

Archer

Archer Directional Drilling Services.
911 Regional Park Drive
Houston, Texas 77060
Tel: 281-934-9600
Fax: 281-951-2101

COG Operating, LLC
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

30-015-40622

February 19, 2013

Re: COG Operating, LLC
MunnyNThaBank State 2H
Field: Cedar Lake
Rig: United 40
Eddy County, New Mexico
API # 30-015-40468

Enclosed please find the original of the surveys performed on the referenced well by Archer Directional Drilling Services. Other information required by your office is as follows:

<u>Name & Title Of Surveyor</u>	<u>Wellhole Number</u>	<u>Survey Depths</u>	<u>Dates Performed</u>	<u>Type Survey</u>
Geo Davila Field Engineer	Original Hole	413-2215	01/14/13-01/17/13	MWD
	Lateral	7138-12113	01/20/13-01/28/13	

If additional information is required, please contact the undersigned at the letterhead address and phone number.

Amador Baggerly
MWD Coordinator



Archer Directional Drilling Services.
911 Regional Park Drive
Houston, Texas 77060
Tel: 281-934-9600
Fax: 281-951-2101

MWD Survey Certification

State of New Mexico
County of Eddy

I, Amador Baggerly, certify that; I am employed by Archer Directional Drilling Services; that I did on the day(s) of 01/14/13 through 01/17/13 and 01/20/13 through 01/28/13, conduct or supervise the taking of MWD surveys; **Original Hole:** from a depth of 413 feet to a depth of 2215 feet; **Lateral:** from a depth of 7138 feet to a depth of 12113 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Archer Directional Drilling Services; that I am authorized and qualified to make this report; that these surveys were conducted at the request of COG Operating, LLC for the MunnyNThaBank State 2H (API # 30-015-40468), Well located 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 Archer Directional Drilling Services.

A handwritten signature in black ink, appearing to be "A Baggerly", written over a horizontal line.

Amador Baggerly
MWD Coordinator



Company: COG Operating, LLC

Job Number:

04039-433-21

Calculation Method

Minimum Curvature

Well: MunnyNThaBank State 2H

Mag Decl.:

7.59

Proposed Azimuth

179.7

Location: Eddy County, New Mexico

Dir Driller:

Levi Galvin

Depth Reference

KBG

Rig: Patriot 2

MWD Eng:

Geo Davila

Tie Into: Assumed Vertical

Job Date: 01/14/13-01/17/13

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Direction Azimuth			
Tie In	298.00	3.3	174.7	0	298	0	0.00	0	0.00	0.00	0	0	0
1	413	2.0	153.0	115	412.88	5.09	5.08 S	1.22 E	5.23	166.54	1.41	-1.13	-18.87
2	498	2.1	158.9	85	497.82	7.87	7.86 S	2.45 E	8.23	162.68	0.27	0.12	6.94
3	584	1.0	121.1	86	583.79	9.73	9.72 S	3.66 E	10.38	159.36	1.68	-1.28	-43.95
4	671	0.8	102.1	87	670.78	10.26	10.24 S	4.90 E	11.35	154.40	0.41	-0.23	-21.84
5	766	1.1	121.2	95	765.77	10.88	10.85 S	6.33 E	12.56	149.72	0.46	0.32	20.11
6	861	1.0	122.6	95	860.75	11.80	11.77 S	7.81 E	14.12	146.42	0.11	-0.11	1.47
7	956	0.8	127.4	95	955.74	12.66	12.62 S	9.04 E	15.52	144.39	0.22	-0.21	5.05
8	1051	1.0	128.9	95	1050.73	13.59	13.54 S	10.21 E	16.96	142.98	0.21	0.21	1.58
9	1146	0.9	146.2	95	1145.72	14.73	14.68 S	11.27 E	18.51	142.49	0.32	-0.11	18.21
10	1241	1.2	159.7	95	1240.70	16.29	16.23 S	12.03 E	20.20	143.46	0.41	0.32	14.21
11	1336	1.6	166.6	95	1335.67	18.52	18.46 S	12.68 E	22.39	145.51	0.46	0.42	7.26
12	1431	1.8	166.1	95	1430.63	21.26	21.19 S	13.35 E	25.05	147.80	0.21	0.21	-0.53
13	1526	2.5	138.5	95	1525.56	24.27	24.19 S	15.08 E	28.51	148.07	1.30	0.74	-29.05
14	1621	3.0	106.5	95	1620.46	26.54	26.45 S	18.84 E	32.47	144.55	1.67	0.53	-33.68
15	1716	2.3	97.3	95	1715.36	27.51	27.40 S	23.11 E	35.85	139.86	0.86	-0.74	-9.68
16	1811	2.4	96.9	95	1810.28	28.01	27.88 S	26.98 E	38.80	135.95	0.11	0.11	-0.42
17	1907	1.8	86.4	96	1906.21	28.17	28.03 S	30.48 E	41.41	132.60	0.74	-0.63	-10.94
18	2002	2.5	81.4	95	2001.15	27.79	27.63 S	34.01 E	43.82	129.08	0.76	0.74	-5.26
19	2097	2.2	86.8	95	2096.07	27.39	27.21 S	37.88 E	46.64	125.69	0.39	-0.32	5.68
20	2164	1.5	83.5	67	2163.03	27.23	27.04 S	40.04 E	48.32	124.04	1.06	-1.04	-4.93
Proj.	2215	1.5	83.5	51	2214.01	27.09	26.89 S	41.36 E	49.34	123.03	0.00	0.00	0.00

