



# **Ursa Operating Company, LLC**

**Rockies Region**

**Hangs A**

**Hangs A 13B-09-06-92**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**20 August, 2015**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Hangs A 13B-09-06-92
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	Hangs A 13B-09-06-92 @ 5424.5usft (Capstar 321)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Hangs A 13B-09-06-92 @ 5424.5usft (Capstar 321)
<b>Site:</b>	Hangs A	<b>North Reference:</b>	True
<b>Well:</b>	Hangs A 13B-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<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	Hangs A				
Site Position:		Northing:	1,627,718.49 usft	Latitude:	39° 32' 12.404 N
From:	Lat/Long	Easting:	2,387,658.46 usft	Longitude:	107° 40' 16.846 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.37 °

Well	Hangs A 13B-09-06-92, SHL: 39.536613577 -107.671342032					
Well Position	+N/-S	-60.3 usft	Northing:	1,627,658.22 usft	Latitude:	39° 32' 11.809 N
	+E/-W	1.1 usft	Easting:	2,387,658.14 usft	Longitude:	107° 40' 16.831 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,424.5 usft	Ground Level:	5,407.5 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>
	IGRF2010	8/17/2015	9.67	65.72	51,897

<b>Design</b>	Design #1				
<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	300.98	

<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	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,087.4	34.56	300.98	2,028.6	148.7	-247.6	3.50	3.50	0.00	300.98	
5,539.3	34.56	300.98	4,871.4	1,156.4	-1,926.4	0.00	0.00	0.00	0.00	
6,526.6	0.00	0.00	5,800.0	1,305.1	-2,174.1	3.50	-3.50	0.00	180.00	
8,778.6	0.00	0.00	8,052.0	1,305.1	-2,174.1	0.00	0.00	0.00	0.00	

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Hangs A 13B-09-06-92 @ 5424.5usft (Capstar 321)
<b>Site:</b>	Hangs A	<b>North Reference:</b>	True
<b>Well:</b>	Hangs A 13B-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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	
0.1	0.00	0.00	0.1	0.0	0.0	0.0	0.00	0.00	0.00	
SHL: 39.536613577 -107.671342032										
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	
Surface Casing										
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
Start Build 3.50										
1,200.0	3.50	300.98	1,199.9	1.6	-2.6	3.1	3.50	3.50	0.00	
1,300.0	7.00	300.98	1,299.5	6.3	-10.5	12.2	3.50	3.50	0.00	
1,400.0	10.50	300.98	1,398.3	14.1	-23.5	27.4	3.50	3.50	0.00	
1,500.0	14.00	300.98	1,496.0	25.0	-41.7	48.6	3.50	3.50	0.00	
1,600.0	17.50	300.98	1,592.3	39.0	-65.0	75.8	3.50	3.50	0.00	
1,700.0	21.00	300.98	1,686.7	56.0	-93.2	108.7	3.50	3.50	0.00	
1,800.0	24.50	300.98	1,778.9	75.9	-126.4	147.4	3.50	3.50	0.00	
1,900.0	28.00	300.98	1,868.5	98.6	-164.3	191.6	3.50	3.50	0.00	
2,000.0	31.50	300.98	1,955.3	124.2	-206.8	241.2	3.50	3.50	0.00	
2,087.4	34.56	300.98	2,028.6	148.7	-247.6	288.8	3.50	3.50	0.00	
Start 3451.9 hold at 2087.4 MD										
2,100.0	34.56	300.98	2,039.0	152.4	-253.8	296.0	0.00	0.00	0.00	
2,200.0	34.56	300.98	2,121.3	181.5	-302.4	352.7	0.00	0.00	0.00	
2,300.0	34.56	300.98	2,203.7	210.7	-351.1	409.5	0.00	0.00	0.00	
2,400.0	34.56	300.98	2,286.1	239.9	-399.7	466.2	0.00	0.00	0.00	
2,500.0	34.56	300.98	2,368.4	269.1	-448.3	522.9	0.00	0.00	0.00	
2,600.0	34.56	300.98	2,450.8	298.3	-497.0	579.6	0.00	0.00	0.00	
2,700.0	34.56	300.98	2,533.1	327.5	-545.6	636.4	0.00	0.00	0.00	
2,800.0	34.56	300.98	2,615.5	356.7	-594.2	693.1	0.00	0.00	0.00	
2,900.0	34.56	300.98	2,697.8	385.9	-642.9	749.8	0.00	0.00	0.00	
3,000.0	34.56	300.98	2,780.2	415.1	-691.5	806.5	0.00	0.00	0.00	
3,100.0	34.56	300.98	2,862.5	444.3	-740.1	863.2	0.00	0.00	0.00	
3,200.0	34.56	300.98	2,944.9	473.5	-788.8	920.0	0.00	0.00	0.00	
3,300.0	34.56	300.98	3,027.3	502.7	-837.4	976.7	0.00	0.00	0.00	
3,400.0	34.56	300.98	3,109.6	531.9	-886.0	1,033.4	0.00	0.00	0.00	
3,500.0	34.56	300.98	3,192.0	561.1	-934.7	1,090.1	0.00	0.00	0.00	
3,600.0	34.56	300.98	3,274.3	590.3	-983.3	1,146.9	0.00	0.00	0.00	
3,700.0	34.56	300.98	3,356.7	619.5	-1,031.9	1,203.6	0.00	0.00	0.00	
3,800.0	34.56	300.98	3,439.0	648.7	-1,080.6	1,260.3	0.00	0.00	0.00	
3,900.0	34.56	300.98	3,521.4	677.9	-1,129.2	1,317.0	0.00	0.00	0.00	
4,000.0	34.56	300.98	3,603.7	707.0	-1,177.8	1,373.8	0.00	0.00	0.00	
4,100.0	34.56	300.98	3,686.1	736.2	-1,226.5	1,430.5	0.00	0.00	0.00	
4,200.0	34.56	300.98	3,768.5	765.4	-1,275.1	1,487.2	0.00	0.00	0.00	
4,300.0	34.56	300.98	3,850.8	794.6	-1,323.7	1,543.9	0.00	0.00	0.00	
4,400.0	34.56	300.98	3,933.2	823.8	-1,372.4	1,600.6	0.00	0.00	0.00	
4,411.3	34.56	300.98	3,942.5	827.1	-1,377.9	1,607.1	0.00	0.00	0.00	

