

COG Operating, LLC

Eddy County(NM27E)

Sec.33-T24S-R28E

Really Scary Federal Com #2H

Wellbore #2-ST

30-015-41411

Survey: Survey #1-Archer MWD

Standard Survey Report

21 July, 2013

Archer

Company:	COG Operating, LLC	Local/Co-ordinate Reference:	Well, Really Scary Federal Com #2H
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3027.30usft
Site:	Sec.33-T24S-R28E	MD Reference:	WELL @ 3027.30usft
Well:	Really Scary Federal Com #2H	North Reference:	Grid:
Wellbore:	Wellbore #2-ST	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2-ST	Database:	EDM-5000-1 Single User Db

Project: Eddy County(NM27E)			
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.33-T24S-R28E				
Site Position:		Northing:	424,523.100 usft	Latitude:	32° 10' 0.864 N	
From:	Map	Easting:	573,720.000 usft	Longitude:	104° 5' 42.326 W	
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.13 °

Well:		Really Scary Federal Com #2H				
Well Position	+N/-S	0.00 usft	Northing:	424,523.100 usft	Latitude:	32° 10' 0.864 N
	+E/-W	0.00 usft	Easting:	573,720.000 usft	Longitude:	104° 5' 42.326 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,010.30 usft

Wellbore:	Wellbore #2-ST				
Magnetics:	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2013/07/12	7.57	59.99	48,320

Design:	Wellbore #2-ST			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 6,500.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	6.53

Survey Program		Date: 2013/07/21		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	6,500.00	Survey #2-VES Gyro (Wellbore #1)	GYD_DP_MS	Gyrodatta gyro-compassing and drop
6,546.00	12,914.00	Survey #1-Archer MWD (Wellbore #2-ST)	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)
Tie-In / OH VES Gyro									
6,500.00	2.61	128.29	6,498.66	-28.73	31.19	-24.99	0.00	0.00	0.00
First Archer Survey-ST									
6,546.00	7.00	101.30	6,544.49	-29.92	34.76	-25.78	10.48	9.54	-58.67
6,577.00	11.50	95.40	6,575.08	-30.59	39.70	-25.87	14.82	14.52	-19.03
6,609.00	14.10	92.30	6,606.29	-31.04	46.77	-25.52	8.40	8.12	-9.69
6,641.00	11.30	90.20	6,637.50	-31.21	53.80	-24.89	8.87	-8.75	-6.56
6,673.00	7.90	78.30	6,669.05	-30.77	59.09	-23.85	12.25	-10.62	-37.19
6,704.00	6.90	79.90	6,699.79	-30.02	63.01	-22.65	3.29	-3.23	5.16
6,736.00	6.70	83.50	6,731.57	-29.47	66.76	-21.68	1.47	-0.62	11.25
6,768.00	4.40	85.70	6,763.42	-29.16	69.83	-21.03	7.22	-7.19	6.87
6,799.00	3.90	75.60	6,794.33	-28.81	72.04	-20.43	2.85	-1.61	-32.58