Archer

COG Operating, LLC

Eddy County(NM27E)

Sec.34-T24S-R27E

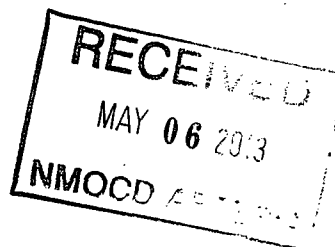
MunnyNThaBank State #2H

Wellbore #1

Design: Wellbore #1

Standard Survey Report

28 January, 2013



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well MunnyNThaBank State #2H
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3238.00usft (Original Well Elev)
Site:	Sec.34-T24S-R27E	MD Reference:	WELL @ 3238.00usft (Original Well Elev)
Well:	MunnyNThaBank State #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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.34-T24S-R27E			
Site Position:		Northing:	429,284.500 usft	Latitude:	32° 10' 48.443 N
From:	Map	Easting:	548,480.100 usft	Longitude:	104° 10' 35.890 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.08 °

Well	MunnyNThaBank State #2H					
Well Position	+N/-S	0.00 usft	Northing:	429,284.500 usft	Latitude:	32° 10' 48.443 N
	+E/-W	0.00 usft	Easting:	548,480.100 usft	Longitude:	104° 10' 35.890 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,221.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2013/01/02	7.67	60.00	48,369

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
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	179.73

