WHITING PETROLEUM CORPORATION

Project: Weld County, CO
Site: S12-T10N-R58W
Well: Razor Federal #12G-1309A
Wellbore: HZ
Design: Plan #1

CATHEDRAL

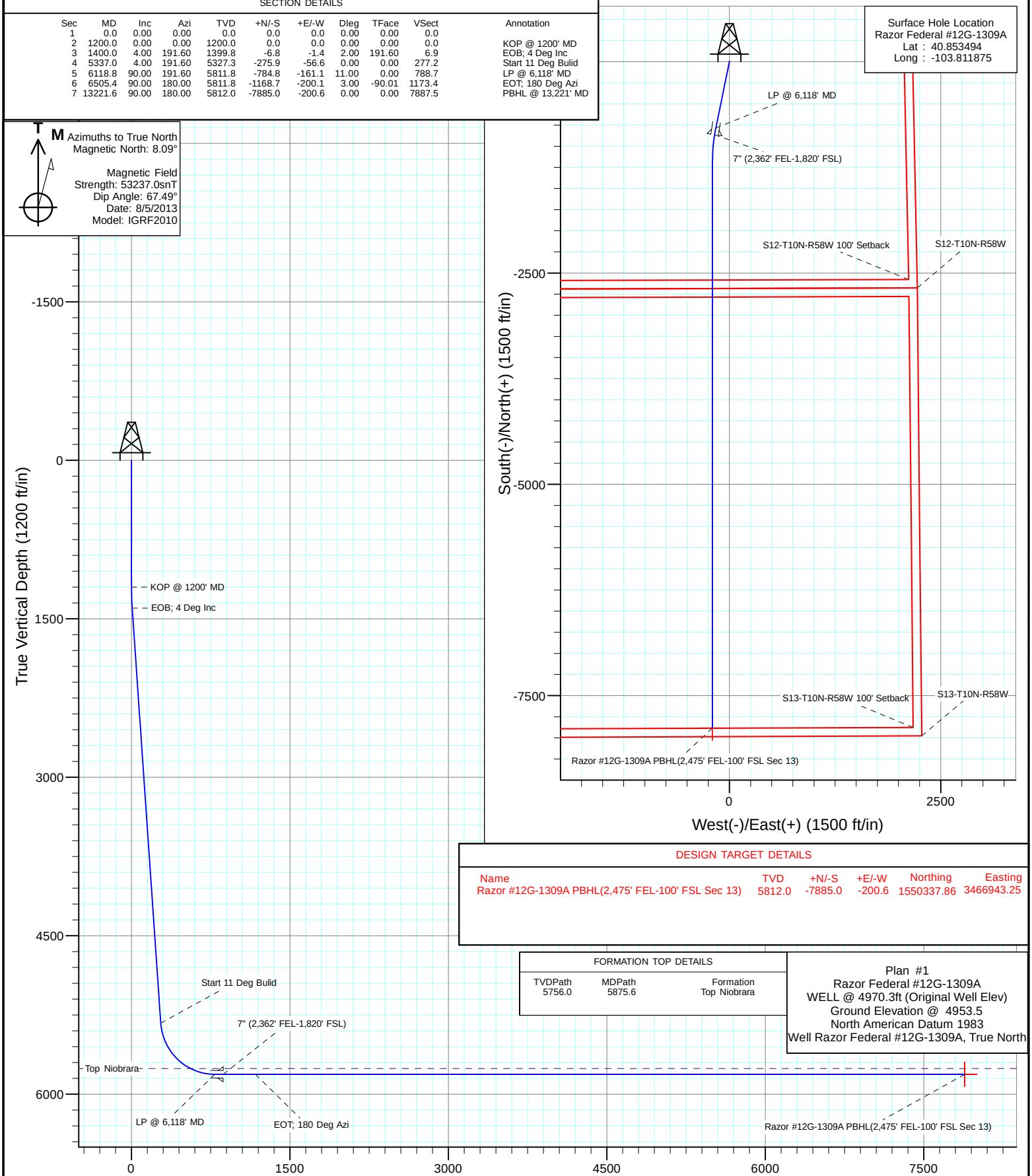
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	KOP @ 1200' MD
3	1400.0	4.00	191.60	1399.8	-6.8	-1.4	2.00	191.60	6.9	EOB; 4 Deg Inc
4	5337.0	4.00	191.60	5327.3	-275.9	-56.6	0.00	0.00	277.2	Start 11 Deg Bulid
5	6118.8	90.00	191.60	5811.8	-784.8	-161.1	11.00	0.00	788.7	LP @ 6,118' MD
6	6505.4	90.00	180.00	5811.8	-1168.7	-200.1	3.00	-90.01	1173.4	EOT; 180 Deg Azi
7	13221.6	90.00	180.00	5812.0	-7885.0	-200.6	0.00	0.00	7887.5	PBHL @ 13,221' MD

Azimuths to True North
Magnetic North: 8.09°

Magnetic Field
Strength: 53237.0snT
Dip Angle: 67.49°
Date: 8/5/2013
Model: IGRF2010

Surface Hole Location
Razor Federal #12G-1309A
Lat : 40.853494
Long : -103.811875



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
Razor #12G-1309A PBHL(2,475' FEL-100' FSL Sec 13)	5812.0	-7885.0	-200.6	1550337.86	3466943.25

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5756.0	5875.6	Top Niobrara

Plan #1
Razor Federal #12G-1309A
WELL @ 4970.3ft (Original Well Elev)
Ground Elevation @ 4953.5
North American Datum 1983
Well Razor Federal #12G-1309A, True North

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Company:	Whiting Petroleum Corporation	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Project:	Weld County, CO	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site:	S12-T10N-R58W	**North Reference:**	True
Well:	Razor Federal #12G-1309A	**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 S12-T10N-R58W

Site Position:		**Northing:**	1,558,541.09 ft	**Latitude:**	40.854456
From:	Lat/Long	**Easting:**	3,465,183.08 ft	**Longitude:**	-103.818397
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	1.09 °

Well Razor Federal #12G-1309A

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,558,225.25 ft	**Latitude:**	40.853494
	+E/-W	0.0 ft	**Easting:**	3,466,993.75 ft	**Longitude:**	-103.811875
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,953.5 ft

Wellbore HZ

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/5/2013	8.09	67.49	53,237

Design Plan #1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	181.46

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,400.0	4.00	191.60	1,399.8	-6.8	-1.4	2.00	2.00	0.00	191.60	
5,337.0	4.00	191.60	5,327.3	-275.9	-56.6	0.00	0.00	0.00	0.00	
6,118.8	90.00	191.60	5,811.8	-784.8	-161.1	11.00	11.00	0.00	0.00	
6,505.4	90.00	180.00	5,811.8	-1,168.7	-200.1	3.00	0.00	-3.00	-90.01	
13,221.6	90.00	180.00	5,812.0	-7,885.0	-200.6	0.00	0.00	0.00	0.00	Razor #12G-1309A P

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Company:	Whiting Petroleum Corporation	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
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Site:	S12-T10N-R58W	**North Reference:**	True
Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
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	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1200' MD
1,300.0	2.00	191.60	1,300.0	-1.7	-0.4	1.7	2.00	2.00	
1,400.0	4.00	191.60	1,399.8	-6.8	-1.4	6.9	2.00	2.00	EOB; 4 Deg Inc
1,500.0	4.00	191.60	1,499.6	-13.7	-2.8	13.7	0.00	0.00	
1,600.0	4.00	191.60	1,599.4	-20.5	-4.2	20.6	0.00	0.00	
1,700.0	4.00	191.60	1,699.1	-27.3	-5.6	27.5	0.00	0.00	
1,800.0	4.00	191.60	1,798.9	-34.2	-7.0	34.3	0.00	0.00	
1,900.0	4.00	191.60	1,898.6	-41.0	-8.4	41.2	0.00	0.00	
2,000.0	4.00	191.60	1,998.4	-47.8	-9.8	48.1	0.00	0.00	
2,100.0	4.00	191.60	2,098.1	-54.7	-11.2	54.9	0.00	0.00	
2,200.0	4.00	191.60	2,197.9	-61.5	-12.6	61.8	0.00	0.00	
2,300.0	4.00	191.60	2,297.6	-68.3	-14.0	68.7	0.00	0.00	
2,400.0	4.00	191.60	2,397.4	-75.2	-15.4	75.5	0.00	0.00	
2,500.0	4.00	191.60	2,497.2	-82.0	-16.8	82.4	0.00	0.00	
2,600.0	4.00	191.60	2,596.9	-88.8	-18.2	89.3	0.00	0.00	
2,700.0	4.00	191.60	2,696.7	-95.7	-19.6	96.1	0.00	0.00	
2,800.0	4.00	191.60	2,796.4	-102.5	-21.0	103.0	0.00	0.00	
2,900.0	4.00	191.60	2,896.2	-109.3	-22.4	109.9	0.00	0.00	
3,000.0	4.00	191.60	2,995.9	-116.2	-23.8	116.7	0.00	0.00	
3,100.0	4.00	191.60	3,095.7	-123.0	-25.2	123.6	0.00	0.00	
3,200.0	4.00	191.60	3,195.5	-129.8	-26.7	130.5	0.00	0.00	
3,300.0	4.00	191.60	3,295.2	-136.7	-28.1	137.3	0.00	0.00	
3,400.0	4.00	191.60	3,395.0	-143.5	-29.5	144.2	0.00	0.00	
3,500.0	4.00	191.60	3,494.7	-150.3	-30.9	151.1	0.00	0.00	
3,600.0	4.00	191.60	3,594.5	-157.2	-32.3	157.9	0.00	0.00	
3,700.0	4.00	191.60	3,694.2	-164.0	-33.7	164.8	0.00	0.00	
3,800.0	4.00	191.60	3,794.0	-170.8	-35.1	171.7	0.00	0.00	
3,900.0	4.00	191.60	3,893.7	-177.7	-36.5	178.5	0.00	0.00	
4,000.0	4.00	191.60	3,993.5	-184.5	-37.9	185.4	0.00	0.00	
4,100.0	4.00	191.60	4,093.3	-191.3	-39.3	192.3	0.00	0.00	
4,200.0	4.00	191.60	4,193.0	-198.2	-40.7	199.1	0.00	0.00	
4,300.0	4.00	191.60	4,292.8	-205.0	-42.1	206.0	0.00	0.00	
4,400.0	4.00	191.60	4,392.5	-211.8	-43.5	212.9	0.00	0.00	
4,500.0	4.00	191.60	4,492.3	-218.7	-44.9	219.7	0.00	0.00	
4,600.0	4.00	191.60	4,592.0	-225.5	-46.3	226.6	0.00	0.00	
4,700.0	4.00	191.60	4,691.8	-232.3	-47.7	233.5	0.00	0.00	
4,800.0	4.00	191.60	4,791.6	-239.2	-49.1	240.3	0.00	0.00	
4,900.0	4.00	191.60	4,891.3	-246.0	-50.5	247.2	0.00	0.00	
5,000.0	4.00	191.60	4,991.1	-252.8	-51.9	254.1	0.00	0.00	
5,100.0	4.00	191.60	5,090.8	-259.7	-53.3	260.9	0.00	0.00	

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Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
5,200.0	4.00	191.60	5,190.6	-266.5	-54.7	267.8	0.00	0.00	
5,300.0	4.00	191.60	5,290.3	-273.3	-56.1	274.7	0.00	0.00	
5,337.0	4.00	191.60	5,327.3	-275.9	-56.6	277.2	0.00	0.00	Start 11 Deg Bulid
5,350.0	5.43	191.60	5,340.2	-276.9	-56.8	278.3	11.00	11.00	
5,400.0	10.93	191.60	5,389.7	-283.9	-58.3	285.3	11.00	11.00	
5,450.0	16.43	191.60	5,438.2	-295.4	-60.6	296.9	11.00	11.00	
5,500.0	21.93	191.60	5,485.4	-311.5	-63.9	313.1	11.00	11.00	
5,550.0	27.43	191.60	5,530.9	-332.0	-68.1	333.6	11.00	11.00	
5,600.0	32.93	191.60	5,574.1	-356.6	-73.2	358.3	11.00	11.00	
5,650.0	38.43	191.60	5,614.7	-385.1	-79.1	387.0	11.00	11.00	
5,700.0	43.93	191.60	5,652.3	-417.4	-85.7	419.4	11.00	11.00	
5,750.0	49.43	191.60	5,686.6	-453.0	-93.0	455.2	11.00	11.00	
5,800.0	54.93	191.60	5,717.2	-491.7	-100.9	494.1	11.00	11.00	
5,850.0	60.43	191.60	5,743.9	-533.0	-109.4	535.7	11.00	11.00	
5,875.6	63.24	191.60	5,756.0	-555.1	-113.9	557.8	11.00	11.00	Top Niobrara
5,900.0	65.93	191.60	5,766.5	-576.7	-118.4	579.6	11.00	11.00	
5,950.0	71.43	191.60	5,784.7	-622.3	-127.7	625.4	11.00	11.00	
6,000.0	76.93	191.60	5,798.3	-669.5	-137.4	672.7	11.00	11.00	
6,050.0	82.43	191.60	5,807.3	-717.6	-147.3	721.1	11.00	11.00	
6,100.0	87.93	191.60	5,811.5	-766.4	-157.3	770.2	11.00	11.00	
6,118.8	90.00	191.60	5,811.8	-784.8	-161.1	788.7	11.00	11.00	LP @ 6,118' MD
6,200.0	90.00	189.16	5,811.8	-864.7	-175.7	868.9	3.00	0.00	7" (2,362' FEL-1,820' FSL)
6,300.0	90.00	186.16	5,811.8	-963.8	-189.1	968.3	3.00	0.00	
6,400.0	90.00	183.16	5,811.8	-1,063.4	-197.2	1,068.1	3.00	0.00	
6,505.4	90.00	180.00	5,811.8	-1,168.7	-200.1	1,173.4	3.00	0.00	EOT; 180 Deg Azi
6,600.0	90.00	180.00	5,811.8	-1,263.4	-200.1	1,268.1	0.00	0.00	
6,700.0	90.00	180.00	5,811.8	-1,363.4	-200.1	1,368.0	0.00	0.00	
6,800.0	90.00	180.00	5,811.8	-1,463.4	-200.1	1,468.0	0.00	0.00	
6,900.0	90.00	180.00	5,811.8	-1,563.4	-200.1	1,568.0	0.00	0.00	
7,000.0	90.00	180.00	5,811.8	-1,663.4	-200.2	1,667.9	0.00	0.00	
7,100.0	90.00	180.00	5,811.8	-1,763.4	-200.2	1,767.9	0.00	0.00	
7,200.0	90.00	180.00	5,811.8	-1,863.4	-200.2	1,867.9	0.00	0.00	
7,300.0	90.00	180.00	5,811.8	-1,963.4	-200.2	1,967.8	0.00	0.00	
7,400.0	90.00	180.00	5,811.8	-2,063.4	-200.2	2,067.8	0.00	0.00	
7,500.0	90.00	180.00	5,811.8	-2,163.4	-200.2	2,167.8	0.00	0.00	
7,600.0	90.00	180.00	5,811.8	-2,263.4	-200.2	2,267.7	0.00	0.00	
7,700.0	90.00	180.00	5,811.8	-2,363.4	-200.2	2,367.7	0.00	0.00	
7,800.0	90.00	180.00	5,811.8	-2,463.4	-200.2	2,467.7	0.00	0.00	
7,900.0	90.00	180.00	5,811.8	-2,563.4	-200.2	2,567.6	0.00	0.00	
8,000.0	90.00	180.00	5,811.8	-2,663.4	-200.2	2,667.6	0.00	0.00	
8,100.0	90.00	180.00	5,811.9	-2,763.4	-200.2	2,767.6	0.00	0.00	
8,200.0	90.00	180.00	5,811.9	-2,863.4	-200.2	2,867.5	0.00	0.00	
8,300.0	90.00	180.00	5,811.9	-2,963.4	-200.3	2,967.5	0.00	0.00	
8,400.0	90.00	180.00	5,811.9	-3,063.4	-200.3	3,067.5	0.00	0.00	
8,500.0	90.00	180.00	5,811.9	-3,163.4	-200.3	3,167.5	0.00	0.00	
8,600.0	90.00	180.00	5,811.9	-3,263.4	-200.3	3,267.4	0.00	0.00	
8,700.0	90.00	180.00	5,811.9	-3,363.4	-200.3	3,367.4	0.00	0.00	
8,800.0	90.00	180.00	5,811.9	-3,463.4	-200.3	3,467.4	0.00	0.00	
8,900.0	90.00	180.00	5,811.9	-3,563.4	-200.3	3,567.3	0.00	0.00	
9,000.0	90.00	180.00	5,811.9	-3,663.4	-200.3	3,667.3	0.00	0.00	
9,100.0	90.00	180.00	5,811.9	-3,763.4	-200.3	3,767.3	0.00	0.00	
9,200.0	90.00	180.00	5,811.9	-3,863.4	-200.3	3,867.2	0.00	0.00	

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Site:	S12-T10N-R58W	**North Reference:**	True
Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
9,300.0	90.00	180.00	5,811.9	-3,963.4	-200.3	3,967.2	0.00	0.00	
9,400.0	90.00	180.00	5,811.9	-4,063.4	-200.3	4,067.2	0.00	0.00	
9,500.0	90.00	180.00	5,811.9	-4,163.4	-200.3	4,167.1	0.00	0.00	
9,600.0	90.00	180.00	5,811.9	-4,263.4	-200.4	4,267.1	0.00	0.00	
9,700.0	90.00	180.00	5,811.9	-4,363.4	-200.4	4,367.1	0.00	0.00	
9,800.0	90.00	180.00	5,811.9	-4,463.4	-200.4	4,467.0	0.00	0.00	
9,900.0	90.00	180.00	5,811.9	-4,563.4	-200.4	4,567.0	0.00	0.00	
10,000.0	90.00	180.00	5,811.9	-4,663.4	-200.4	4,667.0	0.00	0.00	
10,100.0	90.00	180.00	5,811.9	-4,763.4	-200.4	4,766.9	0.00	0.00	
10,200.0	90.00	180.00	5,811.9	-4,863.4	-200.4	4,866.9	0.00	0.00	
10,300.0	90.00	180.00	5,811.9	-4,963.4	-200.4	4,966.9	0.00	0.00	
10,400.0	90.00	180.00	5,811.9	-5,063.4	-200.4	5,066.8	0.00	0.00	
10,500.0	90.00	180.00	5,811.9	-5,163.4	-200.4	5,166.8	0.00	0.00	
10,600.0	90.00	180.00	5,811.9	-5,263.4	-200.4	5,266.8	0.00	0.00	
10,700.0	90.00	180.00	5,811.9	-5,363.4	-200.4	5,366.7	0.00	0.00	
10,800.0	90.00	180.00	5,811.9	-5,463.4	-200.4	5,466.7	0.00	0.00	
10,900.0	90.00	180.00	5,811.9	-5,563.4	-200.5	5,566.7	0.00	0.00	
11,000.0	90.00	180.00	5,811.9	-5,663.4	-200.5	5,666.6	0.00	0.00	
11,100.0	90.00	180.00	5,811.9	-5,763.4	-200.5	5,766.6	0.00	0.00	
11,200.0	90.00	180.00	5,811.9	-5,863.4	-200.5	5,866.6	0.00	0.00	
11,300.0	90.00	180.00	5,812.0	-5,963.4	-200.5	5,966.6	0.00	0.00	
11,400.0	90.00	180.00	5,812.0	-6,063.4	-200.5	6,066.5	0.00	0.00	
11,500.0	90.00	180.00	5,812.0	-6,163.4	-200.5	6,166.5	0.00	0.00	
11,600.0	90.00	180.00	5,812.0	-6,263.4	-200.5	6,266.5	0.00	0.00	
11,700.0	90.00	180.00	5,812.0	-6,363.4	-200.5	6,366.4	0.00	0.00	
11,800.0	90.00	180.00	5,812.0	-6,463.4	-200.5	6,466.4	0.00	0.00	
11,900.0	90.00	180.00	5,812.0	-6,563.4	-200.5	6,566.4	0.00	0.00	
12,000.0	90.00	180.00	5,812.0	-6,663.4	-200.5	6,666.3	0.00	0.00	
12,100.0	90.00	180.00	5,812.0	-6,763.4	-200.5	6,766.3	0.00	0.00	
12,200.0	90.00	180.00	5,812.0	-6,863.4	-200.6	6,866.3	0.00	0.00	
12,300.0	90.00	180.00	5,812.0	-6,963.4	-200.6	6,966.2	0.00	0.00	
12,400.0	90.00	180.00	5,812.0	-7,063.4	-200.6	7,066.2	0.00	0.00	
12,500.0	90.00	180.00	5,812.0	-7,163.4	-200.6	7,166.2	0.00	0.00	
12,600.0	90.00	180.00	5,812.0	-7,263.4	-200.6	7,266.1	0.00	0.00	
12,700.0	90.00	180.00	5,812.0	-7,363.4	-200.6	7,366.1	0.00	0.00	
12,800.0	90.00	180.00	5,812.0	-7,463.4	-200.6	7,466.1	0.00	0.00	
12,900.0	90.00	180.00	5,812.0	-7,563.4	-200.6	7,566.0	0.00	0.00	
13,000.0	90.00	180.00	5,812.0	-7,663.4	-200.6	7,666.0	0.00	0.00	
13,100.0	90.00	180.00	5,812.0	-7,763.4	-200.6	7,766.0	0.00	0.00	
13,200.0	90.00	180.00	5,812.0	-7,863.4	-200.6	7,865.9	0.00	0.00	
13,221.6	90.00	180.00	5,812.0	-7,885.0	-200.6	7,887.5	0.00	0.00	PBHL @ 13,221' MD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Razor #12G-1309A PBH - plan hits target center - Point	0.00	0.00	5,812.0	-7,885.0	-200.6	1,550,337.86	3,466,943.25	40.831853	-103.812600

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Company:	Whiting Petroleum Corporation	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Project:	Weld County, CO	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site:	S12-T10N-R58W	**North Reference:**	True
Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
6,200.0	5,811.8	7" (2,362' FEL-1,820' FSL)	7.000	7.500

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,875.6	5,756.0	Top Niobrara		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,200.0	1,200.0	0.0	0.0	KOP @ 1200' MD
1,400.0	1,399.8	-6.8	-1.4	EOB; 4 Deg Inc
5,337.0	5,327.3	-275.9	-56.6	Start 11 Deg Bulid
6,118.8	5,811.8	-784.8	-161.1	LP @ 6,118' MD
6,505.4	5,811.8	-1,168.7	-200.1	EOT; 180 Deg Azi
13,221.6	5,812.0	-7,885.0	-200.6	PBHL @ 13,221' MD

