

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Razor #20B-2011A
Company:	Whiting Petroleum Corporation	TVD Reference:	KB=17' @ 4924.8usft (Cade #23)
Project:	Weld County, CO	MD Reference:	KB=17' @ 4924.8usft (Cade #23)
Site:	S20-T10N-R58W	North Reference:	True
Well:	Razor #20B-2011A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S20-T10N-R58W			
Site Position:		Northing:	1,549,309.09 usft	Latitude:	40.830094
From:	Lat/Long	Easting:	3,446,260.83 usft	Longitude:	-103.887367
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.04 °

Well	Razor #20B-2011A					
Well Position	+N/-S	0.0 usft	Northing:	1,549,310.17 usft	Latitude:	40.830094
	+E/-W	0.0 usft	Easting:	3,446,320.87 usft	Longitude:	-103.887150
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,907.8 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/15/2014	7.96	67.42	53,091

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	178.06

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	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
831.7	2.63	58.48	831.7	1.6	2.6	2.00	2.00	0.00	58.48	
4,861.7	2.63	58.48	4,857.4	98.4	160.5	0.00	0.00	0.00	0.00	
4,993.5	0.00	0.00	4,989.1	100.0	163.0	2.00	-2.00	0.00	180.00	Razor #20B-2011A V
5,293.5	0.00	0.00	5,289.1	100.0	163.0	0.00	0.00	0.00	0.00	
6,111.6	90.00	180.00	5,810.0	-420.9	163.0	11.00	11.00	22.00	180.00	
10,509.2	90.00	180.00	5,810.0	-4,818.4	163.0	0.00	0.00	0.00	0.00	Razor #20B-2011A P

