



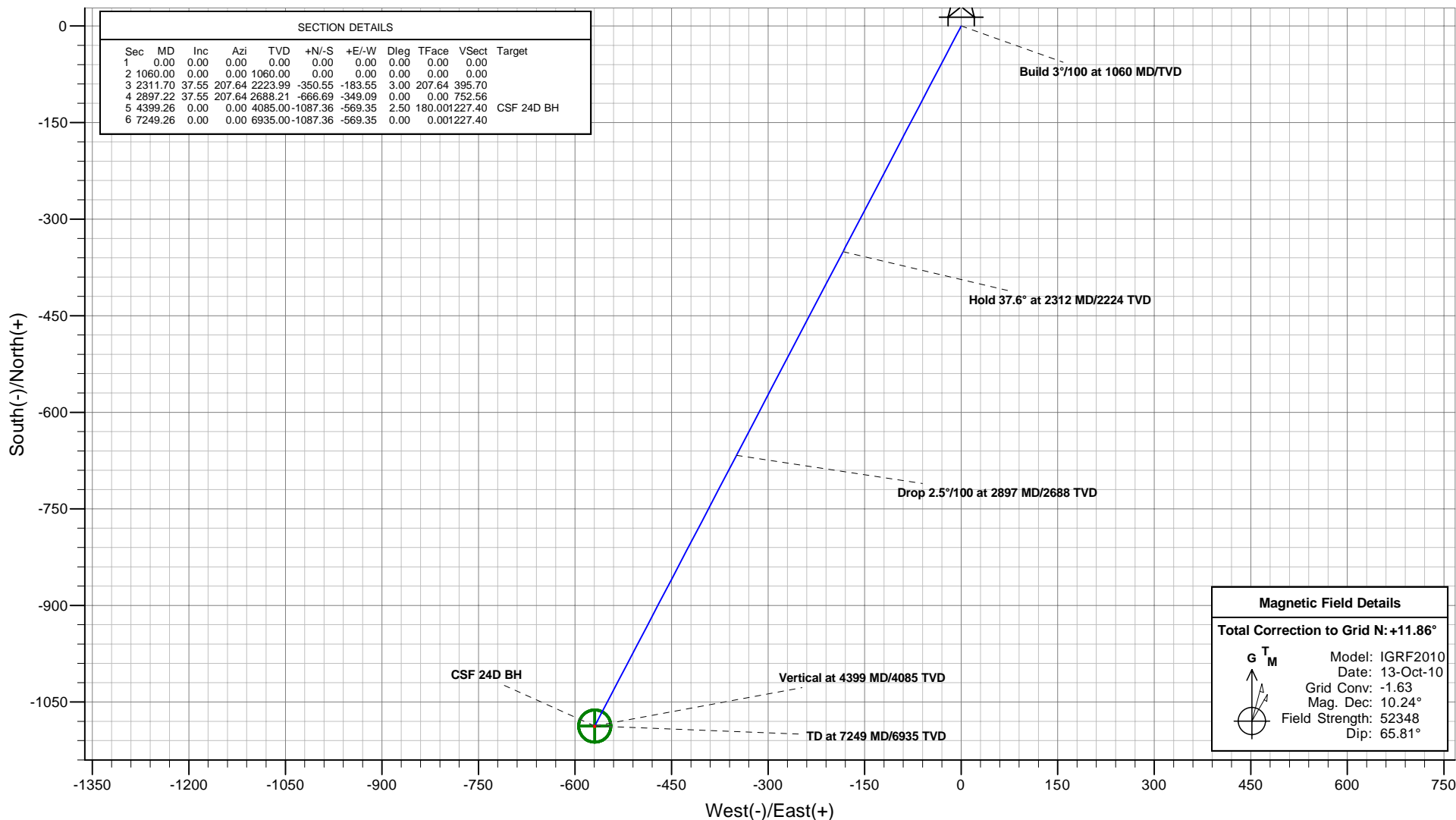
# Antero Resources

## CSF 24D



### PLAN VIEW

Project: Castle Springs Federal Project (E Pad)  
Site: Frontier 12  
Well: CSF 24D-09-07-91 (111194)  
Wellbore: CSF 24D  
Design: CSF 24D P01



Plan: CSF 24D P01  
Created By: ARK Directional Services  
Date: 15:46, July 13 2010

PROJECT DETAILS: Castle Springs Federal Project (E Pad)

