



Project: Weld County, CO  
Site: Sec 30-T10N-R58W  
Well: Razor Federal #30J-1910  
Wellbore: Hz  
Design: APD

ECT DETAILS: Weld County, CO  
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: 7.88°  
Magnetic Field  
Strength: 52804.9nT  
Dip Angle: 67.34°  
Date: 6/16/2016  
Model: IGRF2015

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
1550.00	1551.74	Upper Pierre
3500.00	3504.71	Hygiene
3650.00	3654.93	Lower Pierre
5715.00	5767.57	P200 Marker
5750.00	5817.90	P300 Marker
5774.00	5855.15	P350 Marker
5786.00	5874.84	Sharon Springs
5789.00	5879.89	Niobrara
5809.00	5915.08	Top A Chalk
5844.00	5985.35	Top A Marl
5865.00	6036.12	A Marl
5870.00	6049.74	Top Upper B
5890.00	6114.42	Base Upper B
5902.00	6169.28	Top Lower B

WELL DETAILS: Razor Federal #30J-1910

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude	Slot
0.00	0.00	1541304.27	4838.00	3441205.81	40° 48' 30.160 N	103° 54' 22.140 W	

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	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	457.90	3.16	143.37	457.82	-3.49	2.60	2.00	143.37	-3.41	
4	4924.55	3.16	143.37	4917.68	-200.96	149.40	0.00	-196.12	250.41	
5	5082.44	0.00	0.00	5075.50	-204.45	152.00	2.00	-199.53	254.76	
6	5282.44	0.00	0.00	5275.50	-204.45	152.00	0.00	-199.53	254.76	
7	6282.25	90.00	0.73	5912.00	432.00	160.14	9.00	0.73	436.86	
8	14022.26	90.00	0.73	5912.00	8171.37	259.06	0.00	0.00	8175.47	PBHL 30J-1910

#### ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
300.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	Build 2°/100'
457.82	457.90	3.16	143.37	-3.49	2.60	-3.41	4.35	Hold 3.16° Inc
4917.68	4924.55	3.16	143.37	-200.96	149.40	-196.12	250.41	Drop 2°/100'
5075.50	5082.44	0.00	0.00	-204.45	152.00	-199.53	254.76	Hold Vertical
5275.50	5282.44	0.00	0.00	-204.45	152.00	-199.53	254.76	KOP, Build 9°/100'
5912.00	6282.25	90.00	0.73	432.00	160.14	436.86	891.26	LP @ 90° Inc, Hold
5912.00	14022.26	90.00	0.73	8171.37	259.06	8175.47	8631.27	TD at 14022.26

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL 30J-1910	5912.00	8171.37	259.06	1549478.98	3441317.97	40° 49' 50.900 N	103° 54' 18.770 W
Nelson Ranches #F-1	6756.00	2298.35	124.01	1543604.48	3441288.49	40° 48' 52.869 N	103° 54' 20.527 W

