



COG Operating LLC

Eddy County, NM (NAN27 NME)

Puckett 13 Federal #7H

Puckett 13 Federal #7H

OH

Plan: Plan #1 8-3/4" Hole

SHL = 83' FNL & 970' FEL

PP = 330' FNL & 970' FEL

BHL = 330' FSL & 990' FEL

Standard Planning Report

03 August, 2011



Scientific Drilling
Directional Drilling Operations



Scientific Drilling Planning Report



Database: EDM-Julio
Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Puckett 13 Federal #7H
Well: Puckett 13 Federal #7H
Wellbore: OH
Design: Plan #1 8-3/4" Hole

Local Co-ordinate Reference: Site Puckett 13 Federal #7H
TVD Reference: GL Elev @ 3963 00usft
MD Reference: GL Elev @ 3963 00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project:	Eddy County, NM (NAN27 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:	Puckett 13 Federal #7H		
Site Position:		Northings:	670,270 30 usft
From:	Map	Easting:	658,534 00 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16"
		Grid Convergence:	0 28 °

Well:	Puckett 13 Federal #7H		
Well Position	+N/-S	0 00 usft	Northings:
	+E/-W	0 00 usft	Easting:
Position Uncertainty	0 00 usft	Wellhead Elevation:	Ground Level:

Wellbore:	OH		
Magnetics:	Model Name	Sample Date	Declination
	IGRF2010	2011/07/29	7 73
			Dip Angle
			60 71
			Field Strength
			48,946

Design:	Plan #1 8-3/4" Hole		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0 00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0 00	0 00	0 00
			Direction
			179 91

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
6,122 54	0 00	0 00	6,122 54	0 00	0 00	0 00	0 00	0 00	0 00	
6,872 54	90 00	179 91	6,600 00	-477 46	0 78	12 00	12 00	0 00	179 91	
11,262 28	90 00	179 91	6,600 00	-4,867 20	8 00	0 00	0 00	0 00	0 00	PBHL-Puckett 13 #7H



