



# **Ursa Operating Company, LLC**

**Rockies Region**

**Frei A**

**Frei A18**

**Wellbore #1**

**Plan: Design #3**

## **Standard Planning Report**

**12 August, 2013**



<b>Database:</b>	EDM 2003.21 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Frei A18
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	Frei A18 @ 5611.9ft (PAD EST KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A18 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A18	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #3		

<b>Project</b>	Rockies Region		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		Frei A			
Site Position: From:	Lat/Long	Northing:	1,626,942.75 ft	Latitude:	39° 32' 9.196 N
		Easting:	2,406,826.15 ft	Longitude:	107° 36' 12.020 W
		Position Uncertainty:	0.0 ft	Slot Radius:	"

Well	Frei A18, SHL LAT: 39.536091400, LONG: -107.603299600					
Well Position	+N/-S	74.2 ft	Northing:	1,627,016.62 ft	Latitude:	39° 32' 9.929 N
	+E/-W	11.1 ft	Easting:	2,406,838.95 ft	Longitude:	107° 36' 11.879 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	5,611.9 ft	Ground Level:	5,596.5 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	8/6/2013	9.87	65.80	52,148

<b>Design</b>	Design #3			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	318.08

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,228.0	35.98	318.08	1,161.7	232.4	-208.6	3.50	3.50	0.00	318.08	
4,212.9	35.98	318.08	3,577.3	1,537.3	-1,380.2	0.00	0.00	0.00	0.00	
5,240.9	0.00	0.00	4,539.0	1,769.6	-1,588.8	3.50	-3.50	0.00	180.00	
7,504.9	0.00	0.00	6,803.0	1,769.6	-1,588.8	0.00	0.00	0.00	0.00	Frei A18 BHL

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A18 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A18	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #3		

