



Project: Weld County, CO  
Site: Sec 12-T10N-R58W  
Well: Razor Federal #12H-1316B  
Wellbore: Hz  
Design: APD

PROJECT DETAILS: Weld County, CO  
Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level



Azimuths to True North  
Magnetic North: 7.90°  
Magnetic Field  
Strength: 52918.6snT  
Dip Angle: 67.41°  
Date: 10/1/2015  
Model: IGRF2015

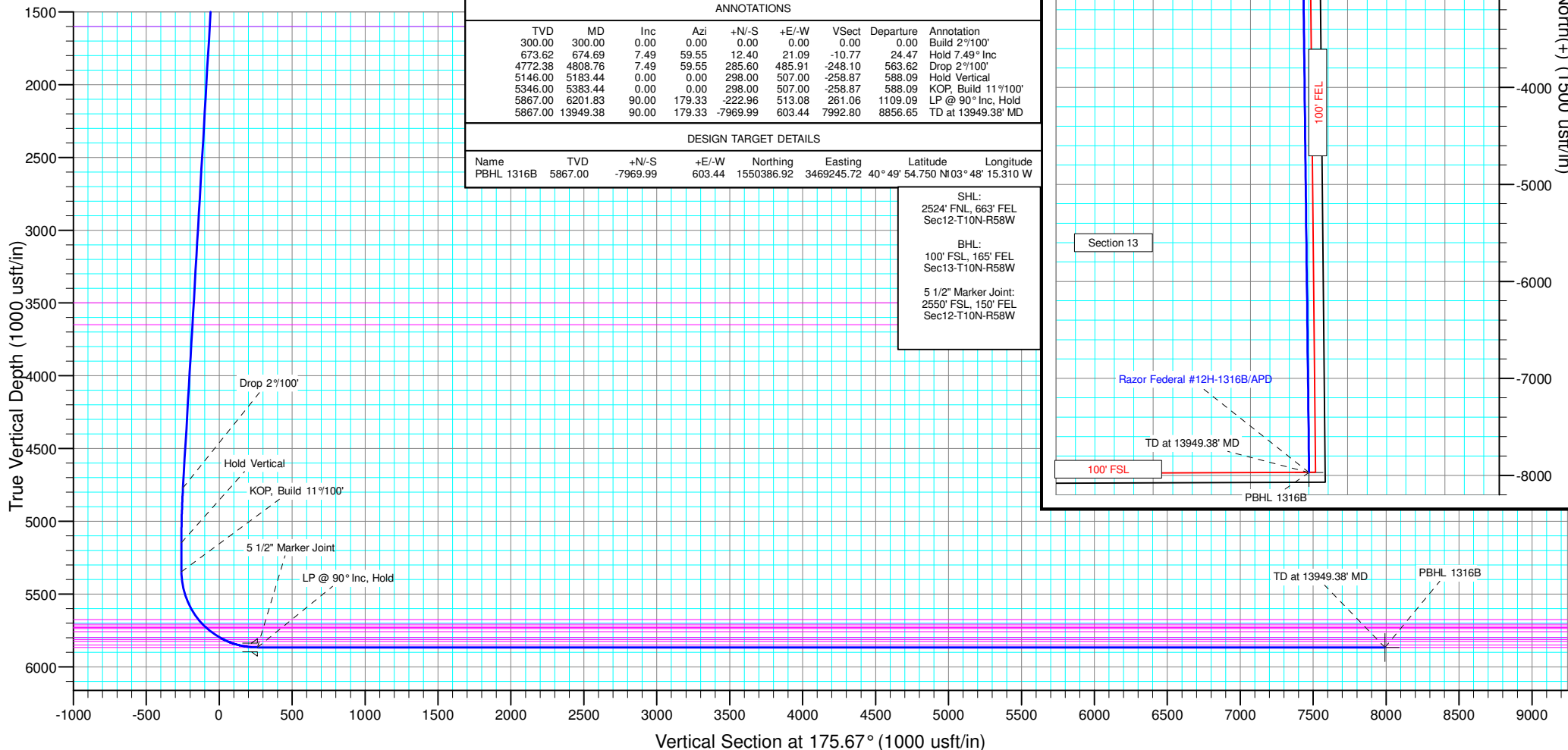
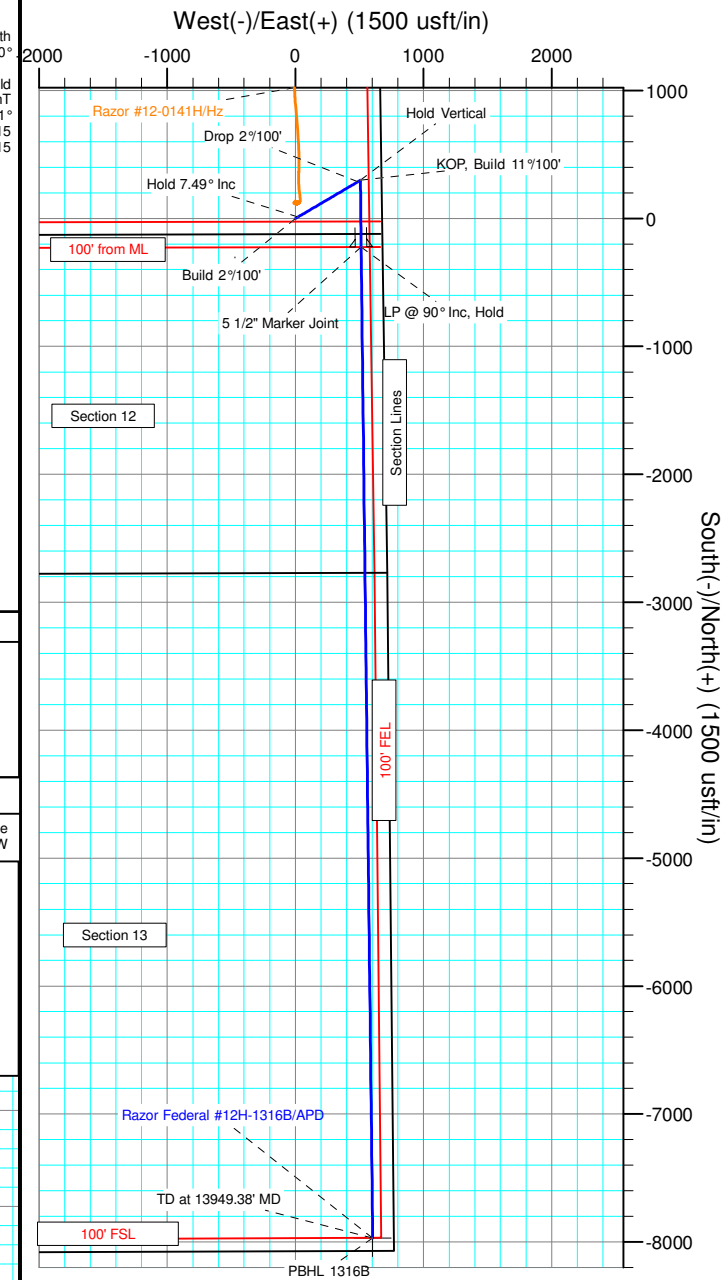
#### WELL DETAILS: Razor Federal #12H-1316B

