



# **Ursa Operating Company, LLC**

**Rockies Region**

**CSF I**

**CSF I 31D-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 31D-16-07-91
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 31D-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 31D-16-07-91, SHL LAT: 39.453593795 LONG:-107.553009479					
Well Position	+N/-S	-471.7 usft	Northing:	1,596,650.96 usft	Latitude:	39° 27' 12.938 N
	+E/-W	43.7 usft	Easting:	2,420,340.05 usft	Longitude:	107° 33' 10.834 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	236.29

<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	
1,598.5	13.95	236.29	1,594.5	-26.8	-40.1	3.50	3.50	0.00	236.29	
5,524.1	13.95	236.29	5,404.5	-551.9	-827.2	0.00	0.00	0.00	0.00	
5,922.6	0.00	0.00	5,799.0	-578.7	-867.3	3.50	-3.50	0.00	180.00	31D-16-07-91 TGT
8,154.6	0.00	0.00	8,031.0	-578.7	-867.3	0.00	0.00	0.00	0.00	

<b>Database:</b>	MasterDB	<b>Local Co-ordinate Reference:</b>	Well CSF I 31D-16-07-91
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 31D-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	236.29	1,299.9	-1.7	-2.5	3.1	3.50	3.50	0.00	
1,400.0	7.00	236.29	1,399.5	-6.8	-10.2	12.2	3.50	3.50	0.00	
1,500.0	10.50	236.29	1,498.3	-15.2	-22.8	27.4	3.50	3.50	0.00	
1,598.5	13.95	236.29	1,594.5	-26.8	-40.1	48.3	3.50	3.50	0.00	
Start 3925.6 hold at 1598.5 MD										
1,600.0	13.95	236.29	1,596.0	-27.0	-40.4	48.6	0.00	0.00	0.00	
1,700.0	13.95	236.29	1,693.1	-40.4	-60.5	72.7	0.00	0.00	0.00	
1,800.0	13.95	236.29	1,790.1	-53.7	-80.5	96.8	0.00	0.00	0.00	
1,900.0	13.95	236.29	1,887.2	-67.1	-100.6	120.9	0.00	0.00	0.00	
2,000.0	13.95	236.29	1,984.2	-80.5	-120.6	145.0	0.00	0.00	0.00	
2,100.0	13.95	236.29	2,081.3	-93.9	-140.7	169.1	0.00	0.00	0.00	
2,200.0	13.95	236.29	2,178.3	-107.2	-160.7	193.2	0.00	0.00	0.00	
2,300.0	13.95	236.29	2,275.4	-120.6	-180.8	217.3	0.00	0.00	0.00	
2,400.0	13.95	236.29	2,372.4	-134.0	-200.8	241.4	0.00	0.00	0.00	
2,500.0	13.95	236.29	2,469.5	-147.4	-220.9	265.5	0.00	0.00	0.00	
2,600.0	13.95	236.29	2,566.6	-160.8	-240.9	289.6	0.00	0.00	0.00	
2,700.0	13.95	236.29	2,663.6	-174.1	-261.0	313.7	0.00	0.00	0.00	
2,800.0	13.95	236.29	2,760.7	-187.5	-281.0	337.8	0.00	0.00	0.00	
2,900.0	13.95	236.29	2,857.7	-200.9	-301.1	361.9	0.00	0.00	0.00	
3,000.0	13.95	236.29	2,954.8	-214.3	-321.1	386.0	0.00	0.00	0.00	
3,100.0	13.95	236.29	3,051.8	-227.6	-341.2	410.1	0.00	0.00	0.00	
3,200.0	13.95	236.29	3,148.9	-241.0	-361.2	434.2	0.00	0.00	0.00	
3,300.0	13.95	236.29	3,245.9	-254.4	-381.3	458.3	0.00	0.00	0.00	
3,400.0	13.95	236.29	3,343.0	-267.8	-401.3	482.4	0.00	0.00	0.00	
3,500.0	13.95	236.29	3,440.0	-281.1	-421.4	506.5	0.00	0.00	0.00	
3,600.0	13.95	236.29	3,537.1	-294.5	-441.4	530.6	0.00	0.00	0.00	
3,700.0	13.95	236.29	3,634.1	-307.9	-461.5	554.7	0.00	0.00	0.00	
3,800.0	13.95	236.29	3,731.2	-321.3	-481.5	578.8	0.00	0.00	0.00	
3,885.3	13.95	236.29	3,814.0	-332.7	-498.6	599.4	0.00	0.00	0.00	
Williams Fork										
3,900.0	13.95	236.29	3,828.2	-334.6	-501.6	602.9	0.00	0.00	0.00	
4,000.0	13.95	236.29	3,925.3	-348.0	-521.6	627.0	0.00	0.00	0.00	
4,100.0	13.95	236.29	4,022.3	-361.4	-541.7	651.1	0.00	0.00	0.00	
4,200.0	13.95	236.29	4,119.4	-374.8	-561.7	675.2	0.00	0.00	0.00	
4,300.0	13.95	236.29	4,216.4	-388.1	-581.7	699.4	0.00	0.00	0.00	
4,400.0	13.95	236.29	4,313.5	-401.5	-601.8	723.5	0.00	0.00	0.00	
4,500.0	13.95	236.29	4,410.5	-414.9	-621.8	747.6	0.00	0.00	0.00	