Whiting Petroleum Corporation

Weld County, CO
S12-T10N-R58W
Razor Federal #12G-1309A
HZ
Plan #1

Anticollision Report

18 October, 2013

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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

Reference Plan #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	Systematic Ellipse
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 10/15/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,221.6	Plan #1 (HZ)	ISCWSA MWD	MWD - ISCWSA

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
S12-T10N-R58W						
Razor #12G-0109A - HZ - Plan #1	900.0	900.0	74.9	71.1	19.835	CC, ES
Razor #12G-0109A - HZ - Plan #1	1,200.0	1,194.5	88.0	82.9	17.188	SF
Razor #12G-0110B - HZ - Plan #1	1,000.0	1,000.0	81.9	77.6	19.370	CC, ES
Razor #12G-0110B - HZ - Plan #1	1,200.0	1,194.8	87.9	82.8	17.174	SF
Razor #12G-0111A - HZ - Plan #1	1,100.0	1,100.0	99.9	95.2	21.361	CC, ES
Razor #12G-0111A - HZ - Plan #1	1,300.0	1,293.6	107.4	101.9	19.409	SF
Razor #12G-0112B - HZ - Plan #1	1,200.0	1,200.0	124.2	119.1	24.240	CC, ES
Razor #12G-0112B - HZ - Plan #1	1,400.0	1,391.7	135.6	129.7	22.898	SF
Razor Federal #12G-1310B - HZ - Plan #1	1,100.0	1,100.0	33.0	28.4	7.057	CC
Razor Federal #12G-1310B - HZ - Plan #1	1,200.0	1,199.8	33.3	28.2	6.521	ES
Razor Federal #12G-1310B - HZ - Plan #1	13,221.6	13,293.1	344.3	52.4	1.180	Level 2, SF
Razor Federal #12G-1311A - HZ - Plan #1	1,000.0	1,000.0	66.1	61.9	15.613	CC, ES
Razor Federal #12G-1311A - HZ - Plan #1	13,221.6	13,250.2	660.3	357.1	2.177	SF
Razor Federal #12G-1312B - HZ - Plan #1	900.0	900.0	99.1	95.4	26.251	CC, ES
Razor Federal #12G-1312B - HZ - Plan #1	13,221.6	13,435.8	995.0	692.7	3.291	SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0109A - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.59	74.9	0.8	74.9				
100.0	100.0	100.0	100.0	0.1	0.1	0.59	74.9	0.8	74.9	74.7	0.18	416.056	
200.0	200.0	200.0	200.0	0.3	0.3	0.59	74.9	0.8	74.9	74.3	0.63	118.974	
300.0	300.0	300.0	300.0	0.5	0.5	0.59	74.9	0.8	74.9	73.8	1.08	69.411	
400.0	400.0	400.0	400.0	0.8	0.8	0.59	74.9	0.8	74.9	73.4	1.53	48.999	
500.0	500.0	500.0	500.0	1.0	1.0	0.59	74.9	0.8	74.9	72.9	1.98	37.864	
600.0	600.0	600.0	600.0	1.2	1.2	0.59	74.9	0.8	74.9	72.5	2.43	30.853	
700.0	700.0	700.0	700.0	1.4	1.4	0.59	74.9	0.8	74.9	72.0	2.88	26.032	
800.0	800.0	800.0	800.0	1.7	1.7	0.59	74.9	0.8	74.9	71.6	3.33	22.515	
900.0	900.0	900.0	900.0	1.9	1.9	0.59	74.9	0.8	74.9	71.1	3.78	19.835	CC, ES
1,000.0	1,000.0	997.6	997.5	2.1	2.1	0.18	76.5	0.2	76.5	72.3	4.22	18.127	
1,100.0	1,100.0	1,094.9	1,094.7	2.3	2.3	-0.96	81.2	-1.4	81.4	76.7	4.67	17.427	
1,200.0	1,200.0	1,194.5	1,194.1	2.6	2.6	-2.35	87.7	-3.6	88.0	82.9	5.12	17.188	SF
1,300.0	1,300.0	1,294.1	1,293.5	2.8	2.8	165.09	94.3	-5.8	96.4	90.9	5.54	17.399	
1,400.0	1,399.8	1,393.4	1,392.6	2.9	3.0	164.76	100.9	-8.1	108.2	102.2	5.94	18.222	
1,500.0	1,499.6	1,492.5	1,491.4	3.1	3.3	164.76	107.4	-10.3	121.6	115.3	6.34	19.177	
1,600.0	1,599.4	1,591.6	1,590.3	3.3	3.5	164.76	114.0	-12.5	135.0	128.3	6.75	19.996	
1,700.0	1,699.1	1,690.7	1,689.1	3.5	3.7	164.77	120.5	-14.7	148.5	141.3	7.17	20.704	
1,800.0	1,798.9	1,789.8	1,788.0	3.7	4.0	164.77	127.1	-17.0	161.9	154.3	7.59	21.320	
1,900.0	1,898.6	1,888.9	1,886.8	4.0	4.2	164.77	133.6	-19.2	175.3	167.3	8.02	21.859	
2,000.0	1,998.4	1,988.0	1,985.7	4.2	4.5	164.77	140.2	-21.4	188.8	180.3	8.45	22.334	
2,100.0	2,098.1	2,087.1	2,084.5	4.4	4.7	164.77	146.7	-23.6	202.2	193.3	8.89	22.756	
2,200.0	2,197.9	2,186.2	2,183.4	4.6	5.0	164.77	153.2	-25.8	215.6	206.3	9.32	23.131	
2,300.0	2,297.6	2,285.3	2,282.2	4.9	5.2	164.77	159.8	-28.1	229.1	219.3	9.76	23.467	
2,400.0	2,397.4	2,384.4	2,381.1	5.1	5.5	164.77	166.3	-30.3	242.5	232.3	10.20	23.770	
2,500.0	2,497.2	2,483.5	2,479.9	5.4	5.7	164.77	172.9	-32.5	255.9	245.3	10.65	24.044	
2,600.0	2,596.9	2,582.6	2,578.8	5.6	6.0	164.77	179.4	-34.7	269.4	258.3	11.09	24.292	
2,700.0	2,696.7	2,681.6	2,677.6	5.8	6.2	164.77	186.0	-37.0	282.8	271.3	11.53	24.518	
2,800.0	2,796.4	2,780.7	2,776.5	6.1	6.5	164.77	192.5	-39.2	296.2	284.3	11.98	24.725	
2,900.0	2,896.2	2,879.8	2,875.3	6.3	6.7	164.78	199.1	-41.4	309.7	297.3	12.43	24.915	
3,000.0	2,995.9	2,978.9	2,974.2	6.6	7.0	164.78	205.6	-43.6	323.1	310.2	12.88	25.090	
3,100.0	3,095.7	3,078.0	3,073.0	6.8	7.2	164.78	212.2	-45.9	336.5	323.2	13.33	25.251	
3,200.0	3,195.5	3,177.1	3,171.9	7.1	7.5	164.78	218.7	-48.1	350.0	336.2	13.78	25.401	
3,300.0	3,295.2	3,276.2	3,270.7	7.3	7.7	164.78	225.2	-50.3	363.4	349.2	14.23	25.540	
3,400.0	3,395.0	3,375.3	3,369.6	7.6	8.0	164.78	231.8	-52.5	376.9	362.2	14.68	25.669	
3,500.0	3,494.7	3,474.4	3,468.5	7.9	8.2	164.78	238.3	-54.7	390.3	375.2	15.13	25.789	
3,600.0	3,594.5	3,573.5	3,567.3	8.1	8.5	164.78	244.9	-57.0	403.7	388.1	15.59	25.902	
3,700.0	3,694.2	3,672.6	3,666.2	8.4	8.7	164.78	251.4	-59.2	417.2	401.1	16.04	26.007	
3,800.0	3,794.0	3,771.7	3,765.0	8.6	9.0	164.78	258.0	-61.4	430.6	414.1	16.49	26.106	
3,900.0	3,893.7	3,870.8	3,863.9	8.9	9.2	164.78	264.5	-63.6	444.0	427.1	16.95	26.199	
4,000.0	3,993.5	3,969.9	3,962.7	9.1	9.5	164.78	271.1	-65.9	457.5	440.1	17.40	26.286	
4,100.0	4,093.3	4,069.0	4,061.6	9.4	9.8	164.78	277.6	-68.1	470.9	453.0	17.86	26.369	
4,200.0	4,193.0	4,168.1	4,160.4	9.7	10.0	164.78	284.2	-70.3	484.3	466.0	18.31	26.447	
4,300.0	4,292.8	4,267.1	4,259.3	9.9	10.3	164.78	290.7	-72.5	497.8	479.0	18.77	26.521	
4,400.0	4,392.5	4,366.2	4,358.1	10.2	10.5	164.78	297.2	-74.8	511.2	492.0	19.22	26.590	
4,500.0	4,492.3	4,465.3	4,457.0	10.4	10.8	164.78	303.8	-77.0	524.6	504.9	19.68	26.657	
4,600.0	4,592.0	4,564.4	4,555.8	10.7	11.0	164.78	310.3	-79.2	538.1	517.9	20.14	26.720	
4,700.0	4,691.8	4,663.5	4,654.7	10.9	11.3	164.78	316.9	-81.4	551.5	530.9	20.59	26.780	
4,800.0	4,791.6	4,762.6	4,753.5	11.2	11.5	164.78	323.4	-83.6	564.9	543.9	21.05	26.837	
4,900.0	4,891.3	4,861.7	4,852.4	11.5	11.8	164.78	330.0	-85.9	578.4	556.9	21.51	26.891	
5,000.0	4,991.1	4,960.8	4,951.2	11.7	12.0	164.78	336.5	-88.1	591.8	569.8	21.96	26.943	
5,100.0	5,090.8	5,059.9	5,050.1	12.0	12.3	164.78	343.1	-90.3	605.2	582.8	22.42	26.993	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0109A - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,159.0	5,148.9	12.2	12.5	164.78	349.6	-92.5	618.7	595.8	22.88	27.040	
5,300.0	5,290.3	5,258.1	5,247.8	12.5	12.8	164.78	356.1	-94.8	632.1	608.8	23.34	27.085	
5,337.0	5,327.3	5,294.8	5,284.4	12.6	12.9	164.78	358.6	-95.6	637.1	613.6	23.51	27.102	
5,350.0	5,340.2	5,307.6	5,297.2	12.6	12.9	164.73	359.4	-95.9	639.0	615.4	23.52	27.163	
5,400.0	5,389.7	5,346.4	5,335.9	12.8	13.0	164.48	362.0	-96.8	649.3	625.8	23.45	27.685	
5,450.0	5,438.2	5,367.7	5,357.1	13.0	13.1	164.03	364.2	-97.5	665.6	642.5	23.17	28.728	
5,500.0	5,485.4	5,400.0	5,389.0	13.2	13.2	163.43	369.0	-99.1	688.2	665.5	22.75	30.254	
5,550.0	5,530.9	5,400.0	5,389.0	13.5	13.2	162.36	369.0	-99.1	715.9	693.7	22.11	32.373	
5,600.0	5,574.1	5,421.6	5,410.0	13.9	13.3	161.08	373.2	-100.6	748.5	727.1	21.42	34.942	
5,650.0	5,614.7	5,450.0	5,437.5	14.2	13.4	159.48	380.1	-102.9	785.8	765.1	20.69	37.981	
5,700.0	5,652.3	5,450.0	5,437.5	14.6	13.4	156.68	380.1	-102.9	826.1	806.0	20.01	41.276	
5,750.0	5,686.6	5,450.0	5,437.5	15.1	13.4	152.49	380.1	-102.9	869.6	849.9	19.70	44.131	
5,800.0	5,717.2	5,450.0	5,437.5	15.6	13.4	145.88	380.1	-102.9	915.5	895.3	20.28	45.140	
5,850.0	5,743.9	5,468.8	5,455.5	16.2	13.5	137.07	385.4	-104.7	962.7	940.6	22.09	43.585	
5,900.0	5,766.5	5,472.0	5,458.5	16.8	13.5	120.11	386.4	-105.0	1,011.2	984.9	26.36	38.357	
5,950.0	5,784.7	5,473.5	5,459.9	17.5	13.5	92.68	386.8	-105.2	1,060.4	1,029.8	30.56	34.699	
6,000.0	5,798.3	5,473.3	5,459.8	18.1	13.5	62.45	386.8	-105.2	1,109.6	1,081.3	28.35	39.141	
6,050.0	5,807.3	5,471.6	5,458.2	18.9	13.5	41.72	386.3	-105.0	1,158.5	1,136.0	22.55	51.365	
6,100.0	5,811.5	5,468.5	5,455.2	19.6	13.5	29.76	385.3	-104.7	1,206.7	1,188.8	17.93	67.297	
6,118.8	5,811.8	5,450.0	5,437.5	19.9	13.4	25.34	380.1	-102.9	1,225.0	1,208.9	16.05	76.327	
6,200.0	5,811.8	5,450.0	5,437.5	21.0	13.4	18.66	380.1	-102.9	1,301.9	1,288.1	13.74	94.779	
6,300.0	5,811.8	5,450.0	5,437.5	22.3	13.4	8.91	380.1	-102.9	1,397.7	1,387.1	10.60	131.801	
6,400.0	5,811.8	5,450.0	5,437.5	23.8	13.4	-2.21	380.1	-102.9	1,494.2	1,484.6	9.62	155.386	
6,505.4	5,811.8	5,450.0	5,437.5	25.3	13.4	-14.55	380.1	-102.9	1,596.4	1,582.9	13.50	118.265	
6,600.0	5,811.8	5,450.0	5,437.5	26.8	13.4	-14.55	380.1	-102.9	1,688.4	1,674.2	14.20	118.915	
6,700.0	5,811.8	5,427.1	5,415.4	28.5	13.3	-14.03	374.5	-101.0	1,785.2	1,770.5	14.73	121.208	
6,800.0	5,811.8	5,421.9	5,410.4	30.2	13.3	-13.91	373.3	-100.6	1,882.7	1,867.2	15.45	121.872	
6,900.0	5,811.8	5,400.0	5,389.0	31.9	13.2	-13.42	369.0	-99.1	1,980.7	1,964.7	16.00	123.772	
7,000.0	5,811.8	5,400.0	5,389.0	33.6	13.2	-13.42	369.0	-99.1	2,078.4	2,061.6	16.79	123.805	
7,100.0	5,811.8	5,400.0	5,389.0	35.4	13.2	-13.42	369.0	-99.1	2,176.2	2,158.7	17.58	123.798	
7,200.0	5,811.8	5,400.0	5,389.0	37.2	13.2	-13.42	369.0	-99.1	2,274.3	2,255.9	18.38	123.761	
7,300.0	5,811.8	5,400.0	5,389.0	39.0	13.2	-13.42	369.0	-99.1	2,372.6	2,353.4	19.18	123.704	
7,400.0	5,811.8	5,400.0	5,389.0	40.8	13.2	-13.42	369.0	-99.1	2,470.9	2,450.9	19.99	123.633	
7,500.0	5,811.8	5,400.0	5,389.0	42.6	13.2	-13.42	369.0	-99.1	2,569.4	2,548.6	20.80	123.553	
7,600.0	5,811.8	5,400.0	5,389.0	44.4	13.2	-13.42	369.0	-99.1	2,668.0	2,646.4	21.61	123.466	
7,700.0	5,811.8	5,400.0	5,389.0	46.3	13.2	-13.42	369.0	-99.1	2,766.8	2,744.3	22.43	123.376	
7,800.0	5,811.8	5,400.0	5,389.0	48.1	13.2	-13.42	369.0	-99.1	2,865.6	2,842.3	23.24	123.283	
7,900.0	5,811.8	5,400.0	5,389.0	49.9	13.2	-13.42	369.0	-99.1	2,964.4	2,940.4	24.06	123.190	
8,000.0	5,811.8	5,400.0	5,389.0	51.8	13.2	-13.42	369.0	-99.1	3,063.4	3,038.5	24.89	123.097	
8,100.0	5,811.9	5,400.0	5,389.0	53.7	13.2	-13.42	369.0	-99.1	3,162.4	3,136.7	25.71	123.005	
8,200.0	5,811.9	5,377.7	5,367.0	55.5	13.1	-12.93	365.5	-97.9	3,261.0	3,234.7	26.23	124.344	
8,300.0	5,811.9	5,375.8	5,365.1	57.4	13.1	-12.88	365.2	-97.8	3,360.0	3,333.0	27.02	124.364	
8,400.0	5,811.9	5,373.9	5,363.2	59.2	13.1	-12.84	365.0	-97.8	3,459.1	3,431.3	27.81	124.378	
8,500.0	5,811.9	5,372.1	5,361.5	61.1	13.1	-12.80	364.7	-97.7	3,558.2	3,529.6	28.61	124.388	
8,600.0	5,811.9	5,350.0	5,339.5	63.0	13.0	-12.32	362.4	-96.9	3,657.8	3,628.7	29.11	125.663	
8,700.0	5,811.9	5,350.0	5,339.5	64.9	13.0	-12.32	362.4	-96.9	3,757.0	3,727.1	29.92	125.555	
8,800.0	5,811.9	5,350.0	5,339.5	66.7	13.0	-12.32	362.4	-96.9	3,856.2	3,825.4	30.74	125.451	
8,900.0	5,811.9	5,350.0	5,339.5	68.6	13.0	-12.32	362.4	-96.9	3,955.4	3,923.9	31.55	125.351	
9,000.0	5,811.9	5,350.0	5,339.5	70.5	13.0	-12.32	362.4	-96.9	4,054.7	4,022.3	32.37	125.255	
9,100.0	5,811.9	5,350.0	5,339.5	72.4	13.0	-12.32	362.4	-96.9	4,154.0	4,120.8	33.19	125.162	
9,200.0	5,811.9	5,350.0	5,339.5	74.3	13.0	-12.32	362.4	-96.9	4,253.3	4,219.3	34.01	125.074	
9,300.0	5,811.9	5,350.0	5,339.5	76.2	13.0	-12.32	362.4	-96.9	4,352.7	4,317.9	34.82	124.989	

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0109A - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	5,350.0	5,339.5	78.1	13.0	-12.32	362.4	-96.9	4,452.1	4,416.4	35.64	124.907	
9,500.0	5,811.9	5,350.0	5,339.5	80.0	13.0	-12.32	362.4	-96.9	4,551.5	4,515.0	36.46	124.828	
9,600.0	5,811.9	5,350.0	5,339.5	81.9	13.0	-12.32	362.4	-96.9	4,650.9	4,613.7	37.28	124.752	
9,700.0	5,811.9	5,350.0	5,339.5	83.7	13.0	-12.32	362.4	-96.9	4,750.4	4,712.3	38.10	124.679	
9,800.0	5,811.9	5,350.0	5,339.5	85.6	13.0	-12.32	362.4	-96.9	4,849.9	4,811.0	38.92	124.608	
9,900.0	5,811.9	5,350.0	5,339.5	87.5	13.0	-12.32	362.4	-96.9	4,949.4	4,909.7	39.74	124.540	
10,000.0	5,811.9	5,350.0	5,339.5	89.4	13.0	-12.32	362.4	-96.9	5,048.9	5,008.4	40.56	124.475	
10,100.0	5,811.9	5,350.0	5,339.5	91.3	13.0	-12.32	362.4	-96.9	5,148.5	5,107.1	41.38	124.411	
10,200.0	5,811.9	5,350.0	5,339.5	93.2	13.0	-12.32	362.4	-96.9	5,248.1	5,205.9	42.20	124.350	
10,300.0	5,811.9	5,350.0	5,339.5	95.1	13.0	-12.32	362.4	-96.9	5,347.6	5,304.6	43.03	124.291	
10,400.0	5,811.9	5,350.0	5,339.5	97.0	13.0	-12.32	362.4	-96.9	5,447.2	5,403.4	43.85	124.234	
10,500.0	5,811.9	5,350.0	5,339.5	98.9	13.0	-12.32	362.4	-96.9	5,546.9	5,502.2	44.67	124.179	
10,600.0	5,811.9	5,350.0	5,339.5	100.9	13.0	-12.32	362.4	-96.9	5,646.5	5,601.0	45.49	124.126	
10,700.0	5,811.9	5,350.0	5,339.5	102.8	13.0	-12.32	362.4	-96.9	5,746.1	5,699.8	46.31	124.075	
10,800.0	5,811.9	5,350.0	5,339.5	104.7	13.0	-12.32	362.4	-96.9	5,845.8	5,798.6	47.13	124.025	
10,900.0	5,811.9	5,350.0	5,339.5	106.6	13.0	-12.32	362.4	-96.9	5,945.4	5,897.5	47.96	123.976	
11,000.0	5,811.9	5,350.0	5,339.5	108.5	13.0	-12.32	362.4	-96.9	6,045.1	5,996.3	48.78	123.929	
11,100.0	5,811.9	5,350.0	5,339.5	110.4	13.0	-12.32	362.4	-96.9	6,144.8	6,095.2	49.60	123.884	
11,200.0	5,811.9	5,344.1	5,333.6	112.3	13.0	-12.19	361.9	-96.7	6,244.5	6,194.2	50.30	124.156	
11,300.0	5,812.0	5,338.0	5,327.5	114.2	13.0	-12.06	361.4	-96.6	6,344.2	6,293.2	50.98	124.433	
11,400.0	5,812.0	5,338.0	5,327.5	116.1	13.0	-12.06	361.4	-96.6	6,443.9	6,392.1	51.80	124.389	
11,500.0	5,812.0	5,338.0	5,327.5	118.0	13.0	-12.06	361.4	-96.6	6,543.6	6,491.0	52.62	124.347	
11,600.0	5,812.0	5,338.0	5,327.5	119.9	13.0	-12.06	361.4	-96.6	6,643.3	6,589.9	53.44	124.306	
11,700.0	5,812.0	5,338.0	5,327.5	121.8	13.0	-12.06	361.4	-96.6	6,743.0	6,688.8	54.26	124.266	
11,800.0	5,812.0	5,338.0	5,327.5	123.7	13.0	-12.06	361.4	-96.6	6,842.8	6,787.7	55.08	124.227	
11,900.0	5,812.0	5,338.0	5,327.5	125.6	13.0	-12.06	361.4	-96.6	6,942.5	6,886.6	55.90	124.190	
12,000.0	5,812.0	5,338.0	5,327.5	127.6	13.0	-12.06	361.4	-96.6	7,042.3	6,985.5	56.72	124.153	
12,100.0	5,812.0	5,338.0	5,327.5	129.5	13.0	-12.06	361.4	-96.6	7,142.0	7,084.5	57.54	124.117	
12,200.0	5,812.0	5,338.0	5,327.5	131.4	13.0	-12.06	361.4	-96.6	7,241.8	7,183.4	58.36	124.083	
12,300.0	5,812.0	5,338.0	5,327.5	133.3	13.0	-12.06	361.4	-96.6	7,341.6	7,282.4	59.18	124.049	
12,400.0	5,812.0	5,333.2	5,322.7	135.2	13.0	-11.96	361.1	-96.4	7,441.3	7,381.4	59.89	124.259	
12,500.0	5,812.0	5,326.6	5,316.2	137.1	13.0	-11.82	360.7	-96.3	7,541.1	7,480.6	60.55	124.553	
12,600.0	5,812.0	5,320.0	5,309.6	139.0	13.0	-11.68	360.2	-96.1	7,640.9	7,579.7	61.21	124.837	
12,700.0	5,812.0	5,313.4	5,303.0	140.9	12.9	-11.55	359.8	-96.0	7,740.6	7,678.8	61.87	125.112	
12,800.0	5,812.0	5,306.8	5,296.4	142.9	12.9	-11.42	359.4	-95.9	7,840.4	7,777.9	62.53	125.377	
12,900.0	5,812.0	5,300.2	5,289.8	144.8	12.9	-11.30	358.9	-95.7	7,940.2	7,877.0	63.20	125.634	
13,000.0	5,812.0	5,293.6	5,283.2	146.7	12.9	-11.18	358.5	-95.6	8,040.0	7,976.1	63.87	125.883	
13,100.0	5,812.0	5,287.0	5,276.6	148.6	12.9	-11.06	358.1	-95.4	8,139.7	8,075.2	64.54	126.124	
13,200.0	5,812.0	5,280.4	5,270.1	150.5	12.9	-10.94	357.6	-95.3	8,239.5	8,174.3	65.21	126.357	
13,221.6	5,812.0	5,279.0	5,268.6	150.9	12.8	-10.92	357.5	-95.2	8,261.1	8,195.7	65.35	126.406	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0110B - HZ - Plan #1 — **Offset Site Error:** 0.0 ft