+N/-S	+E/-W	Northing	Ground Level:	4947.00	Latitude	Longitude	Slot
0.00	0.00	1558343.93	Easting	3468490.19	40° 51' 13.500 N	103° 48' 23.160 W	

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
3	674.69	7.49	59.55	673.62	12.40	21.09	2.00	59.55	-10.77	
4	4808.76	7.49	59.55	4772.38	285.60	485.91	0.00	0.00	-248.10	
5	5183.44	0.00	0.00	5146.00	298.00	507.00	2.00	180.00	-258.87	
6	5383.44	0.00	0.00	5346.00	298.00	507.00	0.00	0.00	-258.87	
7	6201.83	90.00	179.33	5867.00	-222.96	513.08	11.00	179.33	261.06	
8	13949.38	90.00	179.33	5867.00	-7969.99	603.44	0.00	0.00	7992.80	PBHL 1316B

TVDPath	MDPath	Formation
1600.00	1609.05	Upper Pierre
3500.00	3525.42	Hygiene
3650.00	3676.71	Lower Pierre
5676.00	5740.82	P200 Marker
5707.00	5782.27	P300 Marker
5721.00	5802.05	P350 Marker
5730.00	5815.19	Sharon Springs
5737.00	5825.66	Niobrara
5759.00	5860.28	Top A Chalk
5798.00	5930.64	Top A Marl
5814.00	5964.79	A Marl
5825.00	5991.20	Top Upper B
5851.00	6072.38	Base Upper B
5867.00	6201.83	Top Lower B





# **Whiting Petroleum Corp.**

**Weld County, CO**

**Sec 12-T10N-R58W**

**Razor Federal #12H-1316B**

**Hz**

**Plan: APD**

## **Standard Planning Report**

**14 December, 2015**



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12H-1316B
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4968.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4968.00usft
<b>Site:</b>	Sec 12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12H-1316B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

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

Site		Sec 12-T10N-R58W			
Site Position:		Northing:	1,560,767.76 usft	Latitude:	40° 51' 38.329 N
From:	Lat/Long	Easting:	3,463,779.63 usft	Longitude:	103° 49' 23.851 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	1.08 °

Well		Razor Federal #12H-1316B				
Well Position	+N/-S	-2,512.45 usft	Northing:	1,558,343.93 usft	Latitude:	40° 51' 13.500 N
	+E/-W	4,663.89 usft	Easting:	3,468,490.19 usft	Longitude:	103° 48' 23.160 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,947.00 usft

<b>Wellbore</b>	Hz				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	10/1/2015	7.90	67.41	52,919

<b>Design</b>	APD			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	175.67

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
674.69	7.49	59.55	673.62	12.40	21.09	2.00	2.00	0.00	59.55	
4,808.76	7.49	59.55	4,772.38	285.60	485.91	0.00	0.00	0.00	0.00	
5,183.44	0.00	0.00	5,146.00	298.00	507.00	2.00	-2.00	0.00	180.00	
5,383.44	0.00	0.00	5,346.00	298.00	507.00	0.00	0.00	0.00	0.00	
6,201.83	90.00	179.33	5,867.00	-222.96	513.08	11.00	11.00	0.00	179.33	
13,949.38	90.00	179.33	5,867.00	-7,969.99	603.44	0.00	0.00	0.00	0.00	PBHL 1316B