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Site:	S20-T10N-R58W	North Reference:	True
Well:	Razor #20B-2011A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #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 (°/100u)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	320' FNL, 1920' FEL
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	KOP @ 700'
800.0	2.00	58.48	800.0	0.9	1.5	-0.9	2.00	2.00	
831.7	2.63	58.48	831.7	1.6	2.6	-1.5	2.00	2.00	EOB @ 2.63° INC
900.0	2.63	58.48	899.9	3.2	5.3	-3.0	0.00	0.00	
1,000.0	2.63	58.48	999.8	5.6	9.2	-5.3	0.00	0.00	
1,100.0	2.63	58.48	1,099.7	8.0	13.1	-7.6	0.00	0.00	
1,200.0	2.63	58.48	1,199.6	10.4	17.0	-9.9	0.00	0.00	
1,300.0	2.63	58.48	1,299.5	12.8	20.9	-12.1	0.00	0.00	
1,400.0	2.63	58.48	1,399.4	15.2	24.8	-14.4	0.00	0.00	
1,500.0	2.63	58.48	1,499.2	17.6	28.8	-16.7	0.00	0.00	
1,600.0	2.63	58.48	1,599.1	20.0	32.7	-18.9	0.00	0.00	
1,700.0	2.63	58.48	1,699.0	22.4	36.6	-21.2	0.00	0.00	
1,800.0	2.63	58.48	1,798.9	24.8	40.5	-23.5	0.00	0.00	
1,900.0	2.63	58.48	1,898.8	27.3	44.4	-25.7	0.00	0.00	
2,000.0	2.63	58.48	1,998.7	29.7	48.3	-28.0	0.00	0.00	
2,100.0	2.63	58.48	2,098.6	32.1	52.3	-30.3	0.00	0.00	
2,200.0	2.63	58.48	2,198.5	34.5	56.2	-32.5	0.00	0.00	
2,300.0	2.63	58.48	2,298.4	36.9	60.1	-34.8	0.00	0.00	
2,400.0	2.63	58.48	2,398.3	39.3	64.0	-37.1	0.00	0.00	
2,500.0	2.63	58.48	2,498.2	41.7	67.9	-39.3	0.00	0.00	
2,600.0	2.63	58.48	2,598.1	44.1	71.9	-41.6	0.00	0.00	
2,700.0	2.63	58.48	2,698.0	46.5	75.8	-43.9	0.00	0.00	
2,800.0	2.63	58.48	2,797.9	48.9	79.7	-46.2	0.00	0.00	
2,900.0	2.63	58.48	2,897.8	51.3	83.6	-48.4	0.00	0.00	
3,000.0	2.63	58.48	2,997.7	53.7	87.5	-50.7	0.00	0.00	
3,100.0	2.63	58.48	3,097.6	56.1	91.4	-53.0	0.00	0.00	
3,200.0	2.63	58.48	3,197.5	58.5	95.4	-55.2	0.00	0.00	
3,300.0	2.63	58.48	3,297.3	60.9	99.3	-57.5	0.00	0.00	
3,400.0	2.63	58.48	3,397.2	63.3	103.2	-59.8	0.00	0.00	
3,500.0	2.63	58.48	3,497.1	65.7	107.1	-62.0	0.00	0.00	
3,600.0	2.63	58.48	3,597.0	68.1	111.0	-64.3	0.00	0.00	
3,700.0	2.63	58.48	3,696.9	70.5	114.9	-66.6	0.00	0.00	
3,800.0	2.63	58.48	3,796.8	72.9	118.9	-68.8	0.00	0.00	
3,900.0	2.63	58.48	3,896.7	75.3	122.8	-71.1	0.00	0.00	
4,000.0	2.63	58.48	3,996.6	77.7	126.7	-73.4	0.00	0.00	
4,100.0	2.63	58.48	4,096.5	80.1	130.6	-75.7	0.00	0.00	
4,200.0	2.63	58.48	4,196.4	82.5	134.5	-77.9	0.00	0.00	
4,300.0	2.63	58.48	4,296.3	84.9	138.4	-80.2	0.00	0.00	
4,400.0	2.63	58.48	4,396.2	87.3	142.4	-82.5	0.00	0.00	
4,500.0	2.63	58.48	4,496.1	89.7	146.3	-84.7	0.00	0.00	
4,600.0	2.63	58.48	4,596.0	92.1	150.2	-87.0	0.00	0.00	
4,700.0	2.63	58.48	4,695.9	94.5	154.1	-89.3	0.00	0.00	
4,800.0	2.63	58.48	4,795.8	96.9	158.0	-91.5	0.00	0.00	
4,861.7	2.63	58.48	4,857.4	98.4	160.5	-92.9	0.00	0.00	Start 2° Drop

