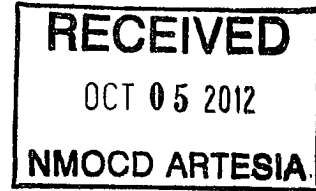


30-015-39521

OPERATOR _____ COG _____
 WELL/LEASE _____ Burch Keely 542 _____
 COUNTY _____ Eddy _____



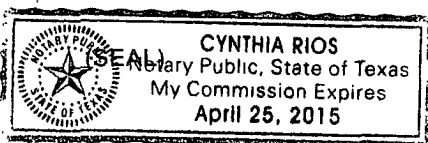
STATE OF NEW MEXICO
 DEVIATION REPORT

227	1.89
288	0.78
527	1.09
742	1.90
869	1.96
1059	1.75
1083	2.02
1147	1.67
1211	1.76
1274	1.49
1338	2.22
1528	4.43
1589	5.34
1747	4.84
1842	5.34
1937	4.63
2033	4.63
2128	5.28
2223	5.54
2319	5.17
2509	5.88
2604	5.57
2699	5.34
2794	5.35
2889	6.42
2985	6.42
3078	6.39
3174	6.51
3269	6.60
3364	5.79
3460	5.42
3554	5.30
3744	5.28
3839	4.28
3934	3.22
4028	1.87
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4313	0.26
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4613	0.48

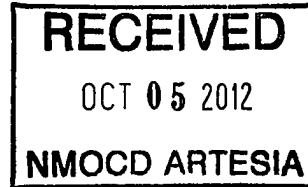
SIGNED BY: Ron Scandolari
 RON SCANDOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS
 COUNTY OF MIDLAND

ON THIS 11th DAY OF June, 2012, BEFORE ME, C RIOS, A NOTARY
 PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED
 THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.



Cynthia Rios
 NOTARY PUBLIC



COG Operating LLC

Eddy County, NM (NAD27 NME)

Burch Keely Unit #542

Burch Keely Unit #542

OH - Job #32D0512617

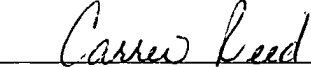
Design: Actual

SDI Standard Survey Report

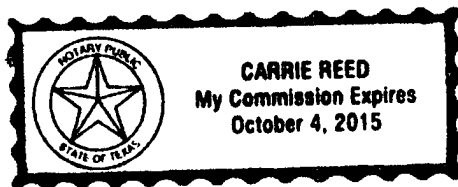
This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 15th of June, 2012.



Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keely Unit #542
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3641.00usft (Basic #35)
Site:	Burch Keely Unit #542	MD Reference:	RF @ 3641.00usft (Basic #35)
Well:	Burch Keely Unit #542	North Reference:	Grid
Wellbore:	OH - Job #32D0512617	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Project	Eddy County, NM (NAD27 NME)		
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	Burch Keely Unit #542			
Site Position:		Northing:	665,636 10 usft	Latitude: 32° 49' 46 299 N
From:	Map	Easting:	596,299 70 usft	Longitude: 104° 1' 11 385 W
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16"	Grid Convergence: 0 17 °

Well	Burch Keely Unit #542			
Well Position	+N/-S	0 00 usft	Northing:	665,636 10 usft
	+E/-W	0 00 usft	Easting:	596,299 70 usft
Position Uncertainty	0 00 usft	Wellhead Elevation:	usft	Ground Level: 3,629 00 usft

Wellbore	OH - Job #32D0512617				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2011/08/23	7 82	60 66	48,911

Design	Actual			
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	143 76

Survey Program	Date	2012/06/01		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 00	985 00	Gyro (OH - Job #32D0512617)	Keeper	Standard Wireline Keeper ver 1 0 2
1,083 00	4,663 00	MWD (OH - Job #32D0512617)	MWD	MWD - Standard

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
10 96	0 10	18 48	10 96	0 01	0 00	18 48	0 01	
West HL-BK #542								
100 00	0 94	18 48	100 00	0 78	0 26	18 48	0 82	
200 00	0 85	4 27	199 98	2 30	0 58	14 07	2 37	
300 00	0 71	4 78	299 97	3 65	0 68	10 58	3 72	
400 00	0 66	54 24	399 97	4 61	1 20	14 61	4 76	
500 00	0 70	42 12	499 96	5 40	2 08	21 06	5 78	
600 00	1 26	68 72	599 95	6 25	3 51	29 34	7 17	
700 00	1 62	63 67	699 91	7 27	5 80	38 58	9 31	
800 00	2 35	52 19	799 85	9 16	8 69	43 50	12 63	



