



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

30-015-40896

April 1, 2013

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

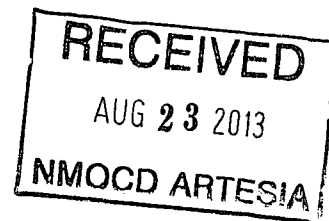
RE: McIntyre DK Federal #15
261' FSL & 2618' FWL
Sec. 17, T17S, R30E
Eddy County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

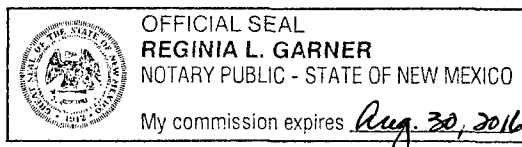
Very truly yours,

Eddie LaRue
Operations Manager



State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 1st day of April, 2013.

Regina L. Garner
Notary Public

Well Dossier 5693727 - MCINTYRE D.K. FEDERAL #15

Depth	Incl/Dev	Azm/Direc	TVD(ftKB)
104	0.70		
191	0.50		
280	1.10		
374	1.20		
524	1.40		
612	0.90		
1062	1.30		
1142	1.10	87.20	1141.94
1174	1.10	72.40	1173.93
1205	0.90	54.70	
1329	1.90	292.50	
1425	4.00	271.60	
1517	4.40	275.10	
1611	5.70	281.40	
1705	6.50	288.90	
1775	6.40	285.90	
1930	6.00	282.30	
2024	5.80	282.40	
2118	5.80	285.50	
2212	6.60	287.50	
2309	6.60	286.00	
2400	6.00	285.30	
2495	6.80	281.30	2488.94
2588	6.90	280.90	2581.28
2682	6.70	282.30	2674.62
2776	6.70	283.10	2767.98
2870	6.90	281.00	
2962	6.80	282.20	
3056	6.80	280.60	
3150	6.80	281.50	
3245	6.80	280.10	
3338	6.70	281.40	
3431	6.60	378.30	
3525	6.70	279.00	
3619	6.90	277.80	
3712	6.70	276.60	
3806	6.70	278.60	
3899	6.50	281.20	
4087	6.50	280.30	
4181	6.50	279.60	
4275	6.40	280.10	
4368	6.60	279.80	
4462	6.60	278.50	
4557	6.50	282.40	
4657	6.70	283.50	
4691	6.90	282.80	



COG Operating, LLC

Eddy County(NM27E)

Sec.17-T17S-R30E

McIntyre DK Federal #15

Wellbore #1

Design: Wellbore #1

Standard Survey Report

02 April, 2013

Archer

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well McIntyre DK Federal #15
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3672.00usft
Site:	Sec. 17-T17S-R30E	MD Reference:	WELL @ 3672.00usft
Well:	McIntyre DK Federal #15	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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. 17-T17S-R30E					
Site Position:		Northing:	665,262.200 usft	Latitude:	32° 49' 42.428 N
From:	Map	Easting:	601,988.900 usft	Longitude:	104° 0' 4.724 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.18 °

Well	McIntyre DK Federal #15					
Well Position	+N/-S	0.00 usft	Northing:	665,064.700 usft	Latitude:	32° 49' 40.400 N
	+E/-W	0.00 usft	Easting:	604,321.800 usft	Longitude:	103° 59' 37.391 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,655.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/20/13	7.61	60.63	48,755

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	281.98	

Survey Program		Date	03/31/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,041.00	Survey #1-VES Gyro (Wellbore #1)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
1,041.00	4,738.00	Survey #2-Archer MWD (Wellbore #1)	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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
First VES Survey									
100.00	0.17	259.62	100.00	-0.03	-0.15	0.14	0.17	0.17	0.00
200.00	0.35	274.23	200.00	-0.03	-0.60	0.58	0.19	0.18	14.61
300.00	0.63	253.90	300.00	-0.16	-1.43	1.36	0.33	0.28	-20.33
400.00	0.82	238.97	399.99	-0.68	-2.57	2.37	0.27	0.19	-14.93
500.00	1.09	244.92	499.97	-1.45	-4.05	3.66	0.29	0.27	5.95
600.00	0.93	269.63	599.96	-1.86	-5.72	5.21	0.46	-0.16	24.71
700.00	0.52	258.03	699.95	-1.96	-6.97	6.41	0.43	-0.41	-11.60
800.00	0.27	338.67	799.95	-1.84	-7.50	6.96	0.55	-0.25	80.64
900.00	0.37	90.74	899.95	-1.62	-7.27	6.77	0.53	0.10	112.07
1,000.00	0.77	78.94	999.94	-1.50	-6.28	5.84	0.41	0.40	-11.80