Survey Program	Date	2013/01/28			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.00	6,500.00	VES Gyro (Wellbore #1)	MWD	MWD - Standard	
6,603.00	12,113.00	Archer MWD Survey (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.67	146.95	100.00	-0.49	0.32	0.49	0.67	0.67	0.00	
200.00	1.70	154.00	199.98	-2.31	1.29	2.32	1.04	1.03	7.05	
300.00	3.01	164.90	299.89	-6.18	2.62	6.19	1.38	1.31	10.90	
400.00	1.94	165.50	399.79	-10.36	3.73	10.37	1.07	-1.07	0.60	
500.00	2.02	149.36	499.74	-13.51	5.05	13.53	0.56	0.08	-16.14	
600.00	0.79	127.14	599.70	-15.44	6.50	15.47	1.32	-1.23	-22.22	
700.00	0.68	116.93	699.70	-16.13	7.58	16.16	0.17	-0.11	-10.21	
800.00	1.00	109.45	799.68	-16.69	8.93	16.73	0.34	0.32	-7.48	
900.00	0.97	129.29	899.67	-17.51	10.41	17.56	0.34	-0.03	19.84	
1,000.00	1.10	130.98	999.65	-18.68	11.79	18.74	0.13	0.13	1.69	
1,100.00	0.94	152.97	1,099.64	-20.04	12.89	20.10	0.42	-0.16	21.99	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well MunnyNThaBank State #2H
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3238.00usft (Original Well Elev)
Site:	Sec.34-T24S-R27E	MD Reference:	WELL @ 3238.00usft (Original Well Elev)
Well:	MunnyNThaBank State #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)	
1,200.00	1.03	143.94	1,199.62	-21.50	13.79	21.56	0.18	0.09	-9.03	
1,300.00	1.30	164.49	1,299.60	-23.32	14.62	23.39	0.49	0.27	20.55	
1,400.00	1.49	150.74	1,399.57	-25.54	15.56	25.62	0.38	0.19	-13.75	
1,500.00	2.08	149.03	1,499.53	-28.23	17.13	28.32	0.59	0.59	-1.71	
1,600.00	2.72	130.68	1,599.44	-31.34	19.86	31.43	0.99	0.64	-18.35	
1,700.00	2.47	113.49	1,699.34	-33.74	23.64	33.85	0.81	-0.25	-17.19	
1,800.00	2.14	100.01	1,799.26	-34.93	27.45	35.06	0.63	-0.33	-13.48	
1,900.00	1.97	88.62	1,899.19	-35.21	31.01	35.36	0.44	-0.17	-11.39	
2,000.00	2.31	87.34	1,999.12	-35.07	34.74	35.24	0.34	0.34	-1.28	
2,100.00	2.19	87.23	2,099.05	-34.89	38.66	35.07	0.12	-0.12	-0.11	
2,200.00	1.17	88.48	2,199.00	-34.77	41.59	34.97	1.02	-1.02	1.25	
2,300.00	0.70	88.45	2,298.99	-34.73	43.22	34.93	0.47	-0.47	-0.03	
2,400.00	0.53	81.88	2,398.98	-34.64	44.29	34.85	0.18	-0.17	-6.57	
2,500.00	0.53	60.46	2,498.98	-34.35	45.15	34.56	0.20	0.00	-21.42	
2,600.00	0.71	56.17	2,598.97	-33.78	46.07	34.00	0.19	0.18	-4.29	
2,700.00	0.61	41.11	2,698.97	-33.03	46.93	33.25	0.20	-0.10	-15.06	
2,800.00	0.52	40.62	2,798.96	-32.29	47.58	32.51	0.09	-0.09	-0.49	
