



30-025-41007

NEW MEXICO SHELF

LEA COUNTY, NM

MALJAMAR

BRANEX-COG FEDERAL COM #18H

OWB

Plan: PWP0

Standard Planning Report

05 February, 2015

JUL 01 2015



COG Operating LLC
Planning Report

Database:	EDM_Users	Local Co-ordinate Reference:	Well BRANEX-COG FEDERAL COM #18H
Company:	NEW MEXICO SHELF	TVD Reference:	RKB=4055+12.5 @ 4067.5usft (UNITED #43)
Project:	LEA COUNTY, NM	MD Reference:	RKB=4055+12.5 @ 4067.5usft (UNITED #43)
Site:	MALJAMAR	North Reference:	Grid
Well:	BRANEX-COG FEDERAL COM #18H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWP0		

Project	LEA 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	MALJAMAR		
Site Position:		Northing:	675,386.60 usft
From:	Map	Easting:	682,929.80 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 51' 19.093 N
		Longitude:	103° 44' 15.489 W
		Grid Convergence:	0.32 °

Well:	BRANEX-COG FEDERAL COM #18H		
Well Position	+N/-S	-4,655.6 usft	Northing:
	+E/-W	-12,515.9 usft	Easting:
Position Uncertainty	3.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 50' 33.700 N
		Longitude:	103° 46' 42.495 W
		Ground Level:	4,055.0 usft

Wellbore	OWB		
Magnetics	Model Name	Sample Date	Declination
	WMM_2005	12/31/2009	7.90
			Dip Angle
			60.77
			Field Strength
			49,133

Design	PWP0		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	5,705.4	0.0	0.0
			Direction
			89.81

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)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,279.1	0.00	0.01	5,279.1	0.0	0.0	0.00	0.00	0.00	0.01	
6,106.5	91.00	89.81	5,800.0	1.8	530.1	11.00	11.00	0.00	89.81	
11,517.7	91.00	89.81	5,705.4	19.8	5,940.4	0.00	0.00	0.00	0.00	PBHL-Branex-COG F



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Site:	MALJAMAR	North Reference:	Grid
Well:	BRANEX-COG FEDERAL COM #18H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWP0		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,279.1	0.00	0.00	5,279.1	0.0	0.0	0.0	0.00	0.00	0.00



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Wellbore:	OWB		
Design:	PWP0		

