4.38
4,731.00	53.50	85.80	4,662.98	33.09	244.93	245.02	10.26	10.00	2.90
4,763.00	57.40	85.80	4,681.13	35.02	271.21	271.30	12.19	12.19	0.00
4,795.00	61.50	86.30	4,697.39	36.92	298.70	298.80	12.88	12.81	1.56
4,826.00	65.50	87.70	4,711.22	38.37	326.40	326.50	13.52	12.90	4.52
4,858.00	68.10	90.50	4,723.83	38.82	355.80	355.90	11.43	8.13	8.75
4,890.00	70.70	93.30	4,735.09	37.82	385.73	385.83	11.54	8.13	8.75
4,921.00	74.30	94.70	4,744.41	35.76	415.22	415.31	12.39	11.61	4.52
4,953.00	77.30	95.10	4,752.26	33.11	446.12	446.21	9.45	9.38	1.25
4,985.00	77.60	95.30	4,759.21	30.27	477.23	477.31	1.12	0.94	0.63
5,017.00	78.40	94.00	4,765.86	27.74	508.43	508.50	4.69	2.50	-4.06
5,049.00	80.40	93.00	4,771.75	25.82	539.82	539.89	6.96	6.25	-3.13
5,081.00	82.40	93.00	4,776.53	24.16	571.42	571.48	6.25	6.25	0.00
5,112.00	84.10	93.20	4,780.18	22.50	602.16	602.21	5.52	5.48	0.65
5,144.00	84.30	93.00	4,783.41	20.78	633.94	634.00	0.88	0.63	-0.63
5,176.00	84.20	93.20	4,786.62	19.05	665.74	665.78	0.70	-0.31	0.63
5,208.00	84.80	93.20	4,789.69	17.28	697.54	697.58	1.88	1.88	0.00
5,239.00	85.70	93.20	4,792.25	15.55	728.38	728.42	2.90	2.90	0.00
5,271.00	86.00	92.80	4,794.57	13.88	760.26	760.29	1.56	0.94	-1.25
5,303.00	86.50	92.50	4,796.66	12.41	792.15	792.18	1.82	1.56	-0.94
5,335.00	87.40	91.90	4,798.36	11.18	824.08	824.11	3.38	2.81	-1.88
5,366.00	88.50	91.40	4,799.47	10.29	855.05	855.08	3.90	3.55	-1.61
5,398.00	89.40	90.70	4,800.06	9.70	887.04	887.06	3.56	2.81	-2.19
5,430.00	90.00	90.00	4,800.23	9.51	919.04	919.06	2.88	1.88	-2.19
5,493.00	91.50	89.80	4,799.40	9.61	982.03	982.05	2.40	2.38	-0.32
5,588.00	91.90	89.50	4,796.58	10.20	1,076.99	1,077.01	0.53	0.42	-0.32
5,683.00	90.90	90.50	4,794.26	10.19	1,171.96	1,171.98	1.49	-1.05	1.05
5,779.00	90.70	90.50	4,792.92	9.36	1,267.94	1,267.96	0.21	-0.21	0.00
5,874.00	91.30	90.70	4,791.26	8.36	1,362.92	1,362.94	0.67	0.63	0.21
5,969.00	91.40	90.70	4,789.03	7.20	1,457.89	1,457.90	0.11	0.11	0.00
6,064.00	91.20	90.70	4,786.87	6.04	1,552.86	1,552.87	0.21	-0.21	0.00
6,159.00	90.90	90.00	4,785.13	5.46	1,647.84	1,647.85	0.80	-0.32	-0.74
6,254.00	91.50	90.70	4,783.14	4.88	1,742.82	1,742.82	0.97	0.63	0.74
6,349.00	91.50	90.50	4,780.65	3.89	1,837.78	1,837.78	0.21	0.00	-0.21
6,445.00	91.50	90.70	4,778.14	2.88	1,933.74	1,933.74	0.21	0.00	0.21
6,540.00	91.40	90.70	4,775.74	1.72	2,028.70	2,028.70	0.11	-0.11	0.00
6,635.00	91.10	90.40	4,773.66	0.81	2,123.68	2,123.67	0.45	-0.32	-0.32
6,730.00	90.90	90.20	4,772.01	0.31	2,218.66	2,218.65	0.30	-0.21	-0.21

Survey Report

Company:	COG Operating LLC	Local Co-ordinate/Reference:	Site Dodd Federal Unit 911H
Project:	Eddy County NM	TVD Reference:	WELL @ 3638.00ft (UDI #40)
Site:	Dodd Federal Unit 911H	MD Reference:	WELL @ 3638.00ft (UDI #40)
Well:	Dodd Federal Unit 911H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Houston IR5000 Database