2,900.00	0.46	42.46	2,898.96	-31.64	48.14	31.87	0.06	-0.06	1.84	
3,000.00	0.11	109.17	2,998.96	-31.38	48.51	31.61	0.43	-0.35	66.71	
3,100.00	0.07	282.87	3,098.96	-31.40	48.54	31.63	0.18	-0.04	173.70	
3,200.00	0.25	274.04	3,198.96	-31.37	48.26	31.60	0.18	0.18	-8.83	
3,300.00	0.37	278.36	3,298.95	-31.31	47.72	31.53	0.12	0.12	4.32	
3,400.00	0.29	275.42	3,398.95	-31.24	47.15	31.46	0.08	-0.08	-2.94	
3,500.00	0.31	290.17	3,498.95	-31.12	46.65	31.34	0.08	0.02	14.75	
3,600.00	0.14	270.37	3,598.95	-31.02	46.27	31.24	0.18	-0.17	-19.80	
3,700.00	0.21	331.42	3,698.95	-30.86	46.06	31.08	0.19	0.07	61.05	
3,800.00	0.43	318.39	3,798.95	-30.42	45.72	30.64	0.23	0.22	-13.03	
3,900.00	0.34	276.51	3,898.95	-30.11	45.18	30.32	0.29	-0.09	-41.88	
4,000.00	0.35	267.28	3,998.94	-30.09	44.58	30.30	0.06	0.01	-9.23	
4,100.00	0.30	252.74	4,098.94	-30.18	44.02	30.39	0.10	-0.05	-14.54	
4,200.00	0.34	233.49	4,198.94	-30.43	43.54	30.64	0.11	0.04	-19.25	
4,300.00	0.47	206.43	4,298.94	-30.98	43.11	31.18	0.23	0.13	-27.06	
4,400.00	0.67	189.92	4,398.93	-31.92	42.83	32.13	0.26	0.20	-16.51	
4,500.00	0.72	184.11	4,498.93	-33.12	42.69	33.33	0.09	0.05	-5.81	
4,600.00	0.46	182.41	4,598.92	-34.15	42.62	34.35	0.26	-0.26	-1.70	
4,700.00	0.70	177.24	4,698.92	-35.16	42.64	35.37	0.25	0.24	-5.17	
4,800.00	0.76	202.22	4,798.91	-36.39	42.41	36.59	0.32	0.06	24.98	
4,900.00	0.71	172.70	4,898.90	-37.62	42.24	37.82	0.38	-0.05	-29.52	
5,000.00	0.79	187.06	4,998.89	-38.91	42.24	39.12	0.20	0.08	14.36	
5,100.00	0.50	217.79	5,098.89	-39.94	41.88	40.14	0.44	-0.29	30.73	
5,200.00	0.64	214.46	5,198.88	-40.75	41.30	40.94	0.14	0.14	-3.33	
5,300.00	0.80	209.59	5,298.87	-41.82	40.64	42.01	0.17	0.16	-4.87	
5,400.00	0.86	216.60	5,398.86	-43.03	39.85	43.22	0.12	0.06	7.01	
5,500.00	0.90	210.93	5,498.85	-44.30	39.00	44.49	0.10	0.04	-5.67	
5,600.00	0.96	199.92	5,598.84	-45.76	38.31	45.95	0.19	0.06	-11.01	
5,700.00	1.14	198.30	5,698.82	-47.50	37.71	47.67	0.18	0.18	-1.62	
5,800.00	1.63	201.57	5,798.79	-49.76	36.88	49.94	0.50	0.49	3.27	
5,900.00	1.74	202.42	5,898.75	-52.49	35.77	52.66	0.11	0.11	0.85	
6,000.00	1.63	210.90	5,998.70	-55.11	34.46	55.28	0.27	-0.11	8.48	
6,100.00	1.86	211.30	6,098.66	-57.72	32.89	57.88	0.23	0.23	0.40	
6,200.00	1.81	230.93	6,198.61	-60.10	30.82	60.25	0.63	-0.05	19.63	
6,300.00	1.74	230.82	6,298.56	-62.06	28.42	62.19	0.07	-0.07	-0.11	
6,400.00	2.03	231.50	6,398.51	-64.12	25.86	64.24	0.29	0.29	0.68	
Tie on to VES										