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<b>Well:</b>	Hangs A 13B-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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)
<b>Williams Fork</b>									
4,500.0	34.56	300.98	4,015.5	853.0	-1,421.0	1,657.4	0.00	0.00	0.00
4,600.0	34.56	300.98	4,097.9	882.2	-1,469.6	1,714.1	0.00	0.00	0.00
4,700.0	34.56	300.98	4,180.2	911.4	-1,518.3	1,770.8	0.00	0.00	0.00
4,800.0	34.56	300.98	4,262.6	940.6	-1,566.9	1,827.5	0.00	0.00	0.00
4,900.0	34.56	300.98	4,344.9	969.8	-1,615.5	1,884.3	0.00	0.00	0.00
5,000.0	34.56	300.98	4,427.3	999.0	-1,664.2	1,941.0	0.00	0.00	0.00
5,100.0	34.56	300.98	4,509.7	1,028.2	-1,712.8	1,997.7	0.00	0.00	0.00
5,200.0	34.56	300.98	4,592.0	1,057.4	-1,761.4	2,054.4	0.00	0.00	0.00
5,300.0	34.56	300.98	4,674.4	1,086.6	-1,810.1	2,111.2	0.00	0.00	0.00
5,400.0	34.56	300.98	4,756.7	1,115.8	-1,858.7	2,167.9	0.00	0.00	0.00
5,500.0	34.56	300.98	4,839.1	1,145.0	-1,907.3	2,224.6	0.00	0.00	0.00
5,539.3	34.56	300.98	4,871.4	1,156.4	-1,926.4	2,246.9	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
5,600.0	32.43	300.98	4,922.1	1,173.7	-1,955.2	2,280.4	3.50	-3.50	0.00
5,700.0	28.93	300.98	5,008.1	1,199.9	-1,998.9	2,331.4	3.50	-3.50	0.00
5,800.0	25.43	300.98	5,097.0	1,223.4	-2,038.1	2,377.1	3.50	-3.50	0.00
5,900.0	21.93	300.98	5,188.6	1,244.1	-2,072.5	2,417.2	3.50	-3.50	0.00
5,949.2	20.21	300.98	5,234.5	1,253.2	-2,087.7	2,434.9	3.50	-3.50	0.00
<b>Top of Gas</b>									
6,000.0	18.43	300.98	5,282.4	1,261.9	-2,102.1	2,451.7	3.50	-3.50	0.00
6,100.0	14.93	300.98	5,378.2	1,276.6	-2,126.7	2,480.4	3.50	-3.50	0.00
6,200.0	11.43	300.98	5,475.5	1,288.4	-2,146.2	2,503.2	3.50	-3.50	0.00
6,300.0	7.93	300.98	5,574.1	1,297.0	-2,160.7	2,520.1	3.50	-3.50	0.00
6,400.0	4.43	300.98	5,673.5	1,302.6	-2,169.9	2,530.8	3.50	-3.50	0.00
6,500.0	0.93	300.98	5,773.4	1,305.0	-2,173.9	2,535.5	3.50	-3.50	0.00
6,526.6	0.00	0.00	5,800.0	1,305.1	-2,174.1	2,535.7	3.50	-3.50	0.00
<b>Start 2252.0 hold at 6526.6 MD - Back to Vertical</b>									
6,600.0	0.00	0.00	5,873.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
6,700.0	0.00	0.00	5,973.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,073.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,173.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,273.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,100.0	0.00	0.00	6,373.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,200.0	0.00	0.00	6,473.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,300.0	0.00	0.00	6,573.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,316.1	0.00	0.00	6,589.5	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
<b>Cameo</b>									
7,400.0	0.00	0.00	6,673.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,500.0	0.00	0.00	6,773.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,600.0	0.00	0.00	6,873.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,700.0	0.00	0.00	6,973.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,073.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
7,900.0	0.00	0.00	7,173.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,000.0	0.00	0.00	7,273.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,100.0	0.00	0.00	7,373.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,200.0	0.00	0.00	7,473.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,278.1	0.00	0.00	7,551.5	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
<b>Rollins</b>									
8,300.0	0.00	0.00	7,573.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,400.0	0.00	0.00	7,673.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00

