



Ursa Operating Company, LLC

Rockies Region

CSF E

CSF E 41C-16-07-91

Wellbore #1

Plan: Design #2

Ursa Operating Company LLC Planning Report

04 December, 2014



Company: Ursa Operating Company, LLC Project: Rockies Region Site: CSF E Well: CSF E 41C-16-07-91 Wellbore: Wellbore #1 Design: Design #2	Local Co-ordinate Reference: Well CSF E 41C-16-07-91 TVD Reference: CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB) MD Reference: CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB) North Reference: True Survey Calculation Method: Minimum Curvature Database: MasterDB
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Project Rockies Region	
Map System: US State Plane 1983	System Datum: Mean Sea Level
Geo Datum: North American Datum 1983	
Map Zone: Colorado Central Zone	

Site CSF E			
Site Position:	Northing:	1,600,196.55 usft	Latitude: 39° 27' 47.492 N
From: Lat/Long	Easting:	2,418,195.90 usft	Longitude: 107° 33' 39.189 W
Position Uncertainty: 0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.30 °

Well CSF E 41C-16-07-91, SHL LAT: 39.458626810 LONG: -107.558739216			
Well Position	+N/-S	0.0 usft	Northing: 1,598,520.31 usft
	+E/-W	0.0 usft	Easting: 2,418,764.09 usft
Position Uncertainty		0.0 usft	Wellhead Elevation: 6,821.4 usft
			Latitude: 39° 27' 31.056 N
			Longitude: 107° 33' 31.461 W
			Ground Level: 6,806.0 usft

Wellbore Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/4/2014	9.70	65.69	51,928

Design Design #2				
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	137.18

Survey Tool Program Date 12/4/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	8,242.4	Design #2 (Wellbore #1)	MWD	MWD - Standard

Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well CSF E 41C-16-07-91
Project:	Rockies Region	TVD Reference:	CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Site:	CSF E	MD Reference:	CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Well:	CSF E 41C-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #2	Database:	MasterDB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-6,821.4	0.0	0.0	0.0	0.00	1,598,520.31	2,418,764.09
100.0	0.00	0.00	100.0	-6,721.4	0.0	0.0	0.0	0.00	1,598,520.31	2,418,764.09
200.0	0.00	0.00	200.0	-6,621.4	0.0	0.0	0.0	0.00	1,598,520.31	2,418,764.09
300.0	0.00	0.00	300.0	-6,521.4	0.0	0.0	0.0	0.00	1,598,520.31	2,418,764.09
Start Build 3.50										
400.0	3.50	137.18	399.9	-6,421.5	-2.2	2.1	3.1	3.50	1,598,518.02	2,418,766.11
500.0	7.00	137.18	499.5	-6,321.9	-8.9	8.3	12.2	3.50	1,598,511.17	2,418,772.18
600.0	10.50	137.18	598.3	-6,223.1	-20.1	18.6	27.4	3.50	1,598,499.79	2,418,782.26
700.0	14.00	137.18	696.0	-6,125.4	-35.7	33.1	48.6	3.50	1,598,483.90	2,418,796.32
800.0	17.50	137.18	792.3	-6,029.1	-55.6	51.5	75.8	3.50	1,598,463.58	2,418,814.31
900.0	21.00	137.18	886.7	-5,934.7	-79.8	73.9	108.7	3.50	1,598,438.90	2,418,836.17
1,000.0	24.50	137.18	978.9	-5,842.5	-108.1	100.2	147.4	3.50	1,598,409.96	2,418,861.80
1,100.0	28.00	137.18	1,068.5	-5,752.9	-140.5	130.2	191.6	3.50	1,598,376.85	2,418,891.12
Surface Casing										
1,200.0	31.50	137.18	1,155.3	-5,666.1	-176.9	164.0	241.2	3.50	1,598,339.70	2,418,924.01
1,300.0	35.00	137.18	1,239.0	-5,582.4	-217.1	201.2	296.1	3.50	1,598,298.66	2,418,960.35
1,403.1	38.61	137.18	1,321.5	-5,499.9	-262.4	243.2	357.8	3.50	1,598,252.45	2,419,001.27
Start 3739.3 hold at 1403.1 MD										
1,500.0	38.61	137.18	1,397.2	-5,424.2	-306.8	284.3	418.3	0.00	1,598,207.16	2,419,041.37
1,600.0	38.61	137.18	1,475.4	-5,346.0	-352.6	326.7	480.7	0.00	1,598,160.44	2,419,082.73
1,700.0	38.61	137.18	1,553.5	-5,267.9	-398.3	369.1	543.1	0.00	1,598,113.72	2,419,124.10
1,800.0	38.61	137.18	1,631.7	-5,189.7	-444.1	411.5	605.5	0.00	1,598,067.01	2,419,165.46
1,900.0	38.61	137.18	1,709.8	-5,111.6	-489.9	454.0	667.9	0.00	1,598,020.29	2,419,206.83
2,000.0	38.61	137.18	1,787.9	-5,033.5	-535.6	496.4	730.3	0.00	1,597,973.58	2,419,248.19
2,100.0	38.61	137.18	1,866.1	-4,955.3	-581.4	538.8	792.7	0.00	1,597,926.86	2,419,289.56
2,200.0	38.61	137.18	1,944.2	-4,877.2	-627.2	581.2	855.1	0.00	1,597,880.14	2,419,330.92
2,300.0	38.61	137.18	2,022.4	-4,799.0	-672.9	623.6	917.4	0.00	1,597,833.43	2,419,372.29
2,400.0	38.61	137.18	2,100.5	-4,720.9	-718.7	666.0	979.8	0.00	1,597,786.71	2,419,413.65

Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well CSF E 41C-16-07-91
Project:	Rockies Region	TVD Reference:	CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Site:	CSF E	MD Reference:	CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Well:	CSF E 41C-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #2	Database:	MasterDB

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,500.0	38.61	137.18	2,178.7	-4,642.7	-764.5	708.4	1,042.2	0.00	1,597,740.00	2,419,455.02	
2,600.0	38.61	137.18	2,256.8	-4,564.6	-810.2	750.8	1,104.6	0.00	1,597,693.28	2,419,496.38	
2,700.0	38.61	137.18	2,335.0	-4,486.4	-856.0	793.3	1,167.0	0.00	1,597,646.56	2,419,537.75	
2,800.0	38.61	137.18	2,413.1	-4,408.3	-901.8	835.7	1,229.4	0.00	1,597,599.85	2,419,579.11	
2,900.0	38.61	137.18	2,491.2	-4,330.2	-947.5	878.1	1,291.8	0.00	1,597,553.13	2,419,620.47	
3,000.0	38.61	137.18	2,569.4	-4,252.0	-993.3	920.5	1,354.2	0.00	1,597,506.42	2,419,661.84	
3,100.0	38.61	137.18	2,647.5	-4,173.9	-1,039.1	962.9	1,416.6	0.00	1,597,459.70	2,419,703.20	
3,200.0	38.61	137.18	2,725.7	-4,095.7	-1,084.8	1,005.3	1,479.0	0.00	1,597,412.98	2,419,744.57	
3,300.0	38.61	137.18	2,803.8	-4,017.6	-1,130.6	1,047.7	1,541.4	0.00	1,597,366.27	2,419,785.93	
3,400.0	38.61	137.18	2,882.0	-3,939.4	-1,176.4	1,090.1	1,603.8	0.00	1,597,319.55	2,419,827.30	
3,492.7	38.61	137.18	2,954.4	-3,867.0	-1,218.8	1,129.5	1,661.7	0.00	1,597,276.25	2,419,865.64	
Williams Fork											
3,500.0	38.61	137.18	2,960.1	-3,861.3	-1,222.1	1,132.6	1,666.2	0.00	1,597,272.84	2,419,868.66	
3,600.0	38.61	137.18	3,038.3	-3,783.1	-1,267.9	1,175.0	1,728.6	0.00	1,597,226.12	2,419,910.03	
3,700.0	38.61	137.18	3,116.4	-3,705.0	-1,313.7	1,217.4	1,791.0	0.00	1,597,179.40	2,419,951.39	
3,800.0	38.61	137.18	3,194.5	-3,626.9	-1,359.4	1,259.8	1,853.4	0.00	1,597,132.69	2,419,992.76	
3,900.0	38.61	137.18	3,272.7	-3,548.7	-1,405.2	1,302.2	1,915.8	0.00	1,597,085.97	2,420,034.12	
4,000.0	38.61	137.18	3,350.8	-3,470.6	-1,451.0	1,344.6	1,978.2	0.00	1,597,039.26	2,420,075.49	
4,100.0	38.61	137.18	3,429.0	-3,392.4	-1,496.7	1,387.0	2,040.6	0.00	1,596,992.54	2,420,116.85	
4,200.0	38.61	137.18	3,507.1	-3,314.3	-1,542.5	1,429.4	2,103.0	0.00	1,596,945.82	2,420,158.22	
4,300.0	38.61	137.18	3,585.3	-3,236.1	-1,588.3	1,471.9	2,165.4	0.00	1,596,899.11	2,420,199.58	
4,400.0	38.61	137.18	3,663.4	-3,158.0	-1,634.0	1,514.3	2,227.8	0.00	1,596,852.39	2,420,240.94	
4,500.0	38.61	137.18	3,741.6	-3,079.8	-1,679.8	1,556.7	2,290.2	0.00	1,596,805.68	2,420,282.31	
4,600.0	38.61	137.18	3,819.7	-3,001.7	-1,725.6	1,599.1	2,352.6	0.00	1,596,758.96	2,420,323.67	
4,700.0	38.61	137.18	3,897.8	-2,923.6	-1,771.3	1,641.5	2,415.0	0.00	1,596,712.24	2,420,365.04	
4,800.0	38.61	137.18	3,976.0	-2,845.4	-1,817.1	1,683.9	2,477.4	0.00	1,596,665.53	2,420,406.40	
4,900.0	38.61	137.18	4,054.1	-2,767.3	-1,862.9	1,726.3	2,539.8	0.00	1,596,618.81	2,420,447.77	