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12H-1316B
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4968.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4968.00usft
<b>Site:</b>	Sec 12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12H-1316B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Build 2°/100'</b>									
400.00	2.00	59.55	399.98	0.88	1.50	-0.77	2.00	2.00	0.00
500.00	4.00	59.55	499.84	3.54	6.02	-3.07	2.00	2.00	0.00
600.00	6.00	59.55	599.45	7.95	13.53	-6.91	2.00	2.00	0.00
674.69	7.49	59.55	673.62	12.40	21.09	-10.77	2.00	2.00	0.00
<b>Hold 7.49° Inc</b>									
700.00	7.49	59.55	698.72	14.07	23.94	-12.22	0.00	0.00	0.00
800.00	7.49	59.55	797.86	20.68	35.18	-17.96	0.00	0.00	0.00
900.00	7.49	59.55	897.01	27.29	46.43	-23.71	0.00	0.00	0.00
1,000.00	7.49	59.55	996.15	33.90	57.67	-29.45	0.00	0.00	0.00
1,100.00	7.49	59.55	1,095.30	40.51	68.91	-35.19	0.00	0.00	0.00
1,200.00	7.49	59.55	1,194.45	47.11	80.16	-40.93	0.00	0.00	0.00
1,300.00	7.49	59.55	1,293.59	53.72	91.40	-46.67	0.00	0.00	0.00
1,400.00	7.49	59.55	1,392.74	60.33	102.64	-52.41	0.00	0.00	0.00
1,500.00	7.49	59.55	1,491.88	66.94	113.89	-58.15	0.00	0.00	0.00
1,600.00	7.49	59.55	1,591.03	73.55	125.13	-63.89	0.00	0.00	0.00
1,609.05	7.49	59.55	1,600.00	74.15	126.15	-64.41	0.00	0.00	0.00
<b>Upper Pierre</b>									
1,700.00	7.49	59.55	1,690.18	80.16	136.37	-69.63	0.00	0.00	0.00
1,800.00	7.49	59.55	1,789.32	86.77	147.62	-75.37	0.00	0.00	0.00
1,900.00	7.49	59.55	1,888.47	93.37	158.86	-81.11	0.00	0.00	0.00
2,000.00	7.49	59.55	1,987.61	99.98	170.10	-86.85	0.00	0.00	0.00
2,100.00	7.49	59.55	2,086.76	106.59	181.35	-92.60	0.00	0.00	0.00
2,200.00	7.49	59.55	2,185.91	113.20	192.59	-98.34	0.00	0.00	0.00
2,300.00	7.49	59.55	2,285.05	119.81	203.84	-104.08	0.00	0.00	0.00
2,400.00	7.49	59.55	2,384.20	126.42	215.08	-109.82	0.00	0.00	0.00
2,500.00	7.49	59.55	2,483.34	133.03	226.32	-115.56	0.00	0.00	0.00
2,600.00	7.49	59.55	2,582.49	139.63	237.57	-121.30	0.00	0.00	0.00
2,700.00	7.49	59.55	2,681.63	146.24	248.81	-127.04	0.00	0.00	0.00
2,800.00	7.49	59.55	2,780.78	152.85	260.05	-132.78	0.00	0.00	0.00
2,900.00	7.49	59.55	2,879.93	159.46	271.30	-138.52	0.00	0.00	0.00
3,000.00	7.49	59.55	2,979.07	166.07	282.54	-144.26	0.00	0.00	0.00
3,100.00	7.49	59.55	3,078.22	172.68	293.78	-150.00	0.00	0.00	0.00
3,200.00	7.49	59.55	3,177.36	179.29	305.03	-155.75	0.00	0.00	0.00
3,300.00	7.49	59.55	3,276.51	185.89	316.27	-161.49	0.00	0.00	0.00
3,400.00	7.49	59.55	3,375.66	192.50	327.51	-167.23	0.00	0.00	0.00
3,500.00	7.49	59.55	3,474.80	199.11	338.76	-172.97	0.00	0.00	0.00
3,525.42	7.49	59.55	3,500.00	200.79	341.61	-174.43	0.00	0.00	0.00
<b>Hygiene</b>									
3,600.00	7.49	59.55	3,573.95	205.72	350.00	-178.71	0.00	0.00	0.00
3,676.71	7.49	59.55	3,650.00	210.79	358.62	-183.11	0.00	0.00	0.00
<b>Lower Pierre</b>									
3,700.00	7.49	59.55	3,673.09	212.33	361.24	-184.45	0.00	0.00	0.00
3,800.00	7.49	59.55	3,772.24	218.94	372.49	-190.19	0.00	0.00	0.00
3,900.00	7.49	59.55	3,871.39	225.55	383.73	-195.93	0.00	0.00	0.00
4,000.00	7.49	59.55	3,970.53	232.15	394.97	-201.67	0.00	0.00	0.00
4,100.00	7.49	59.55	4,069.68	238.76	406.22	-207.41	0.00	0.00	0.00
4,200.00	7.49	59.55	4,168.82	245.37	417.46	-213.15	0.00	0.00	0.00
4,300.00	7.49	59.55	4,267.97	251.98	428.70	-218.89	0.00	0.00	0.00
4,400.00	7.49	59.55	4,367.12	258.59	439.95	-224.64	0.00	0.00	0.00