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Design: Plan #1 8-3/4" Hole

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Site Puckett 13 Federal #7H
GL Elev @ 3963 00usft
GL Elev @ 3963 00usft
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
6,122 54	0 00	0 00	6,122 54	0 00	0 00	0 00	0 00	0 00	0 00
KOP Start Build 12.00°/100'									
6,200 00	9 30	179 91	6,199 66	-6 27	0 01	6 27	12 00	12 00	0 00
6,300 00	21 30	179 91	6,295 94	-32 60	0 05	32 60	12 00	12 00	0 00
6,400 00	33 30	179 91	6,384 65	-78 38	0 13	78 38	12 00	12 00	0 00
6,500 00	45 30	179 91	6,461 89	-141 59	0 23	141 59	12 00	12 00	0 00
6,600 00	57 30	179 91	6,524 31	-219 49	0 36	219 49	12 00	12 00	0 00
6,632 01	61 14	179 91	6,540 69	-246 98	0 41	246 98	12 00	12 00	0 00
PP=330' FNL, Puckett 13 #7H									
6,700 00	69 30	179 91	6,569 16	-308 66	0 51	308 66	12 00	12 00	0 00
6,800 00	81 30	179 91	6,594 50	-405 21	0 67	405 21	12 00	12 00	0 00
6,872 54	90 00	179 91	6,600 00	-477 47	0 78	477 47	12 00	12 00	0 00
Land EOC hold 90.00°									
6,900 00	90 00	179 91	6,600 00	-504 93	0 83	504 93	0 00	0 00	0 00
7,000 00	90 00	179 91	6,600 00	-604 93	0 99	604 93	0 00	0 00	0 00
7,100 00	90 00	179 91	6,600 00	-704 93	1 16	704 93	0 00	0 00	0 00
7,200 00	90 00	179 91	6,600 00	-804 93	1 32	804 93	0 00	0 00	0 00
7,300 00	90 00	179 91	6,600 00	-904 93	1 49	904 93	0 00	0 00	0 00
7,400 00	90 00	179 91	6,600 00	-1,004 93	1 65	1,004 93	0 00	0 00	0 00
7,500 00	90 00	179 91	6,600 00	-1,104 93	1 82	1,104 93	0 00	0 00	0 00
7,600 00	90 00	179 91	6,600 00	-1,204 93	1 98	1,204 93	0 00	0 00	0 00
7,700 00	90 00	179 91	6,600 00	-1,304 93	2 14	1,304 93	0 00	0 00	0 00
7,800 00	90 00	179 91	6,600 00	-1,404 93	2 31	1,404 93	0 00	0 00	0 00
7,900 00	90 00	179 91	6,600 00	-1,504 93	2 47	1,504 93	0 00	0 00	0 00
8,000 00	90 00	179 91	6,600 00	-1,604 93	2 64	1,604 93	0 00	0 00	0 00
8,100 00	90 00	179 91	6,600 00	-1,704 93	2 80	1,704 93	0 00	0 00	0 00
8,200 00	90 00	179 91	6,600 00	-1,804 93	2 97	1,804 93	0 00	0 00	0 00
8,300 00	90 00	179 91	6,600 00	-1,904 93	3 13	1,904 93	0 00	0 00	0 00
8,400 00	90 00	179 91	6,600 00	-2,004 93	3 30	2,004 93	0 00	0 00	0 00
8,500 00	90 00	179 91	6,600 00	-2,104 93	3 46	2,104 93	0 00	0 00	0 00
8,600 00	90 00	179 91	6,600 00	-2,204 93	3 62	2,204 93	0 00	0 00	0 00
8,700 00	90 00	179 91	6,600 00	-2,304 93	3 79	2,304 93	0 00	0 00	0 00
8,800 00	90 00	179 91	6,600 00	-2,404 93	3 95	2,404 93	0 00	0 00	0 00
8,900 00	90 00	179 91	6,600 00	-2,504 93	4 12	2,504 93	0 00	0 00	0 00
9,000 00	90 00	179 91	6,600 00	-2,604 93	4 28	2,604 93	0 00	0 00	0 00
9,100 00	90 00	179 91	6,600 00	-2,704 93	4 45	2,704 93	0 00	0 00	0 00
9,200 00	90 00	179 91	6,600 00	-2,804 93	4 61	2,804 93	0 00	0 00	0 00
9,300 00	90 00	179 91	6,600 00	-2,904 93	4 77	2,904 93	0 00	0 00	0 00
9,400 00	90 00	179 91	6,600 00	-3,004 93	4 94	3,004 93	0 00	0 00	0 00
9,500 00	90 00	179 91	6,600 00	-3,104 93	5 10	3,104 93	0 00	0 00	0 00
9,600 00	90 00	179 91	6,600 00	-3,204 93	5 27	3,204 93	0 00	0 00	0 00
9,700 00	90 00	179 91	6,600 00	-3,304 93	5 43	3,304 93	0 00	0 00	0 00
9,800 00	90 00	179 91	6,600 00	-3,404 93	5 60	3,404 93	0 00	0 00	0 00
9,900 00	90 00	179 91	6,600 00	-3,504 92	5 76	3,504 93	0 00	0 00	0 00
10,000 00	90 00	179 91	6,600 00	-3,604 92	5 93	3,604 93	0 00	0 00	0 00
10,100 00	90 00	179 91	6,600 00	-3,704 92	6 09	3,704 93	0 00	0 00	0 00
10,200 00	90 00	179 91	6,600 00	-3,804 92	6 25	3,804 93	0 00	0 00	0 00
10,300 00	90 00	179 91	6,600 00	-3,904 92	6 42	3,904 93	0 00	0 00	0 00
10,400 00	90 00	179 91	6,600 00	-4,004 92	6 58	4,004 93	0 00	0 00	0 00
10,500 00	90 00	179 91	6,600 00	-4,104 92	6 75	4,104 93	0 00	0 00	0 00
10,600 00	90 00	179 91	6,600 00	-4,204 92	6 91	4,204 93	0 00	0 00	0 00
10,700 00	90 00	179 91	6,600 00	-4,304 92	7 08	4,304 93	0 00	0 00	0 00



Scientific Drilling
Planning Report



Database: EDM-Julio
Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Puckett 13 Federal #7H
Well: Puckett 13 Federal #7H
Wellbore: OH
Design: Plan #1 8-3/4" Hole