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Site:	CSF E	MD Reference:	CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Well:	CSF E 41C-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #2	Database:	MasterDB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
5,000.0	38.61	137.18	4,132.3	-2,689.1	-1,908.6	1,768.7	2,602.2	0.00	1,596,572.10	2,420,489.13
5,100.0	38.61	137.18	4,210.4	-2,611.0	-1,954.4	1,811.2	2,664.6	0.00	1,596,525.38	2,420,530.50
5,142.4	38.61	137.18	4,243.5	-2,577.9	-1,973.8	1,829.1	2,691.0	0.00	1,596,505.58	2,420,548.03
Start Drop -3.50										
5,200.0	36.59	137.18	4,289.2	-2,532.2	-1,999.6	1,853.0	2,726.2	3.50	1,596,479.26	2,420,571.33
5,300.0	33.09	137.18	4,371.3	-2,450.1	-2,041.5	1,891.9	2,783.3	3.50	1,596,436.50	2,420,609.20
5,400.0	29.59	137.18	4,456.6	-2,364.8	-2,079.6	1,927.2	2,835.3	3.50	1,596,397.56	2,420,643.67
5,500.0	26.09	137.18	4,545.1	-2,276.3	-2,113.9	1,958.9	2,882.0	3.50	1,596,362.60	2,420,674.63
5,600.0	22.59	137.18	4,636.2	-2,185.2	-2,144.1	1,987.0	2,923.2	3.50	1,596,331.75	2,420,701.95
5,674.3	19.99	137.18	4,705.4	-2,116.0	-2,163.9	2,005.3	2,950.2	3.50	1,596,311.55	2,420,719.83
Top of Gas										
5,700.0	19.09	137.18	4,729.6	-2,091.8	-2,170.2	2,011.1	2,958.8	3.50	1,596,305.12	2,420,725.53
5,800.0	15.59	137.18	4,825.0	-1,996.4	-2,192.0	2,031.4	2,988.6	3.50	1,596,282.81	2,420,745.28
5,900.0	12.09	137.18	4,922.1	-1,899.3	-2,209.6	2,047.6	3,012.5	3.50	1,596,264.90	2,420,761.14
6,000.0	8.59	137.18	5,020.5	-1,800.9	-2,222.7	2,059.8	3,030.4	3.50	1,596,251.47	2,420,773.03
6,100.0	5.09	137.18	5,119.8	-1,701.6	-2,231.5	2,067.9	3,042.3	3.50	1,596,242.55	2,420,780.93
6,200.0	1.59	137.18	5,219.6	-1,601.8	-2,235.7	2,071.9	3,048.2	3.50	1,596,238.19	2,420,784.79
6,245.4	0.00	0.00	5,265.0	-1,556.4	-2,236.2	2,072.3	3,048.8	3.50	1,596,237.72	2,420,785.21
Start 1997.0 hold at 6245.4 MD - Back to Vertical										
6,300.0	0.00	0.00	5,319.6	-1,501.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
6,400.0	0.00	0.00	5,419.6	-1,401.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
6,500.0	0.00	0.00	5,519.6	-1,301.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
6,600.0	0.00	0.00	5,619.6	-1,201.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
6,685.8	0.00	0.00	5,705.4	-1,116.0	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
Cameo										
6,700.0	0.00	0.00	5,719.6	-1,101.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
6,800.0	0.00	0.00	5,819.6	-1,001.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21
6,900.0	0.00	0.00	5,919.6	-901.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21

