



# **Ursa Operating Company, LLC**

**Rockies Region**

**CSF I**

**CSF I 21A-16-07-91**

**Wellbore #1**

**Plan: Design #2**

## **Standard Planning Report**

**24 July, 2016**



<b>Database:</b>	MasterDB	<b>Local Co-ordinate Reference:</b>	Well CSF I 21A-16-07-91
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	CSF I 21A-16-07-91 @ 7860.0usft (EST Pad KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	CSF I 21A-16-07-91 @ 7860.0usft (EST Pad KB)
<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 21A-16-07-91	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

<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		CSF I				
Site Position:		Northing:	1,597,123.56 usft	Latitude:	39° 27' 17.600 N	
From:	Lat/Long	Easting:	2,420,307.03 usft	Longitude:	107° 33' 11.391 W	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.29 °

Well	CSF I 21A-16-07-91, SHL LAT: 39.453608749 LONG: -107.552979789					
Well Position	+N/-S	-466.3 usft	Northing:	1,596,656.22 usft	Latitude:	39° 27' 12.991 N
	+E/-W	52.1 usft	Easting:	2,420,348.55 usft	Longitude:	107° 33' 10.727 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	7,860.0 usft	Ground Level:	7,845.0 usft

<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>
	IGRF2015	7/24/2016	9.59	65.65	51,647

<b>Design</b>	Design #2			
<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	275.97

<b>Plan Sections</b>										
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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,081.8	30.86	275.97	2,039.7	24.1	-230.5	3.50	3.50	0.00	275.97	
5,487.5	30.86	275.97	4,963.3	206.0	-1,968.1	0.00	0.00	0.00	0.00	
6,369.3	0.00	0.00	5,803.0	230.1	-2,198.6	3.50	-3.50	0.00	180.00	21A-16-07-91 TGT
8,601.3	0.00	0.00	8,035.0	230.1	-2,198.6	0.00	0.00	0.00	0.00	

<b>Database:</b>	MasterDB	<b>Local Co-ordinate Reference:</b>	Well CSF I 21A-16-07-91
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	CSF I 21A-16-07-91 @ 7860.0usft (EST Pad KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	CSF I 21A-16-07-91 @ 7860.0usft (EST Pad KB)
<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 21A-16-07-91	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

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	
Surface Casing										
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
Start Build 3.50										
1,300.0	3.50	275.97	1,299.9	0.3	-3.0	3.1	3.50	3.50	0.00	
1,400.0	7.00	275.97	1,399.5	1.3	-12.1	12.2	3.50	3.50	0.00	
1,500.0	10.50	275.97	1,498.3	2.9	-27.3	27.4	3.50	3.50	0.00	
1,600.0	14.00	275.97	1,596.0	5.1	-48.4	48.6	3.50	3.50	0.00	
1,700.0	17.50	275.97	1,692.3	7.9	-75.4	75.8	3.50	3.50	0.00	
1,800.0	21.00	275.97	1,786.7	11.3	-108.1	108.7	3.50	3.50	0.00	
1,900.0	24.50	275.97	1,878.9	15.3	-146.6	147.4	3.50	3.50	0.00	
2,000.0	28.00	275.97	1,968.5	19.9	-190.6	191.6	3.50	3.50	0.00	
2,081.8	30.86	275.97	2,039.7	24.1	-230.5	231.8	3.50	3.50	0.00	
Start 3405.7 hold at 2081.8 MD										
2,100.0	30.86	275.97	2,055.4	25.1	-239.8	241.1	0.00	0.00	0.00	
2,200.0	30.86	275.97	2,141.2	30.4	-290.9	292.4	0.00	0.00	0.00	
2,300.0	30.86	275.97	2,227.1	35.8	-341.9	343.7	0.00	0.00	0.00	
2,400.0	30.86	275.97	2,312.9	41.1	-392.9	395.0	0.00	0.00	0.00	
2,500.0	30.86	275.97	2,398.8	46.5	-443.9	446.3	0.00	0.00	0.00	
2,600.0	30.86	275.97	2,484.6	51.8	-494.9	497.6	0.00	0.00	0.00	
2,700.0	30.86	275.97	2,570.4	57.1	-545.9	548.9	0.00	0.00	0.00	
2,800.0	30.86	275.97	2,656.3	62.5	-597.0	600.2	0.00	0.00	0.00	
2,900.0	30.86	275.97	2,742.1	67.8	-648.0	651.5	0.00	0.00	0.00	
3,000.0	30.86	275.97	2,828.0	73.2	-699.0	702.8	0.00	0.00	0.00	
3,100.0	30.86	275.97	2,913.8	78.5	-750.0	754.1	0.00	0.00	0.00	
3,200.0	30.86	275.97	2,999.6	83.8	-801.0	805.4	0.00	0.00	0.00	
3,300.0	30.86	275.97	3,085.5	89.2	-852.1	856.7	0.00	0.00	0.00	
3,400.0	30.86	275.97	3,171.3	94.5	-903.1	908.0	0.00	0.00	0.00	
3,500.0	30.86	275.97	3,257.2	99.9	-954.1	959.3	0.00	0.00	0.00	
3,600.0	30.86	275.97	3,343.0	105.2	-1,005.1	1,010.6	0.00	0.00	0.00	
3,700.0	30.86	275.97	3,428.8	110.5	-1,056.1	1,061.9	0.00	0.00	0.00	
3,800.0	30.86	275.97	3,514.7	115.9	-1,107.1	1,113.2	0.00	0.00	0.00	
3,900.0	30.86	275.97	3,600.5	121.2	-1,158.2	1,164.5	0.00	0.00	0.00	
4,000.0	30.86	275.97	3,686.4	126.5	-1,209.2	1,215.8	0.00	0.00	0.00	
4,100.0	30.86	275.97	3,772.2	131.9	-1,260.2	1,267.1	0.00	0.00	0.00	
4,153.3	30.86	275.97	3,818.0	134.7	-1,287.4	1,294.4	0.00	0.00	0.00	
Williams Fork										
4,200.0	30.86	275.97	3,858.1	137.2	-1,311.2	1,318.4	0.00	0.00	0.00	
4,300.0	30.86	275.97	3,943.9	142.6	-1,362.2	1,369.7	0.00	0.00	0.00	
4,400.0	30.86	275.97	4,029.7	147.9	-1,413.2	1,421.0	0.00	0.00	0.00	
4,500.0	30.86	275.97	4,115.6	153.2	-1,464.3	1,472.3	0.00	0.00	0.00	