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well McIntyre DK Federal #15
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3672.00usft
Site:	Sec. 17-T17S-R30E	MD Reference:	WELL @ 3672.00usft
Well:	McIntyre DK Federal #15	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
Tie-In / VES Survey									
1,041.00	0.95	81.38	1,040.94	-1.39	-5.68	5.26	0.45	0.44	5.95
First Archer Survey									
1,142.00	1.10	87.20	1,141.92	-1.22	-3.88	3.54	0.18	0.15	5.76
1,236.00	0.90	1.50	1,235.91	-0.44	-2.96	2.81	1.46	-0.21	-91.17
1,329.00	1.90	292.50	1,328.89	0.88	-4.37	4.45	1.92	1.08	-74.19
1,424.00	4.00	271.60	1,423.76	1.58	-9.13	9.26	2.45	2.21	-22.00
1,517.00	4.40	275.10	1,516.51	1.99	-15.93	15.99	0.51	0.43	3.76
1,611.00	5.70	281.40	1,610.14	3.23	-24.10	24.24	1.50	1.38	6.70
1,705.00	6.50	288.90	1,703.61	5.87	-33.71	34.19	1.20	0.85	7.98
1,775.00	6.40	285.90	1,773.17	8.23	-41.21	42.02	0.50	-0.14	-4.29
1,837.00	6.30	284.80	1,834.79	10.04	-47.82	48.86	0.25	-0.16	-1.77
1,930.00	6.00	282.30	1,927.25	12.38	-57.50	58.82	0.43	-0.32	-2.69
2,024.00	5.80	282.40	2,020.75	14.45	-66.94	68.48	0.21	-0.21	0.11
2,119.00	5.80	285.50	2,115.27	16.76	-76.26	78.07	0.33	0.00	3.26
2,212.00	6.60	287.50	2,207.72	19.62	-85.88	88.08	0.89	0.86	2.15
2,307.00	6.60	286.00	2,302.09	22.77	-96.34	98.96	0.18	0.00	-1.58
2,400.00	6.00	285.30	2,394.53	25.53	-106.16	109.15	0.65	-0.65	-0.75
2,495.00	6.80	281.30	2,488.94	27.94	-116.47	119.73	0.96	0.84	-4.21
2,588.00	6.90	280.90	2,581.28	30.07	-127.35	130.82	0.12	0.11	-0.43
2,682.00	6.70	282.60	2,674.62	32.34	-138.25	141.95	0.30	-0.21	1.81
2,776.00	6.70	283.10	2,767.97	34.78	-148.94	152.91	0.06	0.00	0.53
2,870.00	6.90	281.00	2,861.31	37.10	-159.82	164.04	0.34	0.21	-2.23
2,962.00	6.80	282.20	2,952.66	39.30	-170.57	175.01	0.19	-0.11	1.30
3,056.00	6.80	280.60	3,045.99	41.50	-181.48	186.14	0.20	0.00	-1.70
3,150.00	6.80	281.50	3,139.33	43.64	-192.40	197.27	0.11	0.00	0.96
3,245.00	6.80	280.10	3,233.66	45.74	-203.45	208.52	0.17	0.00	-1.47
3,338.00	6.70	281.40	3,326.02	47.78	-214.19	219.44	0.20	-0.11	1.40
3,431.00	6.60	278.30	3,418.39	49.63	-224.80	230.20	0.40	-0.11	-3.33
3,525.00	6.70	279.00	3,511.76	51.26	-235.56	241.07	0.14	0.11	0.74
3,618.00	6.90	277.80	3,604.11	52.87	-246.45	252.06	0.26	0.22	-1.29
3,712.00	6.70	276.60	3,697.45	54.27	-257.49	263.15	0.26	-0.21	-1.28
3,806.00	6.70	278.70	3,790.81	55.73	-268.36	274.08	0.26	0.00	2.23
3,899.00	6.50	281.20	3,883.19	57.57	-278.89	284.76	0.38	-0.22	2.69
3,993.00	6.50	281.50	3,976.58	59.66	-289.32	295.40	0.04	0.00	0.32
4,087.00	6.50	280.30	4,069.98	61.68	-299.77	306.04	0.14	0.00	-1.28
4,181.00	6.50	279.60	4,163.38	63.51	-310.25	316.68	0.08	0.00	-0.74
4,276.00	6.40	280.10	4,257.77	65.34	-320.76	327.34	0.12	-0.11	0.53
4,368.00	6.60	279.80	4,349.18	67.14	-331.02	337.75	0.22	0.22	-0.33
4,462.00	6.60	278.50	4,442.56	68.86	-341.69	348.54	0.16	0.00	-1.38
4,557.00	6.50	282.40	4,536.94	70.82	-352.34	359.37	0.48	-0.11	4.11
4,651.00	6.70	283.50	4,630.32	73.24	-362.87	370.17	0.25	0.21	1.17
Last Archer Survey									
4,691.00	6.90	282.80	4,670.04	74.32	-367.48	374.90	0.54	0.50	-1.75
PTB									
4,738.00	6.90	282.80	4,716.70	75.57	-372.99	380.55	0.00	0.00	0.00