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well MunnyNThaBank State #2H
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3238.00usft (Original Well Elev)
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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)
6,500.00	2.50	224.90	6,498.43	-66.77	22.93	66.87	0.54	0.47	-6.60
First Archer Survey									
6,603.00	1.87	220.99	6,601.35	-69.62	20.24	69.72	0.63	-0.62	-3.79
7,044.00	1.10	82.50	7,042.28	-74.49	19.73	74.58	0.63	-0.17	-31.40
7,138.00	1.30	63.50	7,136.26	-73.90	21.58	74.00	0.47	0.21	-20.21
7,170.00	1.10	63.10	7,168.25	-73.60	22.18	73.70	0.63	-0.62	-1.25
7,201.00	1.00	240.10	7,199.25	-73.60	22.21	73.70	6.77	-0.32	570.97
7,233.00	4.10	197.10	7,231.22	-74.83	21.63	74.93	10.74	9.69	-134.37
7,264.00	7.60	185.80	7,262.05	-77.93	21.10	78.03	11.83	11.29	-36.45
7,295.00	9.90	173.40	7,292.69	-82.62	21.20	82.72	9.56	7.42	-40.00
7,327.00	13.00	172.50	7,324.05	-88.92	21.98	89.02	9.70	9.69	-2.81
7,359.00	15.00	170.80	7,355.10	-96.58	23.11	96.68	6.38	6.25	-5.31
7,391.00	17.00	173.30	7,385.86	-105.31	24.32	105.43	6.61	6.25	7.81
7,423.00	20.00	177.20	7,416.20	-115.43	25.14	115.54	10.14	9.37	12.19
7,454.00	24.00	176.90	7,444.94	-127.02	25.74	127.14	12.91	12.90	-0.97
7,486.00	28.40	177.90	7,473.65	-141.13	26.37	141.25	13.82	13.75	3.12
7,517.00	32.40	179.20	7,500.38	-156.81	26.75	156.93	13.08	12.90	4.19
7,549.00	36.40	179.80	7,526.78	-174.88	26.91	175.01	12.54	12.50	1.87
7,580.00	40.70	180.10	7,551.02	-194.20	26.92	194.32	13.88	13.87	0.97
7,612.00	45.50	179.90	7,574.37	-216.06	26.92	216.18	15.01	15.00	-0.62
7,644.00	50.50	180.00	7,595.78	-239.83	26.94	239.95	15.63	15.62	0.31
7,676.00	56.00	179.70	7,614.92	-265.46	27.01	265.58	17.20	17.19	-0.94
7,707.00	61.60	179.80	7,630.97	-291.96	27.13	292.09	18.07	18.06	0.32
7,739.00	67.00	179.70	7,644.84	-320.79	27.25	320.91	16.88	16.87	-0.31
7,771.00	72.50	179.60	7,655.91	-350.80	27.44	350.92	17.19	17.19	-0.31
7,788.00	75.00	179.60	7,660.67	-367.12	27.55	367.24	14.71	14.71	0.00
7,819.00	79.10	179.90	7,667.62	-397.32	27.68	397.45	13.26	13.23	0.97
7,851.00	82.90	180.10	7,672.62	-428.92	27.68	429.05	11.89	11.87	0.62
7,883.00	86.20	180.00	7,675.66	-460.77	27.65	460.90	10.32	10.31	-0.31
7,915.00	89.10	180.30	7,676.97	-492.74	27.57	492.87	9.11	9.06	0.94
7,947.00	91.00	180.60	7,676.94	-524.74	27.32	524.86	6.01	5.94	0.94
7,978.00	91.10	180.30	7,676.38	-555.73	27.08	555.86	1.02	0.32	-0.97
8,073.00	87.60	179.90	7,677.45	-650.71	26.91	650.83	3.71	-3.68	-0.42
8,168.00	87.30	180.60	7,681.68	-745.62	26.50	745.73	0.80	-0.32	0.74
8,263.00	87.30	180.00	7,686.16	-840.51	26.00	840.62	0.63	0.00	-0.63
8,390.00	89.70	181.10	7,689.48	-967.45	24.78	967.56	2.08	1.89	0.87
8,485.00	89.50	181.20	7,690.14	-1,062.43	22.87	1,062.52	0.24	-0.21	0.11
8,579.00	89.10	181.50	7,691.29	-1,156.39	20.66	1,156.48	0.53	-0.43	0.32
8,674.00	90.40	181.40	7,691.71	-1,251.36	18.25	1,251.43	1.37	1.37	-0.11
8,769.00	90.40	181.30	7,691.04	-1,346.33	16.02	1,346.39	0.11	0.00	-0.11
8,863.00	90.20	181.40	7,690.55	-1,440.30	13.80	1,440.35	0.24	-0.21	0.11
8,958.00	89.70	181.40	7,690.63	-1,535.28	11.48	1,535.31	0.53	-0.53	0.00
9,053.00	88.70	180.80	7,691.96	-1,630.25	9.66	1,630.28	1.23	-1.05	-0.63
9,148.00	87.70	180.70	7,694.94	-1,725.19	8.41	1,725.21	1.06	-1.05	-0.11
9,244.00	88.70	178.70	7,697.96	-1,821.14	8.92	1,821.16	2.33	1.04	-2.08
9,338.00	88.50	178.40	7,700.26	-1,915.08	11.30	1,915.11	0.38	-0.21	-0.32
9,433.00	88.10	178.80	7,703.07	-2,010.01	13.62	2,010.05	0.60	-0.42	0.42
9,528.00	89.60	178.40	7,704.98	-2,104.96	15.94	2,105.01	1.63	1.58	-0.42
9,623.00	90.20	177.80	7,705.15	-2,199.90	19.09	2,199.97	0.89	0.63	-0.63
9,718.00	90.20	177.70	7,704.82	-2,294.83	22.82	2,294.91	0.11	0.00	-0.11
9,813.00	90.80	178.80	7,703.99	-2,389.78	25.72	2,389.88	1.32	0.63	1.16
9,908.00	90.70	178.70	7,702.74	-2,484.75	27.79	2,484.85	0.15	-0.11	-0.11
10,003.00	92.40	180.10	7,700.17	-2,579.70	28.78	2,579.81	2.32	1.79	1.47
10,098.00	90.90	178.80	7,697.44	-2,674.66	29.70	2,674.77	2.09	-1.58	-1.37