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)
KOP, BEGIN 11°/100' BUILD									
5,300.0	2.30	89.81	5,300.0	0.0	0.4	0.4	11.00	11.00	0.00
5,400.0	13.30	89.81	5,398.9	0.0	14.0	14.0	11.00	11.00	0.00
5,500.0	24.29	89.81	5,493.4	0.2	46.1	46.1	11.00	11.00	0.00
5,600.0	35.29	89.81	5,580.1	0.3	95.7	95.7	11.00	11.00	0.00
5,700.0	46.29	89.81	5,655.7	0.5	161.0	161.0	11.00	11.00	0.00
5,800.0	57.29	89.81	5,717.4	0.8	239.4	239.4	11.00	11.00	0.00
5,900.0	68.29	89.81	5,763.1	1.1	328.2	328.2	11.00	11.00	0.00
6,000.0	79.28	89.81	5,791.0	1.4	424.1	424.1	11.00	11.00	0.00
6,100.0	90.28	89.81	5,800.1	1.7	523.5	523.5	11.00	11.00	0.00
6,106.5	91.00	89.81	5,800.0	1.8	530.0	530.0	11.00	11.00	0.00
EOC, 91° INC, 89.81° AZI									
6,200.0	91.00	89.81	5,798.4	2.1	623.5	623.5	0.00	0.00	0.00
6,300.0	91.00	89.81	5,796.6	2.4	723.5	723.5	0.00	0.00	0.00
6,400.0	91.00	89.81	5,794.9	2.7	823.5	823.5	0.00	0.00	0.00
6,500.0	91.00	89.81	5,793.1	3.1	923.5	923.5	0.00	0.00	0.00
6,600.0	91.00	89.81	5,791.4	3.4	1,023.5	1,023.5	0.00	0.00	0.00
6,700.0	91.00	89.81	5,789.6	3.7	1,123.4	1,123.4	0.00	0.00	0.00
6,800.0	91.00	89.81	5,787.9	4.1	1,223.4	1,223.4	0.00	0.00	0.00
6,900.0	91.00	89.81	5,786.1	4.4	1,323.4	1,323.4	0.00	0.00	0.00
7,000.0	91.00	89.81	5,784.4	4.7	1,423.4	1,423.4	0.00	0.00	0.00
7,100.0	91.00	89.81	5,782.6	5.1	1,523.4	1,523.4	0.00	0.00	0.00
7,200.0	91.00	89.81	5,780.9	5.4	1,623.4	1,623.4	0.00	0.00	0.00
7,300.0	91.00	89.81	5,779.1	5.7	1,723.3	1,723.3	0.00	0.00	0.00
7,400.0	91.00	89.81	5,777.4	6.1	1,823.3	1,823.3	0.00	0.00	0.00
7,500.0	91.00	89.81	5,775.6	6.4	1,923.3	1,923.3	0.00	0.00	0.00
7,600.0	91.00	89.81	5,773.9	6.7	2,023.3	2,023.3	0.00	0.00	0.00
7,700.0	91.00	89.81	5,772.1	7.1	2,123.3	2,123.3	0.00	0.00	0.00
7,800.0	91.00	89.81	5,770.4	7.4	2,223.3	2,223.3	0.00	0.00	0.00
7,900.0	91.00	89.81	5,768.6	7.7	2,323.2	2,323.3	0.00	0.00	0.00
8,000.0	91.00	89.81	5,766.9	8.1	2,423.2	2,423.2	0.00	0.00	0.00
8,100.0	91.00	89.81	5,765.1	8.4	2,523.2	2,523.2	0.00	0.00	0.00
8,200.0	91.00	89.81	5,763.4	8.7	2,623.2	2,623.2	0.00	0.00	0.00
8,300.0	91.00	89.81	5,761.6	9.1	2,723.2	2,723.2	0.00	0.00	0.00
8,400.0	91.00	89.81	5,759.9	9.4	2,823.2	2,823.2	0.00	0.00	0.00
8,500.0	91.00	89.81	5,758.1	9.7	2,923.2	2,923.2	0.00	0.00	0.00
8,600.0	91.00	89.81	5,756.4	10.1	3,023.1	3,023.2	0.00	0.00	0.00
8,700.0	91.00	89.81	5,754.7	10.4	3,123.1	3,123.1	0.00	0.00	0.00
8,800.0	91.00	89.81	5,752.9	10.7	3,223.1	3,223.1	0.00	0.00	0.00
8,900.0	91.00	89.81	5,751.2	11.1	3,323.1	3,323.1	0.00	0.00	0.00
9,000.0	91.00	89.81	5,749.4	11.4	3,423.1	3,423.1	0.00	0.00	0.00
9,100.0	91.00	89.81	5,747.7	11.7	3,523.1	3,523.1	0.00	0.00	0.00
9,200.0	91.00	89.81	5,745.9	12.1	3,623.0	3,623.1	0.00	0.00	0.00
9,300.0	91.00	89.81	5,744.2	12.4	3,723.0	3,723.0	0.00	0.00	0.00
9,400.0	91.00	89.81	5,742.4	12.7	3,823.0	3,823.0	0.00	0.00	0.00
9,500.0	91.00	89.81	5,740.7	13.1	3,923.0	3,923.0	0.00	0.00	0.00
9,600.0	91.00	89.81	5,738.9	13.4	4,023.0	4,023.0	0.00	0.00	0.00
9,700.0	91.00	89.81	5,737.2	13.7	4,123.0	4,123.0	0.00	0.00	0.00
9,800.0	91.00	89.81	5,735.4	14.1	4,222.9	4,223.0	0.00	0.00	0.00
9,900.0	91.00	89.81	5,733.7	14.4	4,322.9	4,323.0	0.00	0.00	0.00
10,000.0	91.00	89.81	5,731.9	14.7	4,422.9	4,422.9	0.00	0.00	0.00
10,100.0	91.00	89.81	5,730.2	15.1	4,522.9	4,522.9	0.00	0.00	0.00
10,200.0	91.00	89.81	5,728.4	15.4	4,622.9	4,622.9	0.00	0.00	0.00