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well McIntyre DK Federal #15
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3672.00usft
Site:	Sec. 17-T17S-R30E	MD Reference:	WELL @ 3672.00usft
Well:	McIntyre DK Federal #15	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	-0.03	-0.15	First VES Survey
1,041.00	1,040.94	-1.39	-5.68	Tie-In / VES Survey
1,142.00	1,141.92	-1.22	-3.88	First Archer Survey
4,691.00	4,670.04	74.32	-367.48	Last Archer Survey
4,738.00	4,716.70	75.57	-372.99	PTB

Checked By: _____	Approved By: _____	Date: _____
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COG Operating, LLC

Eddy County(NM27E)

Sec.17-T17S-R30E

McIntyre DK Federal #15

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

03 April, 2013

Archer

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well McIntyre DK Federal #15
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3672.00usft
Site:	Sec 17-T17S-R30E	MD Reference:	WELL @ 3672.00usft
Well:	McIntyre DK Federal #15	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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 17-T17S-R30E		
Site Position:		Northing:	665,262.200 usft
From:	Map	Easting:	601,988.900 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 49' 42.428 N
		Longitude:	104° 0' 4.724 W
		Grid Convergence:	0.18 °

Well:	McIntyre DK Federal #15		
Well Position	+N-S	0.00 usft	Northing: 665,064.700 usft
	+E-W	0.00 usft	Easting: 604,321.800 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 40.400 N
		Longitude:	103° 59' 37.391 W
		Ground Level:	3,655.00 usft

Wellbore					
Wellbore #1					
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2013/03/20	7.61	60.63	48,755

Design: Wellbore #1				
Audit Notes:				
Version: 1.0		Phase: ACTUAL		Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.00	0.00	0.00	281.98

Survey Program	Date	2013/04/03		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.00	1,041.00	Survey #1-VES Gyro (Wellbore #1)	GYD_DP_MS	Gyrodata gyro-compassing and drop
1,041.00	4,738.00	Survey #2-Archer MWD (Wellbore #1)	MWD	MWD - Standard

