

30-025-40237



HOBBS OCD

NOV 17 2011

RECEIVED

COG Operating LLC

Lea County, NM (NAD27 NME)

GC Federal #44

GC Federal #44

OH

Plan: Plan #2 - 7-7/8" Hole

SHL = 753' FSL & 2206' FEL

BHL = 380' FSL & 2300' FEL

Paddock Top = 380' FSL & 2300' FEL @ 5375' TVD

Standard Planning Report

11 November, 2011



Scientific Drilling
Directional Drilling Operations



Scientific Drilling Planning Report



Database: EDM-Julio
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: GC Federal #44
Well: GC Federal #44
Wellbore: OH
Design: Plan #2 - 7-7/8" Hole

Local Co-ordinate Reference: Well GC Federal #44
TVD Reference: KB Elev (13') @ 3990.00usft (JW #4)
MD Reference: KB Elev (13') @ 3990.00usft (JW #4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project Lea County, NM (NAD27 NME)

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site GC Federal #44

Site Position: Northing: 660,587.70 usft Latitude: 32° 48' 53.460 N
From: Map Easting: 667,940.30 usft Longitude: 103° 47' 12.103 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.30 °

Well GC Federal #44

Well Position: +N/-S 0.00 usft Northing: 660,587.70 usft Latitude: 32° 48' 53.460 N
+E/-W 0.00 usft Easting: 667,940.30 usft Longitude: 103° 47' 12.103 W
Position Uncertainty: 0.00 usft Wellhead Elevation: Ground Level: 3,977.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2011/11/11	7.68	60.69	48,904

Design Plan #2 - 7-7/8" Hole

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	193.71

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,593.56	7.87	193.71	2,592.33	-26.22	-6.40	2.00	2.00	0.00	193.71	
5,006.65	7.87	193.71	4,982.67	-347.28	-84.70	0.00	0.00	0.00	0.00	
5,400.21	0.00	0.00	5,375.00	-373.50	-91.10	2.00	-2.00	0.00	180.00	TG1-GC Fed #44
7,125.21	0.00	0.00	7,100.00	-373.50	-91.10	0.00	0.00	0.00	0.00	PBHL-GC Fed #44



Scientific Drilling
Planning Report



Database: EDM-Julio
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: GC Federal #44
Well: GC Federal #44
Wellbore: OH
Design: Plan #2 - 7-7/8" Hole

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Well GC Federal #44

KB Elev (13') @ 3990.00usft (JW #4)

KB Elev (13') @ 3990.00usft (JW #4)