SHL:  
2307' FSL, 1986' FEL  
Sec30-T10N-R58W

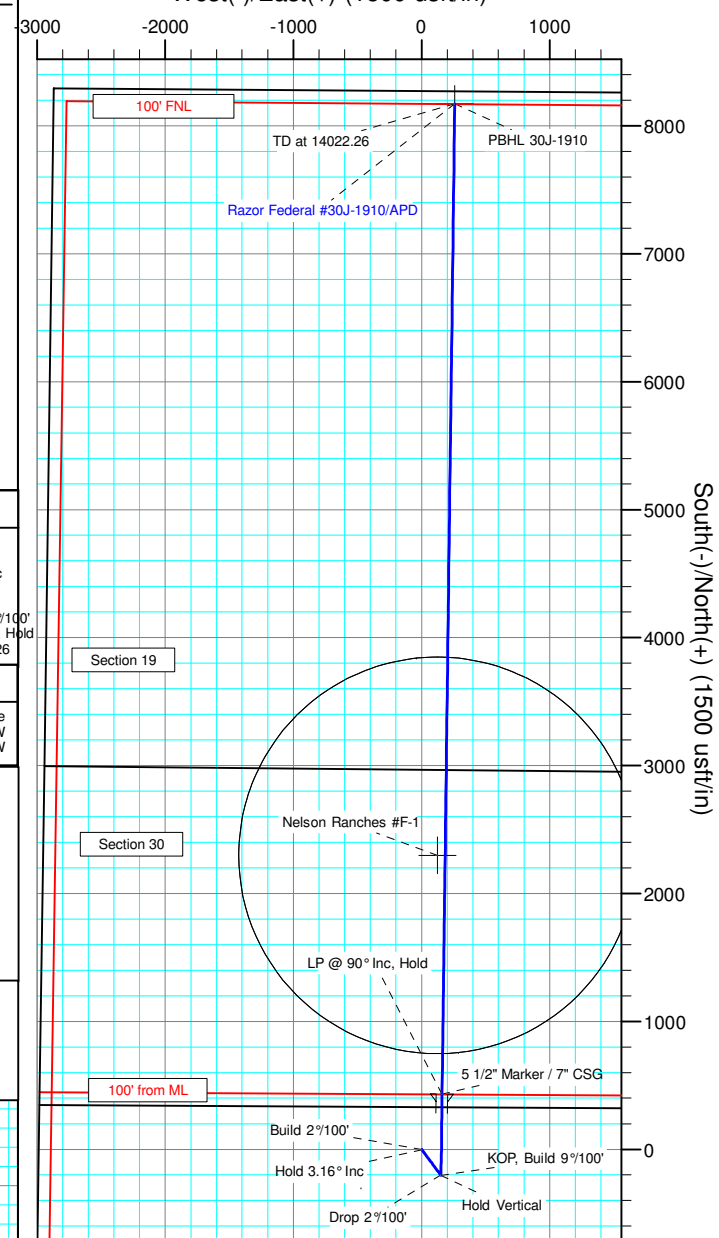
BHL:  
100' FNL, 1658' FEL  
Sec19-T10N-R58W