Local Co-ordinate Reference: Site Puckett 13 Federal #7H
TVD Reference: GL Elev @ 3963 00usft
MD Reference: GL Elev @ 3963 00usft
North Reference: Grid
Survey Calculation Method: 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)
10,800 00	90 00	179 91	6,600 00	-4,404 92	7 24	4,404 93	0 00	0 00	0 00
10,900 00	90 00	179 91	6,600 00	-4,504 92	7 40	4,504 93	0 00	0 00	0 00
11,000 00	90 00	179 91	6,600 00	-4,604 92	7 57	4,604 93	0 00	0 00	0 00
11,100 00	90 00	179 91	6,600 00	-4,704 92	7 73	4,704 93	0 00	0 00	0 00
11,200 00	90 00	179 91	6,600 00	-4,804 92	7 90	4,804 93	0 00	0 00	0 00
11,262.28	90 00	179 91	6,600 00	-4,867.20	8 00	4,867 21	0 00	0 00	0 00

PBHL-Puckett 13 #7H

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
PP=330' FNL, Puckett 1 - plan hits target center - Point	0.00	0 00	6,540 70	-247 01	0 41	670,023 30	658,534 41	32° 50' 27 294 N	103° 49' 1 776 W
PBHL-Puckett 13 #7H - plan hits target center - Point	0 00	0 00	6,600 00	-4,867 20	8 00	665,403 10	658,542 00	32° 49' 41 576 N	103° 49' 1 951 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
6,122 54	6,122 54	0 00	0 00	KOP Start Build 12 00°/100'
6,872 54	6,600 00	-477 47	0 78	Land EOC hold 90 00°



Scientific Drilling for COG Operating LLC
Site: Eddy County, NM (NAN27 NME)
Well: Puckett 13 Federal #7H
Wellbore: OH
Design: Plan #1 8-3/4" Hole



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	6122.54	0.00	0.00	6122.54	0.00	0.00	0.00	0.00	0.00	
3	6872.54	90.00	179.91	6600.00	-477.46	0.78	12.00	179.91	477.46	
4	11262.28	90.00	179.91	6600.00	-4867.20	8.00	0.00	0.00	4867.21	PBHL-Puckett 13 #7H

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PP=330' FNL, Puckett 13 #7H	6540.70	-247.01	0.41	670023.29	658534.41	32°50' 27.294 N	103°49' 1' 776 W	Point
PBHL-Puckett 13 #7H	6600.00	-4867.20	8.00	665403.10	658542.00	32°49' 41.576 N	103°49' 1' 951 W	Point

WELL DETAILS: Puckett 13 Federal #7H

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	670270.30	658534.00	32°50' 29.738 N	103°49' 1' 766 W	