Planned Survey									
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)
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
<b>Start Build 3.50</b>									
300.0	3.50	318.08	299.9	2.3	-2.0	3.1	3.50	3.50	0.00
400.0	7.00	318.08	399.5	9.1	-8.2	12.2	3.50	3.50	0.00
500.0	10.50	318.08	498.3	20.4	-18.3	27.4	3.50	3.50	0.00
600.0	14.00	318.08	596.0	36.2	-32.5	48.6	3.50	3.50	0.00
700.0	17.50	318.08	692.3	56.4	-50.6	75.8	3.50	3.50	0.00
800.0	21.00	318.08	786.7	80.9	-72.6	108.7	3.50	3.50	0.00
900.0	24.50	318.08	878.9	109.7	-98.5	147.4	3.50	3.50	0.00
1,000.0	28.00	318.08	968.5	142.6	-128.0	191.6	3.50	3.50	0.00
1,100.0	31.50	318.08	1,055.3	179.5	-161.2	241.2	3.50	3.50	0.00
1,200.0	35.00	318.08	1,139.0	220.3	-197.8	296.1	3.50	3.50	0.00
1,228.0	35.98	318.08	1,161.7	232.4	-208.6	312.3	3.50	3.50	0.00
<b>Start 2985.0 hold at 1228.0 MD</b>									
1,300.0	35.98	318.08	1,220.0	263.9	-236.9	354.6	0.00	0.00	0.00
1,400.0	35.98	318.08	1,300.9	307.6	-276.2	413.4	0.00	0.00	0.00
1,500.0	35.98	318.08	1,381.9	351.3	-315.4	472.1	0.00	0.00	0.00
1,600.0	35.98	318.08	1,462.8	395.0	-354.6	530.9	0.00	0.00	0.00
1,700.0	35.98	318.08	1,543.7	438.7	-393.9	589.6	0.00	0.00	0.00
1,800.0	35.98	318.08	1,624.6	482.4	-433.1	648.4	0.00	0.00	0.00
1,900.0	35.98	318.08	1,705.6	526.2	-472.4	707.1	0.00	0.00	0.00
2,000.0	35.98	318.08	1,786.5	569.9	-511.6	765.8	0.00	0.00	0.00
2,100.0	35.98	318.08	1,867.4	613.6	-550.9	824.6	0.00	0.00	0.00
2,200.0	35.98	318.08	1,948.3	657.3	-590.1	883.3	0.00	0.00	0.00
2,300.0	35.98	318.08	2,029.3	701.0	-629.4	942.1	0.00	0.00	0.00
2,400.0	35.98	318.08	2,110.2	744.7	-668.6	1,000.8	0.00	0.00	0.00
2,500.0	35.98	318.08	2,191.1	788.4	-707.9	1,059.6	0.00	0.00	0.00
2,600.0	35.98	318.08	2,272.0	832.2	-747.1	1,118.3	0.00	0.00	0.00
2,700.0	35.98	318.08	2,352.9	875.9	-786.4	1,177.1	0.00	0.00	0.00
2,800.0	35.98	318.08	2,433.9	919.6	-825.6	1,235.8	0.00	0.00	0.00
2,900.0	35.98	318.08	2,514.8	963.3	-864.9	1,294.6	0.00	0.00	0.00
3,000.0	35.98	318.08	2,595.7	1,007.0	-904.1	1,353.3	0.00	0.00	0.00
3,100.0	35.98	318.08	2,676.6	1,050.7	-943.4	1,412.1	0.00	0.00	0.00
3,200.0	35.98	318.08	2,757.6	1,094.4	-982.6	1,470.8	0.00	0.00	0.00
3,277.0	35.98	318.08	2,819.9	1,128.1	-1,012.9	1,516.1	0.00	0.00	0.00
<b>WF</b>									
3,300.0	35.98	318.08	2,838.5	1,138.2	-1,021.9	1,529.6	0.00	0.00	0.00
3,400.0	35.98	318.08	2,919.4	1,181.9	-1,061.1	1,588.3	0.00	0.00	0.00
3,500.0	35.98	318.08	3,000.3	1,225.6	-1,100.4	1,647.1	0.00	0.00	0.00
3,600.0	35.98	318.08	3,081.3	1,269.3	-1,139.6	1,705.8	0.00	0.00	0.00
3,700.0	35.98	318.08	3,162.2	1,313.0	-1,178.9	1,764.6	0.00	0.00	0.00
3,800.0	35.98	318.08	3,243.1	1,356.7	-1,218.1	1,823.3	0.00	0.00	0.00
3,900.0	35.98	318.08	3,324.0	1,400.5	-1,257.4	1,882.1	0.00	0.00	0.00
4,000.0	35.98	318.08	3,404.9	1,444.2	-1,296.6	1,940.8	0.00	0.00	0.00
4,100.0	35.98	318.08	3,485.9	1,487.9	-1,335.9	1,999.6	0.00	0.00	0.00
4,200.0	35.98	318.08	3,566.8	1,531.6	-1,375.1	2,058.3	0.00	0.00	0.00
4,212.9	35.98	318.08	3,577.3	1,537.3	-1,380.2	2,065.9	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
4,300.0	32.93	318.08	3,649.0	1,573.9	-1,413.1	2,115.2	3.50	-3.50	0.00
4,400.0	29.43	318.08	3,734.6	1,612.4	-1,447.7	2,166.9	3.50	-3.50	0.00
4,500.0	25.93	318.08	3,823.1	1,647.0	-1,478.7	2,213.4	3.50	-3.50	0.00
4,600.0	22.43	318.08	3,914.3	1,677.5	-1,506.1	2,254.4	3.50	-3.50	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A18 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A18	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #3		