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<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4968.00usft
<b>Site:</b>	Sec 12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12H-1316B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,500.00	7.49	59.55	4,466.26	265.20	451.19	-230.38	0.00	0.00	0.00
4,600.00	7.49	59.55	4,565.41	271.81	462.43	-236.12	0.00	0.00	0.00
4,700.00	7.49	59.55	4,664.55	278.41	473.68	-241.86	0.00	0.00	0.00
4,800.00	7.49	59.55	4,763.70	285.02	484.92	-247.60	0.00	0.00	0.00
4,808.76	7.49	59.55	4,772.38	285.60	485.91	-248.10	0.00	0.00	0.00
<b>Drop 2°/100'</b>									
4,900.00	5.67	59.55	4,863.02	290.90	494.92	-252.70	2.00	-2.00	0.00
5,000.00	3.67	59.55	4,962.68	295.02	501.94	-256.29	2.00	-2.00	0.00
5,100.00	1.67	59.55	5,062.57	297.38	505.95	-258.34	2.00	-2.00	0.00
5,183.44	0.00	0.00	5,146.00	298.00	507.00	-258.87	2.00	-2.00	0.00
<b>Hold Vertical</b>									
5,200.00	0.00	0.00	5,162.56	298.00	507.00	-258.87	0.00	0.00	0.00
5,300.00	0.00	0.00	5,262.56	298.00	507.00	-258.87	0.00	0.00	0.00
5,383.44	0.00	0.00	5,346.00	298.00	507.00	-258.87	0.00	0.00	0.00
<b>KOP, Build 11°/100'</b>									
5,400.00	1.82	179.33	5,362.55	297.74	507.00	-258.61	11.00	11.00	0.00
5,500.00	12.82	179.33	5,461.59	285.02	507.15	-245.92	11.00	11.00	0.00
5,600.00	23.82	179.33	5,556.37	253.64	507.52	-214.60	11.00	11.00	0.00
5,700.00	34.81	179.33	5,643.44	204.76	508.09	-165.82	11.00	11.00	0.00
5,740.82	39.30	179.33	5,676.00	180.17	508.37	-141.28	11.00	11.00	0.00
<b>P200 Marker</b>									
5,782.27	43.86	179.33	5,707.00	152.67	508.70	-113.83	11.00	11.00	0.00
<b>P300 Marker</b>									
5,800.00	45.81	179.33	5,719.57	140.17	508.84	-101.35	11.00	11.00	0.00
5,802.05	46.04	179.33	5,721.00	138.70	508.86	-99.88	11.00	11.00	0.00
<b>P350 Marker</b>									
5,815.19	47.48	179.33	5,730.00	129.13	508.97	-90.33	11.00	11.00	0.00
<b>Sharon Springs</b>									
5,825.66	48.63	179.33	5,737.00	121.34	509.06	-82.56	11.00	11.00	0.00
<b>Niobrara</b>									
5,860.28	52.44	179.33	5,759.00	94.62	509.37	-55.89	11.00	11.00	0.00
<b>Top A Chalk</b>									
5,900.00	56.81	179.33	5,781.99	62.24	509.75	-23.58	11.00	11.00	0.00
5,930.64	60.18	179.33	5,798.00	36.13	510.05	2.49	11.00	11.00	0.00
<b>Top A Marl</b>									
5,964.79	63.93	179.33	5,814.00	5.97	510.41	32.58	11.00	11.00	0.00
<b>A Marl</b>									
5,991.20	66.84	179.33	5,825.00	-18.04	510.69	56.54	11.00	11.00	0.00
<b>Top Upper B</b>									
6,000.00	67.80	179.33	5,828.39	-26.16	510.78	64.65	11.00	11.00	0.00
6,072.38	75.76	179.33	5,851.00	-94.85	511.58	133.20	11.00	11.00	0.00
<b>Base Upper B</b>									
6,100.00	78.80	179.33	5,857.08	-121.79	511.90	160.09	11.00	11.00	0.00
6,200.00	89.80	179.33	5,867.00	-221.14	513.06	259.24	11.00	11.00	0.00
6,201.83	90.00	179.33	5,867.00	-222.97	513.08	261.07	10.99	10.99	0.00
<b>LP @ 90° Inc, Hold - Top Lower B - 5 1/2" Marker Joint</b>									
6,300.00	90.00	179.33	5,867.00	-321.13	514.22	359.04	0.00	0.00	0.00
6,400.00	90.00	179.33	5,867.00	-421.12	515.39	458.83	0.00	0.00	0.00
6,500.00	90.00	179.33	5,867.00	-521.12	516.55	558.63	0.00	0.00	0.00
6,600.00	90.00	179.33	5,867.00	-621.11	517.72	658.42	0.00	0.00	0.00
6,700.00	90.00	179.33	5,867.00	-721.10	518.89	758.22	0.00	0.00	0.00
6,800.00	90.00	179.33	5,867.00	-821.10	520.05	858.02	0.00	0.00	0.00