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<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 21A-16-07-91	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

## 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)
4,600.0	30.86	275.97	4,201.4	158.6	-1,515.3	1,523.6	0.00	0.00	0.00
4,700.0	30.86	275.97	4,287.3	163.9	-1,566.3	1,574.9	0.00	0.00	0.00
4,800.0	30.86	275.97	4,373.1	169.3	-1,617.3	1,626.2	0.00	0.00	0.00
4,900.0	30.86	275.97	4,458.9	174.6	-1,668.3	1,677.5	0.00	0.00	0.00
5,000.0	30.86	275.97	4,544.8	179.9	-1,719.4	1,728.7	0.00	0.00	0.00
5,100.0	30.86	275.97	4,630.6	185.3	-1,770.4	1,780.0	0.00	0.00	0.00
5,200.0	30.86	275.97	4,716.5	190.6	-1,821.4	1,831.3	0.00	0.00	0.00
5,300.0	30.86	275.97	4,802.3	196.0	-1,872.4	1,882.6	0.00	0.00	0.00
5,400.0	30.86	275.97	4,888.1	201.3	-1,923.4	1,933.9	0.00	0.00	0.00
5,487.5	30.86	275.97	4,963.3	206.0	-1,968.1	1,978.8	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
5,500.0	30.42	275.97	4,974.0	206.6	-1,974.4	1,985.2	3.50	-3.50	0.00
5,600.0	26.92	275.97	5,061.7	211.6	-2,022.1	2,033.2	3.50	-3.50	0.00
5,700.0	23.42	275.97	5,152.2	216.1	-2,064.4	2,075.7	3.50	-3.50	0.00
5,800.0	19.92	275.97	5,245.1	219.9	-2,101.1	2,112.6	3.50	-3.50	0.00
5,900.0	16.42	275.97	5,340.1	223.1	-2,132.2	2,143.8	3.50	-3.50	0.00
6,000.0	12.92	275.97	5,436.9	225.8	-2,157.4	2,169.1	3.50	-3.50	0.00
6,100.0	9.42	275.97	5,534.9	227.8	-2,176.6	2,188.5	3.50	-3.50	0.00
6,200.0	5.92	275.97	5,634.0	229.2	-2,189.9	2,201.9	3.50	-3.50	0.00
6,300.0	2.42	275.97	5,733.7	229.9	-2,197.1	2,209.1	3.50	-3.50	0.00
6,369.3	0.00	0.00	5,803.0	230.1	-2,198.6	2,210.6	3.50	-3.50	121.30
<b>Back to Vertical - Start 2232.0 hold at 6369.3 MD - Top of Gas</b>									
6,400.0	0.00	0.00	5,833.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
6,500.0	0.00	0.00	5,933.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,033.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,133.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,233.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,333.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,433.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,533.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,200.0	0.00	0.00	6,633.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,221.3	0.00	0.00	6,655.0	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
<b>Cameo</b>									
7,300.0	0.00	0.00	6,733.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,400.0	0.00	0.00	6,833.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,500.0	0.00	0.00	6,933.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,033.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,133.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,233.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
7,900.0	0.00	0.00	7,333.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,000.0	0.00	0.00	7,433.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,100.0	0.00	0.00	7,533.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,200.0	0.00	0.00	7,633.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,300.0	0.00	0.00	7,733.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,301.3	0.00	0.00	7,735.0	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
<b>Rollins</b>									
8,400.0	0.00	0.00	7,833.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,500.0	0.00	0.00	7,933.7	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
8,601.3	0.00	0.00	8,035.0	230.1	-2,198.6	2,210.6	0.00	0.00	0.00
<b>TD at 8601.3</b>									

