

Results of Directional Survey

DD

API number:	30-025-39950		
OGRID:		Operator:	COG OPERATING LLC
		Property:	BC FEDERAL # 61

surface	ULSTR:	G	20	T 17S	R 32E
				1696 FNL	2000 FEL

BH Loc	ULSTR:	G	20	T 17S	R 32E
7049 MD		7033.8	TVD	1664 FNL	1655 FEL

Top Perf/OH	ULSTR:	G	20	T 17S	R 32E
5356 MD		5340.8	TVD	1658 FNL	1663 FEL

Bot Perf/OH	ULSTR:	G	20	T 17S	R 32E
6740 MD		6724.8	TVD	1663 FNL	1656 FEL

	MD	N/S	E/W	VD
	5335	38.50	336.10	5319.8
TOP PERFS/OH	5356	38.50	336.63	5340.80
	5398	38.50	337.70	5382.80
	5493	38.20	338.50	5477.80
BOT PERFS/OH	6740	32.89	343.81	6724.80
	5540	38.00	338.70	5524.80

NEXT TO LAST	5493	38.20	338.50	5477.80
LAST READING	5540	38.00	338.70	5524.80
TD	7049	31.58	345.12	7033.80

Surface Location	1696	FN	2000	FE
Projected BHL	1664	FN	1655	FE
Location of				
Top Perfs/OH	1658	FN	1663	FE
Bottom Perfs/OH	1663	FN	1656	FE

SUMMARY of Subsurface Locations

Surface Location	G-20-17S-32E	1696	FN	2000	FE	Vert. Depth
Top Perfs/OH	G-20-17S-32E	1658	FN	1663	FE	5340.80
Bottom Perfs/OH	G-20-17S-32E	1663	FN	1656	FE	6724.80
Projected TD	G-20-17S-32E	1664	FN	1655	FE	7033.80

AUG 3 0 2011

30-025-39950

WELL NAME AND NUMBER BC Federal No. 61 Unit G
 LOCATION Section 20, T17S, R32E, 1696 FNL, 2000 FEL, Lea 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
1/4° @ 148'		
3/4° @ 198'		
1 1/4° @ 321'		
1/2° @ 413'		
1° @ 505'		
1 3/4° @ 595'		
2° @ 971'		
1 3/4° @ 1171'		
2° @ 1667'		
1° @ 5990'		
3/4° @ 6438'		
1° @ 7007'		

SUR: G-20-17s-32e, 1696/N & 2000/E
 BHL: G-20-17s-32e, 1664/N & 1655/E
 API # 30-025-39950

HOBBS OCD

JUL 26 2011

RECEIVED

Drilling Contractor- UNITED DRILLING, INC.

By: Luisa Noriega
 (Luisa Noriega)

Title: Assistant Office Manager

Subscribed and sworn to before me this 11th day of May, 2011.

My Commission Expires: 10/8/12

Charles Martin
 Notary Public
Chaves New Mexico
 County State



COG OPERATING LLC

Lea County, NM (NAD27 NME)

BC Federal #61

BC Federal #61

OH - Job #32D0511395

HOBBS OCD

JUL 26 2011

RECEIVED

Survey: MWD Survey

SUR: G-20-17s-32e, 1696/N & 2000/E
BHL: G-20-17s-32e, 1664/N & 1655/E
API #30-025-39950

SDI Standard Survey Report

12 June, 2011

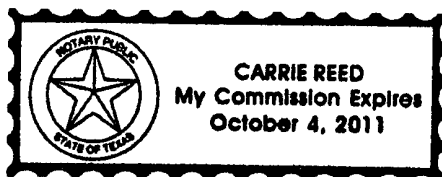
This survey is correct to the best of my knowledge and is supported by actual field data.

K. Hartman

Notarized this date 26th of June, 2011.