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Wellbore:	OWB		
Design:	PWP0		

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)	
10,300.0	91.00	89.81	5,726.7	15.7	4,722.9	4,722.9	0.00	0.00	0.00	
10,400.0	91.00	89.81	5,724.9	16.1	4,822.8	4,822.9	0.00	0.00	0.00	
10,500.0	91.00	89.81	5,723.2	16.4	4,922.8	4,922.9	0.00	0.00	0.00	
10,600.0	91.00	89.81	5,721.4	16.7	5,022.8	5,022.8	0.00	0.00	0.00	
10,700.0	91.00	89.81	5,719.7	17.1	5,122.8	5,122.8	0.00	0.00	0.00	
10,800.0	91.00	89.81	5,717.9	17.4	5,222.8	5,222.8	0.00	0.00	0.00	
10,900.0	91.00	89.81	5,716.2	17.7	5,322.8	5,322.8	0.00	0.00	0.00	
11,000.0	91.00	89.81	5,714.4	18.1	5,422.8	5,422.8	0.00	0.00	0.00	
11,100.0	91.00	89.81	5,712.7	18.4	5,522.7	5,522.8	0.00	0.00	0.00	
11,200.0	91.00	89.81	5,711.0	18.7	5,622.7	5,622.8	0.00	0.00	0.00	
11,300.0	91.00	89.81	5,709.2	19.1	5,722.7	5,722.7	0.00	0.00	0.00	
11,400.0	91.00	89.81	5,707.5	19.4	5,822.7	5,822.7	0.00	0.00	0.00	
11,500.0	91.00	89.81	5,705.7	19.7	5,922.7	5,922.7	0.00	0.00	0.00	
11,517.7	91.00	89.81	5,705.4	19.8	5,940.4	5,940.4	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
PBHL-Branex-COG Fed	0.00	0.00	5,705.4	19.8	5,940.4	670,750.80	676,354.30	32° 50' 33.582 N	103° 45' 32.866 W	
- plan hits target center										
- Point										

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
5,279.1	5,279.1	0.0	0.0	KOP, BEGIN 11°/100' BUILD	
6,106.5	5,800.0	1.8	530.0	EOC, 91° INC, 89.81° AZI	