Survey Program: 0-ISCWSA MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	23.81	74.9	33.0	81.9				
100.0	100.0	100.0	100.0	0.1	0.1	23.81	74.9	33.0	81.9	81.7	0.18	454.685	
200.0	200.0	200.0	200.0	0.3	0.3	23.81	74.9	33.0	81.9	81.2	0.63	130.020	
300.0	300.0	300.0	300.0	0.5	0.5	23.81	74.9	33.0	81.9	80.8	1.08	75.856	
400.0	400.0	400.0	400.0	0.8	0.8	23.81	74.9	33.0	81.9	80.3	1.53	53.548	
500.0	500.0	500.0	500.0	1.0	1.0	23.81	74.9	33.0	81.9	79.9	1.98	41.380	
600.0	600.0	600.0	600.0	1.2	1.2	23.81	74.9	33.0	81.9	79.4	2.43	33.717	
700.0	700.0	700.0	700.0	1.4	1.4	23.81	74.9	33.0	81.9	79.0	2.88	28.449	
800.0	800.0	800.0	800.0	1.7	1.7	23.81	74.9	33.0	81.9	78.5	3.33	24.605	
900.0	900.0	900.0	900.0	1.9	1.9	23.81	74.9	33.0	81.9	78.1	3.78	21.676	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	23.81	74.9	33.0	81.9	77.6	4.23	19.370	CC, ES
1,100.0	1,100.0	1,097.5	1,097.5	2.3	2.3	23.27	76.5	32.9	83.4	78.7	4.67	17.847	
1,200.0	1,200.0	1,194.8	1,194.6	2.6	2.6	21.77	81.5	32.5	87.9	82.8	5.12	17.174	SF
1,300.0	1,300.0	1,294.3	1,293.9	2.8	2.8	-171.83	88.4	32.0	95.9	90.4	5.54	17.314	
1,400.0	1,399.8	1,393.5	1,392.9	2.9	3.0	-173.72	95.3	31.5	107.5	101.6	5.94	18.113	
1,500.0	1,499.6	1,492.6	1,491.7	3.1	3.2	-175.33	102.2	30.9	120.9	114.6	6.34	19.074	
1,600.0	1,599.4	1,591.6	1,590.5	3.3	3.5	-176.62	109.1	30.4	134.4	127.7	6.75	19.911	
1,700.0	1,699.1	1,690.7	1,689.3	3.5	3.7	-177.67	116.0	29.9	148.0	140.8	7.17	20.643	
1,800.0	1,798.9	1,789.7	1,788.1	3.7	4.0	-178.55	122.9	29.4	161.5	154.0	7.59	21.288	
1,900.0	1,898.6	1,888.8	1,886.9	4.0	4.2	-179.29	129.8	28.8	175.2	167.1	8.01	21.858	
2,000.0	1,998.4	1,987.8	1,985.7	4.2	4.4	-179.93	136.6	28.3	188.8	180.4	8.44	22.365	
2,100.0	2,098.1	2,086.8	2,084.5	4.4	4.7	179.52	143.5	27.8	202.5	193.6	8.87	22.818	
2,200.0	2,197.9	2,185.9	2,183.3	4.6	4.9	179.04	150.4	27.2	216.1	206.8	9.31	23.224	
2,300.0	2,297.6	2,284.9	2,282.1	4.9	5.2	178.62	157.3	26.7	229.8	220.1	9.74	23.590	
2,400.0	2,397.4	2,384.0	2,380.9	5.1	5.4	178.25	164.2	26.2	243.5	233.3	10.18	23.921	
2,500.0	2,497.2	2,483.0	2,479.7	5.4	5.7	177.91	171.1	25.6	257.2	246.6	10.62	24.222	
2,600.0	2,596.9	2,582.1	2,578.5	5.6	5.9	177.61	178.0	25.1	270.9	259.9	11.06	24.497	
2,700.0	2,696.7	2,681.1	2,677.3	5.8	6.2	177.34	184.9	24.6	284.6	273.1	11.50	24.748	
2,800.0	2,796.4	2,780.2	2,776.2	6.1	6.4	177.09	191.7	24.1	298.4	286.4	11.95	24.979	
2,900.0	2,896.2	2,879.2	2,875.0	6.3	6.7	176.87	198.6	23.5	312.1	299.7	12.39	25.191	
3,000.0	2,995.9	2,978.3	2,973.8	6.6	6.9	176.66	205.5	23.0	325.8	313.0	12.83	25.387	
3,100.0	3,095.7	3,077.3	3,072.6	6.8	7.2	176.47	212.4	22.5	339.6	326.3	13.28	25.569	
3,200.0	3,195.5	3,176.3	3,171.4	7.1	7.4	176.30	219.3	21.9	353.3	339.6	13.73	25.738	
3,300.0	3,295.2	3,275.4	3,270.2	7.3	7.7	176.13	226.2	21.4	367.1	352.9	14.18	25.895	
3,400.0	3,395.0	3,374.4	3,369.0	7.6	7.9	175.98	233.1	20.9	380.8	366.2	14.62	26.042	
3,500.0	3,494.7	3,473.5	3,467.8	7.9	8.2	175.84	240.0	20.3	394.6	379.5	15.07	26.179	
3,600.0	3,594.5	3,572.5	3,566.6	8.1	8.4	175.71	246.9	19.8	408.3	392.8	15.52	26.307	
3,700.0	3,694.2	3,671.6	3,665.4	8.4	8.7	175.59	253.7	19.3	422.1	406.1	15.97	26.428	
3,800.0	3,794.0	3,770.6	3,764.2	8.6	8.9	175.48	260.6	18.8	435.8	419.4	16.42	26.541	
3,900.0	3,893.7	3,869.7	3,863.0	8.9	9.2	175.37	267.5	18.2	449.6	432.7	16.87	26.648	
4,000.0	3,993.5	3,968.7	3,961.8	9.1	9.4	175.27	274.4	17.7	463.3	446.0	17.32	26.748	
4,100.0	4,093.3	4,067.8	4,060.6	9.4	9.7	175.17	281.3	17.2	477.1	459.3	17.77	26.844	
4,200.0	4,193.0	4,166.8	4,159.4	9.7	9.9	175.08	288.2	16.6	490.9	472.6	18.23	26.934	
4,300.0	4,292.8	4,265.9	4,258.2	9.9	10.2	175.00	295.1	16.1	504.6	486.0	18.68	27.019	
4,400.0	4,392.5	4,364.9	4,357.0	10.2	10.4	174.92	302.0	15.6	518.4	499.3	19.13	27.100	
4,500.0	4,492.3	4,463.9	4,455.8	10.4	10.7	174.84	308.9	15.0	532.2	512.6	19.58	27.177	
4,600.0	4,592.0	4,563.0	4,554.6	10.7	10.9	174.77	315.7	14.5	545.9	525.9	20.03	27.250	
4,700.0	4,691.8	4,662.0	4,653.4	10.9	11.2	174.70	322.6	14.0	559.7	539.2	20.49	27.320	
4,800.0	4,791.6	4,761.1	4,752.2	11.2	11.5	174.64	329.5	13.5	573.5	552.5	20.94	27.386	
4,900.0	4,891.3	4,860.1	4,851.0	11.5	11.7	174.58	336.4	12.9	587.2	565.8	21.39	27.450	
5,000.0	4,991.1	4,959.2	4,949.9	11.7	12.0	174.52	343.3	12.4	601.0	579.2	21.85	27.510	
5,100.0	5,090.8	5,058.2	5,048.7	12.0	12.2	174.46	350.2	11.9	614.8	592.5	22.30	27.568	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0110B - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,157.3	5,147.5	12.2	12.5	174.40	357.1	11.3	628.5	605.8	22.75	27.624	
5,300.0	5,290.3	5,256.3	5,246.3	12.5	12.7	174.35	364.0	10.8	642.3	619.1	23.21	27.677	
5,337.0	5,327.3	5,293.0	5,282.8	12.6	12.8	174.33	366.5	10.6	647.4	624.0	23.38	27.696	
5,350.0	5,340.2	5,305.8	5,295.6	12.6	12.8	174.31	367.4	10.5	649.4	626.0	23.39	27.762	
5,400.0	5,389.7	5,354.7	5,344.4	12.8	13.0	174.20	370.8	10.3	659.8	636.5	23.32	28.290	
5,450.0	5,438.2	5,402.3	5,391.9	13.0	13.1	174.07	374.1	10.0	674.9	651.8	23.06	29.271	
5,500.0	5,485.4	5,441.9	5,431.4	13.2	13.2	173.90	376.9	9.8	694.5	671.9	22.58	30.759	
5,550.0	5,530.9	5,450.0	5,439.5	13.5	13.2	173.57	377.6	9.8	719.7	697.8	21.85	32.935	
5,600.0	5,574.1	5,477.1	5,466.3	13.9	13.3	173.17	380.8	9.5	749.8	728.8	21.00	35.712	
5,650.0	5,614.7	5,500.0	5,488.9	14.2	13.4	172.61	384.7	9.2	785.0	765.0	19.98	39.292	
5,700.0	5,652.3	5,500.0	5,488.9	14.6	13.4	171.66	384.7	9.2	824.0	805.2	18.80	43.829	
5,750.0	5,686.6	5,500.0	5,488.9	15.1	13.4	170.23	384.7	9.2	866.7	849.2	17.57	49.329	
5,800.0	5,717.2	5,522.1	5,510.6	15.6	13.5	168.41	389.3	8.8	911.5	895.1	16.41	55.562	
5,850.0	5,743.9	5,528.0	5,516.3	16.2	13.5	164.95	390.7	8.7	958.7	943.1	15.58	61.529	
5,900.0	5,766.5	5,532.0	5,520.2	16.8	13.5	157.83	391.7	8.7	1,007.3	991.2	16.13	62.461	
5,950.0	5,784.7	5,550.0	5,537.5	17.5	13.6	142.19	396.5	8.3	1,057.2	1,036.5	20.67	51.152	
6,000.0	5,798.3	5,550.0	5,537.5	18.1	13.6	81.06	396.5	8.3	1,107.0	1,075.7	31.31	35.362	
6,050.0	5,807.3	5,550.0	5,537.5	18.9	13.6	30.93	396.5	8.3	1,156.8	1,138.4	18.38	62.924	
6,100.0	5,811.5	5,531.1	5,519.3	19.6	13.5	15.70	391.5	8.7	1,205.7	1,193.7	11.96	100.831	
6,118.8	5,811.8	5,529.9	5,518.1	19.9	13.5	13.43	391.2	8.7	1,224.0	1,212.9	11.06	110.656	
6,200.0	5,811.8	5,524.3	5,512.7	21.0	13.5	3.37	389.8	8.8	1,302.8	1,294.1	8.69	149.991	
6,300.0	5,811.8	5,500.0	5,488.9	22.3	13.4	-9.20	384.7	9.2	1,400.7	1,390.3	10.43	134.303	
6,400.0	5,811.8	5,500.0	5,488.9	23.8	13.4	-21.34	384.7	9.2	1,498.0	1,482.0	15.94	93.974	
6,505.4	5,811.8	5,500.0	5,488.9	25.3	13.4	-32.95	384.7	9.2	1,600.4	1,578.0	22.33	71.668	
6,600.0	5,811.8	5,500.0	5,488.9	26.8	13.4	-32.95	384.7	9.2	1,692.4	1,669.1	23.29	72.672	
6,700.0	5,811.8	5,500.0	5,488.9	28.5	13.4	-32.95	384.7	9.2	1,789.9	1,765.6	24.35	73.500	
6,800.0	5,811.8	5,500.0	5,488.9	30.2	13.4	-32.95	384.7	9.2	1,887.7	1,862.3	25.44	74.213	
6,900.0	5,811.8	5,500.0	5,488.9	31.9	13.4	-32.95	384.7	9.2	1,985.7	1,959.2	26.54	74.831	
7,000.0	5,811.8	5,500.0	5,488.9	33.6	13.4	-32.95	384.7	9.2	2,083.9	2,056.3	27.65	75.370	
7,100.0	5,811.8	5,500.0	5,488.9	35.4	13.4	-32.95	384.7	9.2	2,182.3	2,153.5	28.77	75.844	
7,200.0	5,811.8	5,500.0	5,488.9	37.2	13.4	-32.95	384.7	9.2	2,280.8	2,250.9	29.91	76.263	
7,300.0	5,811.8	5,477.5	5,466.8	39.0	13.3	-31.27	380.9	9.5	2,378.8	2,348.9	29.95	79.415	
7,400.0	5,811.8	5,474.9	5,464.2	40.8	13.3	-31.09	380.5	9.5	2,477.4	2,446.5	30.95	80.053	
7,500.0	5,811.8	5,472.5	5,461.8	42.6	13.3	-30.92	380.2	9.6	2,576.1	2,544.2	31.95	80.634	
7,600.0	5,811.8	5,450.0	5,439.5	44.4	13.2	-29.40	377.6	9.8	2,675.4	2,643.4	31.99	83.642	
7,700.0	5,811.8	5,450.0	5,439.5	46.3	13.2	-29.40	377.6	9.8	2,774.1	2,741.0	33.08	83.859	
7,800.0	5,811.8	5,450.0	5,439.5	48.1	13.2	-29.40	377.6	9.8	2,873.0	2,838.8	34.18	84.055	
7,900.0	5,811.8	5,450.0	5,439.5	49.9	13.2	-29.40	377.6	9.8	2,971.9	2,936.6	35.28	84.234	
8,000.0	5,811.8	5,450.0	5,439.5	51.8	13.2	-29.40	377.6	9.8	3,070.9	3,034.5	36.39	84.396	
8,100.0	5,811.9	5,450.0	5,439.5	53.7	13.2	-29.40	377.6	9.8	3,169.9	3,132.4	37.49	84.545	
8,200.0	5,811.9	5,450.0	5,439.5	55.5	13.2	-29.40	377.6	9.8	3,269.1	3,230.5	38.60	84.682	
8,300.0	5,811.9	5,450.0	5,439.5	57.4	13.2	-29.40	377.6	9.8	3,368.2	3,328.5	39.72	84.808	
8,400.0	5,811.9	5,450.0	5,439.5	59.2	13.2	-29.40	377.6	9.8	3,467.4	3,426.6	40.83	84.925	
8,500.0	5,811.9	5,450.0	5,439.5	61.1	13.2	-29.40	377.6	9.8	3,566.7	3,524.8	41.95	85.032	
8,600.0	5,811.9	5,450.0	5,439.5	63.0	13.2	-29.40	377.6	9.8	3,666.0	3,622.9	43.06	85.133	
8,700.0	5,811.9	5,450.0	5,439.5	64.9	13.2	-29.40	377.6	9.8	3,765.3	3,721.2	44.18	85.226	
8,800.0	5,811.9	5,450.0	5,439.5	66.7	13.2	-29.40	377.6	9.8	3,864.7	3,819.4	45.30	85.313	
8,900.0	5,811.9	5,450.0	5,439.5	68.6	13.2	-29.40	377.6	9.8	3,964.1	3,917.7	46.42	85.394	
9,000.0	5,811.9	5,450.0	5,439.5	70.5	13.2	-29.40	377.6	9.8	4,063.5	4,016.0	47.54	85.470	
9,100.0	5,811.9	5,450.0	5,439.5	72.4	13.2	-29.40	377.6	9.8	4,163.0	4,114.3	48.67	85.541	
9,200.0	5,811.9	5,450.0	5,439.5	74.3	13.2	-29.40	377.6	9.8	4,262.5	4,212.7	49.79	85.608	
9,300.0	5,811.9	5,450.0	5,439.5	76.2	13.2	-29.40	377.6	9.8	4,362.0	4,311.1	50.92	85.672	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0110B - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	5,450.0	5,439.5	78.1	13.2	-29.40	377.6	9.8	4,461.5	4,409.5	52.04	85.731	
9,500.0	5,811.9	5,450.0	5,439.5	80.0	13.2	-29.40	377.6	9.8	4,561.1	4,507.9	53.17	85.788	
9,600.0	5,811.9	5,443.4	5,432.9	81.9	13.2	-28.97	377.0	9.8	4,660.6	4,606.8	53.82	86.590	
9,700.0	5,811.9	5,437.0	5,426.5	83.7	13.2	-28.58	376.5	9.8	4,760.2	4,705.7	54.49	87.353	
9,800.0	5,811.9	5,437.0	5,426.5	85.6	13.2	-28.58	376.5	9.8	4,859.8	4,804.2	55.61	87.397	
9,900.0	5,811.9	5,437.0	5,426.5	87.5	13.2	-28.58	376.5	9.8	4,959.4	4,902.7	56.72	87.440	
10,000.0	5,811.9	5,437.0	5,426.5	89.4	13.2	-28.58	376.5	9.8	5,059.0	5,001.2	57.83	87.480	
10,100.0	5,811.9	5,437.0	5,426.5	91.3	13.2	-28.58	376.5	9.8	5,158.6	5,099.7	58.94	87.519	
10,200.0	5,811.9	5,437.0	5,426.5	93.2	13.2	-28.58	376.5	9.8	5,258.3	5,198.2	60.06	87.556	
10,300.0	5,811.9	5,437.0	5,426.5	95.1	13.2	-28.58	376.5	9.8	5,357.9	5,296.8	61.17	87.590	
10,400.0	5,811.9	5,437.0	5,426.5	97.0	13.2	-28.58	376.5	9.8	5,457.6	5,395.3	62.28	87.624	
10,500.0	5,811.9	5,437.0	5,426.5	98.9	13.2	-28.58	376.5	9.8	5,557.3	5,493.9	63.40	87.656	
10,600.0	5,811.9	5,430.3	5,419.9	100.9	13.2	-28.17	376.1	9.9	5,657.0	5,593.0	63.98	88.416	
10,700.0	5,811.9	5,423.4	5,412.9	102.8	13.1	-27.76	375.6	9.9	5,756.7	5,692.1	64.54	89.195	
10,800.0	5,811.9	5,416.4	5,406.0	104.7	13.1	-27.36	375.1	9.9	5,856.4	5,791.3	65.10	89.961	
10,900.0	5,811.9	5,409.5	5,399.1	106.6	13.1	-26.97	374.6	10.0	5,956.1	5,890.4	65.66	90.715	
11,000.0	5,811.9	5,402.5	5,392.1	108.5	13.1	-26.59	374.1	10.0	6,055.8	5,989.5	66.21	91.456	
11,100.0	5,811.9	5,395.6	5,385.2	110.4	13.1	-26.22	373.7	10.1	6,155.5	6,088.7	66.77	92.186	
11,200.0	5,811.9	5,388.6	5,378.3	112.3	13.1	-25.86	373.2	10.1	6,255.2	6,187.8	67.33	92.903	
11,300.0	5,812.0	5,381.7	5,371.3	114.2	13.0	-25.51	372.7	10.1	6,354.9	6,287.0	67.89	93.608	
11,400.0	5,812.0	5,374.7	5,364.4	116.1	13.0	-25.16	372.2	10.2	6,454.6	6,386.1	68.45	94.300	
11,500.0	5,812.0	5,367.8	5,357.5	118.0	13.0	-24.83	371.7	10.2	6,554.3	6,485.3	69.01	94.982	
11,600.0	5,812.0	5,360.8	5,350.5	119.9	13.0	-24.50	371.2	10.2	6,654.0	6,584.4	69.57	95.651	
11,700.0	5,812.0	5,353.9	5,343.6	121.8	13.0	-24.19	370.8	10.3	6,753.7	6,683.6	70.13	96.308	
11,800.0	5,812.0	5,346.9	5,336.7	123.7	12.9	-23.88	370.3	10.3	6,853.4	6,782.7	70.69	96.955	
11,900.0	5,812.0	5,340.0	5,329.7	125.6	12.9	-23.58	369.8	10.4	6,953.1	6,881.9	71.25	97.589	
12,000.0	5,812.0	5,333.0	5,322.8	127.6	12.9	-23.28	369.3	10.4	7,052.8	6,981.0	71.81	98.213	
12,100.0	5,812.0	5,326.1	5,315.8	129.5	12.9	-22.99	368.8	10.4	7,152.5	7,080.2	72.38	98.825	
12,200.0	5,812.0	5,319.1	5,308.9	131.4	12.9	-22.71	368.3	10.5	7,252.3	7,179.3	72.94	99.427	
12,300.0	5,812.0	5,312.2	5,302.0	133.3	12.9	-22.44	367.9	10.5	7,352.0	7,278.5	73.51	100.017	
12,400.0	5,812.0	5,305.2	5,295.0	135.2	12.8	-22.17	367.4	10.5	7,451.7	7,377.6	74.07	100.597	
12,500.0	5,812.0	5,298.3	5,288.1	137.1	12.8	-21.91	366.9	10.6	7,551.4	7,476.8	74.64	101.167	
12,600.0	5,812.0	5,291.3	5,281.2	139.0	12.8	-21.65	366.4	10.6	7,651.1	7,575.9	75.21	101.726	
12,700.0	5,812.0	5,284.3	5,274.2	140.9	12.8	-21.40	365.9	10.7	7,750.9	7,675.1	75.78	102.275	
12,800.0	5,812.0	5,277.4	5,267.3	142.9	12.8	-21.15	365.4	10.7	7,850.6	7,774.2	76.36	102.813	
12,900.0	5,812.0	5,270.4	5,260.4	144.8	12.8	-20.92	365.0	10.7	7,950.3	7,873.4	76.93	103.342	
13,000.0	5,812.0	5,263.5	5,253.4	146.7	12.7	-20.68	364.5	10.8	8,050.0	7,972.5	77.51	103.862	
13,100.0	5,812.0	5,256.5	5,246.5	148.6	12.7	-20.45	364.0	10.8	8,149.8	8,071.7	78.08	104.371	
13,200.0	5,812.0	5,249.6	5,239.6	150.5	12.7	-20.23	363.5	10.8	8,249.5	8,170.8	78.66	104.872	
13,221.6	5,812.0	5,248.1	5,238.1	150.9	12.7	-20.18	363.4	10.8	8,271.0	8,192.3	78.79	104.978	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0111A - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	41.43	74.9	66.1	99.9				
100.0	100.0	100.0	100.0	0.1	0.1	41.43	74.9	66.1	99.9	99.7	0.18	554.758	