Scientific Drilling International, Inc.
SDI Standard Survey Report



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Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3641.00usft (Basic #35)
Site:	Burch Keely Unit #542	MD Reference:	RF @ 3641 00usft (Basic #35)
Well:	Burch Keely Unit #542	North Reference:	Grid
Wellbore:	OH - Job #32D0512617	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
900 00	2 37	58 03	899 77	11 51	12 06	46 35	16 67	
985 00	2.37	57 03	984 70	13 40	15 03	48 29	20 13	
Gyro Tie-in								
1,083 00	2 02	60 11	1,082 62	15 36	18 23	49 88	23 84	
1,147 00	1 67	70 66	1,146 59	16 23	20 08	51 06	25 82	
1,211 00	1 76	109 24	1,210 57	16 22	21 89	53 47	27 24	
1,274 00	1 49	120 93	1,273 54	15 48	23 51	56 64	28 15	
1,338 00	2 22	149 44	1,337 51	13 98	24 85	60 64	28.52	
1,401 00	2 80	159 65	1,400 45	11 49	26 01	66 17	28 43	
1,464 00	3 28	158 73	1,463 36	8 37	27 20	72 90	28 45	
1,528 00	4 43	156 18	1,527 21	4 40	28 86	81 33	29 19	
1,589 00	5 34	151 40	1,587 99	-0 25	31 17	90 46	31 17	
1,652 00	5 63	147 03	1,650 70	-5.42	34 26	98 98	34 68	
1,747 00	4 84	150 21	1,745 31	-12 80	38 78	108 27	40 84	
1,842 00	5 34	145 85	1,839 93	-19 94	43 26	114 75	47 63	
1,937 00	4 63	142 85	1,934 57	-26 65	48 05	119 02	54 95	
2,033 00	4.62	153 49	2,030 26	-33.20	52 12	122 50	61 80	
2,128 00	5 28	151 78	2,124 91	-40 48	55 89	125 91	69 01	
2,223 00	5 54	153 27	2,219 48	-48 43	60 02	128 90	77 12	
2,319 00	5 17	149 12	2,315 06	-56 28	64 33	131 18	85 47	
2,414 00	6 07	152 41	2,409 61	-64 40	68 85	133 09	94 28	
2,509 00	5 88	148 68	2,504 09	-73 01	73 71	134 73	103 74	
2,604 00	5 57	148 67	2,598 62	-81 11	78 63	135 89	112 97	
2,699 00	5 34	146 01	2,693 19	-88 71	83 50	136 73	121 83	
2,794 00	5 35	149 70	2,787 77	-96 20	88.21	137 48	130 52	
2,889 00	6 42	149 41	2,882 27	-104 59	93 14	138 31	140 06	
2,985 00	6 42	149 50	2,977 67	-113.84	98 60	139 10	150 60	
3,078 00	6 39	148 65	3,070 09	-122 74	103 93	139 74	160 83	
3,174 00	6 51	146 42	3,165 48	-131 84	109.72	140 23	171 52	
3,269 00	6 60	145 63	3,259 86	-140 83	115 78	140 57	182.31	
3,364 00	5 79	148 83	3,354 30	-149.43	121 34	140 92	192 50	
3,460 00	5 42	148 44	3,449 85	-157 44	126 22	141 28	201 79	
3,554 00	5 30	147 35	3,543 43	-164 88	130 89	141 56	210 52	
3,649 00	5 23	149 61	3,638 03	-172 31	135 45	141 83	219 17	
3,744 00	5 28	147 39	3,732 63	-179.73	139 99	142 08	227 81	
3,839 00	4 28	153 71	3,827 30	-186.59	143 92	142 36	235 64	
3,934 00	3 22	151 08	3,922 10	-192 10	146 78	142 62	241 76	
4,028 00	1.87	154 83	4,016 00	-195 80	148 71	142 78	245 87	
4,123 00	0 78	176 29	4,110 98	-197 85	149 41	142 94	247 92	
4,124 04	0 78	176.29	4,112 02	-197 86	149 41	142 94	247 94	
TG1-BK #542								
4,219 00	0 81	173 54	4,206 97	-199 17	149 53	143 10	249 06	
4,313 00	0 26	191 33	4,300 96	-200.04	149 56	143 22	249 77	
4,408 00	0 38	159 18	4,395 96	-200 55	149 63	143 27	250 22	
4,503 00	0 49	146 95	4,490 96	-201.18	149 96	143 30	250 93	



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SDI Standard Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keely Unit #542
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3641 00usft (Basic #35)
Site:	Burch Keely Unit #542	MD Reference:	RF @ 3641 00usft (Basic #35)
Well:	Burch Keely Unit #542	North Reference:	Grid
Wellbore:	OH - Job #32D0512617	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
4,613 00	0 48	155 86	4,600 96	-202 00	150 41	143 33	251 84
Last MWD Survey							
4,663 00	0 48	155 86	4,650 95	-202 38	150 58	143 35	252 25
Projection to Bit - PBHL-BK #542							