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
6,825.00	91.10	89.30	4,770.35	0.73	2,313.64	2,313.64	0.97	0.21	-0.95	
6,920.00	91.00	89.10	4,768.61	2.05	2,408.62	2,408.62	0.24	-0.11	-0.21	
7,015.00	90.80	89.10	4,767.11	3.55	2,503.60	2,503.60	0.21	-0.21	0.00	
7,110.00	90.70	89.10	4,765.87	5.04	2,598.58	2,598.58	0.11	-0.11	0.00	
7,206.00	90.70	90.40	4,764.70	5.46	2,694.57	2,694.57	1.35	0.00	1.35	
7,301.00	91.50	90.20	4,762.87	4.96	2,789.55	2,789.55	0.87	0.84	-0.21	
7,396.00	91.60	90.00	4,760.31	4.79	2,884.51	2,884.51	0.24	0.11	-0.21	
7,491.00	90.90	89.50	4,758.23	5.21	2,979.49	2,979.49	0.91	-0.74	-0.53	
7,587.00	91.00	89.10	4,756.64	6.38	3,075.47	3,075.47	0.43	0.10	-0.42	
7,682.00	90.90	88.90	4,755.07	8.04	3,170.44	3,170.45	0.24	-0.11	-0.21	
7,777.00	91.20	89.60	4,753.33	9.28	3,265.41	3,265.43	0.80	0.32	0.74	
7,872.00	91.20	89.10	4,751.34	10.36	3,360.39	3,360.40	0.53	0.00	-0.53	
7,967.00	90.90	88.90	4,749.59	12.02	3,455.36	3,455.37	0.38	-0.32	-0.21	
8,062.00	90.90	89.50	4,748.10	13.34	3,550.33	3,550.36	0.63	0.00	0.63	
8,158.00	91.20	90.20	4,746.34	13.59	3,646.32	3,646.34	0.79	0.31	0.73	
8,253.00	90.90	90.00	4,744.60	13.43	3,741.30	3,741.32	0.38	-0.32	-0.21	
8,348.00	90.50	89.10	4,743.44	14.17	3,836.29	3,836.31	1.04	-0.42	-0.95	
8,443.00	90.70	89.80	4,742.45	15.09	3,931.28	3,931.31	0.77	0.21	0.74	
8,538.00	91.30	90.50	4,740.79	14.84	4,026.26	4,026.29	0.97	0.63	0.74	
8,633.00	91.40	90.40	4,738.55	14.09	4,121.23	4,121.26	0.15	0.11	-0.11	
8,728.00	91.50	90.20	4,736.15	13.59	4,216.20	4,216.22	0.24	0.11	-0.21	
8,823.00	91.60	90.00	4,733.58	13.43	4,311.17	4,311.19	0.24	0.11	-0.21	
8,919.00	90.70	90.70	4,731.65	12.84	4,407.14	4,407.16	1.19	-0.94	0.73	
9,014.00	90.90	90.70	4,730.32	11.68	4,502.13	4,502.14	0.21	0.21	0.00	
Last Survey @ 9014.00' MD, 4730.32' TVD, 90.90° INC, 90.70° AZ										
9,109.00	90.60	90.20	4,729.08	10.94	4,597.12	4,597.13	0.61	-0.32	-0.53	
Straight line Projection to TD @ 9109.00' MD, 4729.08' TVD										

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9,014.00	4,730.32	11.68	4,502.13	Last Survey @ 9014.00' MD, 4730.32' TVD, 90.90° INC, 90.70° AZ
9,109.00	4,729.08	10.94	4,597.12	Straight line Projection to TD @ 9109.00' MD, 4729.08' TVD

Checked By: _____ Approved By: _____ Date: _____

WELL NAME AND NUMBER Dodd Federal Unit 11 No. 4H
LOCATION Section 11, T17S, R29E, Unit E, 2455 FNL, 130 FWL, Eddy County
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
.9° @ 109'		
.4° @ 293'		
1.3° @ 547'		
1.8° @ 793'		
1.9° @ 1039'		
1.9° @ 1283'		
.8° @ 1500'		
.8° @ 1965'		
.4° @ 2377'		
.6° @ 2789'		
.5° @ 3234'		
.1° @ 3733'		

Drilling Contractor- UNITED DRILLING, INC.

By: Luisa Noriega
(Luisa Noriega)

Title: Asst. Office Manager

Subscribed and sworn to before me this 14th day of September 2012.