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Well:	Razor #20B-2011A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #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 (°/100u)	Comments / Formations
4,900.0	1.87	58.48	4,895.7	99.2	161.7	-93.7	2.00	-2.00	
4,993.5	0.00	0.00	4,989.1	100.0	163.0	-94.4	2.00	-2.00	EOD @ 0° INC
5,000.0	0.00	0.00	4,995.6	100.0	163.0	-94.4	0.00	0.00	
5,100.0	0.00	0.00	5,095.6	100.0	163.0	-94.4	0.00	0.00	
5,200.0	0.00	0.00	5,195.6	100.0	163.0	-94.4	0.00	0.00	
5,293.5	0.00	0.00	5,289.1	100.0	163.0	-94.4	0.00	0.00	Start 11° Build
5,300.0	0.72	180.00	5,295.6	100.0	163.0	-94.4	11.00	11.00	
5,350.0	6.22	180.00	5,345.5	96.9	163.0	-91.4	11.00	11.00	
5,400.0	11.72	180.00	5,394.9	89.1	163.0	-83.6	11.00	11.00	
5,450.0	17.22	180.00	5,443.3	76.7	163.0	-71.1	11.00	11.00	
5,500.0	22.72	180.00	5,490.3	59.6	163.0	-54.0	11.00	11.00	
5,550.0	28.22	180.00	5,535.4	38.1	163.0	-32.6	11.00	11.00	
5,600.0	33.72	180.00	5,578.3	12.4	163.0	-6.8	11.00	11.00	
5,650.0	39.22	180.00	5,618.4	-17.3	163.0	22.8	11.00	11.00	
5,700.0	44.72	180.00	5,655.6	-50.8	163.0	56.3	11.00	11.00	
5,750.0	50.22	180.00	5,689.4	-87.6	163.0	93.1	11.00	11.00	
5,800.0	55.72	180.00	5,719.5	-127.5	163.0	132.9	11.00	11.00	
5,850.0	61.22	180.00	5,745.6	-170.1	163.0	175.5	11.00	11.00	
5,900.0	66.72	180.00	5,767.6	-215.0	163.0	220.4	11.00	11.00	
5,950.0	72.22	180.00	5,785.1	-261.8	163.0	267.2	11.00	11.00	
6,000.0	77.72	180.00	5,798.1	-310.1	163.0	315.4	11.00	11.00	
6,050.0	83.22	180.00	5,806.3	-359.4	163.0	364.7	11.00	11.00	
6,100.0	88.72	180.00	5,809.8	-409.2	163.0	414.5	11.00	11.00	
6,111.6	90.00	180.00	5,810.0	-420.8	163.0	426.1	11.00	11.00	LP @ 5,810' TVD, 90° INC - 7" - 740' FNL, 176°
6,200.0	90.00	180.00	5,810.0	-509.2	163.0	514.5	0.00	0.00	
6,300.0	90.00	180.00	5,810.0	-609.2	163.0	614.4	0.00	0.00	
6,400.0	90.00	180.00	5,810.0	-709.2	163.0	714.3	0.00	0.00	
6,500.0	90.00	180.00	5,810.0	-809.2	163.0	814.3	0.00	0.00	
6,600.0	90.00	180.00	5,810.0	-909.2	163.0	914.2	0.00	0.00	
6,700.0	90.00	180.00	5,810.0	-1,009.2	163.0	1,014.2	0.00	0.00	
6,800.0	90.00	180.00	5,810.0	-1,109.2	163.0	1,114.1	0.00	0.00	
6,900.0	90.00	180.00	5,810.0	-1,209.2	163.0	1,214.1	0.00	0.00	
7,000.0	90.00	180.00	5,810.0	-1,309.2	163.0	1,314.0	0.00	0.00	
7,100.0	90.00	180.00	5,810.0	-1,409.2	163.0	1,413.9	0.00	0.00	
7,200.0	90.00	180.00	5,810.0	-1,509.2	163.0	1,513.9	0.00	0.00	
7,300.0	90.00	180.00	5,810.0	-1,609.2	163.0	1,613.8	0.00	0.00	
7,400.0	90.00	180.00	5,810.0	-1,709.2	163.0	1,713.8	0.00	0.00	
7,500.0	90.00	180.00	5,810.0	-1,809.2	163.0	1,813.7	0.00	0.00	
7,600.0	90.00	180.00	5,810.0	-1,909.2	163.0	1,913.7	0.00	0.00	
7,700.0	90.00	180.00	5,810.0	-2,009.2	163.0	2,013.6	0.00	0.00	
7,800.0	90.00	180.00	5,810.0	-2,109.2	163.0	2,113.5	0.00	0.00	
7,900.0	90.00	180.00	5,810.0	-2,209.2	163.0	2,213.5	0.00	0.00	
8,000.0	90.00	180.00	5,810.0	-2,309.2	163.0	2,313.4	0.00	0.00	
8,100.0	90.00	180.00	5,810.0	-2,409.2	163.0	2,413.4	0.00	0.00	
8,200.0	90.00	180.00	5,810.0	-2,509.2	163.0	2,513.3	0.00	0.00	
8,300.0	90.00	180.00	5,810.0	-2,609.2	163.0	2,613.3	0.00	0.00	
8,400.0	90.00	180.00	5,810.0	-2,709.2	163.0	2,713.2	0.00	0.00	
8,500.0	90.00	180.00	5,810.0	-2,809.2	163.0	2,813.1	0.00	0.00	
8,600.0	90.00	180.00	5,810.0	-2,909.2	163.0	2,913.1	0.00	0.00	
8,700.0	90.00	180.00	5,810.0	-3,009.2	163.0	3,013.0	0.00	0.00	
8,800.0	90.00	180.00	5,810.0	-3,109.2	163.0	3,113.0	0.00	0.00	
8,900.0	90.00	180.00	5,810.0	-3,209.2	163.0	3,212.9	0.00	0.00	