Carrie Reed

Notary Signature
County of Midland
State of Texas





Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING LLC	Local Co-ordinate Reference:	Well BC Federal #61
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB Elev (20') @ 4024 0usft (UDI #42)
Site:	BC Federal #61	MD Reference:	KB Elev (20') @ 4024 0usft (UDI #42)
Well:	BC Federal #61	North Reference:	Grid
Wellbore:	OH - Job #32D0511395	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Project	Lea 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	BC Federal #61		
Site Position:		Northing:	663,418 30 usft
From:	Map	Easting:	668,128 30 usft
Position Uncertainty:	0 0 usft	Slot Radius:	0"
		Latitude:	32° 49' 21 460 N
		Longitude:	103° 47' 9 728 W
		Grid Convergence:	0 30 °

Well	BC Federal #61		
Well Position	+N/-S	0 0 usft	Northing:
	+E/-W	0 0 usft	Easting:
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 21 460 N
		Longitude:	103° 47' 9 728 W
		Ground Level:	4,004 0 usft

Wellbore	OH - Job #32D0511395		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	5/3/2011	7 75
			Dip Angle
			(°)
			60 71
			Field Strength
			(nT)
			48,961

Design	Actual		
Audit Notes:			
Version:	1 0	Phase:	ACTUAL
		Tie On Depth:	0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0 0	0 0	0 0
			Direction
			(°)
			83 68

Survey Program	Date 6/12/2011		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100 0	2,030 0	Gyro Survey (OH - Job #32D0511395)	Keeper
2,130 0	5,540 0	MWD Survey (OH - Job #32D0511395)	MWD
			Description
			Standard Wireline Keeper ver 1 0 2
			MWD - Standard

Survey			
Measured Depth	Inclination	Azimuth	True Vertical
(usft)	(°)	(°)	Depth
0 0	0 00	0 00	0 0
100.0	0 13	162 12	100.0
200 0	0 24	206 71	200 0
300 0	0 44	151 57	300 0
400 0	0 59	165 19	400 0
500 0	1 06	119 04	500 0
600 0	2 08	113 58	599 9
700 0	3 89	112 91	699 8
800 0	4 08	118 90	799 6
900.0	2 96	124 88	899 4
1,000 0	2 69	125 38	999 3
			North/South
			(usft)
			East/West
			(usft)
			Closure Azimuth
			(°)
			Closure Distance
			(usft)
			0 0
			0 1
			0 4
			0 9
			1 8
			3 0
			5 4
			10 4
			17 3
			23 5
			28 4



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SDI Standard Survey Report



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Well:	BC Federal #61	North Reference:	Grid
Wellbore:	OH - Job #32D0511395	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)
1,100 0	2 22	122 02	1,099 2	-17 4	27 6	122 18	32 7
1,200 0	1 69	122 26	1,199 1	-19 2	30 5	122 17	36 1
1,300 0	1 64	126 13	1,299 1	-20 8	32 9	122 32	39 0
1,400 0	1 40	109 31	1,399 0	-22 1	35 2	122 07	41 6
1,500 0	1 35	91 45	1,499 0	-22 5	37 6	120 93	43 8
1,600 0	1 35	75 01	1,599 0	-22 2	39 9	119 14	45 7
1,700 0	1 67	68 68	1,698 9	-21 4	42 4	116 80	47 5
1,800 0	1 55	54 57	1,798 9	-20 1	44 8	114 14	49 1
1,900 0	1 45	64 43	1,898 9	-18 8	47 1	111 73	50 7
2,000 0	1 42	66 56	1,998 8	-17 7	49 4	109 75	52 4
2,030 0	1 28	66 27	2,028 8	-17 4	50 0	109 23	53 0



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From:	Map	Easting:	668,128 30 usft
Position Uncertainty:	0 0 usft	Slot Radius:	0"
		Latitude:	32° 49' 21 460 N
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		Grid Convergence:	0 30 °

Well	BC Federal #61		
Well Position	+N/-S	0 0 usft	Northing:
	+E/-W	0 0 usft	Easting:
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 21 460 N
		Longitude:	103° 47' 9 728 W
		Ground Level:	4,004 0 usft

Wellbore	OH - Job #32D0511395				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	5/3/2011	7 75	60 71	48,961