200.0	200.0	200.0	200.0	0.3	0.3	41.43	74.9	66.1	99.9	99.2	0.63	158.637	
300.0	300.0	300.0	300.0	0.5	0.5	41.43	74.9	66.1	99.9	98.8	1.08	92.551	
400.0	400.0	400.0	400.0	0.8	0.8	41.43	74.9	66.1	99.9	98.3	1.53	65.334	
500.0	500.0	500.0	500.0	1.0	1.0	41.43	74.9	66.1	99.9	97.9	1.98	50.487	
600.0	600.0	600.0	600.0	1.2	1.2	41.43	74.9	66.1	99.9	97.4	2.43	41.138	
700.0	700.0	700.0	700.0	1.4	1.4	41.43	74.9	66.1	99.9	97.0	2.88	34.711	
800.0	800.0	800.0	800.0	1.7	1.7	41.43	74.9	66.1	99.9	96.5	3.33	30.021	
900.0	900.0	900.0	900.0	1.9	1.9	41.43	74.9	66.1	99.9	96.1	3.78	26.447	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	41.43	74.9	66.1	99.9	95.6	4.23	23.634	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	41.43	74.9	66.1	99.9	95.2	4.68	21.361	CC, ES
1,200.0	1,200.0	1,197.0	1,197.0	2.6	2.6	40.99	76.5	66.5	101.4	96.2	5.12	19.803	
1,300.0	1,300.0	1,293.6	1,293.5	2.8	2.8	-152.23	81.3	67.5	107.4	101.9	5.53	19.409	SF
1,400.0	1,399.8	1,392.7	1,392.3	2.9	3.0	-154.81	88.0	69.1	118.4	112.5	5.93	19.966	
1,500.0	1,499.6	1,491.7	1,491.1	3.1	3.2	-157.33	94.7	70.6	131.2	124.9	6.33	20.718	
1,600.0	1,599.4	1,590.7	1,589.8	3.3	3.5	-159.40	101.4	72.2	144.2	137.5	6.74	21.388	
1,700.0	1,699.1	1,689.7	1,688.6	3.5	3.7	-161.13	108.2	73.7	157.4	150.2	7.16	21.985	
1,800.0	1,798.9	1,788.8	1,787.4	3.7	3.9	-162.59	114.9	75.3	170.7	163.1	7.58	22.519	
1,900.0	1,898.6	1,887.8	1,886.2	4.0	4.2	-163.84	121.6	76.8	184.0	176.0	8.00	22.996	
2,000.0	1,998.4	1,986.8	1,985.0	4.2	4.4	-164.92	128.4	78.3	197.5	189.1	8.43	23.426	
2,100.0	2,098.1	2,085.9	2,083.8	4.4	4.7	-165.86	135.1	79.9	211.0	202.1	8.86	23.814	
2,200.0	2,197.9	2,184.9	2,182.6	4.6	4.9	-166.69	141.9	81.4	224.6	215.3	9.29	24.164	
2,300.0	2,297.6	2,283.9	2,281.3	4.9	5.1	-167.42	148.6	83.0	238.2	228.4	9.73	24.482	
2,400.0	2,397.4	2,382.9	2,380.1	5.1	5.4	-168.08	155.3	84.5	251.8	241.6	10.16	24.772	
2,500.0	2,497.2	2,482.0	2,478.9	5.4	5.6	-168.66	162.1	86.0	265.5	254.9	10.60	25.037	
2,600.0	2,596.9	2,581.0	2,577.7	5.6	5.9	-169.19	168.8	87.6	279.2	268.1	11.04	25.280	
2,700.0	2,696.7	2,680.0	2,676.5	5.8	6.1	-169.67	175.5	89.1	292.9	281.4	11.48	25.504	
2,800.0	2,796.4	2,779.0	2,775.3	6.1	6.4	-170.11	182.3	90.7	306.6	294.7	11.93	25.710	
2,900.0	2,896.2	2,878.1	2,874.1	6.3	6.6	-170.51	189.0	92.2	320.4	308.0	12.37	25.901	
3,000.0	2,995.9	2,977.1	2,972.8	6.6	6.9	-170.88	195.7	93.7	334.1	321.3	12.81	26.077	
3,100.0	3,095.7	3,076.1	3,071.6	6.8	7.1	-171.21	202.5	95.3	347.9	334.6	13.26	26.241	
3,200.0	3,195.5	3,175.1	3,170.4	7.1	7.4	-171.53	209.2	96.8	361.7	348.0	13.70	26.394	
3,300.0	3,295.2	3,274.2	3,269.2	7.3	7.6	-171.82	215.9	98.4	375.5	361.3	14.15	26.537	
3,400.0	3,395.0	3,373.2	3,368.0	7.6	7.9	-172.08	222.7	99.9	389.3	374.7	14.60	26.670	
3,500.0	3,494.7	3,472.2	3,466.8	7.9	8.1	-172.33	229.4	101.4	403.1	388.0	15.04	26.796	
3,600.0	3,594.5	3,571.3	3,565.6	8.1	8.4	-172.57	236.1	103.0	416.9	401.4	15.49	26.913	
3,700.0	3,694.2	3,670.3	3,664.3	8.4	8.6	-172.79	242.9	104.5	430.7	414.8	15.94	27.023	
3,800.0	3,794.0	3,769.3	3,763.1	8.6	8.9	-172.99	249.6	106.1	444.6	428.2	16.39	27.128	
3,900.0	3,893.7	3,868.3	3,861.9	8.9	9.1	-173.18	256.3	107.6	458.4	441.6	16.84	27.226	
4,000.0	3,993.5	3,967.4	3,960.7	9.1	9.4	-173.37	263.1	109.2	472.2	454.9	17.29	27.319	
4,100.0	4,093.3	4,066.4	4,059.5	9.4	9.6	-173.54	269.8	110.7	486.1	468.3	17.74	27.406	
4,200.0	4,193.0	4,165.4	4,158.3	9.7	9.9	-173.70	276.5	112.2	499.9	481.7	18.19	27.490	
4,300.0	4,292.8	4,264.4	4,257.1	9.9	10.1	-173.85	283.3	113.8	513.8	495.1	18.64	27.569	
4,400.0	4,392.5	4,363.5	4,355.8	10.2	10.4	-174.00	290.0	115.3	527.6	508.5	19.09	27.644	
4,500.0	4,492.3	4,462.5	4,454.6	10.4	10.6	-174.13	296.7	116.9	541.5	521.9	19.54	27.715	
4,600.0	4,592.0	4,561.5	4,553.4	10.7	10.9	-174.26	303.5	118.4	555.3	535.4	19.99	27.783	
4,700.0	4,691.8	4,660.6	4,652.2	10.9	11.1	-174.39	310.2	119.9	569.2	548.8	20.44	27.848	
4,800.0	4,791.6	4,759.6	4,751.0	11.2	11.4	-174.51	316.9	121.5	583.1	562.2	20.89	27.910	
4,900.0	4,891.3	4,858.6	4,849.8	11.5	11.6	-174.62	323.7	123.0	596.9	575.6	21.34	27.969	
5,000.0	4,991.1	4,957.6	4,948.6	11.7	11.9	-174.73	330.4	124.6	610.8	589.0	21.80	28.025	
5,100.0	5,090.8	5,056.7	5,047.3	12.0	12.1	-174.83	337.1	126.1	624.7	602.4	22.25	28.080	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0111A - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,155.7	5,146.1	12.2	12.4	-174.93	343.9	127.6	638.6	615.9	22.70	28.131	
5,300.0	5,290.3	5,254.7	5,244.9	12.5	12.6	-175.02	350.6	129.2	652.4	629.3	23.15	28.181	
5,337.0	5,327.3	5,291.4	5,281.5	12.6	12.7	-175.06	353.1	129.8	657.6	634.3	23.32	28.199	
5,350.0	5,340.2	5,304.2	5,294.3	12.6	12.8	-175.05	354.0	130.0	659.5	636.2	23.33	28.265	
5,400.0	5,389.7	5,344.6	5,334.6	12.8	12.9	-175.01	356.7	130.6	670.1	646.9	23.25	28.824	
5,450.0	5,438.2	5,365.1	5,355.0	13.0	12.9	-174.88	358.8	131.1	686.8	663.9	22.93	29.951	
5,500.0	5,485.4	5,384.1	5,373.8	13.2	13.0	-174.69	361.4	131.6	709.6	687.2	22.42	31.649	
5,550.0	5,530.9	5,400.0	5,389.4	13.5	13.0	-174.41	364.0	132.3	738.0	716.3	21.72	33.973	
5,600.0	5,574.1	5,416.5	5,405.6	13.9	13.1	-174.02	367.3	133.0	771.3	750.5	20.86	36.979	
5,650.0	5,614.7	5,429.5	5,418.3	14.2	13.2	-173.44	370.2	133.7	809.0	789.1	19.84	40.783	
5,700.0	5,652.3	5,450.0	5,438.0	14.6	13.2	-172.71	375.5	134.9	850.4	831.7	18.70	45.468	
5,750.0	5,686.6	5,450.0	5,438.0	15.1	13.2	-171.27	375.5	134.9	894.5	877.0	17.48	51.167	
5,800.0	5,717.2	5,450.0	5,438.0	15.6	13.2	-168.83	375.5	134.9	941.0	924.7	16.35	57.538	
5,850.0	5,743.9	5,450.0	5,438.0	16.2	13.2	-163.99	375.5	134.9	989.3	973.5	15.81	62.560	
5,900.0	5,766.5	5,450.0	5,438.0	16.8	13.2	-150.80	375.5	134.9	1,038.6	1,020.3	18.34	56.634	
5,950.0	5,784.7	5,450.0	5,438.0	17.5	13.2	-89.53	375.5	134.9	1,088.5	1,057.7	30.76	35.382	
6,000.0	5,798.3	5,450.0	5,438.0	18.1	13.2	-27.88	375.5	134.9	1,138.3	1,121.3	17.00	66.952	
6,050.0	5,807.3	5,450.0	5,438.0	18.9	13.2	-14.60	375.5	134.9	1,187.8	1,176.2	11.63	102.157	
6,100.0	5,811.5	5,450.0	5,438.0	19.6	13.2	-9.72	375.5	134.9	1,236.4	1,226.8	9.65	128.080	
6,118.8	5,811.8	5,450.0	5,438.0	19.9	13.2	-8.61	375.5	134.9	1,254.5	1,245.2	9.28	135.117	
6,200.0	5,811.8	5,450.0	5,438.0	21.0	13.2	-16.28	375.5	134.9	1,332.0	1,319.5	12.49	106.626	
6,300.0	5,811.8	5,450.0	5,438.0	22.3	13.2	-25.50	375.5	134.9	1,427.7	1,410.4	17.23	82.858	
6,400.0	5,811.8	5,450.0	5,438.0	23.8	13.2	-34.00	375.5	134.9	1,523.3	1,501.3	21.97	69.333	
6,505.4	5,811.8	5,429.3	5,418.0	25.3	13.2	-40.28	370.2	133.7	1,623.2	1,597.5	25.73	63.075	
6,600.0	5,811.8	5,424.1	5,413.0	26.8	13.1	-39.90	369.0	133.4	1,713.2	1,686.5	26.62	64.366	
6,700.0	5,811.8	5,400.0	5,389.4	28.5	13.0	-38.19	364.0	132.3	1,809.1	1,782.2	26.92	67.203	
6,800.0	5,811.8	5,400.0	5,389.4	30.2	13.0	-38.19	364.0	132.3	1,904.8	1,876.7	28.10	67.790	
6,900.0	5,811.8	5,400.0	5,389.4	31.9	13.0	-38.19	364.0	132.3	2,001.0	1,971.7	29.30	68.304	
7,000.0	5,811.8	5,400.0	5,389.4	33.6	13.0	-38.19	364.0	132.3	2,097.5	2,067.0	30.51	68.757	
7,100.0	5,811.8	5,400.0	5,389.4	35.4	13.0	-38.19	364.0	132.3	2,194.3	2,162.6	31.73	69.159	
7,200.0	5,811.8	5,400.0	5,389.4	37.2	13.0	-38.19	364.0	132.3	2,291.4	2,258.4	32.96	69.517	
7,300.0	5,811.8	5,400.0	5,389.4	39.0	13.0	-38.19	364.0	132.3	2,388.7	2,354.5	34.20	69.839	
7,400.0	5,811.8	5,400.0	5,389.4	40.8	13.0	-38.19	364.0	132.3	2,486.2	2,450.8	35.45	70.129	
7,500.0	5,811.8	5,400.0	5,389.4	42.6	13.0	-38.19	364.0	132.3	2,584.0	2,547.2	36.71	70.392	
7,600.0	5,811.8	5,400.0	5,389.4	44.4	13.0	-38.19	364.0	132.3	2,681.9	2,643.9	37.97	70.631	
7,700.0	5,811.8	5,400.0	5,389.4	46.3	13.0	-38.19	364.0	132.3	2,779.9	2,740.7	39.24	70.850	
7,800.0	5,811.8	5,400.0	5,389.4	48.1	13.0	-38.19	364.0	132.3	2,878.1	2,837.6	40.51	71.050	
7,900.0	5,811.8	5,400.0	5,389.4	49.9	13.0	-38.19	364.0	132.3	2,976.4	2,934.6	41.78	71.234	
8,000.0	5,811.8	5,377.7	5,367.5	51.8	13.0	-36.72	360.4	131.4	3,074.2	3,032.3	41.93	73.316	
8,100.0	5,811.9	5,375.7	5,365.5	53.7	13.0	-36.59	360.1	131.4	3,172.6	3,129.6	43.08	73.641	
8,200.0	5,811.9	5,373.8	5,363.6	55.5	13.0	-36.47	359.9	131.3	3,271.1	3,226.9	44.24	73.944	
8,300.0	5,811.9	5,372.0	5,361.8	57.4	13.0	-36.36	359.6	131.3	3,369.7	3,324.3	45.40	74.229	
8,400.0	5,811.9	5,350.0	5,340.0	59.2	12.9	-35.03	357.2	130.7	3,468.8	3,423.3	45.51	76.222	
8,500.0	5,811.9	5,350.0	5,340.0	61.1	12.9	-35.03	357.2	130.7	3,567.5	3,520.7	46.74	76.330	
8,600.0	5,811.9	5,350.0	5,340.0	63.0	12.9	-35.03	357.2	130.7	3,666.2	3,618.2	47.97	76.430	
8,700.0	5,811.9	5,350.0	5,340.0	64.9	12.9	-35.03	357.2	130.7	3,765.0	3,715.8	49.20	76.524	
8,800.0	5,811.9	5,350.0	5,340.0	66.7	12.9	-35.03	357.2	130.7	3,863.8	3,813.4	50.43	76.613	
8,900.0	5,811.9	5,350.0	5,340.0	68.6	12.9	-35.03	357.2	130.7	3,962.7	3,911.1	51.67	76.697	
9,000.0	5,811.9	5,350.0	5,340.0	70.5	12.9	-35.03	357.2	130.7	4,061.7	4,008.8	52.90	76.775	
9,100.0	5,811.9	5,350.0	5,340.0	72.4	12.9	-35.03	357.2	130.7	4,160.7	4,106.6	54.14	76.850	
9,200.0	5,811.9	5,350.0	5,340.0	74.3	12.9	-35.03	357.2	130.7	4,259.8	4,204.4	55.38	76.921	
9,300.0	5,811.9	5,350.0	5,340.0	76.2	12.9	-35.03	357.2	130.7	4,358.9	4,302.3	56.62	76.988	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0111A - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	5,350.0	5,340.0	78.1	12.9	-35.03	357.2	130.7	4,458.0	4,400.2	57.86	77.051	
9,500.0	5,811.9	5,350.0	5,340.0	80.0	12.9	-35.03	357.2	130.7	4,557.2	4,498.1	59.10	77.112	
9,600.0	5,811.9	5,350.0	5,340.0	81.9	12.9	-35.03	357.2	130.7	4,656.4	4,596.1	60.34	77.170	
9,700.0	5,811.9	5,350.0	5,340.0	83.7	12.9	-35.03	357.2	130.7	4,755.7	4,694.1	61.58	77.225	
9,800.0	5,811.9	5,350.0	5,340.0	85.6	12.9	-35.03	357.2	130.7	4,854.9	4,792.1	62.82	77.277	
9,900.0	5,811.9	5,350.0	5,340.0	87.5	12.9	-35.03	357.2	130.7	4,954.2	4,890.2	64.07	77.327	
10,000.0	5,811.9	5,350.0	5,340.0	89.4	12.9	-35.03	357.2	130.7	5,053.6	4,988.3	65.31	77.375	
10,100.0	5,811.9	5,350.0	5,340.0	91.3	12.9	-35.03	357.2	130.7	5,152.9	5,086.4	66.56	77.421	
10,200.0	5,811.9	5,350.0	5,340.0	93.2	12.9	-35.03	357.2	130.7	5,252.3	5,184.5	67.80	77.465	
10,300.0	5,811.9	5,350.0	5,340.0	95.1	12.9	-35.03	357.2	130.7	5,351.7	5,282.7	69.05	77.508	
10,400.0	5,811.9	5,350.0	5,340.0	97.0	12.9	-35.03	357.2	130.7	5,451.2	5,380.9	70.29	77.548	
10,500.0	5,811.9	5,350.0	5,340.0	98.9	12.9	-35.03	357.2	130.7	5,550.6	5,479.1	71.54	77.587	
10,600.0	5,811.9	5,350.0	5,340.0	100.9	12.9	-35.03	357.2	130.7	5,650.1	5,577.3	72.79	77.625	
10,700.0	5,811.9	5,350.0	5,340.0	102.8	12.9	-35.03	357.2	130.7	5,749.6	5,675.5	74.03	77.661	
10,800.0	5,811.9	5,350.0	5,340.0	104.7	12.9	-35.03	357.2	130.7	5,849.1	5,773.8	75.28	77.696	
10,900.0	5,811.9	5,344.1	5,334.1	106.6	12.9	-34.69	356.7	130.6	5,948.6	5,872.5	76.07	78.202	
11,000.0	5,811.9	5,338.0	5,328.0	108.5	12.9	-34.34	356.3	130.5	6,048.1	5,971.3	76.83	78.726	
11,100.0	5,811.9	5,338.0	5,328.0	110.4	12.9	-34.34	356.3	130.5	6,147.7	6,069.6	78.06	78.756	
11,200.0	5,811.9	5,338.0	5,328.0	112.3	12.9	-34.34	356.3	130.5	6,247.2	6,167.9	79.29	78.785	
11,300.0	5,812.0	5,338.0	5,328.0	114.2	12.9	-34.34	356.3	130.5	6,346.8	6,266.2	80.53	78.813	
11,400.0	5,812.0	5,338.0	5,328.0	116.1	12.9	-34.34	356.3	130.5	6,446.4	6,364.6	81.76	78.840	
11,500.0	5,812.0	5,338.0	5,328.0	118.0	12.9	-34.34	356.3	130.5	6,546.0	6,463.0	83.00	78.867	
11,600.0	5,812.0	5,338.0	5,328.0	119.9	12.9	-34.34	356.3	130.5	6,645.6	6,561.3	84.24	78.892	
11,700.0	5,812.0	5,338.0	5,328.0	121.8	12.9	-34.34	356.3	130.5	6,745.2	6,659.7	85.47	78.917	
11,800.0	5,812.0	5,338.0	5,328.0	123.7	12.9	-34.34	356.3	130.5	6,844.8	6,758.1	86.71	78.941	
11,900.0	5,812.0	5,338.0	5,328.0	125.6	12.9	-34.34	356.3	130.5	6,944.4	6,856.5	87.94	78.964	
12,000.0	5,812.0	5,338.0	5,328.0	127.6	12.9	-34.34	356.3	130.5	7,044.1	6,954.9	89.18	78.986	
12,100.0	5,812.0	5,331.5	5,321.5	129.5	12.8	-33.98	355.8	130.4	7,143.7	7,053.9	89.83	79.522	
12,200.0	5,812.0	5,324.7	5,314.8	131.4	12.8	-33.61	355.4	130.3	7,243.4	7,152.9	90.45	80.079	
12,300.0	5,812.0	5,317.9	5,308.0	133.3	12.8	-33.24	354.9	130.2	7,343.1	7,252.0	91.07	80.631	
12,400.0	5,812.0	5,311.1	5,301.2	135.2	12.8	-32.88	354.4	130.1	7,442.7	7,351.0	91.68	81.180	
12,500.0	5,812.0	5,304.3	5,294.4	137.1	12.8	-32.53	354.0	130.0	7,542.4	7,450.1	92.29	81.726	
12,600.0	5,812.0	5,297.5	5,287.6	139.0	12.8	-32.18	353.5	129.9	7,642.1	7,549.2	92.89	82.267	
12,700.0	5,812.0	5,290.7	5,280.9	140.9	12.7	-31.84	353.0	129.7	7,741.7	7,648.2	93.49	82.804	
12,800.0	5,812.0	5,283.9	5,274.1	142.9	12.7	-31.51	352.6	129.6	7,841.4	7,747.3	94.09	83.338	
12,900.0	5,812.0	5,277.1	5,267.3	144.8	12.7	-31.18	352.1	129.5	7,941.1	7,846.4	94.69	83.867	
13,000.0	5,812.0	5,270.3	5,260.5	146.7	12.7	-30.86	351.7	129.4	8,040.8	7,945.5	95.28	84.393	
13,100.0	5,812.0	5,263.6	5,253.7	148.6	12.7	-30.55	351.2	129.3	8,140.4	8,044.6	95.87	84.914	
13,200.0	5,812.0	5,256.8	5,247.0	150.5	12.7	-30.24	350.7	129.2	8,240.1	8,143.7	96.45	85.431	
13,221.6	5,812.0	5,255.3	5,245.5	150.9	12.6	-30.17	350.6	129.2	8,261.7	8,165.1	96.58	85.542	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0112B - HZ - Plan #1 — **Offset Site Error:** 0.0 ft