Cathedral Energy Services

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Project:	Weld County, CO	MD Reference:	KB=17' @ 4924.8usft (Cade #23)
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Well:	Razor #20B-2011A	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #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 (°/100u)	Comments / Formations
9,000.0	90.00	180.00	5,810.0	-3,309.2	163.0	3,312.9	0.00	0.00	
9,100.0	90.00	180.00	5,810.0	-3,409.2	163.0	3,412.8	0.00	0.00	
9,200.0	90.00	180.00	5,810.0	-3,509.2	163.0	3,512.7	0.00	0.00	
9,300.0	90.00	180.00	5,810.0	-3,609.2	163.0	3,612.7	0.00	0.00	
9,400.0	90.00	180.00	5,810.0	-3,709.2	163.0	3,712.6	0.00	0.00	
9,500.0	90.00	180.00	5,810.0	-3,809.2	163.0	3,812.6	0.00	0.00	
9,600.0	90.00	180.00	5,810.0	-3,909.2	163.0	3,912.5	0.00	0.00	
9,700.0	90.00	180.00	5,810.0	-4,009.2	163.0	4,012.5	0.00	0.00	
9,800.0	90.00	180.00	5,810.0	-4,109.2	163.0	4,112.4	0.00	0.00	
9,900.0	90.00	180.00	5,810.0	-4,209.2	163.0	4,212.3	0.00	0.00	
10,000.0	90.00	180.00	5,810.0	-4,309.2	163.0	4,312.3	0.00	0.00	
10,100.0	90.00	180.00	5,810.0	-4,409.2	163.0	4,412.2	0.00	0.00	
10,200.0	90.00	180.00	5,810.0	-4,509.2	163.0	4,512.2	0.00	0.00	
10,300.0	90.00	180.00	5,810.0	-4,609.2	163.0	4,612.1	0.00	0.00	
10,400.0	90.00	180.00	5,810.0	-4,709.2	163.0	4,712.1	0.00	0.00	
10,509.2	90.00	180.00	5,810.0	-4,818.4	163.0	4,821.1	0.00	0.00	TD @ 10,509.2' MD - 100' FSL, 1815' FEL

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									
Razor #20B-2011A PBI- - plan hits target center - Point	0.00	0.00	5,810.0	-4,818.4	163.0	1,544,495.54	3,446,571.51	40.816869	-103.886561
Razor #20B-2011A VP - plan hits target center - Point	0.00	0.00	4,989.1	100.0	163.0	1,549,413.12	3,446,482.06	40.830368	-103.886561

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,111.6	5,810.0	7" - 740' FNL, 1762' FEL	0	0

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.5	0.5	0.0	0.0	320' FNL, 1920' FEL
700.0	700.0	0.0	0.0	KOP @ 700'
831.7	831.7	1.6	2.6	EOB @ 2.63° INC
4,861.7	4,857.4	98.4	160.5	Start 2° Drop
4,993.5	4,989.1	100.0	163.0	EOD @ 0° INC
5,293.5	5,289.1	100.0	163.0	Start 11° Build
6,111.6	5,810.0	-420.9	163.0	LP @ 5,810' TVD, 90° INC
10,509.2	5,810.0	-4,818.4	163.0	TD @ 10,509.2' MD
10,509.2	5,810.0	-4,818.4	163.0	100' FSL, 1815' FEL