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well McIntyre-DK Federal #15
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3672.00usft
Site:	Sec. 17-T17S-R30E	MD Reference:	WELL @ 3672.00usft
Well:	McIntyre-DK Federal #15	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	665,064.700	604,321.800	32° 49' 40.400 N	103° 59' 37.391 W
First VES Survey									
100.00	0.17	259.62	100.00	-0.03	-0.15	665,064.673	604,321.654	32° 49' 40.400 N	103° 59' 37.392 W
200.00	0.35	274.23	200.00	-0.03	-0.60	665,064.669	604,321.204	32° 49' 40.400 N	103° 59' 37.398 W
300.00	0.63	253.90	300.00	-0.16	-1.43	665,064.539	604,320.371	32° 49' 40.398 N	103° 59' 37.408 W
400.00	0.82	238.97	399.99	-0.68	-2.57	665,064.018	604,319.229	32° 49' 40.393 N	103° 59' 37.421 W
500.00	1.09	244.92	499.97	-1.45	-4.05	665,063.246	604,317.755	32° 49' 40.386 N	103° 59' 37.438 W
600.00	0.93	269.63	599.96	-1.86	-5.72	665,062.837	604,316.082	32° 49' 40.382 N	103° 59' 37.458 W
700.00	0.52	258.03	699.95	-1.96	-6.97	665,062.738	604,314.826	32° 49' 40.381 N	103° 59' 37.473 W
800.00	0.27	338.67	799.95	-1.84	-7.50	665,062.863	604,314.297	32° 49' 40.382 N	103° 59' 37.479 W
900.00	0.37	90.74	899.95	-1.62	-7.27	665,063.079	604,314.534	32° 49' 40.384 N	103° 59' 37.476 W
1,000.00	0.77	78.94	999.94	-1.50	-6.28	665,063.203	604,315.516	32° 49' 40.385 N	103° 59' 37.464 W
Tie-In / VES Survey									
1,041.00	0.95	81.38	1,040.94	-1.39	-5.68	665,063.307	604,316.123	32° 49' 40.386 N	103° 59' 37.457 W
First Archer Survey									
1,142.00	1.10	87.20	1,141.92	-1.22	-3.88	665,063.480	604,317.919	32° 49' 40.388 N	103° 59' 37.436 W
1,236.00	0.90	1.50	1,235.91	-0.44	-2.96	665,064.262	604,318.839	32° 49' 40.396 N	103° 59' 37.425 W
1,329.00	1.90	292.50	1,328.89	0.88	-4.37	665,065.582	604,317.434	32° 49' 40.409 N	103° 59' 37.442 W
1,424.00	4.00	271.60	1,423.76	1.58	-9.13	665,066.278	604,312.666	32° 49' 40.416 N	103° 59' 37.498 W
1,517.00	4.40	275.10	1,516.51	1.99	-15.93	665,066.685	604,305.870	32° 49' 40.420 N	103° 59' 37.577 W
1,611.00	5.70	281.40	1,610.14	3.23	-24.10	665,067.929	604,297.703	32° 49' 40.433 N	103° 59' 37.673 W
1,705.00	6.50	288.90	1,703.61	5.87	-33.71	665,070.575	604,288.093	32° 49' 40.459 N	103° 59' 37.786 W
1,775.00	6.40	285.90	1,773.17	8.23	-41.21	665,072.927	604,280.592	32° 49' 40.483 N	103° 59' 37.873 W
1,837.00	6.30	284.80	1,834.79	10.04	-47.82	665,074.743	604,273.980	32° 49' 40.501 N	103° 59' 37.951 W
1,930.00	6.00	282.30	1,927.25	12.38	-57.50	665,077.082	604,264.297	32° 49' 40.524 N	103° 59' 38.064 W
2,024.00	5.80	282.40	2,020.75	14.45	-66.94	665,079.148	604,254.858	32° 49' 40.545 N	103° 59' 38.175 W
2,119.00	5.80	285.50	2,115.27	16.76	-76.26	665,081.462	604,245.545	32° 49' 40.568 N	103° 59' 38.284 W
2,212.00	6.60	287.50	2,207.72	19.62	-85.88	665,084.325	604,235.919	32° 49' 40.597 N	103° 59' 38.396 W
2,307.00	6.60	286.00	2,302.09	22.77	-96.34	665,087.471	604,225.464	32° 49' 40.628 N	103° 59' 38.519 W
2,400.00	6.00	285.30	2,394.53	25.53	-106.16	665,090.227	604,215.638	32° 49' 40.656 N	103° 59' 38.634 W