Survey Program: 0-ISCWSA MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	52.94	74.9	99.1	124.2				
100.0	100.0	100.0	100.0	0.1	0.1	52.94	74.9	99.1	124.2	124.0	0.18	690.054	
200.0	200.0	200.0	200.0	0.3	0.3	52.94	74.9	99.1	124.2	123.6	0.63	197.326	
300.0	300.0	300.0	300.0	0.5	0.5	52.94	74.9	99.1	124.2	123.1	1.08	115.123	
400.0	400.0	400.0	400.0	0.8	0.8	52.94	74.9	99.1	124.2	122.7	1.53	81.268	
500.0	500.0	500.0	500.0	1.0	1.0	52.94	74.9	99.1	124.2	122.2	1.98	62.800	
600.0	600.0	600.0	600.0	1.2	1.2	52.94	74.9	99.1	124.2	121.8	2.43	51.171	
700.0	700.0	700.0	700.0	1.4	1.4	52.94	74.9	99.1	124.2	121.4	2.88	43.176	
800.0	800.0	800.0	800.0	1.7	1.7	52.94	74.9	99.1	124.2	120.9	3.33	37.342	
900.0	900.0	900.0	900.0	1.9	1.9	52.94	74.9	99.1	124.2	120.5	3.78	32.897	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	52.94	74.9	99.1	124.2	120.0	4.23	29.397	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	52.94	74.9	99.1	124.2	119.6	4.68	26.571	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	52.94	74.9	99.1	124.2	119.1	5.12	24.240	CC, ES
1,300.0	1,300.0	1,296.2	1,296.2	2.8	2.8	-139.47	76.3	99.8	127.0	121.5	5.54	22.950	
1,400.0	1,399.8	1,391.7	1,391.6	2.9	3.0	-141.66	80.7	101.9	135.6	129.7	5.92	22.898	SF
1,500.0	1,499.6	1,490.4	1,490.0	3.1	3.2	-144.45	86.9	104.8	147.6	141.3	6.33	23.330	
1,600.0	1,599.4	1,589.5	1,588.8	3.3	3.4	-146.83	93.1	107.7	159.9	153.1	6.73	23.736	
1,700.0	1,699.1	1,688.5	1,687.6	3.5	3.7	-148.87	99.4	110.7	172.4	165.2	7.15	24.106	
1,800.0	1,798.9	1,787.5	1,786.4	3.7	3.9	-150.63	105.7	113.6	185.1	177.5	7.57	24.444	
1,900.0	1,898.6	1,886.6	1,885.2	4.0	4.1	-152.16	111.9	116.5	197.9	189.9	8.00	24.752	
2,000.0	1,998.4	1,985.6	1,984.0	4.2	4.4	-153.51	118.2	119.5	210.9	202.5	8.42	25.033	
2,100.0	2,098.1	2,084.7	2,082.8	4.4	4.6	-154.70	124.4	122.4	224.0	215.1	8.86	25.291	
2,200.0	2,197.9	2,183.7	2,181.6	4.6	4.9	-155.76	130.7	125.4	237.1	227.8	9.29	25.527	
2,300.0	2,297.6	2,282.7	2,280.4	4.9	5.1	-156.70	136.9	128.3	250.4	240.6	9.72	25.744	
2,400.0	2,397.4	2,381.8	2,379.2	5.1	5.3	-157.56	143.2	131.2	263.6	253.5	10.16	25.943	
2,500.0	2,497.2	2,480.8	2,478.0	5.4	5.6	-158.33	149.4	134.2	277.0	266.4	10.60	26.127	
2,600.0	2,596.9	2,579.9	2,576.8	5.6	5.8	-159.03	155.7	137.1	290.4	279.3	11.04	26.297	
2,700.0	2,696.7	2,678.9	2,675.6	5.8	6.1	-159.66	161.9	140.0	303.8	292.3	11.48	26.454	
2,800.0	2,796.4	2,777.9	2,774.4	6.1	6.3	-160.25	168.2	143.0	317.3	305.3	11.93	26.600	
2,900.0	2,896.2	2,877.0	2,873.2	6.3	6.6	-160.78	174.4	145.9	330.7	318.4	12.37	26.736	
3,000.0	2,995.9	2,976.0	2,972.0	6.6	6.8	-161.28	180.7	148.9	344.3	331.5	12.82	26.863	
3,100.0	3,095.7	3,075.1	3,070.8	6.8	7.1	-161.74	186.9	151.8	357.8	344.5	13.26	26.982	
3,200.0	3,195.5	3,174.1	3,169.6	7.1	7.3	-162.16	193.2	154.7	371.4	357.7	13.71	27.092	
3,300.0	3,295.2	3,273.1	3,268.4	7.3	7.6	-162.55	199.4	157.7	384.9	370.8	14.15	27.196	
3,400.0	3,395.0	3,372.2	3,367.2	7.6	7.8	-162.92	205.7	160.6	398.5	383.9	14.60	27.294	
3,500.0	3,494.7	3,471.2	3,466.0	7.9	8.1	-163.26	211.9	163.5	412.1	397.1	15.05	27.385	
3,600.0	3,594.5	3,570.3	3,564.8	8.1	8.3	-163.58	218.2	166.5	425.8	410.3	15.50	27.472	
3,700.0	3,694.2	3,669.3	3,663.6	8.4	8.6	-163.88	224.5	169.4	439.4	423.5	15.95	27.553	
3,800.0	3,794.0	3,768.3	3,762.4	8.6	8.8	-164.17	230.7	172.4	453.1	436.7	16.40	27.630	
3,900.0	3,893.7	3,867.4	3,861.2	8.9	9.1	-164.43	237.0	175.3	466.7	449.9	16.85	27.703	
4,000.0	3,993.5	3,966.4	3,960.0	9.1	9.3	-164.68	243.2	178.2	480.4	463.1	17.30	27.772	
4,100.0	4,093.3	4,065.5	4,058.8	9.4	9.6	-164.92	249.5	181.2	494.1	476.3	17.75	27.837	
4,200.0	4,193.0	4,164.5	4,157.6	9.7	9.8	-165.15	255.7	184.1	507.7	489.5	18.20	27.899	
4,300.0	4,292.8	4,263.5	4,256.4	9.9	10.1	-165.36	262.0	187.1	521.4	502.8	18.65	27.958	
4,400.0	4,392.5	4,362.6	4,355.2	10.2	10.3	-165.56	268.2	190.0	535.1	516.0	19.10	28.015	
4,500.0	4,492.3	4,461.6	4,454.0	10.4	10.6	-165.75	274.5	192.9	548.8	529.3	19.55	28.068	
4,600.0	4,592.0	4,560.7	4,552.8	10.7	10.8	-165.93	280.7	195.9	562.5	542.5	20.01	28.119	
4,700.0	4,691.8	4,659.7	4,651.6	10.9	11.1	-166.11	287.0	198.8	576.2	555.8	20.46	28.168	
4,800.0	4,791.6	4,758.7	4,750.4	11.2	11.3	-166.27	293.2	201.7	590.0	569.1	20.91	28.215	
4,900.0	4,891.3	4,857.8	4,849.2	11.5	11.6	-166.43	299.5	204.7	603.7	582.3	21.36	28.259	
5,000.0	4,991.1	4,956.8	4,948.0	11.7	11.8	-166.58	305.7	207.6	617.4	595.6	21.82	28.302	
5,100.0	5,090.8	5,055.9	5,046.8	12.0	12.1	-166.73	312.0	210.6	631.2	608.9	22.27	28.343	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0112B - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,154.9	5,145.6	12.2	12.3	-166.87	318.2	213.5	644.9	622.2	22.72	28.382	
5,300.0	5,290.3	5,253.9	5,244.4	12.5	12.6	-167.00	324.5	216.4	658.6	635.5	23.17	28.420	
5,337.0	5,327.3	5,290.6	5,281.0	12.6	12.7	-167.05	326.8	217.5	663.7	640.4	23.34	28.434	
5,350.0	5,340.2	5,303.4	5,293.8	12.6	12.7	-167.02	327.6	217.9	665.7	642.3	23.36	28.496	
5,400.0	5,389.7	5,352.3	5,342.5	12.8	12.8	-166.89	330.7	219.4	676.0	652.7	23.31	29.001	
5,450.0	5,438.2	5,400.0	5,390.1	13.0	13.0	-166.72	333.7	220.8	690.9	667.8	23.07	29.944	
5,500.0	5,485.4	5,440.2	5,430.2	13.2	13.1	-166.44	336.3	222.0	710.2	687.6	22.64	31.365	
5,550.0	5,530.9	5,450.0	5,440.0	13.5	13.1	-165.77	337.0	222.3	735.0	713.0	22.00	33.411	
5,600.0	5,574.1	5,474.6	5,464.4	13.9	13.2	-165.01	339.7	223.6	764.8	743.6	21.25	35.993	
5,650.0	5,614.7	5,500.0	5,489.4	14.2	13.3	-164.01	343.6	225.4	799.6	779.2	20.40	39.196	
5,700.0	5,652.3	5,500.0	5,489.4	14.6	13.3	-162.07	343.6	225.4	838.0	818.5	19.52	42.932	
5,750.0	5,686.6	5,500.0	5,489.4	15.1	13.3	-159.20	343.6	225.4	880.2	861.4	18.81	46.786	
5,800.0	5,717.2	5,518.9	5,507.9	15.6	13.3	-155.74	347.1	227.1	924.7	906.2	18.45	50.106	
5,850.0	5,743.9	5,524.7	5,513.5	16.2	13.3	-149.45	348.4	227.7	971.4	952.2	19.15	50.737	
5,900.0	5,766.5	5,528.6	5,517.4	16.8	13.4	-138.13	349.2	228.1	1,019.6	997.6	22.00	46.351	
5,950.0	5,784.7	5,530.8	5,519.4	17.5	13.4	-115.96	349.7	228.3	1,068.6	1,040.7	27.97	38.207	
6,000.0	5,798.3	5,531.3	5,519.9	18.1	13.4	-79.39	349.8	228.3	1,118.1	1,087.1	31.00	36.071	
6,050.0	5,807.3	5,530.3	5,518.9	18.9	13.4	-47.98	349.6	228.2	1,167.5	1,142.8	24.69	47.283	
6,100.0	5,811.5	5,527.9	5,516.6	19.6	13.4	-31.25	349.1	228.0	1,216.4	1,197.9	18.50	65.767	
6,118.8	5,811.8	5,526.6	5,515.4	19.9	13.4	-27.31	348.8	227.9	1,234.6	1,217.7	16.87	73.163	
6,200.0	5,811.8	5,521.2	5,510.2	21.0	13.3	-34.18	347.6	227.3	1,312.7	1,292.2	20.51	63.992	
6,300.0	5,811.8	5,500.0	5,489.4	22.3	13.3	-40.12	343.6	225.4	1,408.9	1,385.0	23.87	59.025	
6,400.0	5,811.8	5,500.0	5,489.4	23.8	13.3	-46.88	343.6	225.4	1,504.1	1,476.5	27.59	54.518	
6,505.4	5,811.8	5,500.0	5,489.4	25.3	13.3	-52.85	343.6	225.4	1,603.8	1,572.8	30.95	51.819	
6,600.0	5,811.8	5,500.0	5,489.4	26.8	13.3	-52.85	343.6	225.4	1,693.3	1,661.1	32.20	52.585	
6,700.0	5,811.8	5,500.0	5,489.4	28.5	13.3	-52.85	343.6	225.4	1,788.5	1,754.9	33.60	53.231	
6,800.0	5,811.8	5,500.0	5,489.4	30.2	13.3	-52.85	343.6	225.4	1,884.2	1,849.1	35.02	53.802	
6,900.0	5,811.8	5,500.0	5,489.4	31.9	13.3	-52.85	343.6	225.4	1,980.3	1,943.8	36.46	54.310	
7,000.0	5,811.8	5,500.0	5,489.4	33.6	13.3	-52.85	343.6	225.4	2,076.7	2,038.8	37.92	54.764	
7,100.0	5,811.8	5,500.0	5,489.4	35.4	13.3	-52.85	343.6	225.4	2,173.5	2,134.1	39.40	55.172	
7,200.0	5,811.8	5,500.0	5,489.4	37.2	13.3	-52.85	343.6	225.4	2,270.6	2,229.7	40.88	55.541	
7,300.0	5,811.8	5,478.1	5,467.9	39.0	13.2	-50.94	340.2	223.8	2,367.4	2,326.0	41.39	57.197	
7,400.0	5,811.8	5,475.7	5,465.5	40.8	13.2	-50.74	339.9	223.7	2,464.8	2,422.0	42.75	57.651	
7,500.0	5,811.8	5,473.4	5,463.2	42.6	13.2	-50.55	339.6	223.5	2,562.4	2,518.3	44.12	58.071	
7,600.0	5,811.8	5,471.2	5,461.1	44.4	13.2	-50.36	339.3	223.4	2,660.1	2,614.6	45.50	58.461	
7,700.0	5,811.8	5,450.0	5,440.0	46.3	13.1	-48.64	337.0	222.3	2,758.5	2,712.5	45.94	60.045	
7,800.0	5,811.8	5,450.0	5,440.0	48.1	13.1	-48.64	337.0	222.3	2,856.4	2,809.0	47.40	60.259	
7,900.0	5,811.8	5,450.0	5,440.0	49.9	13.1	-48.64	337.0	222.3	2,954.5	2,905.7	48.87	60.457	
8,000.0	5,811.8	5,450.0	5,440.0	51.8	13.1	-48.64	337.0	222.3	3,052.8	3,002.4	50.34	60.641	
8,100.0	5,811.9	5,450.0	5,440.0	53.7	13.1	-48.64	337.0	222.3	3,151.1	3,099.3	51.82	60.812	
8,200.0	5,811.9	5,450.0	5,440.0	55.5	13.1	-48.64	337.0	222.3	3,249.6	3,196.3	53.30	60.972	
8,300.0	5,811.9	5,450.0	5,440.0	57.4	13.1	-48.64	337.0	222.3	3,348.1	3,293.3	54.78	61.122	
8,400.0	5,811.9	5,450.0	5,440.0	59.2	13.1	-48.64	337.0	222.3	3,446.7	3,390.4	56.26	61.263	
8,500.0	5,811.9	5,450.0	5,440.0	61.1	13.1	-48.64	337.0	222.3	3,545.4	3,487.7	57.75	61.395	
8,600.0	5,811.9	5,450.0	5,440.0	63.0	13.1	-48.64	337.0	222.3	3,644.2	3,584.9	59.24	61.519	
8,700.0	5,811.9	5,450.0	5,440.0	64.9	13.1	-48.64	337.0	222.3	3,743.0	3,682.3	60.73	61.636	
8,800.0	5,811.9	5,450.0	5,440.0	66.7	13.1	-48.64	337.0	222.3	3,841.9	3,779.7	62.22	61.747	
8,900.0	5,811.9	5,450.0	5,440.0	68.6	13.1	-48.64	337.0	222.3	3,940.8	3,877.1	63.71	61.852	
9,000.0	5,811.9	5,450.0	5,440.0	70.5	13.1	-48.64	337.0	222.3	4,039.8	3,974.6	65.21	61.952	
9,100.0	5,811.9	5,450.0	5,440.0	72.4	13.1	-48.64	337.0	222.3	4,138.9	4,072.2	66.71	62.046	
9,200.0	5,811.9	5,450.0	5,440.0	74.3	13.1	-48.64	337.0	222.3	4,238.0	4,169.8	68.21	62.136	
9,300.0	5,811.9	5,450.0	5,440.0	76.2	13.1	-48.64	337.0	222.3	4,337.1	4,267.4	69.71	62.221	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor #12G-0112B - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	5,450.0	5,440.0	78.1	13.1	-48.64	337.0	222.3	4,436.3	4,365.1	71.21	62.302	
9,500.0	5,811.9	5,450.0	5,440.0	80.0	13.1	-48.64	337.0	222.3	4,535.5	4,462.8	72.71	62.380	
9,600.0	5,811.9	5,450.0	5,440.0	81.9	13.1	-48.64	337.0	222.3	4,634.8	4,560.5	74.21	62.454	
9,700.0	5,811.9	5,450.0	5,440.0	83.7	13.1	-48.64	337.0	222.3	4,734.0	4,658.3	75.71	62.525	
9,800.0	5,811.9	5,443.2	5,433.1	85.6	13.1	-48.11	336.5	222.1	4,833.3	4,756.6	76.69	63.022	
9,900.0	5,811.9	5,442.4	5,432.4	87.5	13.1	-48.05	336.4	222.0	4,932.6	4,854.5	78.13	63.135	
10,000.0	5,811.9	5,436.0	5,426.0	89.4	13.1	-47.56	336.0	221.8	5,032.0	4,952.9	79.12	63.599	
10,100.0	5,811.9	5,436.0	5,426.0	91.3	13.1	-47.56	336.0	221.8	5,131.4	5,050.7	80.61	63.658	
10,200.0	5,811.9	5,436.0	5,426.0	93.2	13.1	-47.56	336.0	221.8	5,230.7	5,148.6	82.10	63.715	
10,300.0	5,811.9	5,436.0	5,426.0	95.1	13.1	-47.56	336.0	221.8	5,330.2	5,246.6	83.58	63.770	
10,400.0	5,811.9	5,436.0	5,426.0	97.0	13.1	-47.56	336.0	221.8	5,429.6	5,344.5	85.07	63.822	
10,500.0	5,811.9	5,436.0	5,426.0	98.9	13.1	-47.56	336.0	221.8	5,529.0	5,442.5	86.56	63.873	
10,600.0	5,811.9	5,436.0	5,426.0	100.9	13.1	-47.56	336.0	221.8	5,628.5	5,540.5	88.05	63.921	
10,700.0	5,811.9	5,436.0	5,426.0	102.8	13.1	-47.56	336.0	221.8	5,728.0	5,638.5	89.54	63.968	
10,800.0	5,811.9	5,436.0	5,426.0	104.7	13.1	-47.56	336.0	221.8	5,827.5	5,736.5	91.04	64.014	
10,900.0	5,811.9	5,436.0	5,426.0	106.6	13.1	-47.56	336.0	221.8	5,927.0	5,834.5	92.53	64.057	
11,000.0	5,811.9	5,429.7	5,419.7	108.5	13.0	-47.09	335.6	221.7	6,026.6	5,933.1	93.44	64.497	
11,100.0	5,811.9	5,423.4	5,413.4	110.4	13.0	-46.62	335.2	221.5	6,126.1	6,031.8	94.34	64.937	
11,200.0	5,811.9	5,417.1	5,407.1	112.3	13.0	-46.16	334.8	221.3	6,225.7	6,130.5	95.23	65.377	
11,300.0	5,812.0	5,410.8	5,400.8	114.2	13.0	-45.70	334.4	221.1	6,325.2	6,229.1	96.10	65.818	
11,400.0	5,812.0	5,404.5	5,394.5	116.1	13.0	-45.25	334.0	220.9	6,424.8	6,327.9	96.97	66.258	
11,500.0	5,812.0	5,398.2	5,388.3	118.0	13.0	-44.81	333.6	220.7	6,524.4	6,426.6	97.82	66.699	
11,600.0	5,812.0	5,391.8	5,382.0	119.9	12.9	-44.38	333.2	220.5	6,624.0	6,525.3	98.66	67.139	
11,700.0	5,812.0	5,385.5	5,375.7	121.8	12.9	-43.95	332.8	220.3	6,723.6	6,624.1	99.49	67.579	
11,800.0	5,812.0	5,379.2	5,369.4	123.7	12.9	-43.52	332.4	220.2	6,823.2	6,722.9	100.31	68.019	
11,900.0	5,812.0	5,372.9	5,363.1	125.6	12.9	-43.11	332.0	220.0	6,922.8	6,821.6	101.12	68.459	
12,000.0	5,812.0	5,366.6	5,356.8	127.6	12.9	-42.70	331.6	219.8	7,022.4	6,920.5	101.92	68.899	
12,100.0	5,812.0	5,360.3	5,350.5	129.5	12.9	-42.29	331.2	219.6	7,122.0	7,019.3	102.71	69.338	
12,200.0	5,812.0	5,354.0	5,344.2	131.4	12.9	-41.89	330.8	219.4	7,221.6	7,118.1	103.50	69.777	
12,300.0	5,812.0	5,347.7	5,337.9	133.3	12.8	-41.50	330.4	219.2	7,321.2	7,217.0	104.27	70.215	
12,400.0	5,812.0	5,341.4	5,331.6	135.2	12.8	-41.11	330.0	219.0	7,420.9	7,315.8	105.03	70.653	
12,500.0	5,812.0	5,335.1	5,325.3	137.1	12.8	-40.73	329.6	218.8	7,520.5	7,414.7	105.79	71.090	
12,600.0	5,812.0	5,328.7	5,319.0	139.0	12.8	-40.35	329.2	218.7	7,620.1	7,513.6	106.54	71.527	
12,700.0	5,812.0	5,322.4	5,312.7	140.9	12.8	-39.98	328.8	218.5	7,719.8	7,612.5	107.28	71.962	
12,800.0	5,812.0	5,316.1	5,306.4	142.9	12.8	-39.62	328.4	218.3	7,819.4	7,711.4	108.01	72.397	
12,900.0	5,812.0	5,309.8	5,300.1	144.8	12.7	-39.25	328.0	218.1	7,919.1	7,810.3	108.73	72.831	
13,000.0	5,812.0	5,303.5	5,293.8	146.7	12.7	-38.90	327.6	217.9	8,018.7	7,909.3	109.45	73.264	
13,100.0	5,812.0	5,297.2	5,287.5	148.6	12.7	-38.55	327.2	217.7	8,118.4	8,008.2	110.16	73.696	
13,200.0	5,812.0	5,290.9	5,281.2	150.5	12.7	-38.20	326.8	217.5	8,218.0	8,107.2	110.86	74.127	
13,221.6	5,812.0	5,289.5	5,279.9	150.9	12.7	-38.13	326.7	217.5	8,239.6	8,128.6	111.02	74.220	