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Really Scary Federal Comi#2H
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3027.30usft
Site:	Sec 33-T24S-R28E	MD Reference:	WELL @ 3027.30usft
Well:	Really Scary Federal Com #2H	North Reference:	Grid
Wellbore:	Wellbore #2-ST	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2-ST	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)
6,894.00	3.40	83.50	6,889.14	-27.69	77.97	-18.64	0.75	-0.53	8.32
6,989.00	3.00	64.40	6,984.00	-26.30	83.01	-16.68	1.19	-0.42	-20.11
7,085.00	2.50	46.60	7,079.89	-23.77	86.80	-13.75	1.02	-0.52	-18.54
7,180.00	2.80	77.80	7,174.79	-21.86	90.57	-11.42	1.53	0.32	32.84
7,275.00	3.60	108.10	7,269.65	-22.30	95.67	-11.27	1.94	0.84	31.89
7,370.00	3.50	103.10	7,364.47	-23.88	101.33	-12.20	0.34	-0.11	-5.26
7,465.00	1.90	105.20	7,459.36	-24.95	105.68	-12.77	1.69	-1.68	2.21
7,559.00	1.00	107.50	7,553.33	-25.60	107.96	-13.16	0.96	-0.96	2.45
7,591.00	0.70	109.00	7,585.32	-25.75	108.42	-13.25	0.94	-0.94	4.69
7,623.00	3.40	77.40	7,617.30	-25.61	109.53	-12.99	8.84	8.44	-98.75
7,655.00	7.40	72.60	7,649.15	-24.79	112.42	-11.84	12.57	12.50	-15.00
7,686.00	11.30	68.20	7,679.73	-23.06	117.15	-9.59	12.78	12.58	-14.19
7,718.00	14.00	64.60	7,710.96	-20.23	123.56	-6.05	8.79	8.44	-11.25
7,750.00	17.30	63.80	7,741.76	-16.47	131.32	-1.43	10.33	10.31	-2.50
7,782.00	20.20	62.20	7,772.06	-11.79	140.48	4.26	9.20	9.06	-5.00
7,813.00	22.90	58.10	7,800.90	-6.11	150.34	11.03	9.97	8.71	-13.23
7,845.00	26.20	56.40	7,830.00	1.09	161.51	19.46	10.55	10.31	-5.31
7,877.00	29.80	54.50	7,858.25	9.62	173.87	29.34	11.59	11.25	-5.94
7,908.00	34.00	51.00	7,884.56	19.55	186.89	40.68	14.80	13.55	-11.29
7,940.00	38.30	49.10	7,910.40	31.68	201.34	54.38	13.89	13.44	-5.94
7,972.00	41.00	46.20	7,935.04	45.45	216.42	69.77	10.23	8.44	-9.06
8,004.00	43.50	42.30	7,958.73	60.86	231.41	86.79	11.32	7.81	-12.19
8,035.00	47.00	40.60	7,980.55	77.37	245.98	104.84	11.94	11.29	-5.48
8,067.00	51.10	40.30	8,001.52	95.76	261.65	124.90	12.83	12.81	-0.94
8,099.00	55.70	39.90	8,020.59	115.40	278.19	146.30	14.41	14.37	-1.25
8,130.00	60.20	39.10	8,037.04	135.68	294.90	168.34	14.68	14.52	-2.58
8,162.00	64.30	38.50	8,051.93	157.74	312.64	192.28	12.92	12.81	-1.87
8,193.00	67.60	37.60	8,064.56	180.03	330.08	216.41	10.97	10.65	-2.90
8,225.00	72.00	37.80	8,075.61	203.79	348.44	242.10	13.76	13.75	0.62
8,257.00	77.50	37.00	8,084.03	228.31	367.18	268.59	17.36	17.19	-2.50
8,289.00	82.60	36.10	8,089.55	253.62	385.95	295.87	16.18	15.94	-2.81
8,320.00	87.50	34.00	8,092.23	278.90	403.67	323.00	17.19	15.81	-6.77
8,352.00	89.60	29.50	8,093.04	306.09	420.50	351.93	15.51	6.56	-14.06
8,384.00	89.40	26.30	8,093.32	334.37	435.47	381.73	10.02	-0.62	-10.00
8,415.00	87.60	24.20	8,094.13	362.39	448.69	411.07	8.92	-5.81	-6.77
8,510.00	92.50	22.60	8,094.05	449.55	486.41	501.96	5.43	5.16	-1.68
8,606.00	91.40	16.60	8,090.78	539.89	518.58	595.37	6.35	-1.15	-6.25
8,701.00	91.80	11.30	8,088.12	632.02	541.46	689.50	5.59	0.42	-5.58
8,796.00	88.60	9.30	8,087.79	725.47	558.44	784.28	3.97	-3.37	-2.11
8,891.00	86.90	12.40	8,091.52	818.69	576.31	878.92	3.72	-1.79	3.26
8,986.00	83.60	9.70	8,099.39	911.58	594.45	973.28	4.48	-3.47	-2.84
9,110.00	92.80	6.30	8,103.28	1,034.17	611.67	1,097.03	7.91	7.42	-2.74
9,205.00	90.80	0.10	8,100.29	1,128.92	616.97	1,191.77	6.85	-2.11	-6.53
9,301.00	91.30	355.40	8,098.53	1,224.80	613.20	1,286.60	4.92	0.52	-4.90
9,395.00	91.60	354.80	8,096.15	1,318.43	605.17	1,378.71	0.71	0.32	-0.64
9,491.00	92.20	355.20	8,092.97	1,414.01	596.81	1,472.72	0.75	0.62	0.42
9,584.00	91.40	355.00	8,090.05	1,506.63	588.87	1,563.83	0.89	-0.86	-0.22
9,680.00	90.40	355.30	8,088.54	1,602.27	580.76	1,657.93	1.09	-1.04	0.31
9,775.00	90.80	357.50	8,087.55	1,697.07	574.79	1,751.43	2.35	0.42	2.32
9,870.00	89.20	359.20	8,087.55	1,792.02	572.06	1,845.46	2.46	-1.68	1.79
9,965.00	90.80	0.60	8,087.55	1,887.02	571.89	1,939.82	2.24	1.68	1.47
10,060.00	91.90	0.10	8,085.31	1,981.99	572.47	2,034.24	1.27	1.16	-0.53
10,155.00	89.20	358.70	8,084.40	2,076.97	571.48	2,128.49	3.20	-2.84	-1.47
10,250.00	90.50	359.90	8,084.65	2,171.96	570.32	2,222.73	1.86	1.37	1.26