2,495.00	6.80	281.30	2,488.94	27.94	-116.47	665,092.639	604,205.334	32° 49' 40.680 N	103° 59' 38.755 W
2,588.00	6.90	280.90	2,581.28	30.07	-127.35	665,094.774	604,194.449	32° 49' 40.702 N	103° 59' 38.882 W
2,682.00	6.70	282.60	2,674.62	32.34	-138.25	665,097.038	604,183.553	32° 49' 40.724 N	103° 59' 39.010 W
2,776.00	6.70	283.10	2,767.97	34.78	-148.94	665,099.477	604,172.861	32° 49' 40.749 N	103° 59' 39.135 W
2,870.00	6.90	281.00	2,861.31	37.10	-159.82	665,101.798	604,161.977	32° 49' 40.772 N	103° 59' 39.262 W
2,962.00	6.80	282.20	2,952.66	39.30	-170.57	665,104.003	604,151.229	32° 49' 40.794 N	103° 59' 39.388 W
3,056.00	6.80	280.60	3,045.99	41.50	-181.48	665,106.203	604,140.319	32° 49' 40.816 N	103° 59' 39.516 W
3,150.00	6.80	281.50	3,139.33	43.64	-192.40	665,108.336	604,129.396	32° 49' 40.838 N	103° 59' 39.644 W
3,245.00	6.80	280.10	3,233.66	45.74	-203.45	665,110.444	604,118.348	32° 49' 40.859 N	103° 59' 39.773 W
3,338.00	6.70	281.40	3,326.02	47.78	-214.19	665,112.481	604,107.609	32° 49' 40.880 N	103° 59' 39.899 W
3,431.00	6.60	278.30	3,418.39	49.63	-224.80	665,114.325	604,097.002	32° 49' 40.898 N	103° 59' 40.023 W
3,525.00	6.70	279.00	3,511.76	51.26	-235.56	665,115.963	604,086.241	32° 49' 40.915 N	103° 59' 40.149 W
3,618.00	6.90	277.80	3,604.11	52.87	-246.45	665,117.570	604,075.348	32° 49' 40.931 N	103° 59' 40.277 W
3,712.00	6.70	276.60	3,697.45	54.27	-257.49	665,118.966	604,064.306	32° 49' 40.945 N	103° 59' 40.406 W
3,806.00	6.70	278.70	3,790.81	55.73	-268.36	665,120.426	604,053.439	32° 49' 40.960 N	103° 59' 40.534 W
3,899.00	6.50	281.20	3,883.19	57.57	-278.89	665,122.269	604,042.912	32° 49' 40.978 N	103° 59' 40.657 W
3,993.00	6.50	281.50	3,976.58	59.66	-289.32	665,124.363	604,032.479	32° 49' 40.999 N	103° 59' 40.779 W
4,087.00	6.50	280.30	4,069.98	61.68	-299.77	665,126.375	604,022.031	32° 49' 41.020 N	103° 59' 40.902 W
4,181.00	6.50	279.60	4,163.38	63.51	-310.25	665,128.214	604,011.550	32° 49' 41.038 N	103° 59' 41.024 W
4,276.00	6.40	280.10	4,257.77	65.34	-320.76	665,130.039	604,001.035	32° 49' 41.057 N	103° 59' 41.147 W
4,368.00	6.60	279.80	4,349.18	67.14	-331.02	665,131.838	603,990.777	32° 49' 41.075 N	103° 59' 41.268 W
4,462.00	6.60	278.50	4,442.56	68.86	-341.69	665,133.556	603,980.111	32° 49' 41.092 N	103° 59' 41.393 W
4,557.00	6.50	282.40	4,536.94	70.82	-352.34	665,135.518	603,969.460	32° 49' 41.112 N	103° 59' 41.517 W
4,651.00	6.70	283.50	4,630.32	73.24	-362.87	665,137.941	603,958.932	32° 49' 41.136 N	103° 59' 41.641 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well McIntyre, DK Federal #15
Project:	Eddy County (NM27E)	TVD Reference:	WELL @ 3672.00usft
Site:	Sec. 17-T17S-R30E	MD Reference:	WELL @ 3672.00usft
Well:	McIntyre DK Federal #15	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
Last Archer Survey									
4,691.00	6.90	282.80	4,670.04	74.32	-367.48	665,139.018	603,954.320	32° 49' 41.147 N	103° 59' 41.695 W
PTB									
4,738.00	6.90	282.80	4,716.70	75.57	-372.99	665,140.269	603,948.813	32° 49' 41.160 N	103° 59' 41.759 W

