



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

30-015-39263

December 5, 2011

COG, LLC
Fasken Center, Tower II
550 West Texas Ave, Suite 1300
Midland, TX 79701

RE: Hearse 36 State #3H
155' FNL & 2260' FWL
Sec. 36, T19S, R25E
Eddy County, New Mexico

Dear Sir,

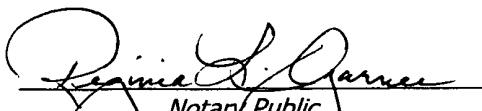
The attached is the Deviation Survey for the above captioned well.

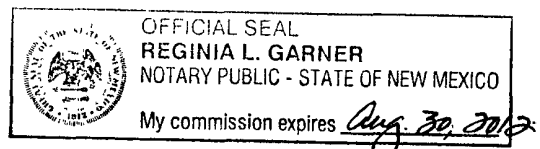
Very truly yours,


Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 5th day of December, 2011.


Regina L. Garner
Notary Public



Hearse 36 State #3H

Date	Depth	Deviation	Direction
11/15/2011	158	1.00	
11/15/2011	247	0.50	
11/15/2011	335	0.40	
11/15/2011	423	0.60	
11/16/2011	474	0.40	
11/16/2011	671	0.60	
11/16/2011	826	1.10	
11/20/2011	1347	0.50	
11/20/2011	1815	0.50	
11/21/2011	2205	0.70	
11/22/2011	2292	3.10	7.70
11/22/2011	2387	13.50	359.20
11/22/2011	2480	23.20	1.20
11/22/2011	2573	33.20	2.90
11/22/2011	2667	43.20	359.90
11/22/2011	2761	51.20	0.50
11/22/2011	2854	61.40	1.50
11/22/2011	2885	65.20	1.70
11/23/2011	2948	73.40	1.90
11/23/2011	3041	83.40	1.30
11/23/2011	3229	91.30	2.00
11/24/2011	3323	91.70	369.90
11/24/2011	3416	90.40	359.90
11/24/2011	3510	92.40	359.90
11/24/2011	3603	91.70	358.90
11/24/2011	3697	91.10	359.10
11/24/2011	3790	92.90	358.90
11/24/2011	3884	90.40	359.40
11/24/2011	3977	90.10	359.20
11/24/2011	4071	89.40	359.40
11/24/2011	4165	91.00	359.20
11/24/2011	4258	90.60	359.80
11/25/2011	4397	90.10	0.10
11/25/2011	4445	90.80	359.90
11/25/2011	4539	90.60	359.90
11/25/2011	4632	89.40	0.80
11/25/2011	4726	88.30	1.70
11/25/2011	4820	89.40	1.90
11/25/2011	4914	90.80	1.70
11/25/2011	5007	89.70	1.70
11/25/2011	5101	89.20	1.90
11/25/2011	5195	90.40	1.20
11/26/2011	5389	91.00	1.50
11/26/2011	5475	89.60	1.90
11/26/2011	5569	89.60	0.10
11/26/2011	5663	91.00	359.80
11/27/2011	5756	90.10	359.20
11/27/2011	5850	91.30	359.10
11/27/2011	5944	89.90	358.90
11/27/2011	6037	91.10	359.70
11/27/2011	6131	90.10	358.90

Date	Depth	Deviation	Direction
11/27/2011	6224	91.10	359.40
11/27/2011	6317	89.60	359.60
11/27/2011	6410	88.50	359.60
11/27/2011	6504	89.90	359.40
11/27/2011	6597	91.00	359.60
11/27/2011	6691	90.60	359.80
11/28/2011	6785	90.40	359.10
11/28/2011	6878	89.00	359.90
11/28/2011	6974	89.90	359.90
11/28/2011	7065	91.30	359.80
11/28/2011	7156	92.20	0.10

30-015-39263

COG Operating LLC

Eddy County, NM

Hearse 36 State #3H

Hearse 36 State #3H

Wellbore #1

Survey: MWD Surveys

Standard Survey Report

29 November, 2011

Crescent Directional Drilling

Survey Report

Company:	COG Operating LLC	Local Coordinate Reference:	Site Hearse 36 State #3H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3434 00ft (Silver Oak #8)
Site:	Hearse 36 State #3H	MD Reference:	WELL @ 3434 00ft (Silver Oak #8)
Well:	Hearse 36 State #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass R5000 DB Server

Project	Eddy County, NM		
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:		Hearse 36 State #3H			
Site Position:		Northing:	585,857 30 ft	Latitude:	32° 36' 38 08 N
From:	Map	Easting:	467,451 40 ft	Longitude:	104° 26' 20 54 W
Position Uncertainty:	0.00 ft	Slot Radius:	13 200 in	Grid Convergence:	-0 06 °