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10,345.00	91.40	359.60	8,083.07	2,266.94	569.90	2,317.05	1.00	0.95	-0.32
10,440.00	93.40	359.40	8,079.09	2,361.85	569.07	2,411.25	2.12	2.11	-0.21
10,535.00	93.40	359.10	8,073.46	2,456.67	567.83	2,505.32	0.32	0.00	-0.32
10,629.00	92.30	359.60	8,068.78	2,550.55	566.77	2,598.46	1.29	-1.17	0.53
10,724.00	90.20	359.30	8,066.71	2,645.52	565.86	2,692.71	2.23	-2.21	-0.32
10,819.00	89.80	359.40	8,066.71	2,740.51	564.78	2,786.96	0.43	-0.42	0.11
10,914.00	90.50	359.40	8,066.46	2,835.51	563.78	2,881.23	0.74	0.74	0.00
11,010.00	90.20	359.40	8,065.88	2,931.50	562.78	2,976.48	0.31	-0.31	0.00
11,105.00	89.50	359.30	8,066.13	3,026.49	561.70	3,070.74	0.74	-0.74	-0.11
11,200.00	90.50	359.70	8,066.13	3,121.49	560.87	3,165.02	1.13	1.05	0.42
11,295.00	90.90	359.10	8,064.97	3,216.47	559.88	3,259.28	0.76	0.42	-0.63
11,389.00	90.50	358.90	8,063.82	3,310.45	558.24	3,352.46	0.48	-0.43	-0.21
11,484.00	91.20	359.00	8,062.41	3,405.42	556.50	3,446.62	0.74	0.74	0.11
11,579.00	90.10	358.20	8,061.33	3,500.39	554.17	3,540.70	1.43	-1.16	-0.84
11,674.00	89.70	357.80	8,061.50	3,595.33	550.86	3,634.65	0.60	-0.42	-0.42
11,769.00	91.00	358.40	8,060.92	3,690.27	547.71	3,728.62	1.51	1.37	0.63
11,864.00	92.00	358.80	8,058.43	3,785.21	545.39	3,822.68	1.13	1.05	0.42
11,958.00	91.90	358.60	8,055.23	3,879.13	543.26	3,915.75	0.24	-0.11	-0.21
12,053.00	91.30	359.80	8,052.58	3,974.08	541.93	4,009.93	1.41	-0.63	1.26
12,148.00	90.40	0.60	8,051.17	4,069.07	542.26	4,104.34	1.27	-0.95	0.84
12,243.00	90.40	0.30	8,050.50	4,164.07	543.01	4,198.80	0.32	0.00	-0.32
12,339.00	90.70	0.60	8,049.58	4,260.06	543.76	4,294.26	0.44	0.31	0.31
12,434.00	90.00	359.40	8,049.00	4,355.05	543.76	4,388.64	1.46	-0.74	-1.26
12,529.00	89.80	358.70	8,049.17	4,450.04	542.19	4,482.83	0.77	-0.21	-0.74
12,625.00	90.20	359.30	8,049.17	4,546.02	540.51	4,578.00	0.75	0.42	0.62
12,720.00	90.10	358.70	8,048.92	4,641.01	538.86	4,672.18	0.64	-0.11	-0.63
12,815.00	90.70	359.10	8,048.26	4,735.99	537.03	4,766.34	0.76	0.63	0.42
Last Archer Survey-ST									
12,863.00	90.30	358.70	8,047.84	4,783.98	536.11	4,813.91	1.18	-0.83	-0.83
PTB									
12,914.00	90.30	358.70	8,047.57	4,834.96	534.95	4,864.43	0.00	0.00	0.00