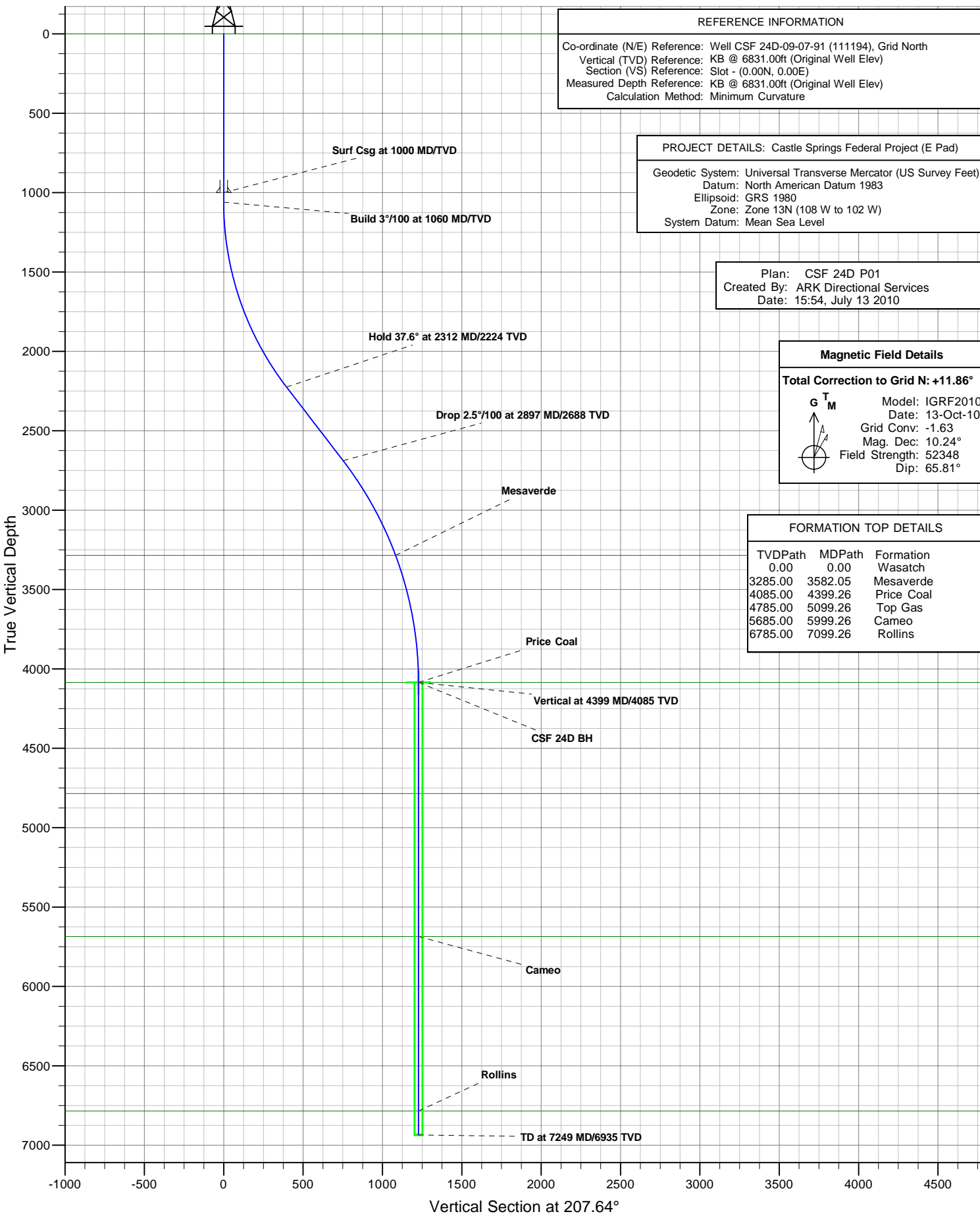
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Zone 13N (108 W to 102 W)  
System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CSF 24D-09-07-91 (111194), Grid North  
Vertical (TVD) Reference: KB @ 6831.00ft (Original Well Elev)  
Section (VS) Reference: Slot - (0.00N, 0.00E)  
Measured Depth Reference: KB @ 6831.00ft (Original Well Elev)  
Calculation Method: Minimum Curvature



## VERTICAL SECTION VIEW



# **Antero Resources**

**Castle Springs Federal Project (E Pad)**

**Frontier 12**

**CSF 24D-09-07-91 (111194)**

**CSF 24D**

**Plan: CSF 24D P01**

## **Standard Planning Report - Geographic**

**13 July, 2010**

# ARK Directional Services

## Planning Report - Geographic

<b>Database:</b>	EDM SERVER DB	<b>Local Co-ordinate Reference:</b>	Well CSF 24D-09-07-91 (111194)
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 6831.00ft (Original Well Elev)
<b>Project:</b>	Castle Springs Federal Project (E Pad)	<b>MD Reference:</b>	KB @ 6831.00ft (Original Well Elev)
<b>Site:</b>	Frontier 12	<b>North Reference:</b>	Grid
<b>Well:</b>	CSF 24D-09-07-91 (111194)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CSF 24D		
<b>Design:</b>	CSF 24D P01		

<b>Project</b>	Castle Springs Federal Project (E Pad)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

<b>Site</b>	Frontier 12		
<b>Site Position:</b>		<b>Northing:</b>	14,339,810.145 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	918,106.443 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.20 in
		<b>Latitude:</b>	39.458485832°N
		<b>Longitude:</b>	107.558944712°W
		<b>Grid Convergence:</b>	-1.63 °