# WOG

## Planning Report

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<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4968.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4968.00usft
<b>Site:</b>	Sec 12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12H-1316B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,900.00	90.00	179.33	5,867.00	-921.09	521.22	957.81	0.00	0.00	0.00
7,000.00	90.00	179.33	5,867.00	-1,021.08	522.39	1,057.61	0.00	0.00	0.00
7,100.00	90.00	179.33	5,867.00	-1,121.08	523.55	1,157.40	0.00	0.00	0.00
7,200.00	90.00	179.33	5,867.00	-1,221.07	524.72	1,257.20	0.00	0.00	0.00
7,300.00	90.00	179.33	5,867.00	-1,321.06	525.88	1,356.99	0.00	0.00	0.00
7,400.00	90.00	179.33	5,867.00	-1,421.05	527.05	1,456.79	0.00	0.00	0.00
7,500.00	90.00	179.33	5,867.00	-1,521.05	528.22	1,556.59	0.00	0.00	0.00
7,600.00	90.00	179.33	5,867.00	-1,621.04	529.38	1,656.38	0.00	0.00	0.00
7,700.00	90.00	179.33	5,867.00	-1,721.03	530.55	1,756.18	0.00	0.00	0.00
7,800.00	90.00	179.33	5,867.00	-1,821.03	531.72	1,855.97	0.00	0.00	0.00
7,900.00	90.00	179.33	5,867.00	-1,921.02	532.88	1,955.77	0.00	0.00	0.00
8,000.00	90.00	179.33	5,867.00	-2,021.01	534.05	2,055.57	0.00	0.00	0.00
8,100.00	90.00	179.33	5,867.00	-2,121.01	535.22	2,155.36	0.00	0.00	0.00
8,200.00	90.00	179.33	5,867.00	-2,221.00	536.38	2,255.16	0.00	0.00	0.00
8,300.00	90.00	179.33	5,867.00	-2,320.99	537.55	2,354.95	0.00	0.00	0.00
8,400.00	90.00	179.33	5,867.00	-2,420.99	538.71	2,454.75	0.00	0.00	0.00
8,500.00	90.00	179.33	5,867.00	-2,520.98	539.88	2,554.54	0.00	0.00	0.00
8,600.00	90.00	179.33	5,867.00	-2,620.97	541.05	2,654.34	0.00	0.00	0.00
8,700.00	90.00	179.33	5,867.00	-2,720.97	542.21	2,754.14	0.00	0.00	0.00
8,800.00	90.00	179.33	5,867.00	-2,820.96	543.38	2,853.93	0.00	0.00	0.00
8,900.00	90.00	179.33	5,867.00	-2,920.95	544.55	2,953.73	0.00	0.00	0.00
9,000.00	90.00	179.33	5,867.00	-3,020.95	545.71	3,053.52	0.00	0.00	0.00
9,100.00	90.00	179.33	5,867.00	-3,120.94	546.88	3,153.32	0.00	0.00	0.00
9,200.00	90.00	179.33	5,867.00	-3,220.93	548.05	3,253.12	0.00	0.00	0.00
9,300.00	90.00	179.33	5,867.00	-3,320.93	549.21	3,352.91	0.00	0.00	0.00
9,400.00	90.00	179.33	5,867.00	-3,420.92	550.38	3,452.71	0.00	0.00	0.00
9,500.00	90.00	179.33	5,867.00	-3,520.91	551.54	3,552.50	0.00	0.00	0.00
9,600.00	90.00	179.33	5,867.00	-3,620.91	552.71	3,652.30	0.00	0.00	0.00
9,700.00	90.00	179.33	5,867.00	-3,720.90	553.88	3,752.10	0.00	0.00	0.00
9,800.00	90.00	179.33	5,867.00	-3,820.89	555.04	3,851.89	0.00	0.00	0.00
9,900.00	90.00	179.33	5,867.00	-3,920.88	556.21	3,951.69	0.00	0.00	0.00
10,000.00	90.00	179.33	5,867.00	-4,020.88	557.38	4,051.48	0.00	0.00	0.00
10,100.00	90.00	179.33	5,867.00	-4,120.87	558.54	4,151.28	0.00	0.00	0.00
10,200.00	90.00	179.33	5,867.00	-4,220.86	559.71	4,251.07	0.00	0.00	0.00
10,300.00	90.00	179.33	5,867.00	-4,320.86	560.87	4,350.87	0.00	0.00	0.00
10,400.00	90.00	179.33	5,867.00	-4,420.85	562.04	4,450.67	0.00	0.00	0.00
10,500.00	90.00	179.33	5,867.00	-4,520.84	563.21	4,550.46	0.00	0.00	0.00
10,600.00	90.00	179.33	5,867.00	-4,620.84	564.37	4,650.26	0.00	0.00	0.00