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,500.00	6,498.66	-28.73	31.19	Tie-In / OH VES Gyro
6,546.00	6,544.49	-29.92	34.76	First Archer Survey-ST
12,863.00	8,047.84	4,783.98	536.11	Last Archer Survey-ST
12,914.00	8,047.57	4,834.96	534.95	PTB

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County(NM27E)
 Site: Sec.33-T24S-R28E
 Well: Really Scary Federal Com #2H
 Wellbore: Wellbore #2-ST
 Design: Design #1-ST
 Lat: 32° 10' 0.864 N
 Long: 104° 5' 42.326 W
 GL: 3010.30
 KB: WELL @ 3027.30usft

Archer

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Annotation
6700.00	1.00	192.43	6698.58	-33.01	-34.10	0.00	0.00	-28.91	Tie-In / Start DLS 3.00" TFO -113.01
6876.86	5.00	90.00	6875.21	-34.51	41.48	3.00	-113.01	-29.57	Start 766.19' hold at 6876.86 MD
7643.05	5.00	90.00	7638.49	-34.51	108.26	0.00	0.00	-21.98	KOP / Start DLS 12.00" TFO -62.04
8378.78	90.63	28.00	8095.00	374.62	366.19	12.00	-62.04	-413.84	EOC / Start DLS 3.00" TFO -89.84
9331.51	90.63	359.42	8084.23	1290.59	589.62	3.00	-89.84	1349.28	Start 3544.61' hold at 9331.51 MD
12876.12	90.63	359.42	8045.00	4834.80	553.50	0.00	0.00	4866.38	TD at 12876.12

WELL DETAILS: Really Scary Federal Com #2H

+N/-S	+E/-W	Northing	Ground Level:	3010.30	Longitude	Slot
0.00	0.00	424523.100	Easting	573720.000	32° 10' 0.864 N	104° 5' 42.326 W