5 1/2" Marker / 7" CSG:  
2519' FNL, 1826' FEL  
Sec30-T10N-R58W

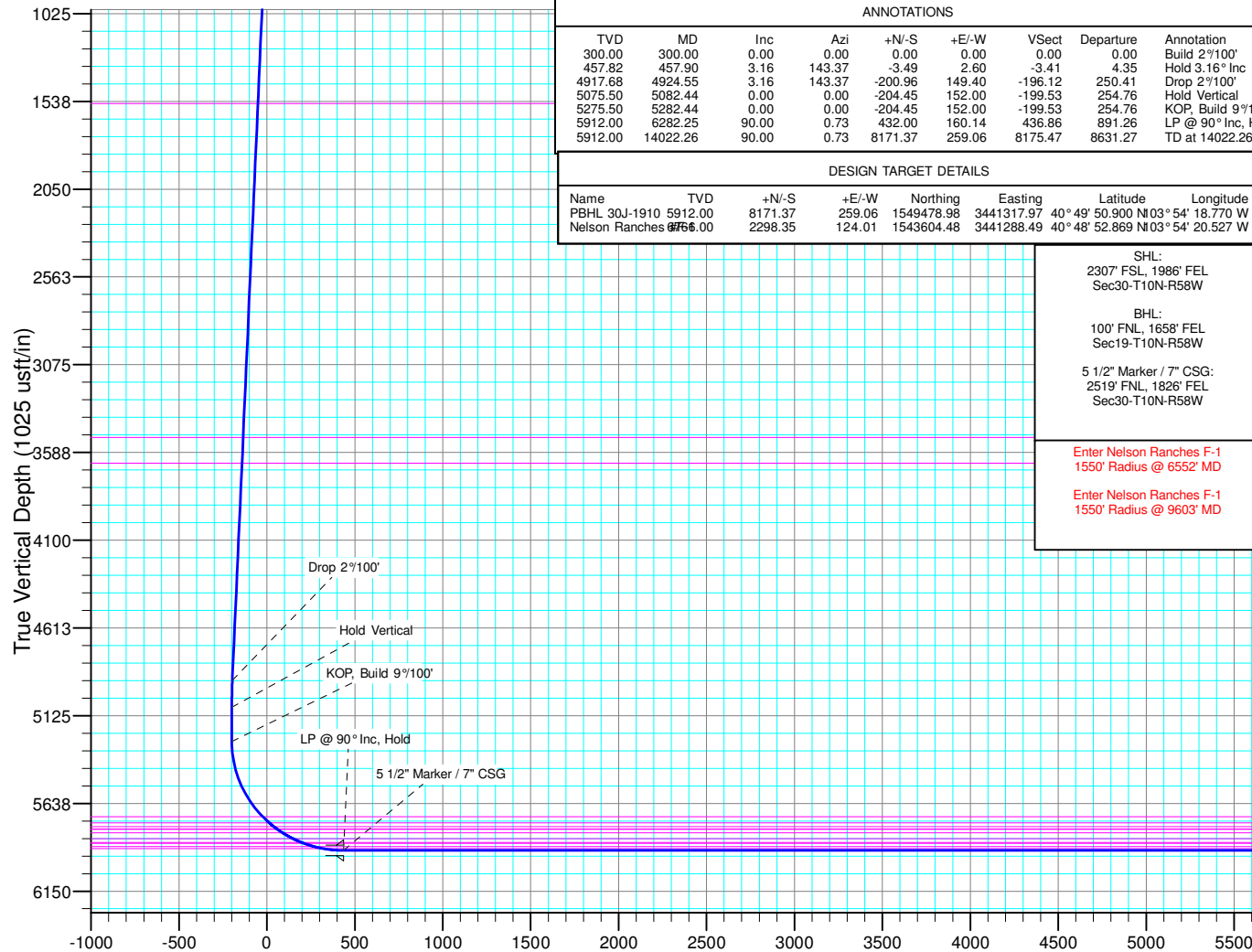
Enter Nelson Ranches F-1  
1550' Radius @ 6552' MD

Enter Nelson Ranches F-1  
1550' Radius @ 9603' MD

West(-)/East(+) (1500 usft/in)



South(-)/North(+) (1500 usft/in)



Vertical Section at 1.82° (1000 usft/in)



# **Whiting Petroleum Corp.**

**Weld County, CO**

**Sec 30-T10N-R58W**

**Razor Federal #30J-1910**

**Hz**

**Plan: APD**

## **Standard Planning Report**

**17 June, 2016**



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #30J-1910
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4859.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4859.00usft
<b>Site:</b>	Sec 30-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #30J-1910	<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		

<b>Site</b>	Sec 30-T10N-R58W			
<b>Site Position:</b>		<b>Northing:</b>	1,538,948.03 usft	<b>Latitude:</b> 40° 48' 7.409 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,438,226.87 usft	<b>Longitude:</b> 103° 55' 1.420 W
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 1.02 °

<b>Well</b>	Razor Federal #30J-1910			
<b>Well Position</b>	<b>+N/-S</b>	2,302.70 usft	<b>Northing:</b>	1,541,304.28 usft
	<b>+E/-W</b>	3,020.52 usft	<b>Easting:</b>	3,441,205.81 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b> 4,838.00 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	6/16/2016	7.88	67.34	52,805