Design	Actual			
Audit Notes:				
Version:	1 0	Phase:	ACTUAL	Tie On Depth:
				0 0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0 0	0 0	0 0	83 68

Survey Program	Date 6/12/2011			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100 0	2,030 0	Gyro Survey (OH - Job #32D0511395)	Keeper	Standard Wireline Keeper ver 1 0 2
2,130 0	5,540 0	MWD Survey (OH - Job #32D0511395)	MWD	MWD - Standard

Survey							
Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)
2,030 0	1 28	66 27	2,028 8	-17 4	50 0	109 23	53 0
Gyro Tie-in							
2,130 0	0 90	80 31	2,128 8	-16 9	51 8	108 03	54 5
2,194 0	1 32	80 69	2,192 8	-16 7	53 0	107 44	55 6
2,257 0	1 78	79 99	2,255 8	-16 4	54 7	106 66	57 1
2,320 0	3 00	84 49	2,318 7	-16 0	57 3	105 63	59 5
2,384 0	4 12	86 01	2,382 6	-15 7	61 3	104 39	63 3
2,447 0	4 72	88 99	2,445 4	-15 5	66 1	103 20	67 9
2,511 0	5 15	87 73	2,509 2	-15 4	71 6	102 10	73 3
2,574 0	5 76	84 86	2,571 9	-15 0	77 6	100 91	79 0
2,637 0	6 23	78 24	2,634 5	-14 0	84 1	99 44	85 2



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Well:	BC Federal #61	North Reference:	Grid
Wellbore:	OH - Job #32D0511395	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey