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Well:	CSF E 41C-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
7,000.0	0.00	0.00	6,019.6	-801.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,100.0	0.00	0.00	6,119.6	-701.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,200.0	0.00	0.00	6,219.6	-601.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,300.0	0.00	0.00	6,319.6	-501.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,400.0	0.00	0.00	6,419.6	-401.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,500.0	0.00	0.00	6,519.6	-301.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,600.0	0.00	0.00	6,619.6	-201.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,700.0	0.00	0.00	6,719.6	-101.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,800.0	0.00	0.00	6,819.6	-1.8	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,900.0	0.00	0.00	6,919.6	98.2	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
7,942.8	0.00	0.00	6,962.4	141.0	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
Rollins											
8,000.0	0.00	0.00	7,019.6	198.2	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
8,100.0	0.00	0.00	7,119.6	298.2	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
8,200.0	0.00	0.00	7,219.6	398.2	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
8,242.4	0.00	0.00	7,262.0	440.6	-2,236.2	2,072.3	3,048.8	0.00	1,596,237.72	2,420,785.21	
TD at 8242.4											

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,685.8	5,705.4	Cameo		0.00		
3,492.7	2,954.4	Williams Fork		0.00		
7,942.8	6,962.4	Rollins		0.00		
5,674.3	4,705.4	Top of Gas		0.00		

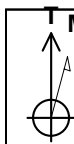
Company: Ursa Operating Company, LLC	Local Co-ordinate Reference: Well CSF E 41C-16-07-91
Project: Rockies Region	TVD Reference: CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Site: CSF E	MD Reference: CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)
Well: CSF E 41C-16-07-91	North Reference: True
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Design #2	Database: MasterDB

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.0	300.0	0.0	0.0	Start Build 3.50
1,100.0	1,068.5	-140.5	130.2	Surface Casing
1,403.1	1,321.5	-262.4	243.2	Start 3739.3 hold at 1403.1 MD
5,142.4	4,243.5	-1,973.8	1,829.1	Start Drop -3.50
6,245.4	5,265.0	-2,236.2	2,072.3	Start 1997.0 hold at 6245.4 MD
6,245.4	5,265.0	-2,236.2	2,072.3	Back to Vertical
8,242.4	7,262.0	-2,236.2	2,072.3	TD at 8242.4

Checked By: _____	Approved By: _____	Date: _____
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Well Name: CSF E 41C-16-07-91
 Surface Location: CSF E
 North American Datum 1983, US State Plane 1983, Colorado Central Zone
 Ground Elevation: 6806.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1598520.31 2418764.09 39° 27' 31.056 N 107° 33' 31.461 W
 PAD Est KB CSF E 41C-16-07-91 @ 6821.4usft (PAD Est KB)



Azimuths to True North
 Magnetic North: 9.70°
 Magnetic Field
 Strength: 51928.2snT
 Dip Angle: 65.69°
 Date: 12/4/2014
 Model: IGRF2010

CSF E
 CSF E 41C-16-07-91
 Design #2
 12:53, December 04 2014

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
41C-16-07-91 TGT4705.0		-2236.2	2072.3	1596237.72	2420785.21	39° 27' 8.954 N	107° 33' 5.041 W	Rectangle (Sides: L40.0 W100.0)

ANNOTATIONS

TVD	MD	Annotation
300.0	300.0	Start Build 3.50
1068.5	1100.0	Surface Casing
1321.5	1403.1	Start 3739.3 hold at 1403.1 MD
4243.5	5142.4	Start Drop -3.50
5265.0	6245.4	Start 1997.0 hold at 6245.4 MD
5265.0	6245.4	Back to Vertical
7262.0	8242.4	TD at 8242.4

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.0
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	0.0
3	1403.1	38.61	137.18	1321.5	-262.4	243.2	3.50	137.18	357.8	
4	5142.4	38.61	137.18	4243.5	-1973.8	1829.1	0.00	0.00	2691.0	
5	6245.4	0.00	0.00	5265.0	-2236.2	2072.3	3.50	180.00	3048.8	
6	8242.4	0.00	0.00	7262.0	-2236.2	2072.3	0.00	0.00	3048.8	

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation	DipAngle	DipDir
2954.4	3492.7	Williams Fork	0.00	
4705.4	5674.3	Top of Gas	0.00	
5705.4	6685.8	Cameo	0.00	
6962.4	7942.8	Rollins	0.00	