<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	1.82

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
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	
457.90	3.16	143.37	457.82	-3.49	2.60	2.00	2.00	0.00	143.37	
4,924.55	3.16	143.37	4,917.68	-200.96	149.40	0.00	0.00	0.00	0.00	
5,082.44	0.00	0.00	5,075.50	-204.45	152.00	2.00	-2.00	0.00	180.00	
5,282.44	0.00	0.00	5,275.50	-204.45	152.00	0.00	0.00	0.00	0.00	
6,282.25	90.00	0.73	5,912.00	432.00	160.14	9.00	9.00	0.00	0.73	
14,022.26	90.00	0.73	5,912.00	8,171.37	259.06	0.00	0.00	0.00	0.00	PBHL 30J-1910



# WOG Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #30J-1910
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4859.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4859.00usft
<b>Site:</b>	Sec 30-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #30J-1910	<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	143.37	399.98	-1.40	1.04	-1.37	2.00	2.00	0.00	
457.90	3.16	143.37	457.82	-3.49	2.60	-3.41	2.00	2.00	0.00	
<b>Hold 3.16° Inc</b>										
500.00	3.16	143.37	499.86	-5.35	3.98	-5.22	0.00	0.00	0.00	
600.00	3.16	143.37	599.70	-9.77	7.27	-9.54	0.00	0.00	0.00	
700.00	3.16	143.37	699.55	-14.19	10.55	-13.85	0.00	0.00	0.00	
800.00	3.16	143.37	799.40	-18.62	13.84	-18.17	0.00	0.00	0.00	
900.00	3.16	143.37	899.25	-23.04	17.13	-22.48	0.00	0.00	0.00	
1,000.00	3.16	143.37	999.10	-27.46	20.41	-26.80	0.00	0.00	0.00	
1,100.00	3.16	143.37	1,098.95	-31.88	23.70	-31.11	0.00	0.00	0.00	
1,200.00	3.16	143.37	1,198.79	-36.30	26.99	-35.43	0.00	0.00	0.00	
1,300.00	3.16	143.37	1,298.64	-40.72	30.27	-39.74	0.00	0.00	0.00	
1,400.00	3.16	143.37	1,398.49	-45.14	33.56	-44.05	0.00	0.00	0.00	
1,500.00	3.16	143.37	1,498.34	-49.56	36.85	-48.37	0.00	0.00	0.00	
1,551.74	3.16	143.37	1,550.00	-51.85	38.55	-50.60	0.00	0.00	0.00	
<b>Upper Pierre</b>										
1,600.00	3.16	143.37	1,598.19	-53.98	40.13	-52.68	0.00	0.00	0.00	
1,700.00	3.16	143.37	1,698.03	-58.40	43.42	-57.00	0.00	0.00	0.00	