Puckett 13 Federal #7H

Created By: Julio Pina Date: 29-Jul-11

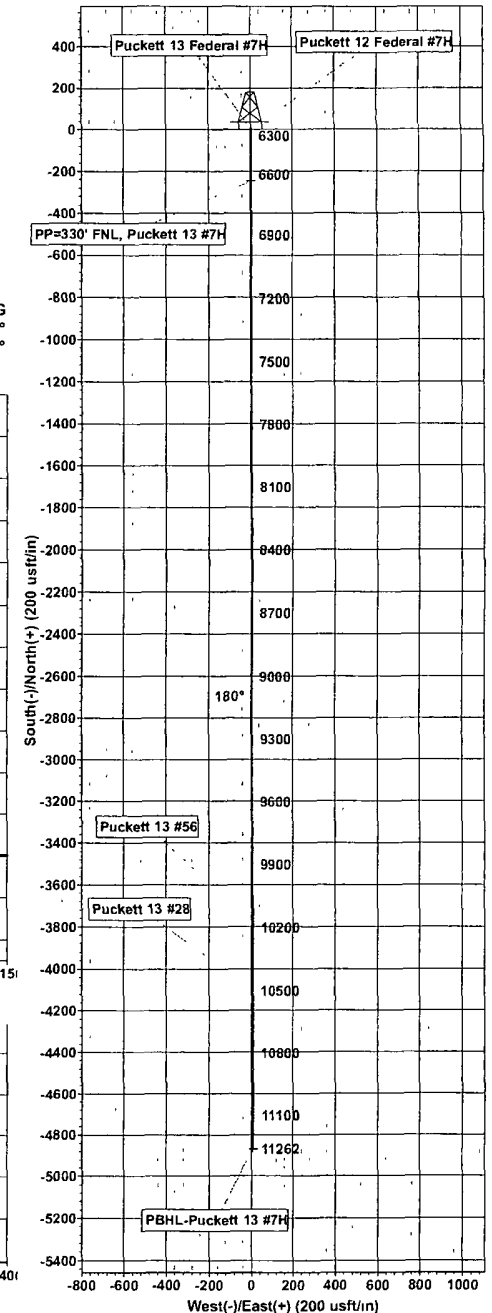
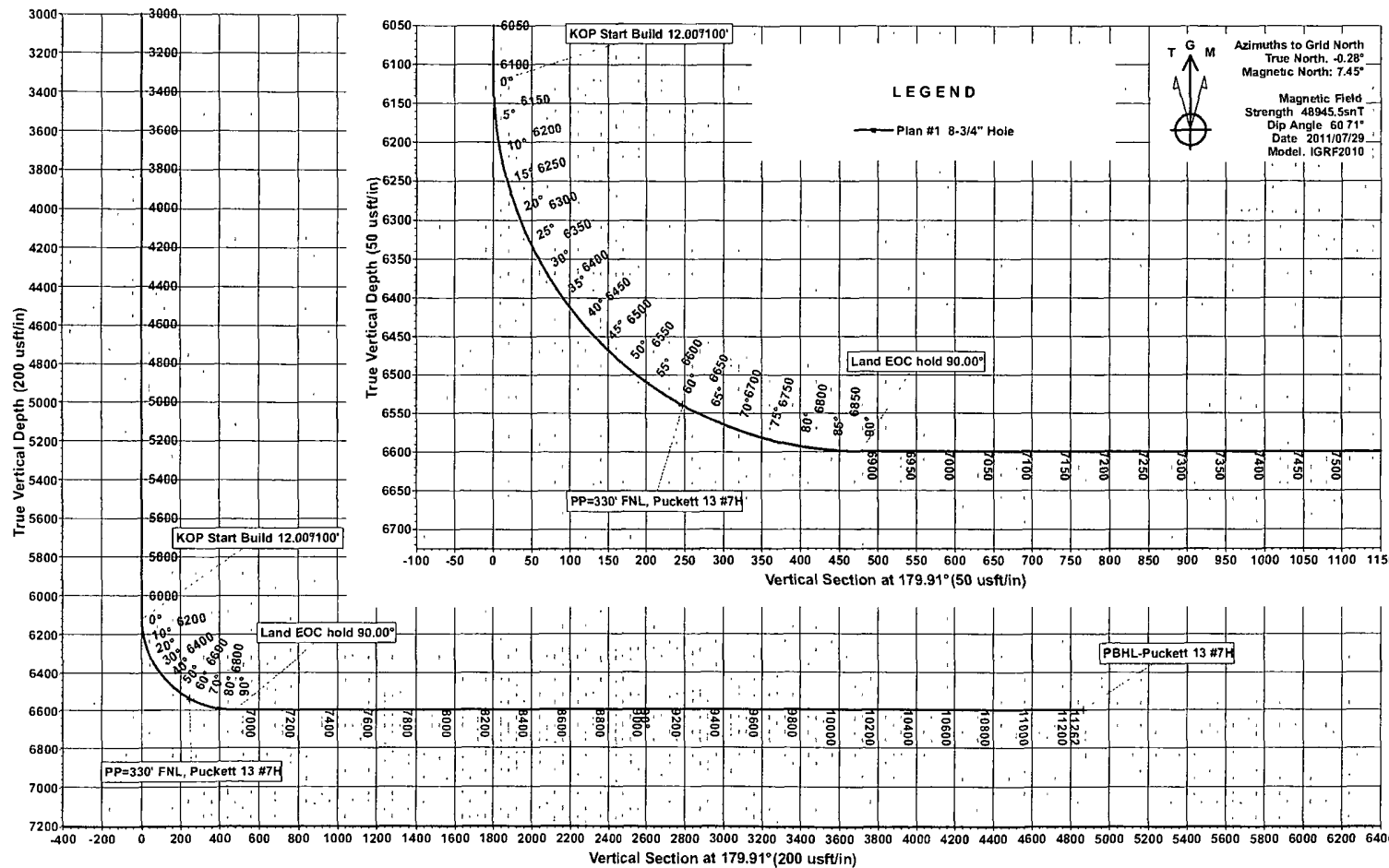
Checked: _____ Date: _____