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<b>Well:</b>	CSF I 21A-16-07-91	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

## Design Targets

### Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
21A-16-07-91 TGT	0.00	0.00	5,803.0	230.1	-2,198.6	1,596,935.94	2,418,155.71	39° 27' 15.265 N	107° 33' 38.758 W
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,232.0)									

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,153.3	3,818.0	Williams Fork		0.00	
6,369.3	5,803.0	Top of Gas		0.00	
7,221.3	6,655.0	Cameo		0.00	
8,301.3	7,735.0	Rollins		0.00	

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,100.0	1,100.0	0.0	0.0	Surface Casing
1,200.0	1,200.0	0.0	0.0	Start Build 3.50
2,081.8	2,039.7	24.1	-230.5	Start 3405.7 hold at 2081.8 MD
5,487.5	4,963.3	206.0	-1,968.1	Start Drop -3.50
6,369.3	5,803.0	230.1	-2,198.6	Back to Vertical
6,369.3	5,803.0	230.1	-2,198.6	Start 2232.0 hold at 6369.3 MD
8,601.3	8,035.0	230.1	-2,198.6	TD at 8601.3



Well Name: CSF I 21A-16-07-91  
Surface Location: CSF I  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 7845.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1596656.22 2420348.55 39° 27' 12.991 N 107° 33' 10.727 W  
EST Pad KB CSF I 21A-16-07-91 @ 7860.0usft (EST Pad KB)



Azimuths to True North  
Magnetic North: 9.59°  
Magnetic Field  
Strength: 51647.2snT  
Dip Angle: 65.65°  
Date: 7/24/2016  
Model: IGRF2015

CSF I  
CSF I 21A-16-07-91  
Design #2  
17:38, July 24 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
21A-16-07-91 TGT5803.0		230.1	-2198.6	1596935.94	2418155.70	39° 27' 15.265 N 107° 33' 38.758 W		Rectangle (Sides: L40.0 W100.0)

#### 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	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	2081.8	30.86	275.97	2039.7	24.1	-230.5	3.50	275.97	231.8	
4	5487.5	30.86	275.97	4963.3	206.0	-1968.1	0.00	0.00	1978.8	
5	6369.3	0.00	0.00	5803.0	230.1	-2198.6	3.50	180.00	2210.6	21A-16-07-91 TGT
6	8601.3	0.00	0.00	8035.0	230.1	-2198.6	0.00	0.00	2210.6	

#### ANNOTATIONS

TVD	MD	Annotation
1100.0	1100.0	Surface Casing
1200.0	1200.0	Start Build 3.50
2039.7	2081.8	Start 3405.7 hold at 2081.8 MD
4963.3	5487.5	Start Drop -3.50
5803.0	6369.3	Back to Vertical
5803.0	6369.3	Start 2232.0 hold at 6369.3 MD
8035.0	8601.3	TD at 8601.3

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3818.0	4153.3	Williams Fork	0.00	
5803.0	6369.3	Top of Gas	0.00	
6655.0	7221.3	Cameo	0.00	
7735.0	8301.3	Rollins	0.00	