Grid

Minimum Curvature

Planned 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
West HL-GC #44 - South HL-GC #44									
2,100 00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8-5/8" Casing									
2,200.00	0.00	0.00	2,200 00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 2.00°/100'									
2,300.00	2 00	193.71	2,299.98	-1.70	-0.41	1.75	2.00	2.00	0.00
2,400 00	4 00	193.71	2,399.84	-6.78	-1 65	6.98	2.00	2.00	0.00
2,500.00	6.00	193.71	2,499 45	-15 25	-3 72	15.69	2.00	2.00	0.00
2,593.56	7.87	193 71	2,592.32	-26.22	-6.40	26.99	2.00	2.00	0.00
EOC hold 7.87°									
2,600.00	7.87	193 71	2,598.70	-27.08	-6.60	27.87	0.00	0.00	0.00
2,700.00	7.87	193.71	2,697.76	-40.38	-9.85	41.57	0.00	0.00	0.00
2,800.00	7.87	193 71	2,796.82	-53.69	-13 10	55 26	0.00	0.00	0.00
2,900 00	7.87	193.71	2,895.88	-66.99	-16.34	68 96	0.00	0.00	0.00
3,000.00	7.87	193.71	2,994.93	-80.30	-19.59	82.65	0.00	0.00	0.00
3,100 00	7.87	193.71	3,093.99	-93.60	-22.83	96.35	0.00	0.00	0.00
3,200 00	7.87	193.71	3,193 05	-106.91	-26.08	110.04	0.00	0.00	0.00
3,300.00	7.87	193.71	3,292.11	-120 21	-29 32	123.74	0.00	0.00	0.00
3,400 00	7.87	193.71	3,391.17	-133.52	-32.57	137.43	0.00	0.00	0.00
3,500.00	7.87	193.71	3,490.22	-146.82	-35.81	151.13	0.00	0.00	0.00
3,600.00	7.87	193.71	3,589.28	-160 13	-39.06	164.82	0.00	0.00	0.00
3,700.00	7 87	193.71	3,688.34	-173.43	-42.30	178.52	0.00	0.00	0.00
3,800.00	7.87	193 71	3,787.40	-186.74	-45.55	192.21	0.00	0.00	0.00
3,900.00	7.87	193.71	3,886.45	-200 04	-48.79	205.91	0.00	0.00	0.00
4,000.00	7.87	193.71	3,985.51	-213.35	-52.04	219.60	0.00	0.00	0.00
4,100.00	7.87	193.71	4,084.57	-226.65	-55.28	233.29	0.00	0.00	0.00
4,200.00	7.87	193 71	4,183.63	-239.96	-58.53	246.99	0.00	0.00	0.00
4,300.00	7.87	193 71	4,282.69	-253 26	-61.77	260.68	0.00	0.00	0.00
4,400.00	7.87	193.71	4,381.74	-266.56	-65.02	274.38	0.00	0.00	0.00
4,500.00	7.87	193.71	4,480.80	-279.87	-68.26	288.07	0.00	0.00	0.00
4,600.00	7.87	193.71	4,579.86	-293.17	-71.51	301.77	0.00	0.00	0.00
4,700 00	7.87	193.71	4,678.92	-306.48	-74.75	315.46	0.00	0.00	0.00
4,800.00	7.87	193.71	4,777 97	-319.78	-78.00	329.16	0.00	0.00	0.00
4,900.00	7.87	193.71	4,877.03	-333.09	-81.24	342.85	0.00	0.00	0.00
5,000.00	7 87	193.71	4,976.09	-346.39	-84.49	356.55	0.00	0.00	0.00
5,006.65	7.87	193.71	4,982.68	-347.28	-84.70	357.46	0.00	0.00	0.00
Start Drop 2.00°/100'									
5,100 00	6.00	193.71	5,075 34	-358.23	-87.38	368.73	2.00	-2.00	0.00
5,200.00	4 00	193.71	5,174 95	-366.71	-89.44	377.46	2.00	-2.00	0.00
5,300.00	2.00	193 71	5,274.81	-371.80	-90.68	382.70	2.00	-2.00	0.00
5,400.21	0.00	0.00	5,375.00	-373 50	-91.10	384.45	2.00	-2.00	165.95
EOC hold 0.00° - TG1-GC Fed #44									
7,125.21	0.00	0.00	7,100.00	-373.50	-91 10	384.45	0.00	0.00	0.00
PBHL-GC Fed #44									



Scientific Drilling
Planning Report



Database: EDM-Julio
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: GC Federal #44
Well: GC Federal #44
Wellbore: OH
Design: Plan #2 - 7-7/8" Hole

Local Co-ordinate Reference: Well GC Federal #44
TVD Reference: KB Elev (13') @ 3990.00usft (JW #4)
MD Reference: KB Elev (13') @ 3990.00usft (JW #4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
West HL-GC #44 - plan misses target center by 435.40usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W0.00 H200.00 D0.00)	0.00	0.00	0.00	-423.50	-101.10	660,164.20	667,839.20	32° 48' 49.275 N	103° 47' 13.313 W
South HL-GC #44 - plan misses target center by 435.40usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W100.00 H0.00 D0.00)	0.00	0.00	0.00	-423.50	-101.10	660,164.20	667,839.20	32° 48' 49.275 N	103° 47' 13.313 W
TG1-GC Fed #44 - plan hits target center - Point	0.00	0.00	5,375.00	-373.50	-91.10	660,214.20	667,849.20	32° 48' 49.769 N	103° 47' 13.193 W
PBHL-GC Fed #44 - plan hits target center - Circle (radius 50.00)	0.00	0.00	7,100.00	-373.50	-91.10	660,214.20	667,849.20	32° 48' 49.769 N	103° 47' 13.193 W