1,800.00	3.16	143.37	1,797.88	-62.82	46.71	-61.31	0.00	0.00	0.00	
1,900.00	3.16	143.37	1,897.73	-67.25	49.99	-65.63	0.00	0.00	0.00	
2,000.00	3.16	143.37	1,997.58	-71.67	53.28	-69.94	0.00	0.00	0.00	
2,100.00	3.16	143.37	2,097.43	-76.09	56.57	-74.26	0.00	0.00	0.00	
2,200.00	3.16	143.37	2,197.27	-80.51	59.85	-78.57	0.00	0.00	0.00	
2,300.00	3.16	143.37	2,297.12	-84.93	63.14	-82.89	0.00	0.00	0.00	
2,400.00	3.16	143.37	2,396.97	-89.35	66.43	-87.20	0.00	0.00	0.00	
2,500.00	3.16	143.37	2,496.82	-93.77	69.71	-91.52	0.00	0.00	0.00	
2,600.00	3.16	143.37	2,596.67	-98.19	73.00	-95.83	0.00	0.00	0.00	
2,700.00	3.16	143.37	2,696.52	-102.61	76.29	-100.14	0.00	0.00	0.00	
2,800.00	3.16	143.37	2,796.36	-107.03	79.58	-104.46	0.00	0.00	0.00	
2,900.00	3.16	143.37	2,896.21	-111.45	82.86	-108.77	0.00	0.00	0.00	
3,000.00	3.16	143.37	2,996.06	-115.88	86.15	-113.09	0.00	0.00	0.00	
3,100.00	3.16	143.37	3,095.91	-120.30	89.44	-117.40	0.00	0.00	0.00	
3,200.00	3.16	143.37	3,195.76	-124.72	92.72	-121.72	0.00	0.00	0.00	
3,300.00	3.16	143.37	3,295.60	-129.14	96.01	-126.03	0.00	0.00	0.00	
3,400.00	3.16	143.37	3,395.45	-133.56	99.30	-130.35	0.00	0.00	0.00	
3,500.00	3.16	143.37	3,495.30	-137.98	102.58	-134.66	0.00	0.00	0.00	
3,504.71	3.16	143.37	3,500.00	-138.19	102.74	-134.86	0.00	0.00	0.00	
<b>Hygiene</b>										
3,600.00	3.16	143.37	3,595.15	-142.40	105.87	-138.98	0.00	0.00	0.00	
3,654.93	3.16	143.37	3,650.00	-144.83	107.68	-141.35	0.00	0.00	0.00	
<b>Lower Pierre</b>										
3,700.00	3.16	143.37	3,695.00	-146.82	109.16	-143.29	0.00	0.00	0.00	
3,800.00	3.16	143.37	3,794.85	-151.24	112.44	-147.60	0.00	0.00	0.00	
3,900.00	3.16	143.37	3,894.69	-155.66	115.73	-151.92	0.00	0.00	0.00	
4,000.00	3.16	143.37	3,994.54	-160.09	119.02	-156.23	0.00	0.00	0.00	
4,100.00	3.16	143.37	4,094.39	-164.51	122.30	-160.55	0.00	0.00	0.00	
4,200.00	3.16	143.37	4,194.24	-168.93	125.59	-164.86	0.00	0.00	0.00	
4,300.00	3.16	143.37	4,294.09	-173.35	128.88	-169.18	0.00	0.00	0.00	
4,400.00	3.16	143.37	4,393.93	-177.77	132.16	-173.49	0.00	0.00	0.00	