Well: Hearse 36 State #3H						
Well Position	+N-S	0 00 ft	Northing:	585,857 30 ft	Latitude:	32° 36' 38 08 N
	+E-W	0 00 ft	Easting:	467,451.40 ft	Longitude:	104° 26' 20.54 W
Position Uncertainty		0 00 ft	Wellhead Elevation:	ft	Ground Level:	3,417 00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/11/2011	7 96	60.38	48,710

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	
	(ft)	(ft)	(ft)	(°)	
	0 00	0 00	0 00	0 18	

Survey Program		Date	11/29/2011	
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100 00	2,197 00	Gyro Surveys (Wellbore #1)	Good__mag	Good Magnetic
2,293 00	7,204 00	MWD Surveys (Wellbore #1)	Good__mag	Good Magnetic

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,197 00	0 68	330 18	2,196 88	-0 80	-18 71	-0 86	0 00	0 00	0 00
2,293 00	3 10	7 70	2,292 82	2 26	-18 65	2 21	2 70	2 52	39 08
2,324 00	6 20	5 70	2,323 72	4 76	-18 37	4 70	10 01	10 00	-6 45
2,355 00	9 90	1 90	2,354.41	9 09	-18.11	9 03	12 05	11 94	-12 26
2,387 00	13 50	359 20	2,385.74	15 58	-18.07	15 52	11 38	11 25	-8.44
2,418 00	17 00	359.10	2,415 64	23 73	-18 20	23 67	11.29	11.29	-0 32
2,449 00	20 00	359.60	2,445 04	33 56	-18 30	33.51	9 69	9 68	1.61
2,480 00	23 20	1.20	2,473 86	44 97	-18.21	44 92	10 50	10 32	5 16
2,511 00	26 60	2 20	2,501 97	58 02	-17 82	57 96	11 05	10 97	3 23
2,542 00	30 00	2 40	2,529 26	72 70	-17 23	72.65	10 97	10 97	0.65

Crescent Directional Drilling

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Hearse 36 State #3H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3434 00ft (Silver Oak #8)
Site:	Hearse 36 State #3H	MD Reference:	WELL @ 3434 00ft (Silver Oak #8)
Well:	Hearse 36 State #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass R5000 DB Server