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
100.00	100.00	-0.03	-0.15	First VES Survey	
1,041.00	1,040.94	-1.39	-5.68	Tie-In / VES Survey	
1,142.00	1,141.92	-1.22	-3.88	First Archer Survey	
4,691.00	4,670.04	74.32	-367.48	Last Archer Survey	
4,738.00	4,716.70	75.57	-372.99	PTB	

Checked By: _____	Approved By: _____	Date: _____
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COG Operating, LLC
Project: Eddy County(NM27E)
Site: Sec.17-117S-R30E
Well: McIntyre DK Federal #15
Wellbore: Wellbore #1
Design: Design #4
Latitude: 32° 49' 40.400 N
Longitude: 103° 59' 37.391 W
Ground Level: 3655.00
WELL @ 3672.00usft

Archer

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

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well McIntyre DK Federal #15, Grid North
Vertical (TVD) Reference: WELL @ 3672.00usft
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: WELL @ 3672.00usft
Calculation Method: Minimum Curvature

WELL DETAILS: McIntyre DK Federal #15

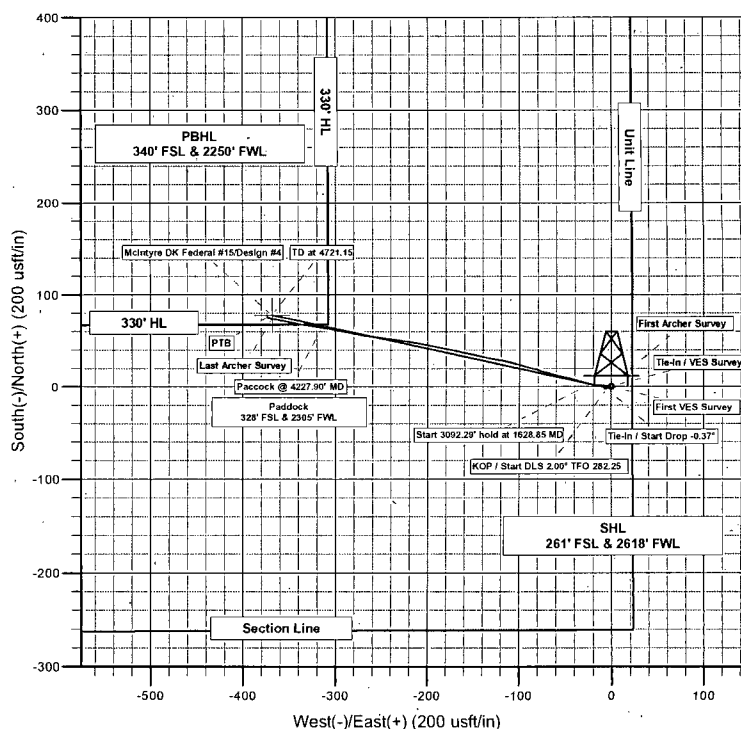
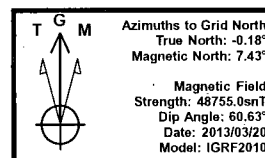
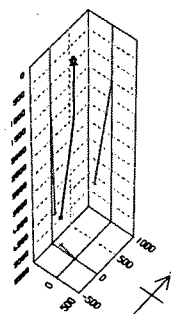
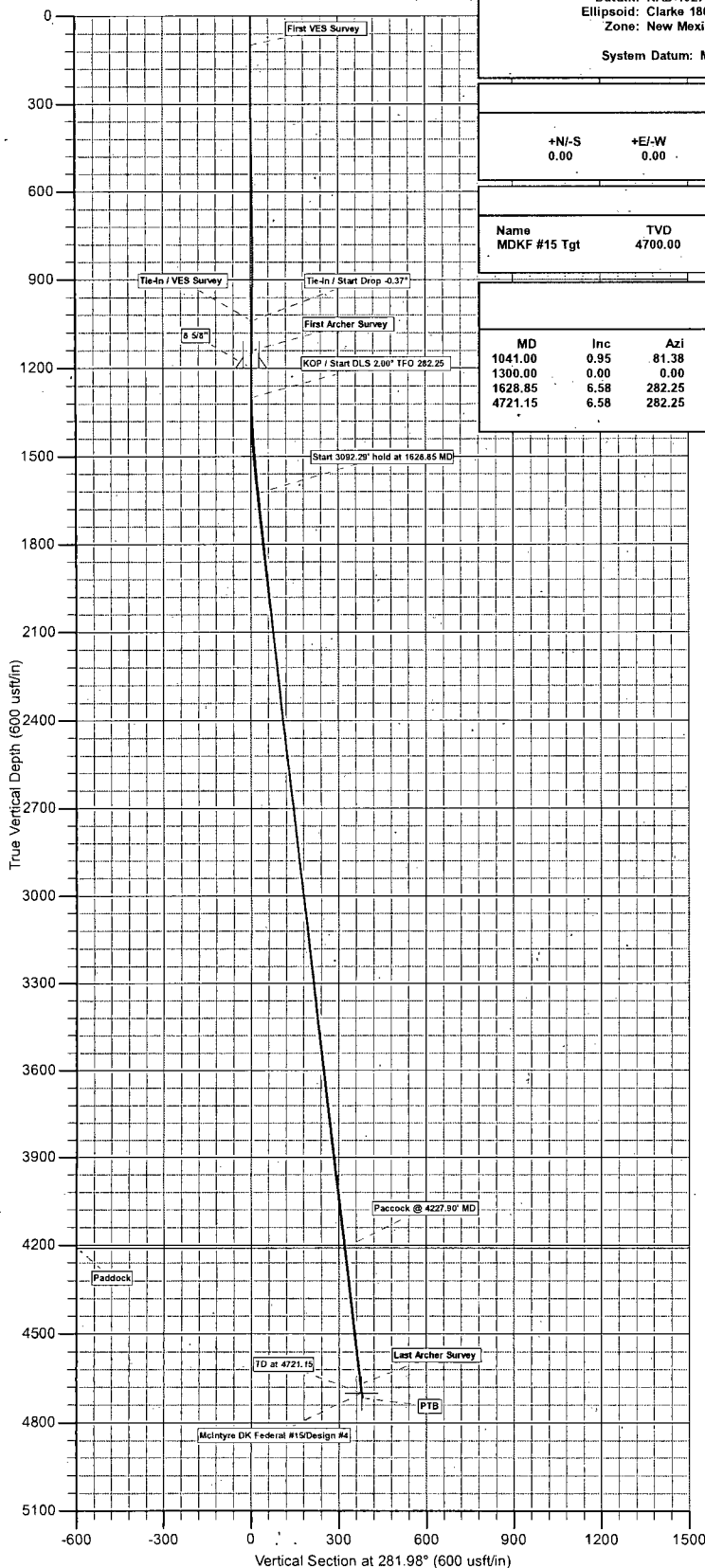
+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude	Slot
0.00	0.00	665064.700	3655.00	604321.800	32° 49' 40.400 N	103° 59' 37.391 W	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
MDKF #15 Tgt	4700.00	78.10	-368.10	665142.800	603953.700	32° 49' 41.184 N	103° 59' 41.702 W	Point

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1041.00	0.95	81.38	1040.94	-1.39	-5.68	0.00	0.00	5.26	Tie-In / Start Drop -0.37°
1300.00	0.00	0.00	1299.93	-1.07	-3.55	0.37	180.00	3.25	KOP / Start DLS 2.00° TFO 282.25
1628.85	6.58	282.25	1628.06	2.93	-21.98	2.00	282.25	22.11	Start 3092.29° hold at 1628.85 MD
4721.15	6.58	282.25	4700.00	78.10	-368.10	0.00	0.00	376.29	TD at 4721.15



Plan: Design #4 (McIntyre DK Federal #15/Wellbore #1)

Created By: Bret Wolford Date: 9:55, March 31 2013