# WOG Planning Report

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<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4859.00usft
<b>Site:</b>	Sec 30-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #30J-1910	<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	3.16	143.37	4,493.78	-182.19	135.45	-177.81	0.00	0.00	0.00
4,600.00	3.16	143.37	4,593.63	-186.61	138.74	-182.12	0.00	0.00	0.00
4,700.00	3.16	143.37	4,693.48	-191.03	142.02	-186.44	0.00	0.00	0.00
4,800.00	3.16	143.37	4,793.33	-195.45	145.31	-190.75	0.00	0.00	0.00
4,900.00	3.16	143.37	4,893.17	-199.87	148.60	-195.06	0.00	0.00	0.00
4,924.55	3.16	143.37	4,917.68	-200.96	149.40	-196.12	0.00	0.00	0.00
<b>Drop 2°/100'</b>									
5,000.00	1.65	143.37	4,993.07	-203.50	151.29	-198.60	2.00	-2.00	0.00
5,082.44	0.00	0.00	5,075.50	-204.45	152.00	-199.53	2.00	-2.00	0.00
<b>Hold Vertical</b>									
5,100.00	0.00	0.00	5,093.06	-204.45	152.00	-199.53	0.00	0.00	0.00
5,200.00	0.00	0.00	5,193.06	-204.45	152.00	-199.53	0.00	0.00	0.00
5,282.44	0.00	0.00	5,275.50	-204.45	152.00	-199.53	0.00	0.00	0.00
<b>KOP, Build 9°/100'</b>									
5,300.00	1.58	0.73	5,293.06	-204.21	152.00	-199.29	9.00	9.00	0.00
5,400.00	10.58	0.73	5,392.39	-193.63	152.14	-188.71	9.00	9.00	0.00
5,500.00	19.58	0.73	5,488.85	-167.63	152.47	-162.72	9.00	9.00	0.00
5,600.00	28.59	0.73	5,580.05	-126.87	152.99	-121.96	9.00	9.00	0.00
5,700.00	37.59	0.73	5,663.75	-72.34	153.69	-67.43	9.00	9.00	0.00
5,767.57	43.67	0.73	5,715.00	-28.37	154.25	-23.47	9.00	9.00	0.00
<b>P200 Marker</b>									
5,800.00	46.59	0.73	5,737.88	-5.39	154.54	-0.49	9.00	9.00	0.00
5,817.90	48.20	0.73	5,750.00	7.79	154.71	12.69	9.00	9.00	0.00
<b>P300 Marker</b>									
5,855.15	51.55	0.73	5,774.00	36.27	155.08	41.16	9.00	9.00	0.00
<b>P350 Marker</b>									
5,874.84	53.33	0.73	5,786.00	51.87	155.28	56.76	9.00	9.00	0.00
<b>Sharon Springs</b>									
5,879.89	53.78	0.73	5,789.00	55.93	155.33	60.82	9.00	9.00	0.00
<b>Niobrara</b>									
5,900.00	55.59	0.73	5,800.63	72.34	155.54	77.23	9.00	9.00	0.00
5,915.08	56.95	0.73	5,809.00	84.88	155.70	89.77	9.00	9.00	0.00
<b>Top A Chalk</b>									
5,985.35	63.27	0.73	5,844.00	145.77	156.48	150.65	9.00	9.00	0.00
<b>Top A Marl</b>									
6,000.00	64.59	0.73	5,850.44	158.93	156.64	163.81	9.00	9.00	0.00
6,036.12	67.84	0.73	5,865.00	191.97	157.07	196.85	9.00	9.00	0.00
<b>A Marl</b>									
6,049.74	69.07	0.73	5,870.00	204.64	157.23	209.52	9.00	9.00	0.00
<b>Top Upper B</b>									
6,100.00	73.59	0.73	5,886.08	252.24	157.84	257.11	9.00	9.00	0.00
6,114.42	74.89	0.73	5,890.00	266.11	158.01	270.99	9.00	9.00	0.00
<b>Base Upper B</b>									
6,169.28	79.83	0.73	5,902.00	319.62	158.70	324.49	9.00	9.00	0.00
<b>Top Lower B</b>									
6,200.00	82.60	0.73	5,906.69	349.98	159.09	354.84	9.00	9.00	0.00
6,282.25	90.00	0.73	5,912.00	431.99	160.14	436.85	9.00	9.00	0.00
<b>LP @ 90° Inc, Hold - 5 1/2" Marker / 7" CSG</b>									
6,300.00	90.00	0.73	5,912.00	449.74	160.36	454.60	0.00	0.00	0.00
6,400.00	90.00	0.73	5,912.00	549.73	161.64	554.58	0.00	0.00	0.00