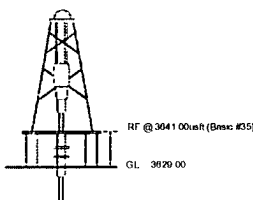
Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
4,613 00	4,600 96	-202 00	150 41	Last MWD Survey	
4,663 00	4,650 95	-202 38	150 58	Projection to Bit	



To convert Magnetic North to Grid Add 7.85°
To convert True North to Grid Subtract 0.17°

Azimuth to Grid North
True North -0.17°
Magnetic North 7.68°
Magnetic Field
Strength 48910 nT
Dip Angle 60.66°
Date 08/23/2011
Model IGRF2010

Burch Keely Unit #542
Eddy County, NM (NAN27 NME)
Northing (Y) 665636.10
Easting (X) 596299.70
Plan #2 vs Actual 7-7/8" Hole



WELL DETAILS

Burch Keely Unit #542						
+N/S	+E/W	Northing	Ground Level	Latitude	Longitude	Slot
0.00	0.00	665636.10	596299.70	32° 49' 40.200 N	104° 1' 11.385 W	

SECTION DETAILS

Sec	MD	Inc	Avi	TVD	+N/S	+E/W	Deg	TFace	VSec	Target
1	985.00	2.37	57.03	984.70	13.40	15.03	0.00	0.00	-1.82	
2	1150.00	2.37	57.03	1149.56	17.11	20.75	0.00	0.00	-1.53	
3	1451.65	5.37	151.35	1450.09	-8.10	32.77	2.00	117.31	17.84	
4	3643.17	5.37	151.35	3631.70	-188.45	140.10	0.00	0.00	234.85	
5	4111.88	0.00	0.00	4100.00	-199.50	140.20	2.00	180.00	247.34	TG1-BK #542
6	4811.88	0.00	0.00	4800.00	-199.50	140.20	0.00	0.00	247.34	PEHL-BK #542

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude	Shape
West HL BK #542	-1.00	-199.50	190.20	665436.60	596405.90	32° 49' 44.319 N	104° 1' 9.093 W	Rectangle (Sides 1300.00 WD 00)
plan measures target center by 1024.57m at 985.00m MD (084.70 TVD) 13.40 N 15.03 E								
TG1 BK #542	4100.00	-199.50	140.20	665436.60	596445.90	32° 49' 44.321 N	104° 1' 9.079 W	Point
plan hits target center								
PEHL BK #542	4800.00	-199.50	140.20	665436.60	596445.90	32° 49' 44.321 N	104° 1' 9.079 W	Circle (Radius 40.00)
plan hits target center								