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,574.00	33.20	2.90	2,556.51	89.45	-16.45	89.40	10.03	10.00	1.56
2,605.00	36.70	2.20	2,581.92	107.19	-15.66	107.14	11.36	11.29	-2.26
2,636.00	40.00	0.60	2,606.23	126.41	-15.20	126.36	11.12	10.65	-5.16
2,667.00	43.20	359.90	2,629.41	146.99	-15.12	146.94	10.43	10.32	-2.26
2,698.00	46.20	0.10	2,651.44	168.79	-15.12	168.74	9.69	9.68	0.65
2,729.00	48.80	359.90	2,672.38	191.65	-15.12	191.60	8.40	8.39	-0.65
2,761.00	51.20	0.50	2,692.95	216.16	-15.03	216.11	7.64	7.50	1.88
2,792.00	54.30	0.60	2,711.71	240.83	-14.79	240.78	10.00	10.00	0.32
2,823.00	57.80	0.30	2,729.02	266.54	-14.59	266.49	11.32	11.29	-0.97
2,854.00	61.40	1.50	2,744.70	293.27	-14.17	293.22	12.08	11.61	3.87
2,886.00	65.20	1.70	2,759.08	321.84	-13.37	321.80	11.89	11.88	0.63
2,917.00	69.40	1.20	2,771.04	350.42	-12.65	350.38	13.63	13.55	-1.61
2,948.00	73.40	1.90	2,780.93	379.79	-11.85	379.75	13.08	12.90	2.26
2,979.00	77.40	1.70	2,788.74	409.76	-10.91	409.73	12.92	12.90	-0.65
3,010.00	80.00	1.30	2,794.81	440.15	-10.11	440.12	8.48	8.39	-1.29
3,041.00	83.40	1.30	2,799.29	470.81	-9.42	470.78	10.97	10.97	0.00
3,072.00	86.10	1.90	2,802.12	501.67	-8.55	501.64	8.92	8.71	1.94
3,136.00	89.40	2.00	2,804.64	565.57	-6.38	565.55	5.16	5.16	0.16
3,229.00	91.30	2.00	2,804.07	658.51	-3.13	658.50	2.04	2.04	0.00
3,323.00	91.70	359.90	2,801.61	752.46	-1.58	752.45	2.27	0.43	-2.23
3,416.00	90.40	359.90	2,799.90	845.44	-1.74	845.43	1.40	-1.40	0.00
3,510.00	92.40	359.90	2,797.61	939.41	-1.90	939.40	2.13	2.13	0.00
3,603.00	91.70	358.90	2,794.28	1,032.34	-2.88	1,032.33	1.31	-0.75	-1.08
3,697.00	91.10	359.10	2,791.98	1,126.30	-4.52	1,126.28	0.67	-0.64	0.21
3,791.00	92.90	358.90	2,788.70	1,220.22	-6.15	1,220.20	1.93	1.91	-0.21
3,884.00	90.40	359.40	2,786.02	1,313.17	-7.53	1,313.14	2.74	-2.69	0.54
3,978.00	90.10	359.20	2,785.61	1,407.16	-8.68	1,407.13	0.38	-0.32	-0.21
4,072.00	89.40	359.40	2,786.02	1,501.15	-9.83	1,501.11	0.77	-0.74	0.21
4,165.00	91.00	359.20	2,785.70	1,594.14	-10.97	1,594.10	1.73	1.72	-0.22
4,259.00	90.60	359.80	2,784.39	1,688.13	-11.79	1,688.08	0.77	-0.43	0.64
4,352.00	90.10	0.10	2,783.82	1,781.13	-11.87	1,781.08	0.63	-0.54	0.32
4,446.00	90.80	359.90	2,783.08	1,875.12	-11.87	1,875.08	0.77	0.74	-0.21
4,539.00	90.60	359.90	2,781.94	1,968.11	-12.03	1,968.07	0.22	-0.22	0.00
4,633.00	89.40	0.80	2,781.94	2,062.11	-11.46	2,062.06	1.60	-1.28	0.96
4,727.00	88.30	1.70	2,783.83	2,156.07	-9.41	2,156.03	1.51	-1.17	0.96
4,820.00	89.40	1.90	2,785.70	2,249.00	-6.48	2,248.97	1.20	1.18	0.22
4,914.00	90.80	1.70	2,785.53	2,342.95	-3.53	2,342.93	1.50	1.49	-0.21
5,007.00	89.70	1.70	2,785.13	2,435.91	-0.77	2,435.89	1.18	-1.18	0.00
5,101.00	89.20	1.90	2,786.03	2,529.86	2.18	2,529.85	0.57	-0.53	0.21
5,195.00	90.40	1.20	2,786.36	2,623.82	4.72	2,623.82	1.48	1.28	-0.74
5,288.00	89.60	1.70	2,786.36	2,716.79	7.07	2,716.80	1.01	-0.86	0.54
5,382.00	91.00	1.50	2,785.87	2,810.75	9.70	2,810.77	1.50	1.49	-0.21
5,475.00	89.60	1.90	2,785.38	2,903.70	12.46	2,903.73	1.57	-1.51	0.43

Crescent Directional Drilling

Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Hearse 36 State #3H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3434 00ft (Silver Oak #8)
Site:	Hearse 36 State #3H	MD Reference:	WELL @ 3434 00ft (Silver Oak #8)
Well:	Hearse 36 State #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass R5000 DB Server

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,570.00	89.60	0.10	2,786.04	2,998.68	14.12	2,998.71	1.89	0.00	-1.89
5,663.00	91.00	359.80	2,785.56	3,091.68	14.03	3,091.71	1.54	1.51	-0.32
5,757.00	90.10	359.20	2,784.65	3,185.67	13.21	3,185.70	1.15	-0.96	-0.64
5,850.00	91.30	359.10	2,783.52	3,278.65	11.84	3,278.67	1.29	1.29	-0.11
5,944.00	89.90	358.90	2,782.53	3,372.63	10.19	3,372.65	1.50	-1.49	-0.21
6,037.00	91.10	358.70	2,781.72	3,465.60	8.25	3,465.61	1.31	1.29	-0.22
6,131.00	90.10	358.90	2,780.74	3,559.58	6.28	3,559.58	1.08	-1.06	0.21
6,224.00	91.10	359.40	2,779.76	3,652.56	4.90	3,652.56	1.20	1.08	0.54
6,317.00	89.60	359.60	2,779.20	3,745.55	4.09	3,745.55	1.63	-1.61	0.22
6,412.00	88.50	359.60	2,780.77	3,840.54	3.42	3,840.53	1.16	-1.16	0.00
6,505.00	89.90	359.40	2,782.07	3,933.52	2.61	3,933.51	1.52	1.51	-0.22
6,598.00	91.00	359.60	2,781.34	4,026.51	1.80	4,026.50	1.20	1.18	0.22
6,692.00	90.60	359.80	2,780.03	4,120.50	1.31	4,120.49	0.48	-0.43	0.21
6,786.00	90.40	359.10	2,779.21	4,214.49	0.41	4,214.47	0.77	-0.21	-0.74
6,880.00	89.00	359.90	2,779.70	4,308.49	-0.41	4,308.46	1.72	-1.49	0.85
6,974.00	89.90	359.90	2,780.60	4,402.48	-0.58	4,402.46	0.96	0.96	0.00
7,068.00	91.30	359.80	2,779.62	4,496.47	-0.82	4,496.45	1.49	1.49	-0.11
7,155.00	92.00	359.90	2,777.11	4,583.44	-1.05	4,583.41	0.81	0.80	0.11
Last Survey @ 7155.00 MD, 2777.11 TVD, 92.00 INC, 359.90 AZ									
7,204.00	92.00	359.90	2,775.40	4,632.41	-1.14	4,632.38	0.00	0.00	0.00
Straight line Projection to TD @ 7204.00' MD, 2775.40' TVD.									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,155.00	2,777.11	4,583.44	-1.05	Last Survey @ 7155.00 MD, 2777.11 TVD, 92.00 INC, 359.90 AZ
7,204.00	2,775.40	4,632.41	-1.14	Straight line Projection to TD @ 7204.00' MD, 2775.40' TVD