Reviewed: _____ Date: _____

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

AZIMUTH CORRECTIONS
ALL AZIMUTHS MUST BE CORRECTED TO GRID
GRID CORRECTIONS MUST BE APPLIED BEFORE PLOTTING
To convert a Magnetic Direction to a Grid Direction, Add 7.45°
To convert a True Direction to a Grid Direction, Subtract 0.28°



ATTACHMENT TO FORM 3160-3
 COG Operating, LLC
 Puckett 13 Federal #7H
 SHL: 83' FNL & 970' FEL, Unit A
 BHL: 330' FSL & 990' FEL, Unit P
 Sec 13, T17S, R31E
 Eddy County, NM

1. Proration Unit Spacing: 160 Acres
2. Ground Elevation: 3963'
3. Proposed Depths: Horizontal TVD = 6,600', MD = 11262' Pilot Hole = 6,900'
4. Estimated tops of geological markers:

Quaternary	Surface
Rustler	682'
Top of Salt	900'
Base of Salt	1923'
Yates	2028'
Seven Rivers	2356'
Queen	2980'
Grayburg	3415'
San Andres	3739'
Glorieta	5247'
Paddock	5317'
Blinberry	5745'
Tubb	6700'

5. Possible mineral bearing formations:

Water Sand	150'	Fresh Water
Grayburg	3415'	Oil/Gas
San Andres	3739'	Oil/Gas
Glorieta	5247'	Oil/Gas
Paddock	5317'	Oil/Gas
Blinberry	5745'	Oil/Gas
Tubb	6700'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 600' and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 9 5/8" casing to 2000' and circulating cement, in a single or multi-stage job and/or with an ECP, back to the surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them. This will be achieved by cementing, with a single or multi-stage job, the 5 1/2" production casing back 200' into the intermediate casing (although cement volume is actually calculated to surface), to be run at TD. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react to protect the wellbore and/or environment.

See corA
] see corA

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
Puckett 13 Federal #7H
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6. Casing Program - Proposed

	<u>Hole size</u>	<u>Interval</u>	<u>OD of Casing</u>	<u>Weight</u>	<u>Cond.</u>	<u>Collar</u>	<u>Grade</u>
See CoA	17-1/2"	0' - +/-600' ⁷⁵⁰	13-3/8"	48#	New	STC	H-40 or J/K-55
	Collapse sf – 3.87, Burst sf – 8.70, Tension sf – 14.91						
	12-1/4"	0' - +/-2000' ²¹⁵⁵	9-5/8"	36#	New	STC	J/K-55
	Collapse sf – 2.88, Burst sf – 5.01, Tension sf – 8.11						
	8-3/4"	0' – 11262'	7" x 5-1/2"	26#/17#	New	LTC	L-80
	Collapse sf – 1.87, Burst sf – 2.48, Tension sf – 2.08						

Production string will be a tapered string with 7" 26# L-80 LTC ran from surface to kick off point and then crossed over to 5 1/2" 17# L-80 LTC.

7. Cement Program

13 3/8" Surface Csg: Set at +/- 600' MD, Lead Slurry: 450sx Class "C" w/ 2% CaCl₂ & .25 pps CF, 1.32 yield. 45% excess, calculated to surface.

9 5/8" Intrmd. Csg: Set at +/- 2000' MD. Single Stage: Lead Slurry: 300 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1 .25 pps CF, 2.45 yield. Tail Slurry: 200 sx Class "C" w/ 2% CaCl₂, 1.32 yield. 76% excess, calculated to surface.