10,700.00	90.00	179.33	5,867.00	-4,720.83	565.54	4,750.05	0.00	0.00	0.00
10,800.00	90.00	179.33	5,867.00	-4,820.82	566.71	4,849.85	0.00	0.00	0.00
10,900.00	90.00	179.33	5,867.00	-4,920.82	567.87	4,949.65	0.00	0.00	0.00
11,000.00	90.00	179.33	5,867.00	-5,020.81	569.04	5,049.44	0.00	0.00	0.00
11,100.00	90.00	179.33	5,867.00	-5,120.80	570.21	5,149.24	0.00	0.00	0.00
11,200.00	90.00	179.33	5,867.00	-5,220.80	571.37	5,249.03	0.00	0.00	0.00
11,300.00	90.00	179.33	5,867.00	-5,320.79	572.54	5,348.83	0.00	0.00	0.00
11,400.00	90.00	179.33	5,867.00	-5,420.78	573.70	5,448.63	0.00	0.00	0.00
11,500.00	90.00	179.33	5,867.00	-5,520.78	574.87	5,548.42	0.00	0.00	0.00
11,600.00	90.00	179.33	5,867.00	-5,620.77	576.04	5,648.22	0.00	0.00	0.00
11,700.00	90.00	179.33	5,867.00	-5,720.76	577.20	5,748.01	0.00	0.00	0.00
11,800.00	90.00	179.33	5,867.00	-5,820.76	578.37	5,847.81	0.00	0.00	0.00
11,900.00	90.00	179.33	5,867.00	-5,920.75	579.54	5,947.60	0.00	0.00	0.00
12,000.00	90.00	179.33	5,867.00	-6,020.74	580.70	6,047.40	0.00	0.00	0.00
12,100.00	90.00	179.33	5,867.00	-6,120.74	581.87	6,147.20	0.00	0.00	0.00
12,200.00	90.00	179.33	5,867.00	-6,220.73	583.03	6,246.99	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12H-1316B
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4968.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4968.00usft
<b>Site:</b>	Sec 12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12H-1316B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,300.00	90.00	179.33	5,867.00	-6,320.72	584.20	6,346.79	0.00	0.00	0.00
12,400.00	90.00	179.33	5,867.00	-6,420.71	585.37	6,446.58	0.00	0.00	0.00
12,500.00	90.00	179.33	5,867.00	-6,520.71	586.53	6,546.38	0.00	0.00	0.00
12,600.00	90.00	179.33	5,867.00	-6,620.70	587.70	6,646.18	0.00	0.00	0.00
12,700.00	90.00	179.33	5,867.00	-6,720.69	588.87	6,745.97	0.00	0.00	0.00
12,800.00	90.00	179.33	5,867.00	-6,820.69	590.03	6,845.77	0.00	0.00	0.00
12,900.00	90.00	179.33	5,867.00	-6,920.68	591.20	6,945.56	0.00	0.00	0.00
13,000.00	90.00	179.33	5,867.00	-7,020.67	592.37	7,045.36	0.00	0.00	0.00
13,100.00	90.00	179.33	5,867.00	-7,120.67	593.53	7,145.16	0.00	0.00	0.00
13,200.00	90.00	179.33	5,867.00	-7,220.66	594.70	7,244.95	0.00	0.00	0.00
13,300.00	90.00	179.33	5,867.00	-7,320.65	595.86	7,344.75	0.00	0.00	0.00
13,400.00	90.00	179.33	5,867.00	-7,420.65	597.03	7,444.54	0.00	0.00	0.00
13,500.00	90.00	179.33	5,867.00	-7,520.64	598.20	7,544.34	0.00	0.00	0.00
13,600.00	90.00	179.33	5,867.00	-7,620.63	599.36	7,644.13	0.00	0.00	0.00
13,700.00	90.00	179.33	5,867.00	-7,720.63	600.53	7,743.93	0.00	0.00	0.00
13,800.00	90.00	179.33	5,867.00	-7,820.62	601.70	7,843.73	0.00	0.00	0.00
13,900.00	90.00	179.33	5,867.00	-7,920.61	602.86	7,943.52	0.00	0.00	0.00
13,949.38	90.00	179.33	5,867.00	-7,969.99	603.44	7,992.80	0.00	0.00	0.00
TD at 13949.38' MD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL 1316B	0.00	0.00	5,867.00	-7,969.99	603.44	1,550,386.92	3,469,245.72	40° 49' 54.750 N	103° 48' 15.310 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
6,201.83	5,867.00	5 1/2" Marker Joint	7.000	8.750	