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1310B - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	33.0	33.0				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	33.0	33.0	32.9	0.19	176.701	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	33.0	33.0	32.4	0.64	51.912	
300.0	300.0	300.0	300.0	0.5	0.5	90.01	0.0	33.0	33.0	32.0	1.09	30.425	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	33.0	33.0	31.5	1.54	21.519	
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	33.0	33.0	31.1	1.99	16.646	
600.0	600.0	600.0	600.0	1.2	1.2	90.01	0.0	33.0	33.0	30.6	2.43	13.572	
700.0	700.0	700.0	700.0	1.4	1.4	90.01	0.0	33.0	33.0	30.2	2.88	11.457	
800.0	800.0	800.0	800.0	1.7	1.7	90.01	0.0	33.0	33.0	29.7	3.33	9.912	
900.0	900.0	900.0	900.0	1.9	1.9	90.01	0.0	33.0	33.0	29.3	3.78	8.734	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.01	0.0	33.0	33.0	28.8	4.23	7.807	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.3	90.01	0.0	33.0	33.0	28.4	4.68	7.057	CC
1,200.0	1,200.0	1,199.8	1,199.8	2.6	2.5	92.99	-1.7	33.2	33.3	28.2	5.10	6.521	ES
1,300.0	1,300.0	1,299.5	1,299.4	2.8	2.7	-92.89	-6.9	33.8	34.5	29.0	5.47	6.309	
1,400.0	1,399.8	1,399.5	1,399.1	2.9	2.9	-90.46	-13.9	34.5	36.6	30.8	5.83	6.274	
1,500.0	1,499.6	1,499.5	1,498.8	3.1	3.1	-90.92	-20.8	35.2	38.7	32.5	6.21	6.227	
1,600.0	1,599.4	1,599.4	1,598.6	3.3	3.3	-91.33	-27.7	36.0	40.8	34.2	6.62	6.168	
1,700.0	1,699.1	1,699.4	1,698.3	3.5	3.5	-91.70	-34.7	36.7	42.9	35.9	7.04	6.101	
1,800.0	1,798.9	1,799.4	1,798.0	3.7	3.7	-92.03	-41.6	37.4	45.1	37.6	7.47	6.031	
1,900.0	1,898.6	1,899.4	1,897.8	4.0	4.0	-92.34	-48.5	38.1	47.2	39.3	7.92	5.960	
2,000.0	1,998.4	1,999.4	1,997.5	4.2	4.2	-92.62	-55.5	38.9	49.3	40.9	8.37	5.889	
2,100.0	2,098.1	2,099.3	2,097.2	4.4	4.4	-92.87	-62.4	39.6	51.4	42.6	8.83	5.821	
2,200.0	2,197.9	2,199.3	2,197.0	4.6	4.7	-93.11	-69.3	40.3	53.5	44.2	9.30	5.755	
2,300.0	2,297.6	2,299.3	2,296.7	4.9	4.9	-93.32	-76.3	41.1	55.7	45.9	9.78	5.693	
2,400.0	2,397.4	2,399.3	2,396.4	5.1	5.2	-93.52	-83.2	41.8	57.8	47.5	10.26	5.633	
2,500.0	2,497.2	2,499.2	2,496.2	5.4	5.4	-93.71	-90.1	42.5	59.9	49.2	10.74	5.576	
2,600.0	2,596.9	2,599.2	2,595.9	5.6	5.7	-93.89	-97.1	43.2	62.0	50.8	11.23	5.523	
2,700.0	2,696.7	2,699.2	2,695.6	5.8	5.9	-94.05	-104.0	44.0	64.2	52.4	11.73	5.472	
2,800.0	2,796.4	2,799.2	2,795.4	6.1	6.1	-94.20	-111.0	44.7	66.3	54.1	12.22	5.424	
2,900.0	2,896.2	2,899.2	2,895.1	6.3	6.4	-94.34	-117.9	45.4	68.4	55.7	12.72	5.379	
3,000.0	2,995.9	2,999.1	2,994.8	6.6	6.7	-94.48	-124.8	46.2	70.6	57.3	13.22	5.336	
3,100.0	3,095.7	3,099.1	3,094.6	6.8	6.9	-94.60	-131.8	46.9	72.7	59.0	13.72	5.296	
3,200.0	3,195.5	3,199.1	3,194.3	7.1	7.2	-94.72	-138.7	47.6	74.8	60.6	14.23	5.258	
3,300.0	3,295.2	3,299.1	3,294.0	7.3	7.4	-94.83	-145.6	48.3	76.9	62.2	14.73	5.221	
3,400.0	3,395.0	3,399.0	3,393.8	7.6	7.7	-94.94	-152.6	49.1	79.1	63.8	15.24	5.187	
3,500.0	3,494.7	3,499.0	3,493.5	7.9	7.9	-95.04	-159.5	49.8	81.2	65.4	15.75	5.155	
3,600.0	3,594.5	3,599.0	3,593.2	8.1	8.2	-95.14	-166.4	50.5	83.3	67.1	16.26	5.124	
3,700.0	3,694.2	3,699.0	3,693.0	8.4	8.4	-95.23	-173.4	51.3	85.5	68.7	16.77	5.095	
3,800.0	3,794.0	3,798.9	3,792.7	8.6	8.7	-95.31	-180.3	52.0	87.6	70.3	17.29	5.067	
3,900.0	3,893.7	3,898.9	3,892.4	8.9	9.0	-95.40	-187.2	52.7	89.7	71.9	17.80	5.040	
4,000.0	3,993.5	3,998.9	3,992.2	9.1	9.2	-95.48	-194.2	53.5	91.8	73.5	18.31	5.015	
4,100.0	4,093.3	4,098.9	4,091.9	9.4	9.5	-95.55	-201.1	54.2	94.0	75.1	18.83	4.991	
4,200.0	4,193.0	4,198.9	4,191.6	9.7	9.7	-95.62	-208.1	54.9	96.1	76.8	19.34	4.968	
4,300.0	4,292.8	4,298.8	4,291.4	9.9	10.0	-95.69	-215.0	55.6	98.2	78.4	19.86	4.946	
4,400.0	4,392.5	4,398.8	4,391.1	10.2	10.3	-95.76	-221.9	56.4	100.4	80.0	20.38	4.925	
4,500.0	4,492.3	4,498.8	4,490.8	10.4	10.5	-95.82	-228.9	57.1	102.5	81.6	20.90	4.905	
4,600.0	4,592.0	4,598.8	4,590.6	10.7	10.8	-95.88	-235.8	57.8	104.6	83.2	21.41	4.886	
4,700.0	4,691.8	4,698.7	4,690.3	10.9	11.0	-95.94	-242.7	58.6	106.8	84.8	21.93	4.868	
4,800.0	4,791.6	4,798.7	4,790.0	11.2	11.3	-95.99	-249.7	59.3	108.9	86.4	22.45	4.850	
4,900.0	4,891.3	4,898.7	4,889.8	11.5	11.6	-96.05	-256.6	60.0	111.0	88.1	22.97	4.833	
5,000.0	4,991.1	4,998.7	4,989.5	11.7	11.8	-96.10	-263.5	60.7	113.2	89.7	23.49	4.817	
5,100.0	5,090.8	5,098.6	5,089.2	12.0	12.1	-96.15	-270.5	61.5	115.3	91.3	24.01	4.801	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1310B - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,198.6	5,189.0	12.2	12.3	-96.20	-277.4	62.2	117.4	92.9	24.53	4.787	
5,300.0	5,290.3	5,298.6	5,288.7	12.5	12.6	-96.24	-284.3	62.9	119.6	94.5	25.05	4.772	
5,337.0	5,327.3	5,335.6	5,325.6	12.6	12.7	-96.26	-286.9	63.2	120.3	95.1	25.25	4.767	
5,350.0	5,340.2	5,348.6	5,338.6	12.6	12.7	-96.31	-287.8	63.3	120.6	95.3	25.31	4.766	
5,400.0	5,389.7	5,398.4	5,388.3	12.8	12.9	-97.86	-291.3	63.7	122.2	96.6	25.60	4.772	
5,450.0	5,438.2	5,447.4	5,437.1	13.0	13.0	-101.29	-294.8	64.0	124.7	98.8	25.90	4.814	
5,500.0	5,485.4	5,495.6	5,484.8	13.2	13.1	-104.95	-301.3	64.7	129.1	102.9	26.20	4.926	
5,550.0	5,530.9	5,544.5	5,532.4	13.5	13.3	-108.15	-312.3	65.9	135.5	108.9	26.51	5.109	
5,600.0	5,574.1	5,594.0	5,579.4	13.9	13.6	-110.80	-328.0	67.5	143.7	116.9	26.83	5.355	
5,650.0	5,614.7	5,644.3	5,625.3	14.2	13.9	-112.85	-348.3	69.7	153.6	126.4	27.18	5.650	
5,700.0	5,652.3	5,695.3	5,669.6	14.6	14.2	-114.32	-373.4	72.3	164.9	137.3	27.58	5.979	
5,750.0	5,686.6	5,746.9	5,711.8	15.1	14.6	-115.23	-403.0	75.4	177.4	149.4	28.06	6.324	
5,800.0	5,717.2	5,799.3	5,751.3	15.6	15.0	-115.65	-437.1	79.0	191.1	162.4	28.66	6.666	
5,850.0	5,743.9	5,852.3	5,787.6	16.2	15.5	-115.62	-475.6	83.0	205.5	176.1	29.43	6.984	
5,900.0	5,766.5	5,906.2	5,820.3	16.8	16.1	-115.21	-518.1	87.5	220.7	190.3	30.39	7.264	
5,950.0	5,784.7	5,960.8	5,848.7	17.5	16.7	-114.47	-564.4	92.4	236.4	204.9	31.53	7.499	
6,000.0	5,798.3	6,016.2	5,872.4	18.1	17.4	-113.46	-614.2	97.6	252.5	219.7	32.85	7.687	
6,050.0	5,807.3	6,072.4	5,890.9	18.9	18.2	-112.22	-667.0	103.2	268.9	234.5	34.35	7.828	
6,100.0	5,811.5	6,129.6	5,903.7	19.6	19.0	-110.79	-722.4	109.0	285.2	249.2	35.99	7.926	
6,118.8	5,811.8	6,151.3	5,906.9	19.9	19.3	-110.21	-743.8	111.2	291.4	254.7	36.63	7.954	
6,200.0	5,811.8	6,246.0	5,911.3	21.0	20.7	-109.03	-837.8	120.9	314.0	274.5	39.49	7.953	
6,300.0	5,811.8	6,363.0	5,911.3	22.3	22.3	-107.58	-954.5	127.9	332.4	289.5	42.86	7.753	
6,400.0	5,811.8	6,471.9	5,911.3	23.8	23.9	-107.00	-1,063.4	128.7	340.8	294.8	46.00	7.407	
6,505.4	5,811.8	6,577.2	5,911.3	25.3	25.6	-106.83	-1,168.7	128.7	343.6	294.3	49.22	6.980	
6,600.0	5,811.8	6,671.9	5,911.3	26.8	27.2	-106.83	-1,263.4	128.7	343.6	291.4	52.21	6.581	
6,700.0	5,811.8	6,771.9	5,911.3	28.5	28.9	-106.83	-1,363.4	128.7	343.6	288.1	55.48	6.193	
6,800.0	5,811.8	6,871.9	5,911.3	30.2	30.6	-106.83	-1,463.4	128.7	343.6	284.8	58.81	5.843	
6,900.0	5,811.8	6,971.9	5,911.3	31.9	32.4	-106.83	-1,563.4	128.8	343.6	281.4	62.18	5.526	
7,000.0	5,811.8	7,071.9	5,911.3	33.6	34.2	-106.82	-1,663.4	128.8	343.6	278.0	65.59	5.239	
7,100.0	5,811.8	7,171.9	5,911.3	35.4	36.0	-106.82	-1,763.4	128.8	343.6	274.6	69.02	4.979	
7,200.0	5,811.8	7,271.9	5,911.3	37.2	37.8	-106.82	-1,863.4	128.8	343.6	271.2	72.49	4.741	
7,300.0	5,811.8	7,371.9	5,911.3	39.0	39.6	-106.82	-1,963.4	128.8	343.7	267.7	75.97	4.523	
7,400.0	5,811.8	7,471.9	5,911.3	40.8	41.4	-106.82	-2,063.4	128.8	343.7	264.2	79.48	4.324	
7,500.0	5,811.8	7,571.9	5,911.3	42.6	43.2	-106.82	-2,163.4	128.8	343.7	260.7	83.00	4.141	
7,600.0	5,811.8	7,671.9	5,911.3	44.4	45.1	-106.81	-2,263.4	128.8	343.7	257.1	86.54	3.971	
7,700.0	5,811.8	7,771.9	5,911.2	46.3	46.9	-106.81	-2,363.4	128.8	343.7	253.6	90.09	3.815	
7,800.0	5,811.8	7,871.9	5,911.2	48.1	48.8	-106.81	-2,463.4	128.8	343.7	250.1	93.66	3.670	
7,900.0	5,811.8	7,971.9	5,911.2	49.9	50.6	-106.81	-2,563.4	128.8	343.7	246.5	97.23	3.535	
8,000.0	5,811.8	8,071.9	5,911.2	51.8	52.5	-106.81	-2,663.4	128.8	343.7	242.9	100.82	3.409	
8,100.0	5,811.9	8,171.9	5,911.2	53.7	54.4	-106.80	-2,763.4	128.8	343.7	239.3	104.41	3.292	
8,200.0	5,811.9	8,271.9	5,911.2	55.5	56.2	-106.80	-2,863.4	128.8	343.8	235.7	108.01	3.183	
8,300.0	5,811.9	8,371.9	5,911.2	57.4	58.1	-106.80	-2,963.4	128.8	343.8	232.1	111.62	3.080	
8,400.0	5,811.9	8,471.9	5,911.2	59.2	60.0	-106.80	-3,063.4	128.8	343.8	228.5	115.23	2.983	
8,500.0	5,811.9	8,571.9	5,911.2	61.1	61.8	-106.80	-3,163.4	128.8	343.8	224.9	118.85	2.893	
8,600.0	5,811.9	8,671.9	5,911.2	63.0	63.7	-106.80	-3,263.4	128.9	343.8	221.3	122.47	2.807	
8,700.0	5,811.9	8,771.9	5,911.2	64.9	65.6	-106.79	-3,363.4	128.9	343.8	217.7	126.10	2.726	
8,800.0	5,811.9	8,871.9	5,911.2	66.7	67.5	-106.79	-3,463.4	128.9	343.8	214.1	129.74	2.650	
8,900.0	5,811.9	8,971.9	5,911.2	68.6	69.4	-106.79	-3,563.4	128.9	343.8	210.5	133.37	2.578	
9,000.0	5,811.9	9,071.9	5,911.2	70.5	71.3	-106.79	-3,663.4	128.9	343.8	206.8	137.01	2.510	
9,100.0	5,811.9	9,171.9	5,911.2	72.4	73.2	-106.79	-3,763.4	128.9	343.9	203.2	140.66	2.445	
9,200.0	5,811.9	9,271.9	5,911.2	74.3	75.1	-106.78	-3,863.4	128.9	343.9	199.6	144.31	2.383	
9,300.0	5,811.9	9,371.9	5,911.2	76.2	77.0	-106.78	-3,963.4	128.9	343.9	195.9	147.96	2.324	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1310B - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	9,471.9	5,911.2	78.1	78.9	-106.78	-4,063.4	128.9	343.9	192.3	151.61	2.268	
9,500.0	5,811.9	9,571.9	5,911.2	80.0	80.7	-106.78	-4,163.4	128.9	343.9	188.6	155.26	2.215	
9,600.0	5,811.9	9,671.9	5,911.2	81.9	82.6	-106.78	-4,263.4	128.9	343.9	185.0	158.92	2.164	
9,700.0	5,811.9	9,771.9	5,911.2	83.7	84.5	-106.77	-4,363.4	128.9	343.9	181.3	162.58	2.115	
9,800.0	5,811.9	9,871.9	5,911.2	85.6	86.4	-106.77	-4,463.4	128.9	343.9	177.7	166.24	2.069	
9,900.0	5,811.9	9,971.9	5,911.2	87.5	88.3	-106.77	-4,563.4	128.9	343.9	174.0	169.91	2.024	
10,000.0	5,811.9	10,071.9	5,911.1	89.4	90.2	-106.77	-4,663.4	128.9	344.0	170.4	173.57	1.982	
10,100.0	5,811.9	10,171.9	5,911.1	91.3	92.2	-106.77	-4,763.4	128.9	344.0	166.7	177.24	1.941	
10,200.0	5,811.9	10,271.9	5,911.1	93.2	94.1	-106.77	-4,863.4	129.0	344.0	163.1	180.91	1.901	
10,300.0	5,811.9	10,371.9	5,911.1	95.1	96.0	-106.76	-4,963.4	129.0	344.0	159.4	184.58	1.864	
10,400.0	5,811.9	10,471.9	5,911.1	97.0	97.9	-106.76	-5,063.4	129.0	344.0	155.7	188.25	1.827	
10,500.0	5,811.9	10,571.9	5,911.1	98.9	99.8	-106.76	-5,163.4	129.0	344.0	152.1	191.93	1.792	
10,600.0	5,811.9	10,671.9	5,911.1	100.9	101.7	-106.76	-5,263.4	129.0	344.0	148.4	195.60	1.759	
10,700.0	5,811.9	10,771.9	5,911.1	102.8	103.6	-106.76	-5,363.4	129.0	344.0	144.8	199.28	1.726	
10,800.0	5,811.9	10,871.9	5,911.1	104.7	105.5	-106.75	-5,463.4	129.0	344.0	141.1	202.95	1.695	
10,900.0	5,811.9	10,971.9	5,911.1	106.6	107.4	-106.75	-5,563.4	129.0	344.1	137.4	206.63	1.665	
11,000.0	5,811.9	11,071.9	5,911.1	108.5	109.3	-106.75	-5,663.4	129.0	344.1	133.8	210.31	1.636	
11,100.0	5,811.9	11,171.9	5,911.1	110.4	111.2	-106.75	-5,763.4	129.0	344.1	130.1	213.99	1.608	
11,200.0	5,811.9	11,271.9	5,911.1	112.3	113.1	-106.75	-5,863.4	129.0	344.1	126.4	217.67	1.581	
11,300.0	5,812.0	11,371.9	5,911.1	114.2	115.0	-106.75	-5,963.4	129.0	344.1	122.7	221.35	1.555	
11,400.0	5,812.0	11,471.9	5,911.1	116.1	116.9	-106.74	-6,063.4	129.0	344.1	119.1	225.04	1.529	