Whiting Petroleum Corporation

Weld County, CO

S20-T10N-R58W

Razor #20B-2011A

HZ

Plan #1

Anticollision Report

15 October, 2014

Anticollision Report

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S20-T10N-R58W						
Razor #20B-2009A - HZ - Plan #1	500.0	500.0	60.1	58.1	30.258	CC, ES
Razor #20B-2009A - HZ - Plan #1	800.0	792.8	76.5	73.2	23.159	SF
Razor #20B-2012B - HZ - Plan #1	500.0	500.0	29.9	27.9	15.059	CC, ES
Razor #20B-2012B - HZ - Plan #1	700.0	697.7	36.7	33.8	12.796	SF
S29-T10N-R58W						
Razor 29F 2008B - HZ - Plan #1						Out of range

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	Local Co-ordinate Reference:	Well Razor #20B-2011A
Project:	Weld County, CO	TVD Reference:	KB=17' @ 4924.8usft (Cade #23)
Reference Site:	S20-T10N-R58W	MD Reference:	KB=17' @ 4924.8usft (Cade #23)
Site Error:	0.0usft	North Reference:	True
Reference Well:	Razor #20B-2011A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S20-T10N-R58W - Razor #20B-2009A - HZ - Plan #1													Offset Site Error: 0.0 usft	
Survey Program: 0-ISCWSA MWD													Offset Well Error: 0.0 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-60.1	60.1					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-60.1	60.1	59.9	0.19	321.905		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-60.1	60.1	59.4	0.64	94.410		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-60.1	60.1	59.0	1.09	55.317		
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-60.1	60.1	58.5	1.54	39.119		
500.0	500.0	500.0	500.0	1.0	1.0	-90.00	0.0	-60.1	60.1	58.1	1.98	30.258	CC, ES	
600.0	600.0	598.0	597.9	1.2	1.2	-89.65	0.4	-61.7	61.7	59.3	2.42	25.498		
700.0	700.0	695.7	695.5	1.4	1.4	-88.71	1.5	-66.6	66.7	63.9	2.86	23.363		
800.0	800.0	792.8	792.3	1.7	1.6	-146.52	3.3	-74.6	76.5	73.2	3.30	23.159	SF	
900.0	899.9	891.5	890.4	1.9	1.9	-146.73	5.7	-84.8	90.6	86.9	3.75	24.188		
1,000.0	999.8	990.5	988.8	2.1	2.2	-146.98	8.0	-95.1	104.9	100.7	4.18	25.065		
1,100.0	1,099.7	1,089.4	1,087.3	2.3	2.4	-147.16	10.4	-105.4	119.1	114.5	4.63	25.748		
1,200.0	1,199.6	1,188.4	1,185.7	2.6	2.7	-147.30	12.7	-115.6	133.4	128.3	5.07	26.292		
1,300.0	1,299.5	1,287.4	1,284.1	2.8	3.0	-147.42	15.1	-125.9	147.7	142.1	5.52	26.733		
1,400.0	1,399.4	1,386.4	1,382.5	3.0	3.3	-147.52	17.4	-136.2	161.9	155.9	5.98	27.097		
1,500.0	1,499.2	1,485.4	1,480.9	3.2	3.6	-147.60	19.8	-146.5	176.2	169.8	6.43	27.404		
1,600.0	1,599.1	1,584.3	1,579.3	3.5	3.9	-147.66	22.2	-156.7	190.4	183.6	6.88	27.665		