FORMATION TOP DETAILS

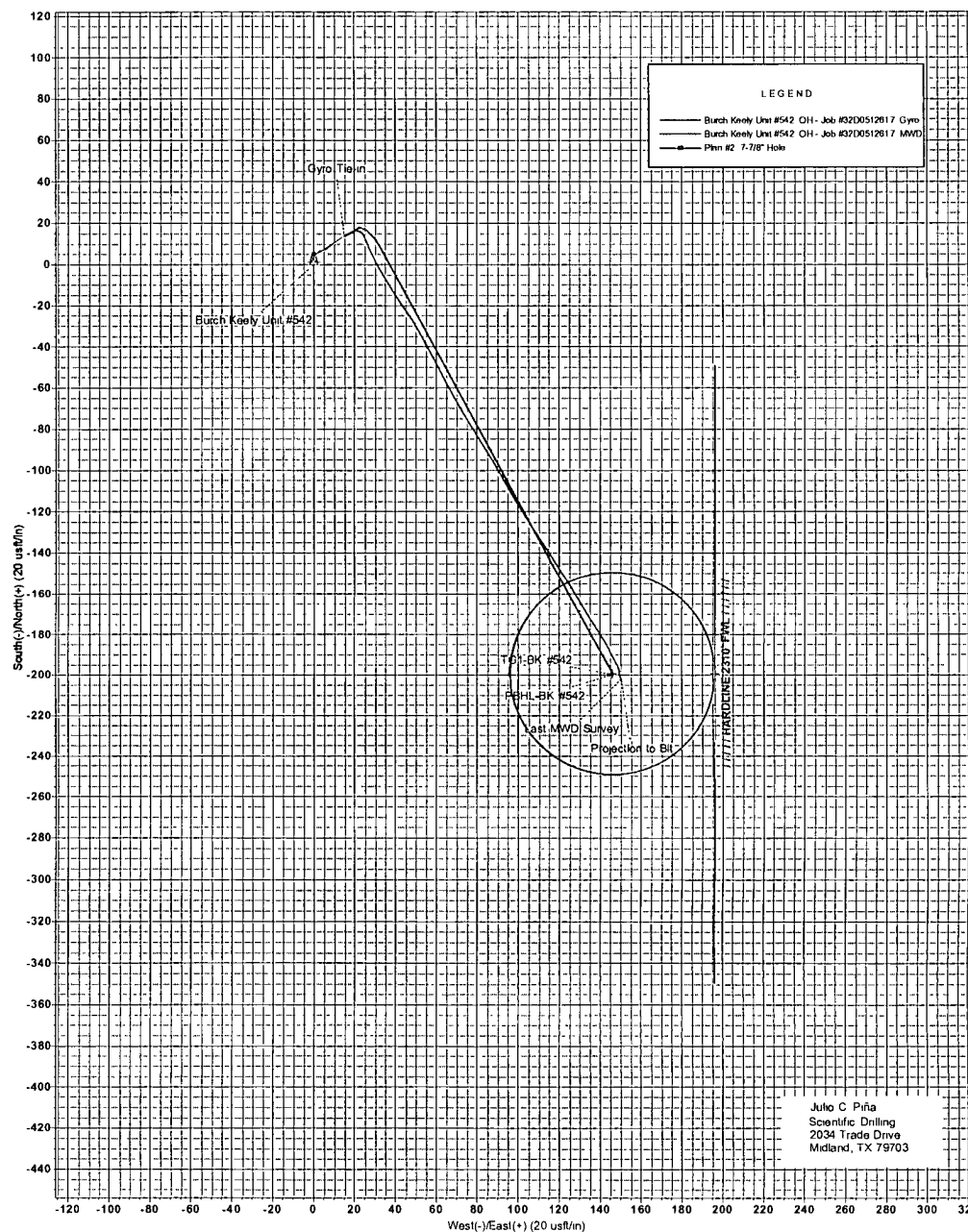
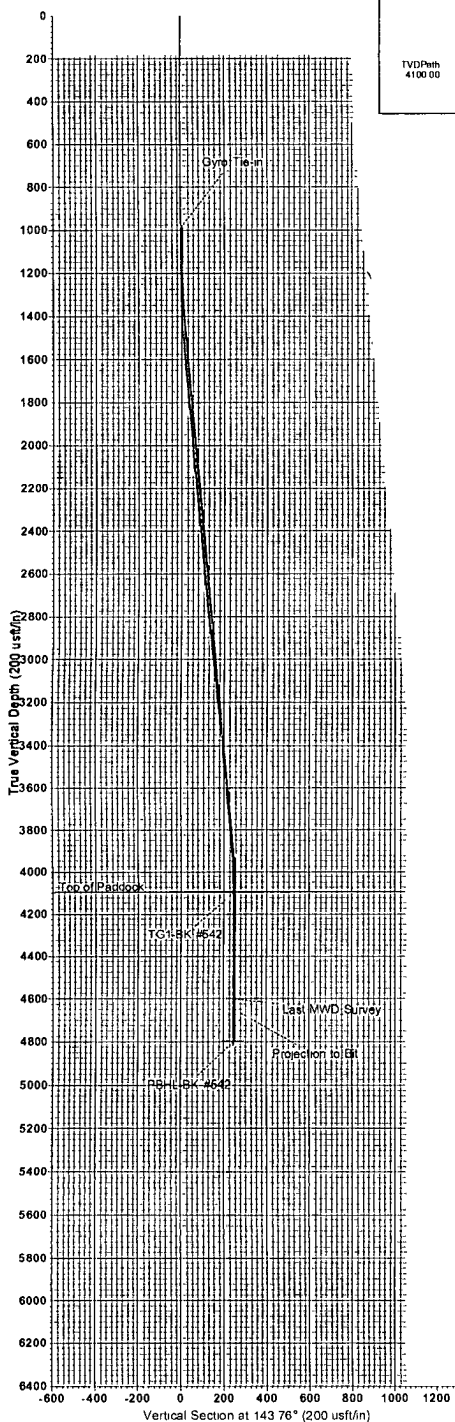
TVDPath	MDPath	Formation	DipAngle	DipDir
4100.00	4111.88	Top of Paddock	0.00	

CASING DETAILS

TVD	MD	Name	Size
1050.00		8-5/8" Casing	8-5/8"

PROJECT DETAILS

Eddy County NM (NAN27 NME)
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



Julio C. Peña
Scientific Drilling
2034 Trade Drive
Midland, TX 79703