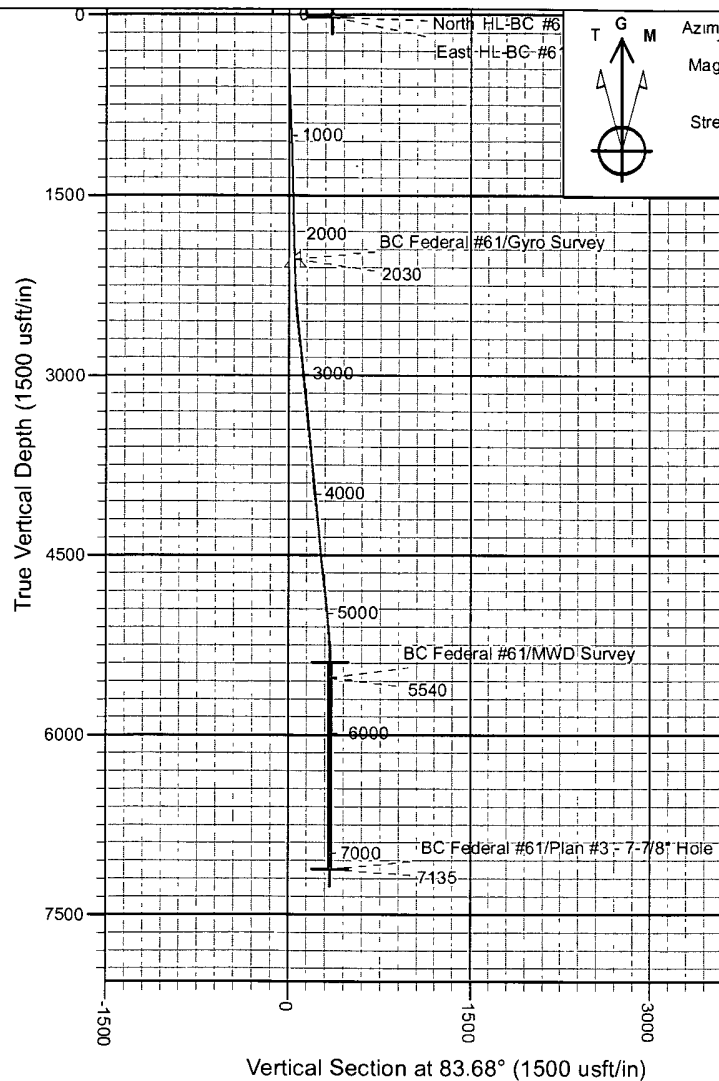
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
2,701 0	5 90	79 25	2,698 2	-12 7	90 7	97 94	91 6
2,795 0	5 31	79 04	2,791 7	-10 9	99 7	96 25	100 3
2,891 0	5 62	75 27	2,887 3	-8 9	108 6	94 68	109 0
2,985 0	5 55	78 16	2,980 8	-6 8	117 6	93 30	117 7
3,080 0	6 04	77 02	3,075 4	-4 7	126 9	92 13	127 0
3,175 0	5 98	77 37	3,169 8	-2 5	136 6	91 06	136 6
3,270 0	5 08	76 49	3,264 4	-0 5	145 5	90 18	145 5
3,365 0	5 84	71 27	3,359 0	2 1	154 2	89 23	154 2
3,460 0	5 44	70 33	3,453 5	5 2	163 0	88 19	163 1
3,555 0	5 76	75 63	3,548 0	7 8	171 9	87 39	172 1
3,650 0	5 74	78 58	3,642 6	10 0	181 2	86 85	181 4
3,753 0	5 60	77 54	3,745 1	12 1	191 1	86 38	191 5
3,848 0	5 45	74 82	3,839 6	14 3	200 0	85 92	200 5
3,942 0	6 33	82 94	3,933 1	16 1	209 4	85 61	210 1
4,037 0	6 09	81 64	4,027 6	17 4	219 6	85 46	220 3
4,132 0	5 89	85 01	4,122 1	18 6	229 5	85 37	230 2
4,227 0	5 86	85 07	4,216 6	19 4	239 2	85 35	239 9
4,322 0	5 82	83 72	4,311 1	20 4	248 8	85 32	249 6
4,417 0	6 00	77 94	4,405 6	21 9	258 4	85 15	259 3
4,512 0	5 95	75 92	4,500 0	24 2	268 0	84 85	269 1
4,607 0	5 97	76 26	4,594 5	26 6	277 6	84 54	278 9
4,702 0	6 06	76 61	4,689 0	28 9	287 3	84 26	288 7
4,797 0	6 15	74 97	4,783 5	31 4	297 1	83 97	298 7
4,892 0	6 10	75 29	4,877 9	34 0	306 9	83 68	308 8
4,955 0	5 26	78 31	4,940 6	35 4	313 0	83 55	315 0
5,018 0	4 68	77 85	5,003 4	36 5	318 3	83 45	320 4
5,081 0	3 84	81 30	5,066 2	37 4	322 9	83 39	325 1
5,145 0	3 64	81 58	5,130 1	38 0	327 0	83 37	329 2
5,208 0	3 30	82 45	5,193 0	38 5	330 8	83 35	333 0
5,272 0	2 30	96 50	5,256 9	38 6	333 9	83 40	336 1
5,335 0	1 74	92 37	5,319 8	38 5	336 1	83 47	338 3
5,398 0	1 09	84 19	5,382 8	38 5	337 7	83 50	339 8
5,462 0	0 41	150 70	5,446 8	38 3	338 4	83 54	340 5
5,493 0	0 30	132 88	5,477 8	38 2	338 5	83 56	340 6
Last MWD Survey							
5,540 0	0 30	132 88	5,524 8	38 0	338 7	83 59	340 8
Projection to Bit							

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,030 0	2,028 8	-17 4	50 0	Gyro Tie-in
5,493 0	5,477 8	38 2	338 5	Last MWD Survey
5,540 0	5,524 8	38 0	338 7	Projection to Bit