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #12H-1316B
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4968.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4968.00usft
<b>Site:</b>	Sec 12-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #12H-1316B	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Hz		
<b>Design:</b>	APD		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,609.05	1,600.00	Upper Pierre				
3,525.42	3,500.00	Hygiene				
3,676.71	3,650.00	Lower Pierre				
5,740.82	5,676.00	P200 Marker				
5,782.27	5,707.00	P300 Marker				
5,802.05	5,721.00	P350 Marker				
5,815.19	5,730.00	Sharon Springs				
5,825.66	5,737.00	Niobrara				
5,860.28	5,759.00	Top A Chalk				
5,930.64	5,798.00	Top A Marl				
5,964.79	5,814.00	A Marl				
5,991.20	5,825.00	Top Upper B				
6,072.38	5,851.00	Base Upper B				
6,201.83	5,867.00	Top Lower B				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.00	0.00	Build 2°/100'
674.69	673.62	12.40	21.09	Hold 7.49° Inc
4,808.76	4,772.38	285.60	485.91	Drop 2°/100'
5,183.44	5,146.00	298.00	507.00	Hold Vertical
5,383.44	5,346.00	298.00	507.00	KOP, Build 11°/100'
6,201.83	5,867.00	-222.96	513.08	LP @ 90° Inc, Hold
13,949.38	5,867.00	-7,969.99	603.44	TD at 13949.38' MD