Checked By _____ Approved By: _____ Date: _____

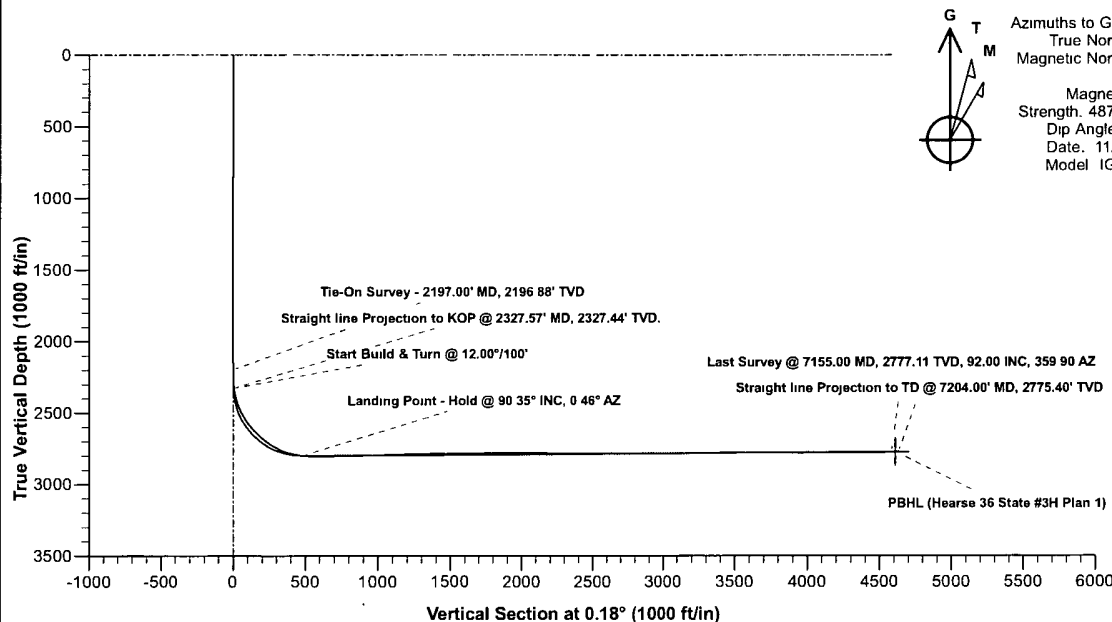


COG Operating LLC
Hearse 36 State #3H
Eddy County, NM
Plan #3



Surface Location		Ground Elev	WELL @ 3434.00ft (Silver Oak #8)			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	585857.30	467451.40	32° 36' 38.08 N	104° 26' 20.54 W	

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (Hearse 36 State #3H Plan 1)	2775 00	4610.00	14 30	590467 30	467465.70	32° 37' 23.70 N	104° 26' 20 43 W



Azimuths to Grd North
True North: 0.06°
Magnetic North: 8.02°

Magnetic Field
Strength: 48710.4 nT
Dip Angle: 60.38°
Date: 11/11/2011
Model: IGRF2010

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Annotation	
1	2197.00	0.68	330.18	2196.88	-0.80	-18.71	0.00	0.00	-0.86	Tie-On Survey - 2197.00' MD, 2196.88' TVD	
2	2327.57	0.68	330.18	2327.45	0.54	-19.48	0.00	0.00	0.48	Start Build & Turn @ 12.00°/100'	
3	3075.57	90.35	0.46	2800.00	480.68	-18.51	12.00	30.27	480.82	Landing Point - Hold @ 90.35° INC, 0.46° AZ	
4	7204.90	90.35	0.46	2775.00	4610.00	14.30	0.00	0.00	4610.02	TD @ 7204.90' MD, 2775.00' TVD	