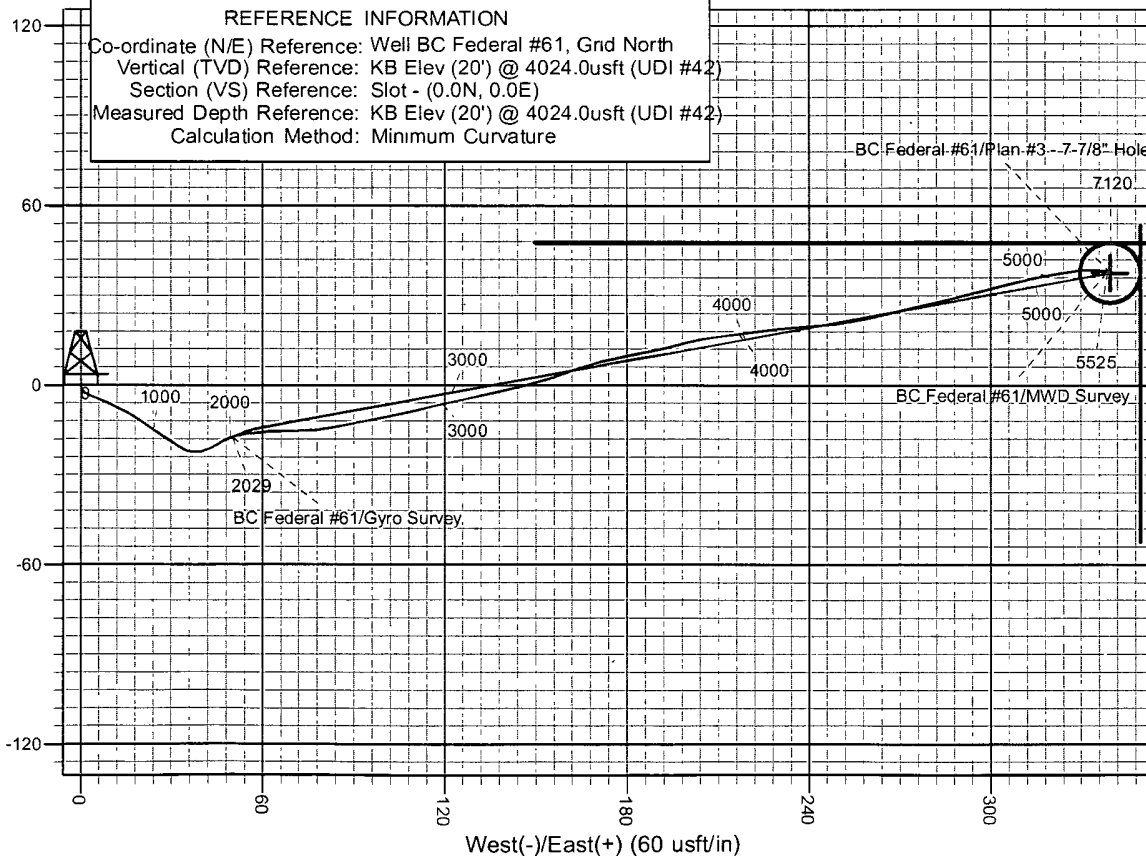
Project: Lea County, NM (NAD27 NME)
 Site: BC Federal #61
 Well: BC Federal #61
 Wellbore: OH - Job #32D0511395
 Design: Plan #3 - 7-7/8" Hole



Azimuths to Grid North
 True North -0.30°
 Magnetic North 7.45°
 Magnetic Field
 Strength 48961.2 nT
 Dip Angle 60.71°
 Date 5/3/2011
 Model IGRF2010

WELL DETAILS: BC Federal #61
 KB Elev (20') @ 4024.0usft (UDI #42)
 Ground Level: 4004.0
 Easting 668128.30
 Latitude 32° 49' 21.460 N
 Longitude 103° 47' 9.728 W
 Slot

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	663418.30	668128.30	32° 49' 21.460 N	103° 47' 9.728 W	



COMPANY DETAILS: COG OPERATING LLC
 223032

Calculation Method: Minimum Curvature
 Error System: ISCWSA
 Scan Method: Closest Approach 3D
 Error Surface: Elliptical Conic
 Warning Method: Error Ratio

PROJECT DETAILS: Lea County, NM (NAD27 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

SITE DETAILS: BC Federal #61
 Site Centre Latitude: 32° 49' 21.460 N
 Longitude: 103° 47' 9.728 W
 Positional Uncertainty: 0.0
 Convergence: 0.30
 Local North: Grid