DESIGN TARGET DETAILS

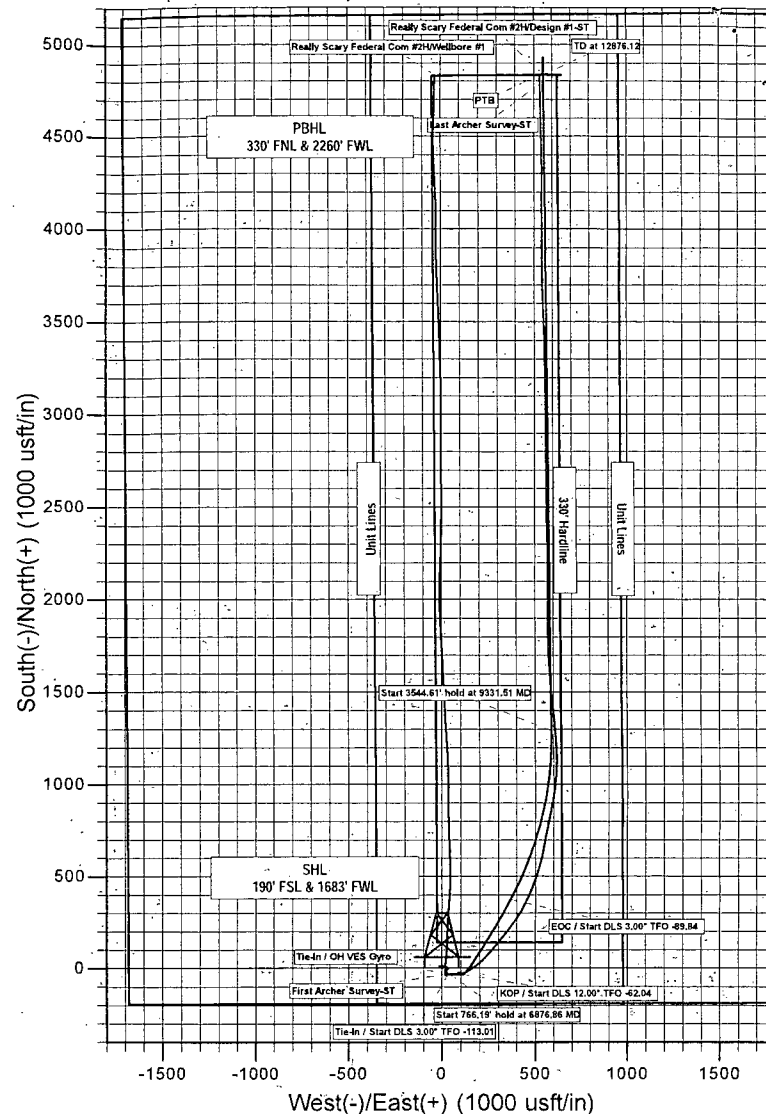
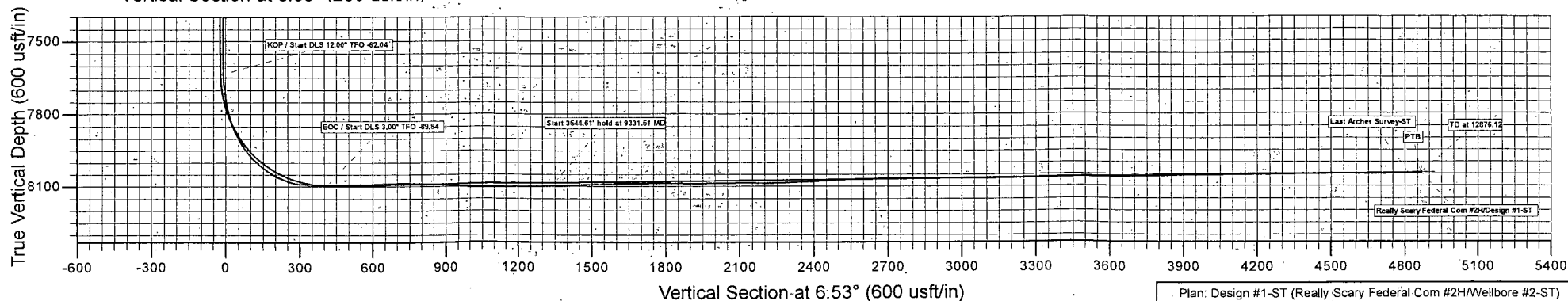
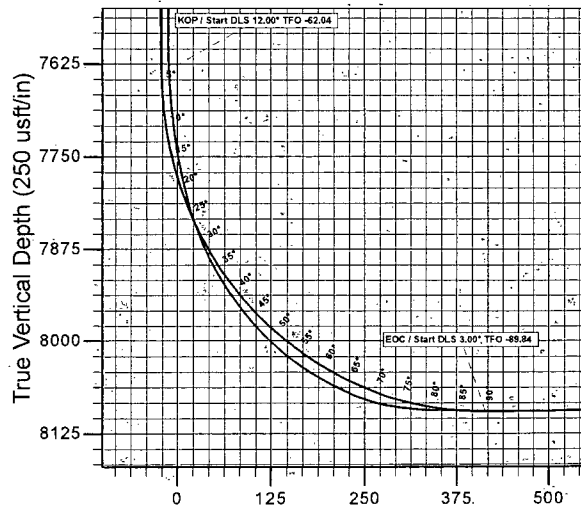
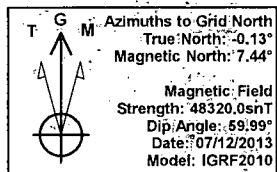
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
RSFC #2H ST PBHL	8045.00	4834.80	553.50	429357.900	574273.500	32° 10' 48.699 N	104° 5' 35.761 W	Point

PROJECT DETAILS: Eddy County(NM27E)

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

SITE DETAILS: Sec.33-T24S-R28E

Site Centre Latitude: 32° 10' 0.864 N
 Longitude: 104° 5' 42.326 W
 Positional Uncertainty: 0.00
 Convergence: 0.13
 Local North: Grid



Plan: Design #1-ST (Really Scary Federal Com #2H/Wellbore #2-ST)

Created By: Bret Wolford Date: 8:12, July 21 2013