See
CoA
Multi Stage: Stage 1: 200 sx Class "C" w/ 2% CaCl₂, 1.32 yield. 76% excess. Stage 2: 300 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1 .25 pps CF, 2.45 yield, back to surface, 176% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 500' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

Pilot Hole Cement: 7-7/8" hole +/- 6000'-6900', 350sx Class C, 16.8 ppg, 1.02 yd, 17% excess, calculated to surface. Cement volume to be adjusted proportionally with pilot hole td.

7 x 5 1/2" Production Csg: Set at +/- 11262' MD. Single Stage: Lead Slurry: 400 sx 35:65:6:C:Poz:Gel w/ 5% salt, 5 pps LCM, .2% SMS, .3% FL-52A, .125 pps CF, 2.01 yd. Inter. Slurry: 300 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, .3% FL-52A; 1.37 yield Tail Slurry: 450 sx Class "H" SOLUCEM-H w/ .7% HR-601, 2.62 yield 59% excess in open hole, calculated to surface. **This is a minimum volume and will be adjusted up after caliper is run.**

Multi Stage: Stage 1: (Assumed TD of 11262' MD to DV at 3550') Lead Slurry: 350 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, .3% FL-52A; 1.37 yield Tail Slurry: 450 sx Class "H" SOLUCEM-H w/ .7% HR-601, 2.62 yield; 7% excess. **This is a minimum volume and will be adjusted up after caliper is run.** Stage 2: Lead Slurry: 350 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, .3% FL-52A; 1.37 yield. Tail Slurry: 150 sx Class C w/ 0.3% R-3 + 1.5% CD-32, 1.02 yield. 28% excess calculated back to surface (no need for excess in casing overlap). **This is a minimum volume and will be adjusted up after caliper is run.**

Multi stage tool to be set at approximately, depending on hole conditions, 3550'. Cement volumes will be adjusted proportionately for depth changes of multi stage tool; assumption for use of tool is water flow.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
Puckett 13 Federal #7H
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8. Pressure Control Equipment:

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on the bottom. A 13-5/8" will be used during the drilling of the well. The BOP will be nipped up on the 13 3/8" surface casing with BOP equipment and tested to 2000 psi. After setting 9-5/8" the BOP will then be nipped up on the 9-5/8" intermediate casing and tested by a third party to 2000 psi and used continuously until total depth is reached. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment (Exhibit #10) will include a Kelly cock and floor safety valve, choke lines and a choke manifold (Exhibit #11) with a 2000 psi WP rating.

9. Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 600' ⁷⁵⁵	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
600' - 2000' ²¹⁵⁵	10	30	NC	Brine mud, lime for PH and paper for seepage and sweeps.
2000' - 11262'	9.1	29	NC	Drill section with fresh water/cut brine circulating the reserve utilizing periodic sweeps of paper as needed for seepage control and solids removal.

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the well site at all times.

10. Production Hole Drilling Summary:

Reduce hole size at 6000' to 7 7/8", drill pilot hole to 6900'. After evaluation, plug back pilot hole to 6,000'. Drill 8 3/4" hole and kick off at +/- 6123', building curve over +/- 750' to horizontal at 6600' TVD. Drill horizontal section in a Southerly direction for +/-4390' lateral to TD at +/-11262' MD, 6600' TVD. Run 5-1/2" production casing in Open hole lateral and cement to surface.

11. Auxiliary Well Control and Monitoring Equipment

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
Puckett 13 Federal #7H
Page 4 of 4

12. Logging, Testing and Coring Program:

See CONT

- A. The evaluation program will consist of PEX, LDT-CNL-GR, HRLA_GR, FMI, Rotary Cores and will be ran from T.D. in vertical pilot hole to 9 5/8" casing shoe.
- B. The mud logging program will consist of lagged 10' samples from intermediate casing point to T.D. in vertical pilot hole and from Kick off point to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 7" x 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

13. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 90 degrees and estimated maximum bottom hole pressure is 1800 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, however an H2S plan is attached to the Drilling Program. No major loss of circulation zones has been reported in offsetting wells.