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Reference Site:	S20-T10N-R58W	MD Reference:	KB=17' @ 4924.8usft (Cade #23)
Site Error:	0.0usft	North Reference:	True
Reference Well:	Razor #20B-2011A	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S20-T10N-R58W - Razor #20B-2012B - HZ - Plan #1												Offset Site Error: 0.0 usft	
Survey Program: 0-ISCSWA MWD												Offset Well Error: 0.0 usft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.02	0.0	29.9	29.9				
100.0	100.0	100.0	100.0	0.1	0.1	90.02	0.0	29.9	29.9	29.7	0.19	160.211	
200.0	200.0	200.0	200.0	0.3	0.3	90.02	0.0	29.9	29.9	29.3	0.64	46.988	
300.0	300.0	300.0	300.0	0.5	0.5	90.02	0.0	29.9	29.9	28.8	1.09	27.531	
400.0	400.0	400.0	400.0	0.8	0.8	90.02	0.0	29.9	29.9	28.4	1.54	19.469	
500.0	500.0	500.0	500.0	1.0	1.0	90.02	0.0	29.9	29.9	27.9	1.98	15.059	CC, ES
600.0	600.0	599.0	598.9	1.2	1.2	89.36	0.4	31.6	31.6	29.2	2.42	13.029	
700.0	700.0	697.7	697.5	1.4	1.4	87.76	1.4	36.6	36.7	33.8	2.87	12.796	SF
800.0	800.0	796.1	795.5	1.7	1.7	28.40	3.2	44.8	43.6	40.3	3.30	13.231	
900.0	899.9	895.5	894.4	1.9	1.9	28.79	5.5	55.5	50.6	46.9	3.74	13.549	
1,000.0	999.8	995.2	993.5	2.1	2.2	29.17	7.9	66.3	57.5	53.3	4.18	13.774	
1,100.0	1,099.7	1,095.0	1,092.6	2.3	2.5	29.47	10.2	77.1	64.4	59.8	4.62	13.939	
1,200.0	1,199.6	1,194.8	1,191.8	2.6	2.7	29.72	12.5	87.9	71.4	66.3	5.07	14.065	
1,300.0	1,299.5	1,294.5	1,290.9	2.8	3.0	29.92	14.9	98.7	78.3	72.8	5.53	14.162	
1,400.0	1,399.4	1,394.3	1,390.1	3.0	3.3	30.09	17.2	109.5	85.2	79.2	5.98	14.240	
1,500.0	1,499.2	1,494.0	1,489.2	3.2	3.6	30.23	19.5	120.3	92.1	85.7	6.44	14.302	
1,600.0	1,599.1	1,593.8	1,588.4	3.5	3.9	30.35	21.9	131.1	99.0	92.1	6.90	14.354	
1,700.0	1,699.0	1,693.6	1,687.5	3.7	4.2	30.46	24.2	141.9	106.0	98.6	7.36	14.396	
1,800.0	1,798.9	1,793.3	1,786.7	4.0	4.5	30.55	26.5	152.7	112.9	105.1	7.82	14.433	
1,900.0	1,898.8	1,893.1	1,885.8	4.2	4.8	30.64	28.8	163.5	119.8	111.5	8.28	14.464	
2,000.0	1,998.7	1,992.8	1,985.0	4.4	5.1	30.71	31.2	174.3	126.7	118.0	8.75	14.491	
2,100.0	2,098.6	2,092.6	2,084.1	4.7	5.4	30.77	33.5	185.1	133.7	124.4	9.21	14.514	
2,200.0	2,198.5	2,192.4	2,183.3	4.9	5.7	30.83	35.8	195.9	140.6	130.9	9.67	14.535	
2,300.0	2,298.4	2,292.1	2,282.4	5.1	6.0	30.89	38.2	206.7	147.5	137.4	10.14	14.553	
2,400.0	2,398.3	2,391.9	2,381.5	5.4	6.3	30.94	40.5	217.5	154.4	143.8	10.60	14.570	
2,500.0	2,498.2	2,491.6	2,480.7	5.6	6.6	30.98	42.8	228.3	161.3	150.3	11.06	14.584	
2,600.0	2,598.1	2,591.4	2,579.8	5.8	6.9	31.02	45.2	239.1	168.3	156.7	11.53	14.598	
2,700.0	2,698.0	2,691.2	2,679.0	6.1	7.2	31.06	47.5	249.9	175.2	163.2	11.99	14.610	
2,800.0	2,797.9	2,790.9	2,778.1	6.3	7.5	31.10	49.8	260.7	182.1	169.7	12.46	14.622	
2,900.0	2,897.8	2,890.7	2,877.3	6.6	7.8	31.13	52.2	271.5	189.0	176.1	12.92	14.632	
3,000.0	2,997.7	2,990.4	2,976.4	6.8	8.1	31.16	54.5	282.3	196.0	182.6	13.38	14.642	