11,500.0	5,812.0	11,571.9	5,911.1	118.0	118.9	-106.74	-6,163.4	129.0	344.1	115.4	228.72	1.505	
11,600.0	5,812.0	11,671.9	5,911.1	119.9	120.8	-106.74	-6,263.4	129.0	344.1	111.7	232.41	1.481	Level 3
11,700.0	5,812.0	11,771.9	5,911.1	121.8	122.7	-106.74	-6,363.4	129.0	344.1	108.1	236.09	1.458	Level 3
11,800.0	5,812.0	11,871.9	5,911.1	123.7	124.6	-106.74	-6,463.4	129.1	344.2	104.4	239.78	1.435	Level 3
11,900.0	5,812.0	11,971.9	5,911.1	125.6	126.5	-106.73	-6,563.4	129.1	344.2	100.7	243.46	1.414	Level 3
12,000.0	5,812.0	12,071.9	5,911.1	127.6	128.4	-106.73	-6,663.4	129.1	344.2	97.0	247.15	1.393	Level 3
12,100.0	5,812.0	12,171.9	5,911.1	129.5	130.3	-106.73	-6,763.4	129.1	344.2	93.4	250.84	1.372	Level 3
12,200.0	5,812.0	12,271.9	5,911.1	131.4	132.2	-106.73	-6,863.4	129.1	344.2	89.7	254.53	1.352	Level 3
12,300.0	5,812.0	12,371.9	5,911.1	133.3	134.1	-106.73	-6,963.4	129.1	344.2	86.0	258.21	1.333	Level 3
12,400.0	5,812.0	12,471.9	5,911.0	135.2	136.1	-106.73	-7,063.4	129.1	344.2	82.3	261.90	1.314	Level 3
12,500.0	5,812.0	12,571.9	5,911.0	137.1	138.0	-106.72	-7,163.4	129.1	344.2	78.6	265.59	1.296	Level 3
12,600.0	5,812.0	12,671.9	5,911.0	139.0	139.9	-106.72	-7,263.4	129.1	344.2	75.0	269.28	1.278	Level 3
12,700.0	5,812.0	12,771.9	5,911.0	140.9	141.8	-106.72	-7,363.4	129.1	344.3	71.3	272.98	1.261	Level 3
12,800.0	5,812.0	12,871.9	5,911.0	142.9	143.7	-106.72	-7,463.4	129.1	344.3	67.6	276.67	1.244	Level 2
12,900.0	5,812.0	12,971.9	5,911.0	144.8	145.6	-106.72	-7,563.4	129.1	344.3	63.9	280.36	1.228	Level 2
13,000.0	5,812.0	13,071.9	5,911.0	146.7	147.5	-106.71	-7,663.4	129.1	344.3	60.2	284.05	1.212	Level 2
13,100.0	5,812.0	13,171.9	5,911.0	148.6	149.5	-106.71	-7,763.4	129.1	344.3	56.6	287.74	1.197	Level 2
13,200.0	5,812.0	13,271.9	5,911.0	150.5	151.1	-106.71	-7,863.4	129.1	344.3	53.1	291.19	1.182	Level 2
13,207.5	5,812.0	13,279.4	5,911.0	150.7	151.2	-106.71	-7,870.9	129.1	344.3	52.9	291.43	1.181	Level 2
13,221.6	5,812.0	13,293.1	5,911.0	150.9	151.4	-106.71	-7,884.6	129.1	344.3	52.4	291.90	1.180	Level 2, SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1311A - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	66.1	66.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	66.1	66.1	65.9	0.19	353.402	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	66.1	66.1	65.5	0.64	103.824	
300.0	300.0	300.0	300.0	0.5	0.5	90.01	0.0	66.1	66.1	65.0	1.09	60.851	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	66.1	66.1	64.6	1.54	43.037	
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	66.1	66.1	64.1	1.99	33.292	
600.0	600.0	600.0	600.0	1.2	1.2	90.01	0.0	66.1	66.1	63.7	2.43	27.145	
700.0	700.0	700.0	700.0	1.4	1.4	90.01	0.0	66.1	66.1	63.2	2.88	22.914	
800.0	800.0	800.0	800.0	1.7	1.7	90.01	0.0	66.1	66.1	62.8	3.33	19.824	
900.0	900.0	900.0	900.0	1.9	1.9	90.01	0.0	66.1	66.1	62.3	3.78	17.469	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.01	0.0	66.1	66.1	61.9	4.23	15.613	CC, ES
1,100.0	1,100.0	1,099.2	1,099.2	2.3	2.3	91.40	-1.6	66.7	66.7	62.0	4.65	14.336	
1,200.0	1,200.0	1,198.1	1,198.0	2.6	2.5	95.38	-6.5	68.4	68.8	63.7	5.05	13.609	
1,300.0	1,300.0	1,297.9	1,297.5	2.8	2.7	-92.52	-13.0	70.8	72.1	66.7	5.44	13.259	
1,400.0	1,399.8	1,397.9	1,397.2	2.9	2.9	-91.79	-19.5	73.2	75.7	69.9	5.81	13.032	
1,500.0	1,499.6	1,497.8	1,496.9	3.1	3.1	-92.45	-26.1	75.6	79.4	73.2	6.20	12.801	
1,600.0	1,599.4	1,597.7	1,596.6	3.3	3.3	-93.05	-32.6	78.0	83.1	76.5	6.62	12.563	
1,700.0	1,699.1	1,697.6	1,696.3	3.5	3.5	-93.61	-39.2	80.3	86.8	79.8	7.04	12.329	
1,800.0	1,798.9	1,797.6	1,796.0	3.7	3.8	-94.11	-45.7	82.7	90.5	83.1	7.48	12.102	
1,900.0	1,898.6	1,897.5	1,895.6	4.0	4.0	-94.58	-52.3	85.1	94.3	86.3	7.93	11.886	
2,000.0	1,998.4	1,997.4	1,995.3	4.2	4.2	-95.01	-58.8	87.5	98.0	89.6	8.39	11.681	
2,100.0	2,098.1	2,097.4	2,095.0	4.4	4.5	-95.41	-65.4	89.9	101.7	92.9	8.85	11.488	
2,200.0	2,197.9	2,197.3	2,194.7	4.6	4.7	-95.78	-71.9	92.3	105.5	96.1	9.33	11.307	
2,300.0	2,297.6	2,297.2	2,294.4	4.9	5.0	-96.12	-78.5	94.7	109.2	99.4	9.80	11.138	
2,400.0	2,397.4	2,397.1	2,394.1	5.1	5.2	-96.45	-85.0	97.0	112.9	102.7	10.29	10.980	
2,500.0	2,497.2	2,497.1	2,493.7	5.4	5.5	-96.75	-91.6	99.4	116.7	105.9	10.77	10.832	
2,600.0	2,596.9	2,597.0	2,593.4	5.6	5.7	-97.03	-98.1	101.8	120.5	109.2	11.26	10.694	
2,700.0	2,696.7	2,696.9	2,693.1	5.8	6.0	-97.30	-104.7	104.2	124.2	112.5	11.76	10.565	
2,800.0	2,796.4	2,796.9	2,792.8	6.1	6.2	-97.55	-111.2	106.6	128.0	115.7	12.25	10.445	
2,900.0	2,896.2	2,896.8	2,892.5	6.3	6.5	-97.78	-117.8	109.0	131.7	119.0	12.75	10.331	
3,000.0	2,995.9	2,996.7	2,992.2	6.6	6.7	-98.01	-124.3	111.3	135.5	122.2	13.25	10.225	
3,100.0	3,095.7	3,096.6	3,091.9	6.8	7.0	-98.22	-130.9	113.7	139.3	125.5	13.75	10.126	
3,200.0	3,195.5	3,196.6	3,191.5	7.1	7.2	-98.42	-137.4	116.1	143.0	128.8	14.26	10.032	
3,300.0	3,295.2	3,296.5	3,291.2	7.3	7.5	-98.61	-144.0	118.5	146.8	132.0	14.76	9.944	
3,400.0	3,395.0	3,396.4	3,390.9	7.6	7.8	-98.79	-150.5	120.9	150.6	135.3	15.27	9.861	
3,500.0	3,494.7	3,496.3	3,490.6	7.9	8.0	-98.96	-157.1	123.3	154.3	138.5	15.78	9.782	
3,600.0	3,594.5	3,596.3	3,590.3	8.1	8.3	-99.12	-163.6	125.6	158.1	141.8	16.28	9.708	
3,700.0	3,694.2	3,696.2	3,690.0	8.4	8.5	-99.28	-170.2	128.0	161.9	145.1	16.79	9.638	
3,800.0	3,794.0	3,796.1	3,789.6	8.6	8.8	-99.43	-176.7	130.4	165.6	148.3	17.31	9.572	
3,900.0	3,893.7	3,896.1	3,889.3	8.9	9.1	-99.57	-183.3	132.8	169.4	151.6	17.82	9.508	
4,000.0	3,993.5	3,996.0	3,989.0	9.1	9.3	-99.70	-189.8	135.2	173.2	154.9	18.33	9.449	
4,100.0	4,093.3	4,095.9	4,088.7	9.4	9.6	-99.83	-196.4	137.6	177.0	158.1	18.84	9.392	
4,200.0	4,193.0	4,195.8	4,188.4	9.7	9.8	-99.96	-202.9	140.0	180.8	161.4	19.36	9.337	
4,300.0	4,292.8	4,295.8	4,288.1	9.9	10.1	-100.08	-209.5	142.3	184.5	164.7	19.87	9.286	
4,400.0	4,392.5	4,395.7	4,387.8	10.2	10.4	-100.19	-216.0	144.7	188.3	167.9	20.39	9.237	
4,500.0	4,492.3	4,495.6	4,487.4	10.4	10.6	-100.30	-222.6	147.1	192.1	171.2	20.90	9.190	
4,600.0	4,592.0	4,595.6	4,587.1	10.7	10.9	-100.41	-229.2	149.5	195.9	174.5	21.42	9.145	
4,700.0	4,691.8	4,695.5	4,686.8	10.9	11.1	-100.51	-235.7	151.9	199.7	177.7	21.94	9.102	
4,800.0	4,791.6	4,795.4	4,786.5	11.2	11.4	-100.61	-242.3	154.3	203.4	181.0	22.45	9.061	
4,900.0	4,891.3	4,895.3	4,886.2	11.5	11.7	-100.70	-248.8	156.6	207.2	184.2	22.97	9.021	
5,000.0	4,991.1	4,995.3	4,985.9	11.7	11.9	-100.79	-255.4	159.0	211.0	187.5	23.49	8.984	
5,100.0	5,090.8	5,095.2	5,085.5	12.0	12.2	-100.88	-261.9	161.4	214.8	190.8	24.01	8.947	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1311A - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,195.1	5,185.2	12.2	12.4	-100.96	-268.5	163.8	218.6	194.0	24.52	8.913	
5,300.0	5,290.3	5,295.0	5,284.9	12.5	12.7	-101.05	-275.0	166.2	222.4	197.3	25.04	8.879	
5,337.0	5,327.3	5,332.0	5,321.8	12.6	12.8	-101.08	-277.4	167.1	223.8	198.5	25.23	8.867	
5,350.0	5,340.2	5,344.1	5,333.8	12.6	12.8	-101.06	-278.3	167.4	224.3	199.0	25.30	8.866	
5,400.0	5,389.7	5,387.4	5,376.8	12.8	13.0	-100.95	-283.3	169.2	227.8	202.2	25.58	8.907	
5,450.0	5,438.2	5,430.6	5,419.0	13.0	13.1	-100.75	-291.5	172.2	233.7	207.8	25.91	9.018	
5,500.0	5,485.4	5,473.4	5,460.1	13.2	13.3	-100.45	-303.0	176.4	241.8	215.5	26.30	9.192	
5,550.0	5,530.9	5,515.8	5,499.6	13.5	13.6	-100.05	-317.4	181.6	252.1	225.4	26.76	9.422	
5,600.0	5,574.1	5,557.7	5,537.3	13.9	13.8	-99.52	-334.6	187.9	264.6	237.3	27.28	9.698	
5,650.0	5,614.7	5,600.0	5,573.7	14.2	14.1	-98.89	-354.8	195.2	279.0	251.1	27.88	10.007	
5,700.0	5,652.3	5,640.1	5,606.5	14.6	14.4	-98.09	-376.4	203.1	295.2	266.7	28.54	10.343	
5,750.0	5,686.6	5,680.5	5,637.7	15.1	14.7	-97.17	-400.5	211.8	313.2	283.9	29.29	10.690	
5,800.0	5,717.2	5,720.4	5,666.5	15.6	15.1	-96.12	-426.4	221.3	332.6	302.5	30.15	11.033	
5,850.0	5,743.9	5,759.8	5,692.8	16.2	15.5	-94.94	-454.1	231.4	353.5	322.4	31.09	11.373	
5,900.0	5,766.5	5,800.0	5,717.2	16.8	16.0	-93.69	-484.1	242.3	375.6	343.5	32.10	11.700	
5,950.0	5,784.7	5,837.7	5,737.8	17.5	16.4	-92.25	-513.8	253.1	398.8	365.6	33.18	12.020	
6,000.0	5,798.3	5,876.4	5,756.5	18.1	16.9	-90.77	-545.6	264.7	422.8	388.5	34.32	12.321	
6,050.0	5,807.3	5,915.1	5,772.6	18.9	17.4	-89.23	-578.6	276.7	447.5	412.0	35.50	12.606	
6,100.0	5,811.5	5,953.9	5,786.1	19.6	17.9	-87.65	-612.8	289.1	472.8	436.1	36.73	12.872	
6,118.8	5,811.8	5,968.6	5,790.5	19.9	18.1	-87.06	-626.0	293.9	482.4	445.2	37.21	12.966	
6,200.0	5,811.8	6,035.1	5,805.4	21.0	19.1	-89.20	-686.8	316.1	523.0	483.5	39.48	13.248	
6,300.0	5,811.8	6,124.3	5,812.3	22.3	20.5	-90.06	-770.3	346.4	569.4	527.0	42.38	13.435	
6,400.0	5,811.8	6,257.8	5,812.3	23.8	22.5	-90.05	-897.3	387.4	607.7	561.7	45.98	13.218	
6,505.4	5,811.8	6,408.6	5,812.3	25.3	24.7	-90.05	-1,043.8	422.8	635.3	585.3	50.03	12.699	
6,600.0	5,811.8	6,549.4	5,812.3	26.8	26.9	-90.04	-1,182.8	445.4	650.5	596.7	53.81	12.089	
6,700.0	5,811.8	6,701.1	5,812.3	28.5	29.2	-90.04	-1,333.9	458.2	659.0	601.0	57.98	11.366	
6,800.0	5,811.8	6,830.6	5,812.3	30.2	31.3	-90.04	-1,463.4	460.1	660.2	598.4	61.84	10.676	
6,900.0	5,811.8	6,930.6	5,812.3	31.9	33.0	-90.04	-1,563.4	460.1	660.2	594.9	65.30	10.110	
7,000.0	5,811.8	7,030.6	5,812.3	33.6	34.7	-90.04	-1,663.4	460.1	660.2	591.4	68.80	9.596	
7,100.0	5,811.8	7,130.6	5,812.3	35.4	36.4	-90.04	-1,763.4	460.1	660.2	587.9	72.34	9.127	
7,200.0	5,811.8	7,230.6	5,812.3	37.2	38.1	-90.04	-1,863.4	460.1	660.2	584.3	75.91	8.698	
7,300.0	5,811.8	7,330.6	5,812.3	39.0	39.9	-90.04	-1,963.4	460.1	660.2	580.7	79.51	8.304	
7,400.0	5,811.8	7,430.6	5,812.3	40.8	41.7	-90.04	-2,063.4	460.1	660.2	577.1	83.12	7.943	
7,500.0	5,811.8	7,530.6	5,812.3	42.6	43.5	-90.04	-2,163.4	460.1	660.2	573.5	86.76	7.610	
7,600.0	5,811.8	7,630.6	5,812.3	44.4	45.3	-90.04	-2,263.4	460.0	660.2	569.8	90.41	7.303	
7,700.0	5,811.8	7,730.6	5,812.3	46.3	47.1	-90.04	-2,363.4	460.0	660.2	566.2	94.08	7.018	
7,800.0	5,811.8	7,830.6	5,812.2	48.1	48.9	-90.04	-2,463.4	460.0	660.2	562.5	97.77	6.753	
7,900.0	5,811.8	7,930.6	5,812.2	49.9	50.7	-90.03	-2,563.4	460.0	660.2	558.8	101.46	6.507	
8,000.0	5,811.8	8,030.6	5,812.2	51.8	52.5	-90.03	-2,663.4	460.0	660.2	555.1	105.17	6.278	
8,100.0	5,811.9	8,130.6	5,812.2	53.7	54.4	-90.03	-2,763.4	460.0	660.3	551.4	108.88	6.064	
8,200.0	5,811.9	8,230.6	5,812.2	55.5	56.2	-90.03	-2,863.4	460.0	660.3	547.6	112.61	5.863	
8,300.0	5,811.9	8,330.6	5,812.2	57.4	58.1	-90.03	-2,963.4	460.0	660.3	543.9	116.34	5.675	
8,400.0	5,811.9	8,430.6	5,812.2	59.2	59.9	-90.03	-3,063.4	460.0	660.3	540.2	120.08	5.499	
8,500.0	5,811.9	8,530.6	5,812.2	61.1	61.8	-90.03	-3,163.4	460.0	660.3	536.4	123.82	5.332	
8,600.0	5,811.9	8,630.6	5,812.2	63.0	63.6	-90.03	-3,263.4	460.0	660.3	532.7	127.58	5.175	
8,700.0	5,811.9	8,730.6	5,812.2	64.9	65.5	-90.03	-3,363.4	460.0	660.3	528.9	131.33	5.027	
8,800.0	5,811.9	8,830.6	5,812.2	66.7	67.4	-90.03	-3,463.4	460.0	660.3	525.2	135.09	4.887	
8,900.0	5,811.9	8,930.6	5,812.2	68.6	69.2	-90.03	-3,563.4	460.0	660.3	521.4	138.86	4.755	
9,000.0	5,811.9	9,030.6	5,812.2	70.5	71.1	-90.03	-3,663.4	460.0	660.3	517.6	142.63	4.629	
9,100.0	5,811.9	9,130.6	5,812.2	72.4	73.0	-90.03	-3,763.4	459.9	660.3	513.9	146.41	4.510	
9,200.0	5,811.9	9,230.6	5,812.2	74.3	74.8	-90.03	-3,863.4	459.9	660.3	510.1	150.18	4.396	
9,300.0	5,811.9	9,330.6	5,812.2	76.2	76.7	-90.03	-3,963.4	459.9	660.3	506.3	153.97	4.288	