Planned Survey									
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)
4,669.3	20.01	318.08	3,978.9	1,696.1	-1,522.8	2,279.4	3.50	-3.50	0.00
<b>Top of Gas</b>									
4,700.0	18.93	318.08	4,007.9	1,703.7	-1,529.7	2,289.7	3.50	-3.50	0.00
4,800.0	15.43	318.08	4,103.4	1,725.7	-1,549.4	2,319.2	3.50	-3.50	0.00
4,900.0	11.93	318.08	4,200.5	1,743.3	-1,565.2	2,342.9	3.50	-3.50	0.00
5,000.0	8.43	318.08	4,299.0	1,756.5	-1,577.0	2,360.5	3.50	-3.50	0.00
5,100.0	4.93	318.08	4,398.3	1,765.1	-1,584.8	2,372.2	3.50	-3.50	0.00
5,200.0	1.43	318.08	4,498.1	1,769.3	-1,588.5	2,377.7	3.50	-3.50	0.00
5,240.9	0.00	0.00	4,539.0	1,769.6	-1,588.8	2,378.2	3.50	-3.50	0.00
<b>Start 2264.0 hold at 5240.9 MD</b>									
5,300.0	0.00	0.00	4,598.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
5,400.0	0.00	0.00	4,698.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
5,500.0	0.00	0.00	4,798.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
5,600.0	0.00	0.00	4,898.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
5,700.0	0.00	0.00	4,998.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
5,800.0	0.00	0.00	5,098.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
5,900.0	0.00	0.00	5,198.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,000.0	0.00	0.00	5,298.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,029.8	0.00	0.00	5,327.9	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
<b>Cameo</b>									
6,100.0	0.00	0.00	5,398.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,200.0	0.00	0.00	5,498.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,300.0	0.00	0.00	5,598.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,400.0	0.00	0.00	5,698.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,500.0	0.00	0.00	5,798.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,600.0	0.00	0.00	5,898.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,700.0	0.00	0.00	5,998.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,098.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,198.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
7,000.0	0.00	0.00	6,298.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
7,100.0	0.00	0.00	6,398.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
7,200.0	0.00	0.00	6,498.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
7,204.8	0.00	0.00	6,502.9	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
<b>Rollins</b>									
7,300.0	0.00	0.00	6,598.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
7,400.0	0.00	0.00	6,698.1	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
7,504.9	0.00	0.00	6,803.0	1,769.6	-1,588.8	2,378.2	0.00	0.00	0.00
<b>TD at 7504.9</b>									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,277.0	2,819.9	WF		0.00	
4,669.3	3,978.9	Top of Gas		0.00	
6,029.8	5,327.9	Cameo		0.00	
7,204.8	6,502.9	Rollins		0.00	

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A18 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A18	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #3		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	Start Build 3.50
1,228.0	1,161.7	232.4	-208.6	Start 2985.0 hold at 1228.0 MD
4,212.9	3,577.3	1,537.3	-1,380.2	Start Drop -3.50
5,240.9	4,539.0	1,769.6	-1,588.8	Start 2264.0 hold at 5240.9 MD
7,504.9	6,803.0	1,769.6	-1,588.8	TD at 7504.9



Well Name: Frei A18  
Surface Location: Frei A  
North American Datum 1983 , US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5596.5  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1627016.62 2406838.95 39° 32' 9.929 N 107° 36' 11.879 W  
PAD EST KB Frei A18 @ 5611.9ft (PAD EST KB)



Azimuths to True North  
Magnetic North: 9.87°  
Magnetic Field  
Strength: 52148.4snT  
Dip Angle: 65.80°  
Date: 8/6/2013  
Model: IGRF200510

Frei A  
Frei A18  
Design #3  
21:03, August 12 2013

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Frei A18 TGT	3979.0	1769.6	-1588.8	1628822.56	2405291.53	39° 32' 27.419 N	107° 36' 32.160 W	Point
Frei A18 BHL	6803.0	1769.6	-1588.8	1628822.56	2405291.53	39° 32' 27.419 N	107° 36' 32.160 W	Point

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1228.0	35.98	318.08	1161.7	232.4	-208.6	3.50	318.08	312.3	
4	4212.9	35.98	318.08	3577.3	1537.3	-1380.2	0.00	0.00	2065.9	
5	5240.9	0.00	0.00	4539.0	1769.6	-1588.8	3.50	180.00	2378.2	
6	7504.9	0.00	0.00	6803.0	1769.6	-1588.8	0.00	0.00	2378.2	Frei A18 BHL

#### ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	Start Build 3.50
1161.7	1228.0	Start 2985.0 hold at 1228.0 MD
3577.3	4212.9	Start Drop -3.50
4539.0	5240.9	Start 2264.0 hold at 5240.9 MD
6803.0	7504.9	TD at 7504.9

#### FORMATION TOP DETAILS

TVDP	MDP	Path	Formation
2819.9	3277.0	WF	WF
3978.9	4669.3	Top of Gas	Top of Gas
5327.9	6029.8	Cameo	Cameo
6502.9	7204.8	Rollins	Rollins