Cathedral Energy Services

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Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=17' @ 4924.8usft (Cade #23)

Offset Depths are relative to Offset Datum

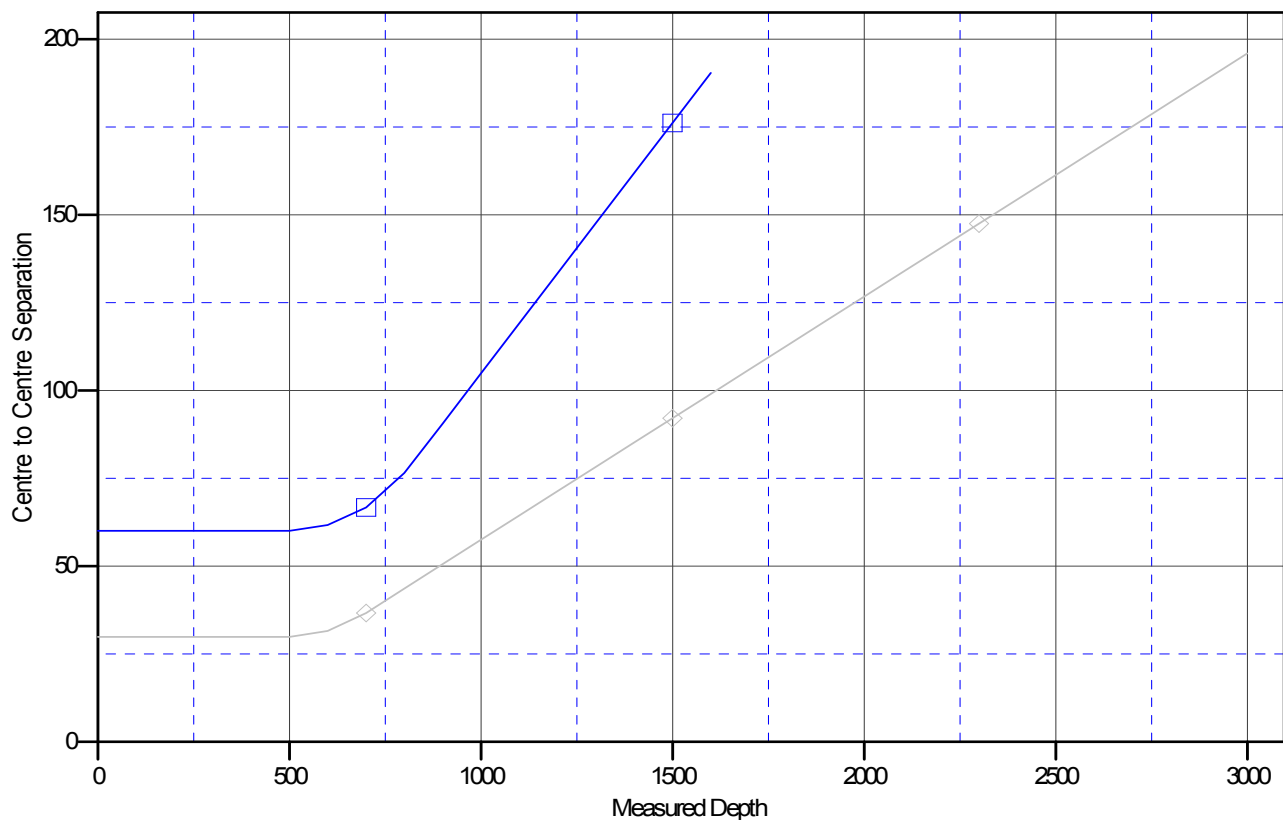
Central Meridian is -105.500000 °

Coordinates are relative to: Razor #20B-2011A

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 1.04°

Ladder Plot



LEGEND

—◆— Razor #20B-2012B, HZ, Plan #1 V0
 —■— Razor #20B-2009A, HZ, Plan #1 V0