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<b>Well:</b>	Hangs A 13B-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## 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)
8,500.0	0.00	0.00	7,773.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,600.0	0.00	0.00	7,873.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,700.0	0.00	0.00	7,973.4	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
8,778.1	0.00	0.00	8,051.5	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
<b>TD</b>									
8,778.6	0.00	0.00	8,052.0	1,305.1	-2,174.1	2,535.7	0.00	0.00	0.00
<b>TD at 8778.6</b>									

## 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									
Hangs A 13B-09-06-92 1	0.00	0.00	5,235.0	1,305.1	-2,174.1	1,629,014.89	2,385,515.87	39° 32' 24.707 N	107° 40' 44.583 W
- plan misses target center by 94.8usft at 5983.0usft MD (5266.4 TVD, 1259.1 N, -2097.4 E)									
- Rectangle (sides W100.0 H40.0 D2,817.0)									

## Formations

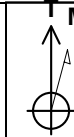
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,411.3	3,942.5	Williams Fork		0.00	
5,949.2	5,234.5	Top of Gas		0.00	
7,316.1	6,589.5	Cameo		0.00	
8,278.1	7,551.5	Rollins		0.00	
8,778.1	8,051.5	TD		0.00	

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.1	0.1	0.0	0.0	SHL: 39.536613577 -107.671342032
1,000.0	1,000.0	0.0	0.0	Surface Casing
1,100.0	1,100.0	0.0	0.0	Start Build 3.50
2,087.4	2,028.6	148.7	-247.6	Start 3451.9 hold at 2087.4 MD
5,539.3	4,871.4	1,156.4	-1,926.4	Start Drop -3.50
6,526.6	5,800.0	1,305.1	-2,174.1	Start 2252.0 hold at 6526.6 MD
6,526.6	5,800.0	1,305.1	-2,174.1	Back to Vertical
8,778.6	8,052.0	1,305.1	-2,174.1	TD at 8778.6
8,778.6	8,052.0	1,305.1	-2,174.1	BHL: 39.5401963 -107.6790509



Well Name: Hangs A 13B-09-06-92  
Surface Location: Hangs A  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5407.5  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1627658.22 2387658.14 39° 32' 11.809 N 107° 40' 16.831 W  
Capstar 321 Hangs A 13B-09-06-92 @ 5424.5usft (Capstar 321)



Azimuths to True North  
Magnetic North: 9.67°  
Magnetic Field  
Strength: 51896.5nT  
Dip Angle: 65.72°  
Date: 8/17/2015  
Model: IGRF2010

Hangs A  
Hangs A 13B-09-06-92  
Design #1  
11:04, August 20 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Hangs A 13B-09-06-92 TGT	5235.0	1305.1	-2174.1	1629014.89	2385515.879	39° 32' 24.7071N	107° 40' 44.583 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	1100.0	0.00	0.00	1100.0	0.0	0.0	0.00	0.00	0.0	
3	2087.4	34.56	300.98	2028.6	148.7	-247.6	3.50	300.98	288.8	
4	5539.3	34.56	300.98	4871.4	1156.4	-1926.4	0.00	0.00	2246.9	
5	6526.6	0.00	0.00	5800.0	1305.1	-2174.1	3.50	180.00	2535.7	
6	8778.6	0.00	0.00	8052.0	1305.1	-2174.1	0.00	0.00	2535.7	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.536613577 -107.671342032
1000.0	1000.0	Surface Casing
1100.0	1100.0	Start Build 3.50
2028.6	2087.4	Start 3451.9 hold at 2087.4 MD
4871.4	5539.3	Start Drop -3.50
5800.0	6526.6	Start 2252.0 hold at 6526.6 MD
5800.0	6526.6	Back to Vertical
8052.0	8778.6	TD at 8778.6
8052.0	8778.6	BHL: 39.5401963 -107.6790509

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3942.5	4411.3	Williams Fork	0.00	
5234.5	5949.2	Top of Gas	0.00	
6589.5	7316.1	Cameo	0.00	
7551.5	8278.1	Rollins	0.00	
8051.5	8778.1	TD	0.00	