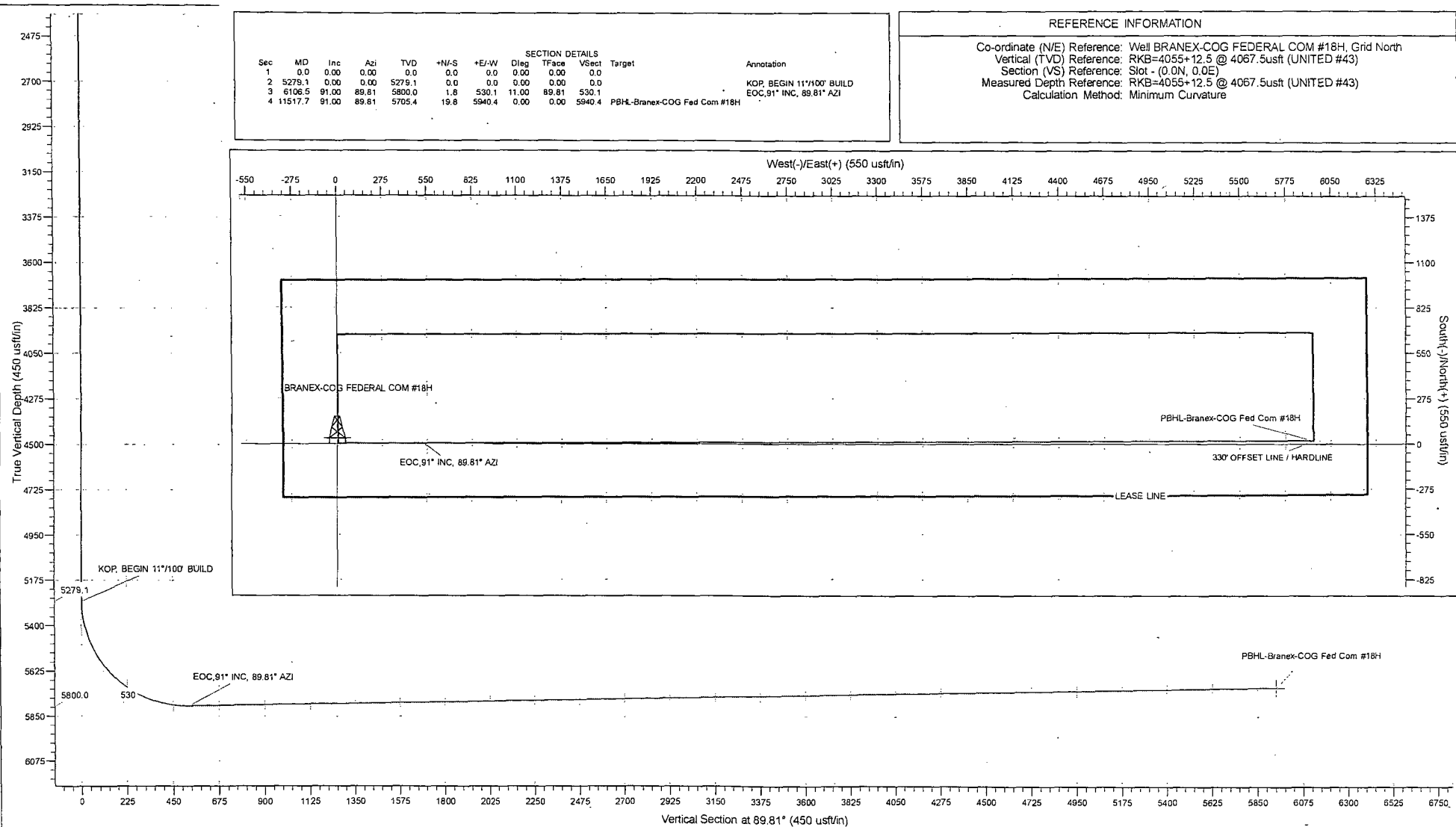


Project: LEA COUNTY, NM.
Site: MALJAMAR
Well: BRANEX-COG FEDERAL COM #18H
Wellbore: OWB
Design: PWP0

SECTION DETAILS											Target	Annotation
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl			
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0			
2	5279.1	0.00	0.00	5279.1	0.0	0.0	0.00	0.00	0.0			KOP, BEGIN 11"100' BUILD
3	6106.5	91.00	89.81	5800.0	1.8	530.1	11.00	89.81	530.1			EOC, 91° INC, 89.81° AZI
4	11517.7	91.00	89.81	5705.4	19.8	5940.4	0.00	0.00	5940.4	PBHL-Branex-COG Fed Com #18H		

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well BRANEX-COG FEDERAL COM #18H, Grid North
Vertical (TVD) Reference: RKB=4055+12.5 @ 4067.5usft (UNITED #43)
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: RKB=4055+12.5 @ 4067.5usft (UNITED #43)
Calculation Method: Minimum Curvature



PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING, LLC
LEASE NO.:	NM0315713
WELL NAME & NO.:	18H-BRANEX-COG FEDERAL COM
SURFACE HOLE FOOTAGE:	330'/S. & 330'/W.
BOTTOM HOLE FOOTAGE:	330'/S. & 990'/W. Section 10.
LOCATION:	Section 9, T. 17 S., R. 32 E., NMPM
COUNTY:	Lea County, New Mexico

The original COAs still stand with the following drilling modifications:

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Lea County**

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 393-3612

1. A Hydrogen Sulfide (H₂S) Drilling Plan should be activated 500 feet prior to drilling into the **Grayburg** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. **The record of the drilling rate along with the GR/N well log run from TD to surface will be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least **8 hours**. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possible water and brine flows in the Salado and Artesia Group.

Possible lost circulation in the Grayburg and San Andres formations.

1. The 13-3/8 inch surface casing shall be set at **approximately 943 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

Option #1:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Option #2:

Operator has proposed DV tool at depth of 993', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

3. The minimum required fill of cement behind the **7 x 5-1/2** inch production casing is:

Option #1:

☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

Option #2:

Operator has proposed DV tool at depth of 4064', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve tie-back on the next stage.

b. Second stage above DV tool:

☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.
4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

JAM 062215