Casing Points

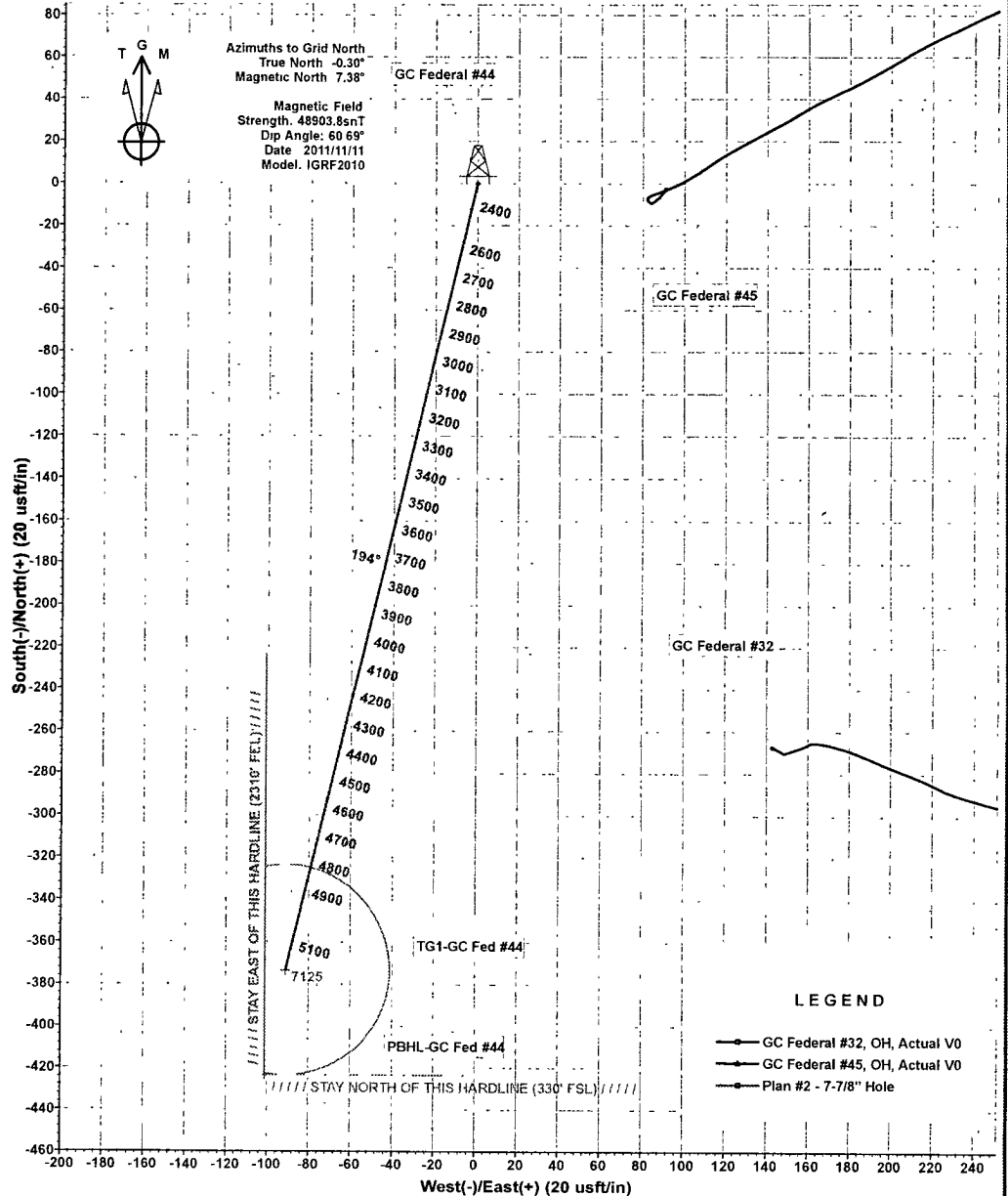
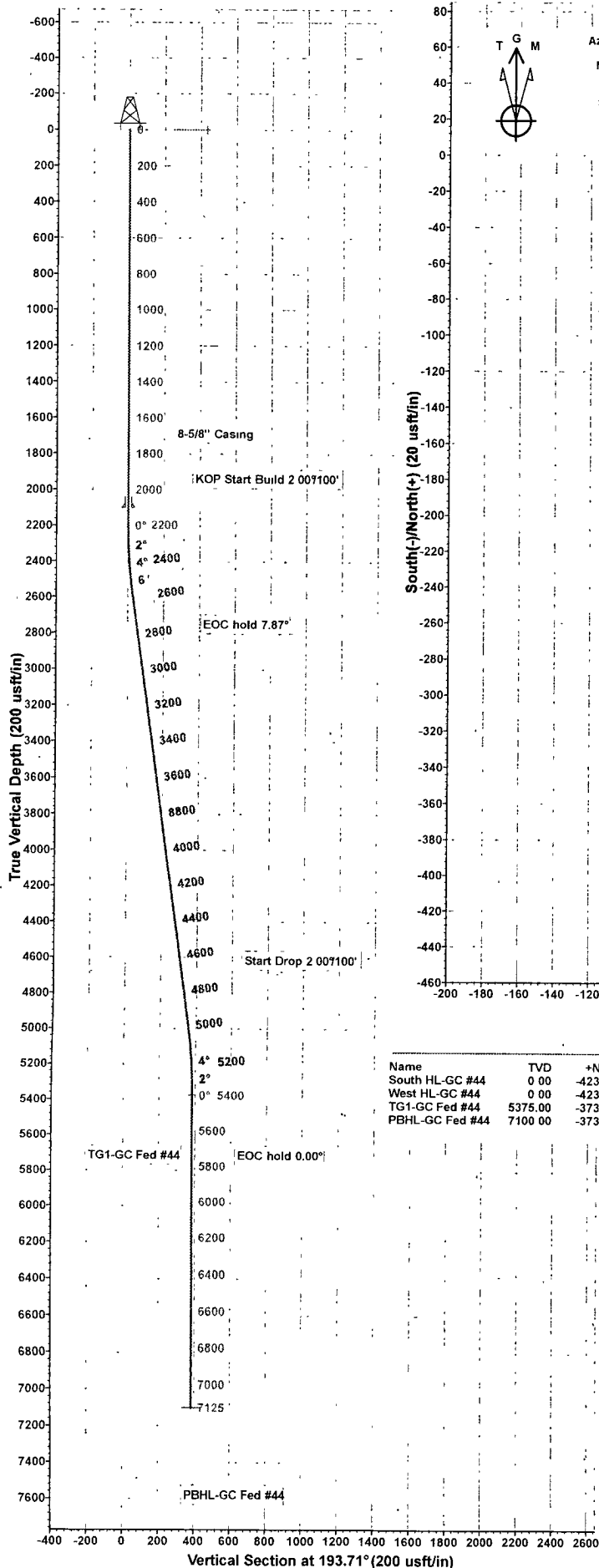
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,100.00	2,100.00	8-5/8" Casing	8-5/8	12-1/4

