



Ursa Operating Company, LLC

Rockies Region

Valley Farms O

Valley Farms O 21C-15-06-92

Wellbore #1

Plan: Design #1

Standard Planning Report

24 July, 2015



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Valley Farms O 21C-15-06-92
Company:	Ursa Operating Company, LLC	TVD Reference:	Valley Farms O 21C-15-06-92 @ 5449.0usft (PLAN KB)
Project:	Rockies Region	MD Reference:	Valley Farms O 21C-15-06-92 @ 5449.0usft (PLAN KB)
Site:	Valley Farms O	North Reference:	True
Well:	Valley Farms O 21C-15-06-92	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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		Valley Farms O			
Site Position:		Northing:	1,627,349.92 usft	Latitude:	39° 32' 9.673 N
From:	Lat/Long	Easting:	2,391,526.29 usft	Longitude:	107° 39' 27.378 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.36 °

Well	Valley Farms O 21C-15-06-92, SHL: 39.535744491 -107.657675932					
Well Position	+N/-S	-100.5 usft	Northing:	1,627,249.92 usft	Latitude:	39° 32' 8.680 N
	+E/-W	-20.0 usft	Easting:	2,391,503.88 usft	Longitude:	107° 39' 27.633 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,449.0 usft	Ground Level:	5,432.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/21/2015	9.67	65.72	51,905

Design	Design #1				
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	158.77	

Plan Sections										
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	
1,813.7	24.98	158.77	1,791.3	-142.7	55.5	3.50	3.50	0.00	158.77	
4,969.3	24.98	158.77	4,651.7	-1,384.8	538.1	0.00	0.00	0.00	0.00	
5,682.9	0.00	0.00	5,343.0	-1,527.5	593.5	3.50	-3.50	0.00	180.00	21C-15-06-92 TGT
8,152.9	0.00	0.00	7,813.0	-1,527.5	593.5	0.00	0.00	0.00	0.00	

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Project:	Rockies Region	MD Reference:	Valley Farms O 21C-15-06-92 @ 5449.0usft (PLAN KB)
Site:	Valley Farms O	North Reference:	True
Well:	Valley Farms O 21C-15-06-92	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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: 39.535744491 -107.657675932										
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	158.77	1,199.9	-2.8	1.1	3.1	3.50	3.50	0.00	
1,300.0	7.00	158.77	1,299.5	-11.4	4.4	12.2	3.50	3.50	0.00	
1,400.0	10.50	158.77	1,398.3	-25.6	9.9	27.4	3.50	3.50	0.00	
1,500.0	14.00	158.77	1,496.0	-45.3	17.6	48.6	3.50	3.50	0.00	
1,600.0	17.50	158.77	1,592.3	-70.6	27.4	75.8	3.50	3.50	0.00	
1,700.0	21.00	158.77	1,686.7	-101.3	39.4	108.7	3.50	3.50	0.00	
1,800.0	24.50	158.77	1,778.9	-137.4	53.4	147.4	3.50	3.50	0.00	
1,813.7	24.98	158.77	1,791.3	-142.7	55.5	153.1	3.50	3.50	0.00	
Start 3155.6 hold at 1813.7 MD										
1,900.0	24.98	158.77	1,869.5	-176.7	68.7	189.6	0.00	0.00	0.00	
2,000.0	24.98	158.77	1,960.2	-216.1	84.0	231.8	0.00	0.00	0.00	
2,100.0	24.98	158.77	2,050.8	-255.4	99.2	274.0	0.00	0.00	0.00	
2,200.0	24.98	158.77	2,141.5	-294.8	114.5	316.3	0.00	0.00	0.00	
2,300.0	24.98	158.77	2,232.1	-334.1	129.8	358.5	0.00	0.00	0.00	
2,400.0	24.98	158.77	2,322.8	-373.5	145.1	400.7	0.00	0.00	0.00	
2,500.0	24.98	158.77	2,413.4	-412.9	160.4	442.9	0.00	0.00	0.00	
2,600.0	24.98	158.77	2,504.1	-452.2	175.7	485.2	0.00	0.00	0.00	
2,700.0	24.98	158.77	2,594.7	-491.6	191.0	527.4	0.00	0.00	0.00	
2,800.0	24.98	158.77	2,685.4	-530.9	206.3	569.6	0.00	0.00	0.00	
2,900.0	24.98	158.77	2,776.0	-570.3	221.6	611.8	0.00	0.00	0.00	
3,000.0	24.98	158.77	2,866.6	-609.7	236.9	654.1	0.00	0.00	0.00	
3,100.0	24.98	158.77	2,957.3	-649.0	252.2	696.3	0.00	0.00	0.00	
3,200.0	24.98	158.77	3,047.9	-688.4	267.5	738.5	0.00	0.00	0.00	
3,300.0	24.98	158.77	3,138.6	-727.8	282.8	780.8	0.00	0.00	0.00	
3,400.0	24.98	158.77	3,229.2	-767.1	298.1	823.0	0.00	0.00	0.00	
3,500.0	24.98	158.77	3,319.9	-806.5	313.4	865.2	0.00	0.00	0.00	
3,600.0	24.98	158.77	3,410.5	-845.8	328.7	907.4	0.00	0.00	0.00	
3,700.0	24.98	158.77	3,501.2	-885.2	344.0	949.7	0.00	0.00	0.00	
3,800.0	24.98	158.77	3,591.8	-924.6	359.3	991.9	0.00	0.00	0.00	
3,900.0	24.98	158.77	3,682.5	-963.9	374.5	1,034.1	0.00	0.00	0.00	
3,972.3	24.98	158.77	3,748.0	-992.4	385.6	1,064.7	0.00	0.00	0.00	
Williams Fork										
4,000.0	24.98	158.77	3,773.1	-1,003.3	389.8	1,076.4	0.00	0.00	0.00	
4,100.0	24.98	158.77	3,863.8	-1,042.6	405.1	1,118.6	0.00	0.00	0.00	
4,200.0	24.98	158.77	3,954.4	-1,082.0	420.4	1,160.8	0.00	0.00	0.00	