Archer
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well MunnyNThaBank State #2H
Project:	Eddy County(NM27E)	TVD Reference:	WELL @ 3238.00usft (Original Well Elev)
Site:	Sec.34-T24S-R27E	MD Reference:	WELL @ 3238.00usft (Original Well Elev)
Well:	MunnyNThaBank State #2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)
10,193.00	89.10	180.60	7,697.44	-2,769.65	30.19	2,769.76	2.68	-1.89	1.89
10,288.00	88.50	181.10	7,699.43	-2,864.61	28.78	2,864.72	0.82	-0.63	0.53
10,383.00	88.30	181.50	7,702.08	-2,959.55	26.63	2,959.65	0.47	-0.21	0.42
10,478.00	87.50	181.70	7,705.56	-3,054.45	23.98	3,054.53	0.87	-0.84	0.21
10,574.00	88.30	182.20	7,709.08	-3,150.33	20.71	3,150.39	0.98	0.83	0.52
10,669.00	89.10	181.70	7,711.23	-3,245.25	17.48	3,245.30	0.99	0.84	-0.53
10,764.00	88.50	182.20	7,713.22	-3,340.17	14.25	3,340.20	0.82	-0.63	0.53
10,859.00	88.30	182.80	7,715.88	-3,435.04	10.11	3,435.05	0.67	-0.21	0.63
10,954.00	89.10	182.40	7,718.03	-3,529.92	5.80	3,529.91	0.94	0.84	-0.42
11,049.00	89.80	183.50	7,718.94	-3,624.79	0.91	3,624.75	1.37	0.74	1.16
11,144.00	90.70	183.50	7,718.53	-3,719.61	-4.89	3,719.55	0.95	0.95	0.00
11,239.00	89.60	182.40	7,718.28	-3,814.48	-9.78	3,814.39	1.64	-1.16	-1.16
11,334.00	89.10	182.00	7,719.36	-3,909.40	-13.42	3,909.30	0.67	-0.53	-0.42
11,429.00	88.40	182.40	7,721.43	-4,004.31	-17.07	4,004.18	0.85	-0.74	0.42
11,524.00	88.60	181.80	7,723.92	-4,099.21	-20.55	4,099.07	0.67	0.21	-0.63
11,619.00	89.50	180.40	7,725.49	-4,194.18	-22.37	4,194.03	1.75	0.95	-1.47
11,714.00	88.50	179.40	7,727.15	-4,289.16	-22.21	4,289.01	1.49	-1.05	-1.05
11,809.00	88.00	178.90	7,730.05	-4,384.11	-20.80	4,383.96	0.74	-0.53	-0.53
11,904.00	88.80	178.70	7,732.70	-4,479.05	-18.81	4,478.91	0.87	0.84	-0.21
11,999.00	89.60	178.40	7,734.03	-4,574.01	-16.41	4,573.88	0.90	0.84	-0.32
Last Archer Survey									
12,057.00	89.70	177.70	7,734.38	-4,631.97	-14.43	4,631.85	1.22	0.17	-1.21
Proj. to TD									
12,113.00	89.70	177.70	7,734.68	-4,687.93	-12.19	4,687.82	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,500.00	6,498.43	-66.77	22.93	Tie on to VES
6,603.00	6,601.35	-69.62	20.24	First Archer Survey
12,057.00	7,734.38	-4,631.97	-14.43	Last Archer Survey
12,113.00	7,734.68	-4,687.93	-12.19	Proj. to TD