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,200.00	2,200.00	0.00	0.00	KOP Start Build 2.00°/100'
2,593.56	2,592.32	-26.22	-6.40	EOC hold 7.87°
5,006.65	4,982.68	-347.28	-84.70	Start Drop 2.00°/100'
5,400.21	5,375.00	-373.50	-91.10	EOC hold 0.00°



Scientific Drilling for COG Operating LLC
Site: Lea County, NM (NAD27 NME)
Well: GC Federal #44
Wellbore: OH
Design: Plan #2 - 7-7/8" Hole



WELLBORE TARGET DETAILS (MAP CO-ORDINATES)									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
South HL-GC #44	0 00	-423 50	-101 10	660164 20	667839 20	32°48' 49.275 N	103°47' 13.313 W	Rectangle (Sides: L 0 00 W100 00)	
West HL-GC #44	0 00	-423 50	-101 10	660164 20	667839 20	32°48' 49.275 N	103°47' 13.313 W	Rectangle (Sides: L 200 00 W0 00)	
TG1-GC Fed #44	5375 00	-373 50	-91 10	660214 20	667849 20	32°48' 49.769 N	103°47' 13.193 W	Point	
PBHL-GC Fed #44	7100 00	-373 50	-91 10	660214 20	667849 20	32°48' 49.769 N	103°47' 13.193 W	Circle (Radius 50 00)	

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00
3	2593.56	7.87	193.71	2592.33	-26.22	-6.40	2.00	193.71	26.99
4	45006.65	7.87	193.71	4982.67	-347.28	-84.70	0.00	0.00	357.46
5	55400.21	0.00	0.00	5375.00	-373.50	-91.10	2.00	180.00	384.45
6	7125.21	0.00	0.00	7100.00	-373.50	-91.10	0.00	0.00	384.45

WELL DETAILS GC Federal #44									
+N/-S	+E/-W	Northing	Easting	Ground Level	Latitude	Longitude	Slot		
0 00	0 00	660587 70	667940 30	3977.00	32°48' 53.460 N	103°47' 12.103 W			

PROJECT DETAILS: Lea County, NM (NAD27 NME)									
Geodetic System: US State Plane 1927 (Exact solution)					Plan Plan #2 - 7-7/8" Hole (GC Federal #44/OH)				
Datum: NAD 1927 (NADCON CONUS)					Created By: Julio Pina				
Ellipsoid: Clarke 1866					Checked: _____				
Zone: New Mexico East 3001					Date: _____				
System Datum: Mean Sea Level					Reviewed: _____				
					Date: _____				
					Approved: _____				
					Date: _____				