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Well:	Valley Farms O 21C-15-06-92	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)	
4,300.0	24.98	158.77	4,045.1	-1,121.4	435.7	1,203.0	0.00	0.00	0.00	
4,400.0	24.98	158.77	4,135.7	-1,160.7	451.0	1,245.3	0.00	0.00	0.00	
4,500.0	24.98	158.77	4,226.3	-1,200.1	466.3	1,287.5	0.00	0.00	0.00	
4,600.0	24.98	158.77	4,317.0	-1,239.4	481.6	1,329.7	0.00	0.00	0.00	
4,700.0	24.98	158.77	4,407.6	-1,278.8	496.9	1,372.0	0.00	0.00	0.00	
4,800.0	24.98	158.77	4,498.3	-1,318.2	512.2	1,414.2	0.00	0.00	0.00	
4,900.0	24.98	158.77	4,588.9	-1,357.5	527.5	1,456.4	0.00	0.00	0.00	
4,969.3	24.98	158.77	4,651.7	-1,384.8	538.1	1,485.7	0.00	0.00	0.00	
Start Drop -3.50										
5,000.0	23.90	158.77	4,679.7	-1,396.6	542.7	1,498.4	3.50	-3.50	0.00	
5,100.0	20.40	158.77	4,772.3	-1,431.8	556.3	1,536.1	3.50	-3.50	0.00	
5,200.0	16.90	158.77	4,867.0	-1,461.6	567.9	1,568.1	3.50	-3.50	0.00	
5,300.0	13.40	158.77	4,963.5	-1,486.0	577.4	1,594.2	3.50	-3.50	0.00	
5,400.0	9.90	158.77	5,061.5	-1,504.8	584.7	1,614.4	3.50	-3.50	0.00	
5,500.0	6.40	158.77	5,160.4	-1,518.0	589.8	1,628.6	3.50	-3.50	0.00	
5,600.0	2.90	158.77	5,260.1	-1,525.6	592.8	1,636.7	3.50	-3.50	0.00	
5,682.9	0.00	0.00	5,343.0	-1,527.5	593.5	1,638.8	3.50	-3.50	0.00	
Back to Vertical - Start 2470.0 hold at 5682.9 MD - Top of Gas										
5,700.0	0.00	0.00	5,360.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,460.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,560.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,000.0	0.00	0.00	5,660.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,100.0	0.00	0.00	5,760.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,200.0	0.00	0.00	5,860.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,300.0	0.00	0.00	5,960.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,060.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,160.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,260.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,654.9	0.00	0.00	6,315.0	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
Cameo										
6,700.0	0.00	0.00	6,360.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,460.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,560.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,000.0	0.00	0.00	6,660.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,100.0	0.00	0.00	6,760.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,200.0	0.00	0.00	6,860.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,300.0	0.00	0.00	6,960.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,060.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,160.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,260.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,652.9	0.00	0.00	7,313.0	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
Rollins										
7,700.0	0.00	0.00	7,360.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,460.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,560.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
8,000.0	0.00	0.00	7,660.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
8,100.0	0.00	0.00	7,760.1	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
8,152.8	0.00	0.00	7,812.9	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
BHL: 39.5315508 -107.6555716										
8,152.9	0.00	0.00	7,813.0	-1,527.5	593.5	1,638.8	0.00	0.00	0.00	
TD at 8152.9 - TD										