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 31D-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	13.95	236.29	4,507.6	-428.3	-641.9	771.7	0.00	0.00	0.00
4,700.0	13.95	236.29	4,604.7	-441.7	-661.9	795.8	0.00	0.00	0.00
4,800.0	13.95	236.29	4,701.7	-455.0	-682.0	819.9	0.00	0.00	0.00
4,900.0	13.95	236.29	4,798.8	-468.4	-702.0	844.0	0.00	0.00	0.00
5,000.0	13.95	236.29	4,895.8	-481.8	-722.1	868.1	0.00	0.00	0.00
5,100.0	13.95	236.29	4,992.9	-495.2	-742.1	892.2	0.00	0.00	0.00
5,200.0	13.95	236.29	5,089.9	-508.5	-762.2	916.3	0.00	0.00	0.00
5,300.0	13.95	236.29	5,187.0	-521.9	-782.2	940.4	0.00	0.00	0.00
5,400.0	13.95	236.29	5,284.0	-535.3	-802.3	964.5	0.00	0.00	0.00
5,500.0	13.95	236.29	5,381.1	-548.7	-822.3	988.6	0.00	0.00	0.00
5,524.1	13.95	236.29	5,404.5	-551.9	-827.2	994.4	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
5,600.0	11.29	236.29	5,478.5	-561.1	-840.9	1,010.9	3.50	-3.50	0.00
5,700.0	7.79	236.29	5,577.1	-570.3	-854.7	1,027.5	3.50	-3.50	0.00
5,800.0	4.29	236.29	5,676.6	-576.1	-863.5	1,038.0	3.50	-3.50	0.00
5,900.0	0.79	236.29	5,776.4	-578.6	-867.2	1,042.5	3.50	-3.50	0.00
5,922.6	0.00	0.00	5,799.0	-578.7	-867.3	1,042.6	3.50	-3.50	0.00
<b>Back to Vertical - Start 2232.0 hold at 5922.6 MD - Top of Gas</b>									
6,000.0	0.00	0.00	5,876.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,976.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,076.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,176.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,276.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,376.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,476.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,576.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,774.6	0.00	0.00	6,651.0	-578.7	-867.3	1,042.6	0.00	0.00	0.00
<b>Cameo</b>									
6,800.0	0.00	0.00	6,676.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,776.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,876.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,976.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,076.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,300.0	0.00	0.00	7,176.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,276.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,376.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,476.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,576.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,676.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
7,854.6	0.00	0.00	7,731.0	-578.7	-867.3	1,042.6	0.00	0.00	0.00
<b>Rollins</b>									
7,900.0	0.00	0.00	7,776.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
8,000.0	0.00	0.00	7,876.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
8,100.0	0.00	0.00	7,976.4	-578.7	-867.3	1,042.6	0.00	0.00	0.00
8,154.6	0.00	0.00	8,031.0	-578.7	-867.3	1,042.6	0.00	0.00	0.00
<b>TD at 8154.6</b>									

<b>Database:</b>	MasterDB	<b>Local Co-ordinate Reference:</b>	Well CSF I 31D-16-07-91
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	CSF I 31D-16-07-91 @ 7860.0usft (PAD Est KB)
<b>Site:</b>	CSF I	<b>North Reference:</b>	True
<b>Well:</b>	CSF I 31D-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									
31D-16-07-91 TGT	0.00	0.00	5,799.0	-578.7	-867.3	1,596,092.04	2,419,459.89	39° 27' 7.218 N	107° 33' 21.891 W
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,232.0)									

## Formations

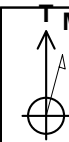
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,885.3	3,814.0	Williams Fork		0.00	
5,922.6	5,799.0	Top of Gas		0.00	
6,774.6	6,651.0	Cameo		0.00	
7,854.6	7,731.0	Rollins		0.00	

## 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
1,598.5	1,594.5	-26.8	-40.1	Start 3925.6 hold at 1598.5 MD
5,524.1	5,404.5	-551.9	-827.2	Start Drop -3.50
5,922.6	5,799.0	-578.7	-867.3	Back to Vertical
5,922.6	5,799.0	-578.7	-867.3	Start 2232.0 hold at 5922.6 MD
8,154.6	8,031.0	-578.7	-867.3	TD at 8154.6



Well Name: CSF I 31D-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 1596650.97 2420340.04 39° 27' 12.938 N 107° 33' 10.834 W  
PAD Est KB CSF I 31D-16-07-91 @ 7860.0usft (PAD Est 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 31D-16-07-91  
Design #2  
18:17, July 24 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
31D-16-07-91 TGT	5799.0	-578.7	-867.3	1596092.04	2419459.89	39° 27' 7.218 N 107° 33' 21.891 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	1598.5	13.95	236.29	1594.5	-26.8	-40.1	3.50	236.29	48.3	
4	5524.1	13.95	236.29	5404.5	-551.9	-827.2	0.00	0.00	994.4	
5	5922.6	0.00	0.00	5799.0	-578.7	-867.3	3.50	180.00	1042.6	31D-16-07-91 TGT
6	8154.6	0.00	0.00	8031.0	-578.7	-867.3	0.00	0.00	1042.6	

#### ANNOTATIONS

TVD	MD	Annotation
1100.0	1100.0	Surface Casing
1200.0	1200.0	Start Build 3.50
1594.5	1598.5	Start 3925.6 hold at 1598.5 MD
5404.5	5524.1	Start Drop -3.50
5799.0	5922.6	Back to Vertical
5799.0	5922.6	Start 2232.0 hold at 5922.6 MD
8031.0	8154.6	TD at 8154.6

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3814.0	3885.3	Williams Fork	0.00	
5799.0	5922.6	Top of Gas	0.00	
6651.0	6774.6	Cameo	0.00	
7731.0	7854.6	Rollins	0.00	