<b>Well</b>	CSF 24D-09-07-91 (111194)		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	
		<b>Latitude:</b>	39.458458545°N
		<b>Longitude:</b>	107.558984486°W
		<b>Ground Level:</b>	6,807.00 ft

<b>Wellbore</b>	CSF 24D				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2010/10/13	10.24	65.81	52,348

<b>Design</b>	CSF 24D P01				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE		<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	207.64	

<b>Plan Sections</b>										
<b>Measured Depth</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical Depth</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Dogleg Rate</b>	<b>Build Rate</b>	<b>Turn Rate</b>	<b>TFO</b>	<b>Target</b>
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,060.00	0.00	0.00	1,060.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,311.70	37.55	207.64	2,223.99	-350.55	-183.55	3.00	3.00	0.00	207.64	
2,897.22	37.55	207.64	2,688.21	-666.69	-349.09	0.00	0.00	0.00	0.00	
4,399.26	0.00	0.00	4,085.00	-1,087.36	-569.35	2.50	-2.50	0.00	180.00	CSF 24D BH
7,249.26	0.00	0.00	6,935.00	-1,087.36	-569.35	0.00	0.00	0.00	0.00	

# ARK Directional Services

## Planning Report - Geographic

<b>Database:</b>	EDM SERVER DB	<b>Local Co-ordinate Reference:</b>	Well CSF 24D-09-07-91 (111194)
<b>Company:</b>	Antero Resources	<b>TVD Reference:</b>	KB @ 6831.00ft (Original Well Elev)
<b>Project:</b>	Castle Springs Federal Project (E Pad)	<b>MD Reference:</b>	KB @ 6831.00ft (Original Well Elev)
<b>Site:</b>	Frontier 12	<b>North Reference:</b>	Grid
<b>Well:</b>	CSF 24D-09-07-91 (111194)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	CSF 24D		
<b>Design:</b>	CSF 24D P01		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,339,800.526	918,094.932	39.458458545°N	107.558984486°W	
Wasatch										
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,339,800.526	918,094.932	39.458458545°N	107.558984486°W	
Surf Csg at 1000 MD/TVD										
1,060.00	0.00	0.00	1,060.00	0.00	0.00	14,339,800.526	918,094.932	39.458458545°N	107.558984486°W	
Build 3°/100 at 1060 MD/TVD										
2,311.70	37.55	207.64	2,223.99	-350.55	-183.55	14,339,449.975	917,911.381	39.457482430°N	107.559598901°W	
Hold 37.6° at 2312 MD/2224 TVD										
2,897.22	37.55	207.64	2,688.21	-666.69	-349.09	14,339,133.833	917,745.846	39.456602125°N	107.560152992°W	
Drop 2.5°/100 at 2897 MD/2688 TVD										
3,582.05	20.43	207.64	3,285.00	-959.64	-502.48	14,338,840.884	917,592.455	39.455786399°N	107.560666422°W	
Mesaverde										
4,399.26	0.00	0.00	4,085.00	-1,087.36	-569.35	14,338,713.171	917,525.584	39.455430781°N	107.560890250°W	
Vertical at 4399 MD/4085 TVD - Price Coal										
5,099.26	0.00	0.00	4,785.00	-1,087.36	-569.35	14,338,713.171	917,525.584	39.455430781°N	107.560890250°W	
Top Gas										
5,999.26	0.00	0.00	5,685.00	-1,087.36	-569.35	14,338,713.171	917,525.584	39.455430781°N	107.560890250°W	
Cameo										
7,099.26	0.00	0.00	6,785.00	-1,087.36	-569.35	14,338,713.171	917,525.584	39.455430781°N	107.560890250°W	
Rollins										
7,249.26	0.00	0.00	6,935.00	-1,087.36	-569.35	14,338,713.171	917,525.584	39.455430781°N	107.560890250°W	
TD at 7249 MD/6935 TVD										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
CSF 24D BH - plan hits target center - Circle (radius 25.00)	0.00	360.00	4,085.00	-1,087.36	-569.35	14,338,713.171	917,525.584	39.455430781°N	107.560890250°W	

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,000.00	1,000.00	Surf Csg at 1000 MD/TVD	5.50	6.00	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
0.00	0.00	Wasatch				
3,582.05	3,285.00	Mesaverde				
4,399.26	4,085.00	Price Coal				
5,099.26	4,785.00	Top Gas				
5,999.26	5,685.00	Cameo				
7,099.26	6,785.00	Rollins				

# ARK Directional Services

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<b>Wellbore:</b>	CSF 24D		
<b>Design:</b>	CSF 24D P01		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,060.00	1,060.00	0.00	0.00	Build 3°/100 at 1060 MD/TVD	
2,311.70	2,223.99	-350.55	-183.55	Hold 37.6° at 2312 MD/2224 TVD	
2,897.22	2,688.21	-666.69	-349.09	Drop 2.5°/100 at 2897 MD/2688 TVD	
4,399.26	4,085.00	-1,087.36	-569.35	Vertical at 4399 MD/4085 TVD	
7,249.26	6,935.00	-1,087.36	-569.35	TD at 7249 MD/6935 TVD	