Carlae Martin
Notary Public
Charles Hernandez
County State

My Commission Expires: 10/8/12



Company: COG OPERATING LLC (CONCHO)
Lease/Well: DODD FEDERAL UNIT/No. 911H



Rig Name: UDI 40
State/County: NEW MEXICO/EDDY
Latitude: 32.85
GRID North is 0.15 Degrees East of True North
VS-Azi: 0.00 Degrees

Depth Reference : RKB = 14 FEET

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: dodd fed unit #911h_ed.ut

Minimum Curvature Method

Report Date/Time: 9/6/2012 / 14:00

Vaughn Energy Services
Gardendale Texas

432-563-5444

Surveyor: Danny Spring

Dodd Federal Unit No. 911H / API 30-015-40346

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W 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	****
100.00	0.51	287.14	100.00	0.13	-0.43	0.45	287.14	0.51
200.00	0.23	304.57	200.00	0.38	-1.02	1.09	290.31	0.30
300.00	0.27	349.15	300.00	0.72	-1.23	1.43	300.37	0.19
400.00	0.95	91.48	399.99	0.93	-0.44	1.03	334.48	1.04
500.00	1.23	91.06	499.97	0.89	1.47	1.71	58.76	0.28
600.00	1.41	99.98	599.95	0.66	3.75	3.81	80.08	0.27
700.00	1.45	91.25	699.92	0.42	6.22	6.24	86.17	0.22
800.00	1.67	89.15	799.88	0.41	8.94	8.95	87.37	0.23
900.00	1.75	94.20	899.83	0.32	11.92	11.92	88.46	0.17
1000.00	1.57	90.24	999.79	0.20	14.81	14.82	89.22	0.21
1100.00	1.26	88.11	1099.76	0.23	17.28	17.29	89.23	0.32
1200.00	1.19	86.21	1199.74	0.34	19.42	19.42	89.00	0.08
1300.00	1.04	75.27	1299.72	0.64	21.34	21.35	88.29	0.26
1400.00	0.77	69.69	1399.71	1.10	22.85	22.87	87.24	0.28
1500.00	0.72	72.06	1499.70	1.53	24.07	24.12	86.37	0.06
1600.00	0.73	64.32	1599.69	2.00	25.25	25.32	85.47	0.10
1700.00	0.86	60.84	1699.68	2.64	26.48	26.61	84.30	0.14
1800.00	0.88	77.51	1799.67	3.18	27.89	28.07	83.50	0.25

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.75	80.71	1899.66	3.45	29.29	29.49	83.28	0.14
2000.00	0.47	54.34	1999.65	3.79	30.27	30.50	82.85	0.39
2100.00	0.55	50.03	2099.65	4.34	30.97	31.27	82.02	0.09
2200.00	0.27	34.64	2199.65	4.84	31.47	31.84	81.26	0.30
2300.00	0.68	132.43	2299.64	4.63	32.04	32.37	81.77	0.76
2400.00	0.24	7.60	2399.64	4.44	32.50	32.80	82.22	0.84
2500.00	0.32	35.75	2499.64	4.88	32.69	33.05	81.51	0.16
2600.00	0.16	323.03	2599.64	5.22	32.77	33.18	80.96	0.31
2700.00	0.33	59.68	2699.64	5.47	32.94	33.39	80.57	0.38
2800.00	0.30	77.17	2799.64	5.68	33.44	33.92	80.37	0.10
2900.00	0.24	72.06	2899.64	5.80	33.90	34.39	80.29	0.07
3000.00	0.27	123.32	2999.64	5.74	34.29	34.76	80.50	0.22
3100.00	0.37	108.12	3099.63	5.51	34.79	35.22	81.00	0.13
3200.00	0.43	112.22	3199.63	5.27	35.44	35.83	81.55	0.07
3300.00	0.45	107.70	3299.63	5.01	36.16	36.50	82.12	0.04
3400.00	0.49	190.59	3399.63	4.47	36.45	36.72	83.01	0.62
3500.00	0.54	117.70	3499.62	3.83	36.79	36.99	84.06	0.61
3600.00	0.51	132.61	3599.62	3.30	37.53	37.68	84.97	0.14
3700.00	0.36	104.39	3699.62	2.92	38.17	38.28	85.62	0.26
3800.00	0.37	150.63	3799.61	2.57	38.63	38.71	86.20	0.28
3900.00	0.34	156.13	3899.61	2.02	38.90	38.96	87.03	0.04
4000.00	0.30	206.92	3999.61	1.51	38.90	38.93	87.77	0.28
4100.00	0.19	104.87	4099.61	1.23	38.94	38.96	88.19	0.39
4200.00	0.20	135.13	4199.61	1.07	39.23	39.24	88.44	0.10
4213.00	0.35	147.93	4212.61	1.02	39.26	39.28	88.51	1.24