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County(NM27E)
Site: Sec.34-T24S-R27E
Well: MunnyNThaBank State #2H
Wellbore: Wellbore #1
Design: Design #2
Lat: 32° 10' 48.443 N
Long: 104° 10' 35.890 W
GL: 3221.00
KB: WELL @ 3238.00usft (Original Well Elev)

Archer

SECTION DETAILS

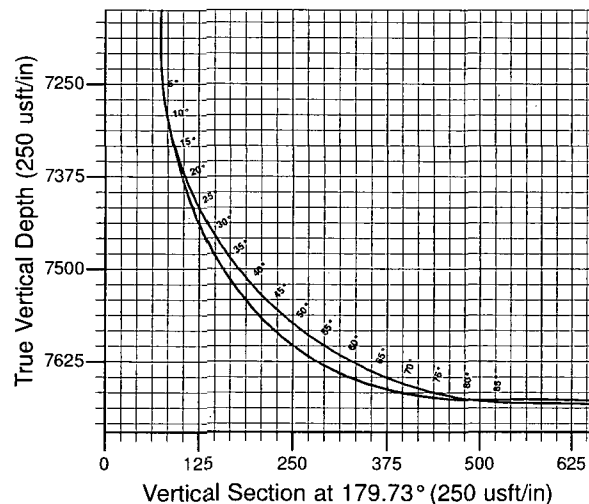
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
7044.00	1.10	82.50	7042.28	-74.49	19.73	0.00	0.00	74.58	Tie On - Hold to KOP
7204.02	1.10	82.50	7202.27	-74.09	22.78	0.00	0.00	74.20	KOP - Build 12°/100'
7949.57	89.32	180.12	7680.83	-545.90	30.81	12.00	97.63	546.04	EOC - Hold to TD
12092.37	89.32	180.12	7730.00	-4688.40	22.30	0.00	0.00	4688.45	TD at 12091.54

WELL DETAILS: MunnyNThaBank State #2H

+N/-S	+E/-W	Northing	Ground Level:	3221.00	Slot
0.00	0.00	429284.500	Easting	548480.100	
			Latitude	32° 10' 48.443 N	
			Longitude	104° 10' 35.890 W	

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
MunnyNThaBank State #2H PBHL	7730.00	-4688.40	22.30	32° 10' 2.044 N	104° 10' 35.710 W	Point



PROJECT DETAILS: Eddy County(NM27E)

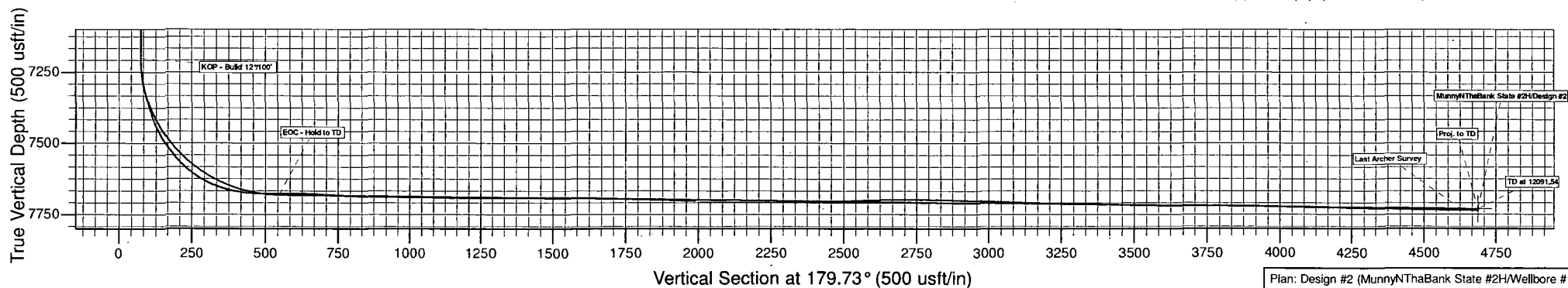
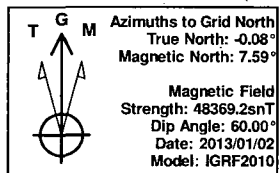
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

System Datum: Mean Sea Level

SITE DETAILS: Sec.34-T24S-R27E

Site Centre Latitude: 32° 10' 48.443 N
Longitude: 104° 10' 35.890 W

Positional Uncertainty: 0.00
Convergence: 0.08
Local North: Grid



Plan: Design #2 (MunnyNThaBank State #2H/Wellbore #1)
Created By: Dusty Moyer Date: 15:14, January 28 2013