Cathedral Energy Services

Anticollision Report

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1311A - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	9,430.6	5,812.2	78.1	78.6	-90.02	-4,063.4	459.9	660.3	502.5	157.75	4.186	
9,500.0	5,811.9	9,530.6	5,812.2	80.0	80.5	-90.02	-4,163.4	459.9	660.3	498.7	161.54	4.087	
9,600.0	5,811.9	9,630.6	5,812.2	81.9	82.4	-90.02	-4,263.4	459.9	660.3	494.9	165.33	3.994	
9,700.0	5,811.9	9,730.6	5,812.2	83.7	84.3	-90.02	-4,363.4	459.9	660.3	491.2	169.12	3.904	
9,800.0	5,811.9	9,830.6	5,812.2	85.6	86.2	-90.02	-4,463.4	459.9	660.3	487.4	172.91	3.819	
9,900.0	5,811.9	9,930.6	5,812.2	87.5	88.0	-90.02	-4,563.4	459.9	660.3	483.6	176.71	3.737	
10,000.0	5,811.9	10,030.6	5,812.2	89.4	89.9	-90.02	-4,663.4	459.9	660.3	479.8	180.51	3.658	
10,100.0	5,811.9	10,130.6	5,812.1	91.3	91.8	-90.02	-4,763.4	459.9	660.3	476.0	184.31	3.582	
10,200.0	5,811.9	10,230.6	5,812.1	93.2	93.7	-90.02	-4,863.4	459.9	660.3	472.2	188.11	3.510	
10,300.0	5,811.9	10,330.6	5,812.1	95.1	95.6	-90.02	-4,963.4	459.9	660.3	468.4	191.91	3.441	
10,400.0	5,811.9	10,430.6	5,812.1	97.0	97.5	-90.02	-5,063.4	459.9	660.3	464.6	195.72	3.374	
10,500.0	5,811.9	10,530.6	5,812.1	98.9	99.4	-90.02	-5,163.4	459.9	660.3	460.8	199.53	3.309	
10,600.0	5,811.9	10,630.6	5,812.1	100.9	101.3	-90.02	-5,263.4	459.9	660.3	457.0	203.33	3.247	
10,700.0	5,811.9	10,730.6	5,812.1	102.8	103.2	-90.02	-5,363.4	459.8	660.3	453.1	207.14	3.188	
10,800.0	5,811.9	10,830.6	5,812.1	104.7	105.1	-90.02	-5,463.4	459.8	660.3	449.3	210.95	3.130	
10,900.0	5,811.9	10,930.6	5,812.1	106.6	107.0	-90.02	-5,563.4	459.8	660.3	445.5	214.77	3.074	
11,000.0	5,811.9	11,030.6	5,812.1	108.5	108.9	-90.01	-5,663.4	459.8	660.3	441.7	218.58	3.021	
11,100.0	5,811.9	11,130.6	5,812.1	110.4	110.8	-90.01	-5,763.4	459.8	660.3	437.9	222.39	2.969	
11,200.0	5,811.9	11,230.6	5,812.1	112.3	112.7	-90.01	-5,863.4	459.8	660.3	434.1	226.21	2.919	
11,300.0	5,812.0	11,330.6	5,812.1	114.2	114.6	-90.01	-5,963.4	459.8	660.3	430.3	230.02	2.871	
11,400.0	5,812.0	11,430.6	5,812.1	116.1	116.5	-90.01	-6,063.4	459.8	660.3	426.5	233.84	2.824	
11,500.0	5,812.0	11,530.6	5,812.1	118.0	118.4	-90.01	-6,163.4	459.8	660.3	422.6	237.66	2.778	
11,600.0	5,812.0	11,630.6	5,812.1	119.9	120.3	-90.01	-6,263.4	459.8	660.3	418.8	241.48	2.734	
11,700.0	5,812.0	11,730.6	5,812.1	121.8	122.2	-90.01	-6,363.4	459.8	660.3	415.0	245.30	2.692	
11,800.0	5,812.0	11,830.6	5,812.1	123.7	124.1	-90.01	-6,463.4	459.8	660.3	411.2	249.12	2.651	
11,900.0	5,812.0	11,930.6	5,812.1	125.6	126.0	-90.01	-6,563.4	459.8	660.3	407.4	252.94	2.611	
12,000.0	5,812.0	12,030.6	5,812.1	127.6	128.0	-90.01	-6,663.4	459.8	660.3	403.5	256.76	2.572	
12,100.0	5,812.0	12,130.6	5,812.1	129.5	129.9	-90.01	-6,763.4	459.8	660.3	399.7	260.58	2.534	
12,200.0	5,812.0	12,230.6	5,812.1	131.4	131.8	-90.01	-6,863.4	459.8	660.3	395.9	264.40	2.497	
12,300.0	5,812.0	12,330.6	5,812.1	133.3	133.7	-90.01	-6,963.4	459.7	660.3	392.1	268.23	2.462	
12,400.0	5,812.0	12,430.6	5,812.0	135.2	135.6	-90.01	-7,063.4	459.7	660.3	388.3	272.05	2.427	
12,500.0	5,812.0	12,530.6	5,812.0	137.1	137.5	-90.00	-7,163.4	459.7	660.3	384.4	275.88	2.394	
12,600.0	5,812.0	12,630.6	5,812.0	139.0	139.4	-90.00	-7,263.4	459.7	660.3	380.6	279.70	2.361	
12,700.0	5,812.0	12,730.6	5,812.0	140.9	141.3	-90.00	-7,363.4	459.7	660.3	376.8	283.53	2.329	
12,800.0	5,812.0	12,830.6	5,812.0	142.9	143.2	-90.00	-7,463.4	459.7	660.3	373.0	287.35	2.298	
12,900.0	5,812.0	12,930.6	5,812.0	144.8	145.1	-90.00	-7,563.4	459.7	660.3	369.1	291.18	2.268	
13,000.0	5,812.0	13,030.6	5,812.0	146.7	147.0	-90.00	-7,663.4	459.7	660.3	365.3	295.01	2.238	
13,100.0	5,812.0	13,130.6	5,812.0	148.6	149.0	-90.00	-7,763.4	459.7	660.3	361.5	298.83	2.210	
13,200.0	5,812.0	13,230.6	5,812.0	150.5	150.8	-90.00	-7,863.4	459.7	660.3	357.8	302.55	2.183	
13,208.0	5,812.0	13,238.7	5,812.0	150.7	150.9	-90.00	-7,871.5	459.7	660.3	357.5	302.82	2.181	
13,221.6	5,812.0	13,250.2	5,812.0	150.9	151.1	-90.00	-7,883.0	459.7	660.3	357.1	303.27	2.177	SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1312B - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-ISCWSA MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	99.1	99.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	99.1	99.1	99.0	0.18	550.652	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	99.1	99.1	98.5	0.63	157.463	
300.0	300.0	300.0	300.0	0.5	0.5	90.01	0.0	99.1	99.1	98.1	1.08	91.866	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	99.1	99.1	97.6	1.53	64.851	
500.0	500.0	500.0	500.0	1.0	1.0	90.01	0.0	99.1	99.1	97.2	1.98	50.113	
600.0	600.0	600.0	600.0	1.2	1.2	90.01	0.0	99.1	99.1	96.7	2.43	40.834	
700.0	700.0	700.0	700.0	1.4	1.4	90.01	0.0	99.1	99.1	96.3	2.88	34.454	
800.0	800.0	800.0	800.0	1.7	1.7	90.01	0.0	99.1	99.1	95.8	3.33	29.798	
900.0	900.0	900.0	900.0	1.9	1.9	90.01	0.0	99.1	99.1	95.4	3.78	26.251	CC, ES
1,000.0	1,000.0	998.2	998.2	2.1	2.1	90.84	-1.5	100.0	100.0	95.8	4.20	23.838	
1,100.0	1,100.0	1,096.2	1,096.1	2.3	2.3	93.24	-5.8	102.6	102.8	98.2	4.60	22.355	
1,200.0	1,200.0	1,195.9	1,195.5	2.6	2.5	96.34	-11.8	106.1	106.9	101.8	5.02	21.300	
1,300.0	1,300.0	1,295.7	1,295.1	2.8	2.7	-93.20	-17.8	109.7	111.3	105.9	5.41	20.563	
1,400.0	1,399.8	1,395.6	1,394.7	2.9	2.9	-93.02	-23.8	113.2	116.0	110.2	5.79	20.013	
1,500.0	1,499.6	1,495.5	1,494.4	3.1	3.1	-93.76	-29.8	116.8	120.8	114.6	6.20	19.488	
1,600.0	1,599.4	1,595.4	1,594.0	3.3	3.3	-94.44	-35.7	120.3	125.6	119.0	6.61	18.983	
1,700.0	1,699.1	1,695.2	1,693.6	3.5	3.6	-95.07	-41.7	123.9	130.4	123.3	7.05	18.504	
1,800.0	1,798.9	1,795.1	1,793.3	3.7	3.8	-95.66	-47.7	127.4	135.2	127.7	7.49	18.055	
1,900.0	1,898.6	1,895.0	1,892.9	4.0	4.0	-96.21	-53.7	131.0	140.1	132.1	7.94	17.637	
2,000.0	1,998.4	1,994.9	1,992.5	4.2	4.3	-96.72	-59.7	134.5	145.0	136.6	8.40	17.249	
2,100.0	2,098.1	2,094.7	2,092.1	4.4	4.5	-97.19	-65.7	138.1	149.8	141.0	8.87	16.889	
2,200.0	2,197.9	2,194.6	2,191.8	4.6	4.8	-97.64	-71.7	141.6	154.7	145.4	9.34	16.557	
2,300.0	2,297.6	2,294.5	2,291.4	4.9	5.0	-98.06	-77.7	145.2	159.6	149.8	9.82	16.249	
2,400.0	2,397.4	2,394.3	2,391.0	5.1	5.3	-98.46	-83.7	148.7	164.5	154.2	10.31	15.964	
2,500.0	2,497.2	2,494.2	2,490.7	5.4	5.5	-98.83	-89.7	152.3	169.4	158.6	10.79	15.699	
2,600.0	2,596.9	2,594.1	2,590.3	5.6	5.8	-99.18	-95.7	155.9	174.4	163.1	11.28	15.454	
2,700.0	2,696.7	2,694.0	2,689.9	5.8	6.1	-99.51	-101.7	159.4	179.3	167.5	11.77	15.226	
2,800.0	2,796.4	2,793.8	2,789.6	6.1	6.3	-99.82	-107.7	163.0	184.2	171.9	12.27	15.014	
2,900.0	2,896.2	2,893.7	2,889.2	6.3	6.6	-100.12	-113.6	166.5	189.1	176.4	12.77	14.816	
3,000.0	2,995.9	2,993.6	2,988.8	6.6	6.8	-100.40	-119.6	170.1	194.1	180.8	13.27	14.631	
3,100.0	3,095.7	3,093.5	3,088.4	6.8	7.1	-100.67	-125.6	173.6	199.0	185.3	13.77	14.458	
3,200.0	3,195.5	3,193.3	3,188.1	7.1	7.3	-100.93	-131.6	177.2	204.0	189.7	14.27	14.296	
3,300.0	3,295.2	3,293.2	3,287.7	7.3	7.6	-101.17	-137.6	180.7	208.9	194.2	14.77	14.143	
3,400.0	3,395.0	3,393.1	3,387.3	7.6	7.9	-101.40	-143.6	184.3	213.9	198.6	15.28	14.000	
3,500.0	3,494.7	3,493.0	3,487.0	7.9	8.1	-101.63	-149.6	187.8	218.8	203.1	15.78	13.866	
3,600.0	3,594.5	3,592.8	3,586.6	8.1	8.4	-101.84	-155.6	191.4	223.8	207.5	16.29	13.739	
3,700.0	3,694.2	3,692.7	3,686.2	8.4	8.6	-102.04	-161.6	194.9	228.8	212.0	16.80	13.619	
3,800.0	3,794.0	3,792.6	3,785.9	8.6	8.9	-102.23	-167.6	198.5	233.7	216.4	17.31	13.506	
3,900.0	3,893.7	3,892.5	3,885.5	8.9	9.2	-102.42	-173.6	202.1	238.7	220.9	17.82	13.398	
4,000.0	3,993.5	3,992.3	3,985.1	9.1	9.4	-102.60	-179.6	205.6	243.7	225.3	18.33	13.297	
4,100.0	4,093.3	4,092.2	4,084.7	9.4	9.7	-102.77	-185.6	209.2	248.6	229.8	18.84	13.200	
4,200.0	4,193.0	4,192.1	4,184.4	9.7	9.9	-102.93	-191.5	212.7	253.6	234.3	19.35	13.108	
4,300.0	4,292.8	4,291.9	4,284.0	9.9	10.2	-103.09	-197.5	216.3	258.6	238.7	19.86	13.021	
4,400.0	4,392.5	4,391.8	4,383.6	10.2	10.5	-103.24	-203.5	219.8	263.6	243.2	20.37	12.938	
4,500.0	4,492.3	4,491.7	4,483.3	10.4	10.7	-103.39	-209.5	223.4	268.6	247.7	20.89	12.859	
4,600.0	4,592.0	4,591.6	4,582.9	10.7	11.0	-103.53	-215.5	226.9	273.6	252.2	21.40	12.783	
4,700.0	4,691.8	4,691.4	4,682.5	10.9	11.2	-103.67	-221.5	230.5	278.5	256.6	21.91	12.711	
4,800.0	4,791.6	4,791.3	4,782.2	11.2	11.5	-103.80	-227.5	234.0	283.5	261.1	22.43	12.642	
4,900.0	4,891.3	4,891.2	4,881.8	11.5	11.8	-103.92	-233.5	237.6	288.5	265.6	22.94	12.576	
5,000.0	4,991.1	4,991.1	4,981.4	11.7	12.0	-104.05	-239.5	241.1	293.5	270.0	23.46	12.512	
5,100.0	5,090.8	5,090.9	5,081.0	12.0	12.3	-104.17	-245.5	244.7	298.5	274.5	23.97	12.452	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1312B - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,190.6	5,190.8	5,180.7	12.2	12.5	-104.28	-251.5	248.3	303.5	279.0	24.49	12.394	
5,300.0	5,290.3	5,290.7	5,280.3	12.5	12.8	-104.39	-257.5	251.8	308.5	283.5	25.00	12.338	
5,337.0	5,327.3	5,327.6	5,317.2	12.6	12.9	-104.43	-259.7	253.1	310.3	285.1	25.19	12.318	
5,350.0	5,340.2	5,340.6	5,330.1	12.6	12.9	-104.40	-260.5	253.6	311.0	285.8	25.26	12.314	
5,400.0	5,389.7	5,390.3	5,379.7	12.8	13.1	-104.73	-263.4	255.4	314.4	288.9	25.52	12.321	
5,450.0	5,438.2	5,438.9	5,428.2	13.0	13.2	-105.69	-266.4	257.1	319.2	293.4	25.80	12.373	
5,500.0	5,485.4	5,477.3	5,466.3	13.2	13.3	-106.43	-270.0	259.2	326.4	300.3	26.08	12.515	
5,550.0	5,530.9	5,515.5	5,503.8	13.5	13.5	-106.94	-276.0	262.8	336.7	310.3	26.39	12.758	
5,600.0	5,574.1	5,550.0	5,537.3	13.9	13.6	-107.02	-283.4	267.2	350.1	323.4	26.74	13.095	
5,650.0	5,614.7	5,590.6	5,575.7	14.2	13.8	-107.11	-294.6	273.8	366.4	339.2	27.16	13.491	
5,700.0	5,652.3	5,627.3	5,609.5	14.6	14.0	-106.74	-306.9	281.1	385.5	357.8	27.64	13.946	
5,750.0	5,686.6	5,663.3	5,641.6	15.1	14.2	-106.03	-320.9	289.4	407.1	378.9	28.20	14.436	
5,800.0	5,717.2	5,700.0	5,673.1	15.6	14.5	-105.06	-337.1	299.1	431.1	402.2	28.85	14.939	
5,850.0	5,743.9	5,733.2	5,700.3	16.2	14.8	-103.61	-353.4	308.7	457.2	427.6	29.61	15.439	
5,900.0	5,766.5	5,767.0	5,726.8	16.8	15.0	-101.90	-371.5	319.4	485.2	454.7	30.47	15.925	
5,950.0	5,784.7	5,800.0	5,751.3	17.5	15.3	-99.88	-390.5	330.7	514.8	483.4	31.42	16.385	
6,000.0	5,798.3	5,832.6	5,774.1	18.1	15.7	-97.57	-410.6	342.6	545.9	513.4	32.48	16.809	
6,050.0	5,807.3	5,864.5	5,794.9	18.9	16.0	-95.00	-431.4	354.9	578.2	544.7	33.58	17.222	
6,100.0	5,811.5	5,896.0	5,814.0	19.6	16.4	-92.21	-452.9	367.7	611.5	576.8	34.69	17.628	
6,118.8	5,811.8	5,907.8	5,820.7	19.9	16.5	-91.11	-461.3	372.7	624.3	589.2	35.11	17.780	
6,200.0	5,811.8	5,963.0	5,849.3	21.0	17.2	-94.22	-501.9	396.8	678.8	642.0	36.82	18.435	
6,300.0	5,811.8	6,044.0	5,881.7	22.3	18.3	-96.91	-565.6	434.5	743.2	704.1	39.06	19.025	
6,400.0	5,811.8	6,138.5	5,904.6	23.8	19.8	-98.08	-644.3	481.2	802.8	761.1	41.78	19.215	
6,505.4	5,811.8	6,261.3	5,910.8	25.3	21.7	-97.59	-749.9	543.3	859.0	813.6	45.38	18.929	
6,600.0	5,811.8	6,416.8	5,910.8	26.8	24.1	-96.94	-888.4	614.1	901.8	852.6	49.26	18.307	
6,700.0	5,811.8	6,594.8	5,910.8	28.5	27.0	-96.41	-1,053.3	680.9	939.2	885.4	53.86	17.438	
6,800.0	5,811.8	6,785.3	5,910.8	30.2	30.1	-96.04	-1,235.8	735.1	967.6	908.7	58.86	16.440	
6,900.0	5,811.8	6,985.4	5,910.8	31.9	33.4	-95.82	-1,432.4	772.1	986.0	921.9	64.10	15.382	
7,000.0	5,811.8	7,191.4	5,910.8	33.6	36.7	-95.72	-1,637.6	788.6	994.0	924.6	69.43	14.317	
7,100.0	5,811.8	7,317.1	5,910.8	35.4	38.6	-95.72	-1,763.3	789.2	994.3	921.0	73.32	13.561	
7,200.0	5,811.8	7,417.1	5,910.8	37.2	40.3	-95.72	-1,863.3	789.2	994.3	917.5	76.81	12.945	
7,300.0	5,811.8	7,517.1	5,910.8	39.0	41.9	-95.72	-1,963.3	789.2	994.3	914.0	80.34	12.377	
7,400.0	5,811.8	7,617.1	5,910.8	40.8	43.6	-95.71	-2,063.3	789.2	994.4	910.5	83.89	11.853	
7,500.0	5,811.8	7,717.1	5,910.8	42.6	45.3	-95.71	-2,163.3	789.2	994.4	906.9	87.46	11.369	
7,600.0	5,811.8	7,817.1	5,910.9	44.4	47.0	-95.71	-2,263.3	789.2	994.4	903.3	91.06	10.920	
7,700.0	5,811.8	7,917.1	5,910.9	46.3	48.7	-95.71	-2,363.3	789.2	994.4	899.7	94.67	10.503	
7,800.0	5,811.8	8,017.1	5,910.9	48.1	50.4	-95.71	-2,463.3	789.2	994.4	896.1	98.30	10.116	
7,900.0	5,811.8	8,117.1	5,910.9	49.9	52.2	-95.71	-2,563.3	789.3	994.4	892.5	101.95	9.754	
8,000.0	5,811.8	8,217.1	5,910.9	51.8	53.9	-95.71	-2,663.3	789.3	994.4	888.8	105.61	9.416	
8,100.0	5,811.9	8,317.1	5,910.9	53.7	55.7	-95.71	-2,763.3	789.3	994.4	885.2	109.28	9.100	
8,200.0	5,811.9	8,417.1	5,910.9	55.5	57.5	-95.71	-2,863.3	789.3	994.5	881.5	112.96	8.804	
8,300.0	5,811.9	8,517.1	5,910.9	57.4	59.2	-95.71	-2,963.3	789.3	994.5	877.8	116.65	8.525	
8,400.0	5,811.9	8,617.1	5,910.9	59.2	61.0	-95.71	-3,063.3	789.3	994.5	874.1	120.35	8.263	
8,500.0	5,811.9	8,717.1	5,910.9	61.1	62.8	-95.71	-3,163.3	789.3	994.5	870.4	124.05	8.017	
8,600.0	5,811.9	8,817.1	5,910.9	63.0	64.6	-95.71	-3,263.3	789.3	994.5	866.7	127.77	7.784	
8,700.0	5,811.9	8,917.1	5,910.9	64.9	66.5	-95.71	-3,363.3	789.3	994.5	863.0	131.49	7.563	
8,800.0	5,811.9	9,017.1	5,910.9	66.7	68.3	-95.71	-3,463.3	789.3	994.5	859.3	135.22	7.355	
8,900.0	5,811.9	9,117.1	5,910.9	68.6	70.1	-95.71	-3,563.3	789.3	994.5	855.6	138.95	7.158	
9,000.0	5,811.9	9,217.1	5,910.9	70.5	71.9	-95.71	-3,663.3	789.3	994.5	851.9	142.69	6.970	
9,100.0	5,811.9	9,317.1	5,910.9	72.4	73.8	-95.71	-3,763.3	789.3	994.6	848.1	146.43	6.792	
9,200.0	5,811.9	9,417.1	5,910.9	74.3	75.6	-95.71	-3,863.3	789.3	994.6	844.4	150.17	6.623	
9,300.0	5,811.9	9,517.1	5,910.9	76.2	77.5	-95.71	-3,963.3	789.3	994.6	840.7	153.92	6.462	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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 S12-T10N-R58W - Razor Federal #12G-1312B - HZ - Plan #1

Survey Program: 0-ISCWSA MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
9,400.0	5,811.9	9,617.1	5,910.9	78.1	79.3	-95.71	-4,063.3	789.3	994.6	836.9	157.68	6.308	
9,500.0	5,811.9	9,717.1	5,910.9	80.0	81.2	-95.71	-4,163.3	789.3	994.6	833.2	161.44	6.161	
9,600.0	5,811.9	9,817.1	5,910.9	81.9	83.0	-95.71	-4,263.3	789.3	994.6	829.4	165.20	6.021	
9,700.0	5,811.9	9,917.1	5,910.9	83.7	84.9	-95.71	-4,363.3	789.3	994.6	825.7	168.96	5.887	
9,800.0	5,811.9	10,017.1	5,910.9	85.6	86.7	-95.71	-4,463.3	789.3	994.6	821.9	172.73	5.758	
9,900.0	5,811.9	10,117.1	5,910.9	87.5	88.6	-95.71	-4,563.3	789.3	994.7	818.2	176.50	5.636	
10,000.0	5,811.9	10,217.1	5,910.9	89.4	90.5	-95.71	-4,663.3	789.3	994.7	814.4	180.27	5.518	
10,100.0	5,811.9	10,317.1	5,910.9	91.3	92.3	-95.71	-4,763.3	789.3	994.7	810.6	184.04	5.405	
10,200.0	5,811.9	10,417.1	5,910.9	93.2	94.2	-95.71	-4,863.3	789.3	994.7	806.9	187.82	5.296	
10,300.0	5,811.9	10,517.1	5,910.9	95.1	96.1	-95.71	-4,963.3	789.4	994.7	803.1	191.60	5.192	
10,400.0	5,811.9	10,617.1	5,910.9	97.0	98.0	-95.71	-5,063.3	789.4	994.7	799.3	195.38	5.091	
10,500.0	5,811.9	10,717.1	5,910.9	98.9	99.8	-95.71	-5,163.3	789.4	994.7	795.6	199.16	4.995	
10,600.0	5,811.9	10,817.1	5,910.9	100.9	101.7	-95.71	-5,263.3	789.4	994.7	791.8	202.94	4.902	
10,700.0	5,811.9	10,917.1	5,910.9	102.8	103.6	-95.71	-5,363.3	789.4	994.7	788.0	206.73	4.812	
10,800.0	5,811.9	11,017.1	5,910.9	104.7	105.5	-95.71	-5,463.3	789.4	994.8	784.2	210.51	4.725	
10,900.0	5,811.9	11,117.1	5,910.9	106.6	107.4	-95.71	-5,563.3	789.4	994.8	780.5	214.30	4.642	
11,000.0	5,811.9	11,217.1	5,910.9	108.5	109.2	-95.71	-5,663.3	789.4	994.8	776.7	218.09	4.561	
11,100.0	5,811.9	11,317.1	5,911.0	110.4	111.1	-95.71	-5,763.3	789.4	994.8	772.9	221.88	4.483	
11,200.0	5,811.9	11,417.1	5,911.0	112.3	113.0	-95.71	-5,863.3	789.4	994.8	769.1	225.67	4.408	
11,300.0	5,812.0	11,517.1	5,911.0	114.2	114.9	-95.71	-5,963.3	789.4	994.8	765.3	229.47	4.335	
11,400.0	5,812.0	11,617.1	5,911.0	116.1	116.8	-95.71	-6,063.3	789.4	994.8	761.6	233.26	4.265	
11,500.0	5,812.0	11,717.1	5,911.0	118.0	118.7	-95.71	-6,163.3	789.4	994.8	757.8	237.06	4.197	
11,600.0	5,812.0	11,817.1	5,911.0	119.9	120.6	-95.71	-6,263.3	789.4	994.8	754.0	240.85	4.131	
11,700.0	5,812.0	11,917.1	5,911.0	121.8	122.5	-95.71	-6,363.3	789.4	994.9	750.2	244.65	4.066	
11,800.0	5,812.0	12,017.1	5,911.0	123.7	124.3	-95.71	-6,463.3	789.4	994.9	746.4	248.45	4.004	
11,900.0	5,812.0	12,117.1	5,911.0	125.6	126.2	-95.71	-6,563.3	789.4	994.9	742.6	252.25	3.944	
12,000.0	5,812.0	12,217.1	5,911.0	127.6	128.1	-95.71	-6,663.3	789.4	994.9	738.8	256.05	3.886	
12,100.0	5,812.0	12,317.1	5,911.0	129.5	130.0	-95.71	-6,763.3	789.4	994.9	735.1	259.85	3.829	
12,200.0	5,812.0	12,417.1	5,911.0	131.4	131.9	-95.71	-6,863.3	789.4	994.9	731.3	263.65	3.774	
12,300.0	5,812.0	12,517.1	5,911.0	133.3	133.8	-95.71	-6,963.3	789.4	994.9	727.5	267.45	3.720	
12,400.0	5,812.0	12,617.1	5,911.0	135.2	135.7	-95.71	-7,063.3	789.4	994.9	723.7	271.26	3.668	
12,500.0	5,812.0	12,717.1	5,911.0	137.1	137.6	-95.71	-7,163.3	789.4	995.0	719.9	275.06	3.617	
12,600.0	5,812.0	12,817.1	5,911.0	139.0	139.5	-95.71	-7,263.3	789.4	995.0	716.1	278.86	3.568	
12,700.0	5,812.0	12,917.1	5,911.0	140.9	141.4	-95.71	-7,363.3	789.4	995.0	712.3	282.67	3.520	
12,800.0	5,812.0	13,017.1	5,911.0	142.9	143.3	-95.71	-7,463.3	789.5	995.0	708.5	286.48	3.473	
12,900.0	5,812.0	13,117.1	5,911.0	144.8	145.2	-95.71	-7,563.3	789.5	995.0	704.7	290.28	3.428	
13,000.0	5,812.0	13,217.1	5,911.0	146.7	147.1	-95.71	-7,663.3	789.5	995.0	700.9	294.09	3.383	
13,100.0	5,812.0	13,317.1	5,911.0	148.6	149.0	-95.71	-7,763.3	789.5	995.0	697.1	297.90	3.340	
13,200.0	5,812.0	13,417.1	5,911.0	150.5	150.9	-95.71	-7,863.3	789.5	995.0	693.4	301.64	3.299	
13,207.1	5,812.0	13,424.3	5,911.0	150.6	151.0	-95.71	-7,870.5	789.5	995.0	693.2	301.88	3.296	
13,221.6	5,812.0	13,435.8	5,911.0	150.9	151.2	-95.71	-7,882.0	789.5	995.0	692.7	302.34	3.291	SF

Company:	Whiting Petroleum Corporation	**Local Co-ordinate Reference:**	Well Razor Federal #12G-1309A
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Reference Site:	S12-T10N-R58W	**MD Reference:**	WELL @ 4970.3ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Razor Federal #12G-1309A	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**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

Reference Depths are relative to WELL @ 4970.3ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Razor Federal #12G-1309A
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 1.09°