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Project:	Rockies Region	MD Reference:	Valley Farms O 21C-15-06-92 @ 5449.0usft (PLAN KB)
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Well:	Valley Farms O 21C-15-06-92	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
21C-15-06-92 TGT	0.00	0.00	5,343.0	-1,527.5	593.5	1,625,708.75	2,392,060.98	39° 31' 53.583 N	107° 39' 20.058 W
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,470.0)									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
3,972.3	3,748.0	Williams Fork		0.00		
5,682.9	5,343.0	Top of Gas		0.00		
6,654.9	6,315.0	Cameo		0.00		
7,652.9	7,313.0	Rollins		0.00		
8,152.9	7,813.0	TD		0.00		

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
0.1	0.1	0.0	0.0	SHL: 39.535744491 -107.657675932	
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	
1,813.7	1,791.3	-142.7	55.5	Start 3155.6 hold at 1813.7 MD	
4,969.3	4,651.7	-1,384.8	538.1	Start Drop -3.50	
5,682.9	5,343.0	-1,527.5	593.5	Back to Vertical	
5,682.9	5,343.0	-1,527.5	593.5	Start 2470.0 hold at 5682.9 MD	
8,152.8	7,812.9	-1,527.5	593.5	BHL: 39.5315508 -107.6555716	
8,152.9	7,813.0	-1,527.5	593.5	TD at 8152.9	



Well Name:Valley Farms O 21C-15-06-92
Surface Location: Valley Farms O
North American Datum 1983 , US State Plane 1983 , Colorado Central Zone
Ground Elevation: 5432.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1627249.93 2391503.88 39° 32' 8.680 N 107° 39' 27.633 W
PLAN KB Valley Farms O 21C-15-06-92 @ 5449.0usft (PLAN KB)



Azimuths to True North
Magnetic North: 9.67°
Magnetic Field
Strength: 51905.0snT
Dip Angle: 65.72°
Date: 7/21/2015
Model: IGRF2010

Valley Farms O
Valley Farms O 21C-15-06-92
Design #1
10:58, July 24 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
21C-15-06-92 TGT	5343.0	-1527.5	593.5	1625708.75	2392060.98	39° 31' 53.5831N	107° 39' 20.058 W	Rectangle (Sides: L40.0 W100.0)

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	
2	1100.0	0.00	0.00	1100.0	0.0	0.0	0.00	0.00	0.0	
3	1813.7	24.98	158.77	1791.3	-142.7	55.5	3.50	158.77	153.1	
4	4969.3	24.98	158.77	4651.7	-1384.8	538.1	0.00	0.00	1485.7	
5	5682.9	0.00	0.00	5343.0	-1527.5	593.5	3.50	180.00	1638.8	21C-15-06-92 TGT
6	8152.9	0.00	0.00	7813.0	-1527.5	593.5	0.00	0.00	1638.8	

ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.535744491 -107.657675932
1000.0	1000.0	Surface Casing
1100.0	1100.0	Start Build 3.50
1791.3	1813.7	Start 3155.6 hold at 1813.7 MD
4651.7	4969.3	Start Drop -3.50
5343.0	5682.9	Back to Vertical
5343.0	5682.9	Start 2470.0 hold at 5682.9 MD
7812.9	8152.8	BHL: 39.5315508 -107.6555716
7813.0	8152.9	TD at 8152.9

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3748.0	3972.3	Williams Fork	0.00	
5343.0	5682.9	Top of Gas	0.00	
6315.0	6654.9	Cameo	0.00	
7313.0	7652.9	Rollins	0.00	
7813.0	8152.9	TD	0.00	