14. Anticipated Starting Date

Drilling operations will commence approximately on October 30, 2011 with drilling and completion operations lasting approximately 90 days.

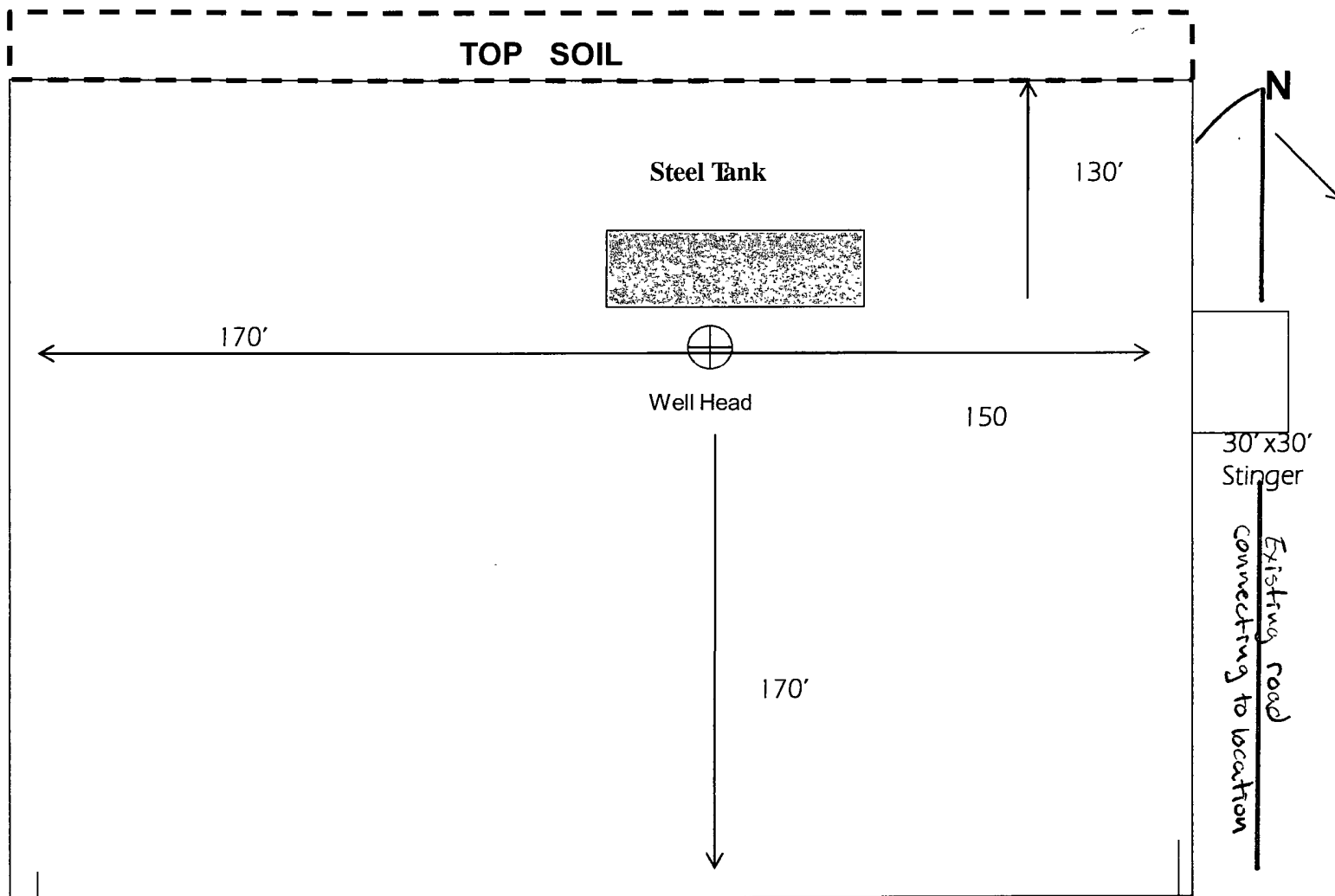


Exhibit #6

Connecting to the Puckett 12
#7H location



Not To Scale

COG OPERATING LLC
Rig Layout-Closed Loop
System: Puckett 13 #7H