6,500.00	90.00	0.73	5,912.00	649.73	162.92	654.56	0.00	0.00	0.00
6,600.00	90.00	0.73	5,912.00	749.72	164.20	754.54	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #30J-1910
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4859.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4859.00usft
<b>Site:</b>	Sec 30-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #30J-1910	<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)
6,700.00	90.00	0.73	5,912.00	849.71	165.47	854.53	0.00	0.00	0.00
6,800.00	90.00	0.73	5,912.00	949.70	166.75	954.51	0.00	0.00	0.00
6,900.00	90.00	0.73	5,912.00	1,049.69	168.03	1,054.49	0.00	0.00	0.00
7,000.00	90.00	0.73	5,912.00	1,149.68	169.31	1,154.47	0.00	0.00	0.00
7,100.00	90.00	0.73	5,912.00	1,249.68	170.59	1,254.45	0.00	0.00	0.00
7,200.00	90.00	0.73	5,912.00	1,349.67	171.86	1,354.44	0.00	0.00	0.00
7,300.00	90.00	0.73	5,912.00	1,449.66	173.14	1,454.42	0.00	0.00	0.00
7,400.00	90.00	0.73	5,912.00	1,549.65	174.42	1,554.40	0.00	0.00	0.00
7,500.00	90.00	0.73	5,912.00	1,649.64	175.70	1,654.38	0.00	0.00	0.00
7,600.00	90.00	0.73	5,912.00	1,749.64	176.98	1,754.37	0.00	0.00	0.00
7,700.00	90.00	0.73	5,912.00	1,849.63	178.26	1,854.35	0.00	0.00	0.00
7,800.00	90.00	0.73	5,912.00	1,949.62	179.53	1,954.33	0.00	0.00	0.00
7,900.00	90.00	0.73	5,912.00	2,049.61	180.81	2,054.31	0.00	0.00	0.00
8,000.00	90.00	0.73	5,912.00	2,149.60	182.09	2,154.29	0.00	0.00	0.00
8,100.00	90.00	0.73	5,912.00	2,249.60	183.37	2,254.28	0.00	0.00	0.00
8,200.00	90.00	0.73	5,912.00	2,349.59	184.65	2,354.26	0.00	0.00	0.00
8,300.00	90.00	0.73	5,912.00	2,449.58	185.92	2,454.24	0.00	0.00	0.00
8,400.00	90.00	0.73	5,912.00	2,549.57	187.20	2,554.22	0.00	0.00	0.00
8,500.00	90.00	0.73	5,912.00	2,649.56	188.48	2,654.20	0.00	0.00	0.00
8,600.00	90.00	0.73	5,912.00	2,749.55	189.76	2,754.19	0.00	0.00	0.00
8,700.00	90.00	0.73	5,912.00	2,849.55	191.04	2,854.17	0.00	0.00	0.00
8,800.00	90.00	0.73	5,912.00	2,949.54	192.31	2,954.15	0.00	0.00	0.00
8,900.00	90.00	0.73	5,912.00	3,049.53	193.59	3,054.13	0.00	0.00	0.00
9,000.00	90.00	0.73	5,912.00	3,149.52	194.87	3,154.11	0.00	0.00	0.00
9,100.00	90.00	0.73	5,912.00	3,249.51	196.15	3,254.10	0.00	0.00	0.00
9,200.00	90.00	0.73	5,912.00	3,349.51	197.43	3,354.08	0.00	0.00	0.00
9,300.00	90.00	0.73	5,912.00	3,449.50	198.70	3,454.06	0.00	0.00	0.00
9,400.00	90.00	0.73	5,912.00	3,549.49	199.98	3,554.04	0.00	0.00	0.00
9,500.00	90.00	0.73	5,912.00	3,649.48	201.26	3,654.03	0.00	0.00	0.00
9,600.00	90.00	0.73	5,912.00	3,749.47	202.54	3,754.01	0.00	0.00	0.00
9,700.00	90.00	0.73	5,912.00	3,849.46	203.82	3,853.99	0.00	0.00	0.00
9,800.00	90.00	0.73	5,912.00	3,949.46	205.10	3,953.97	0.00	0.00	0.00
9,900.00	90.00	0.73	5,912.00	4,049.45	206.37	4,053.95	0.00	0.00	0.00
10,000.00	90.00	0.73	5,912.00	4,149.44	207.65	4,153.94	0.00	0.00	0.00
10,100.00	90.00	0.73	5,912.00	4,249.43	208.93	4,253.92	0.00	0.00	0.00
10,200.00	90.00	0.73	5,912.00	4,349.42	210.21	4,353.90	0.00	0.00	0.00
10,300.00	90.00	0.73	5,912.00	4,449.42	211.49	4,453.88	0.00	0.00	0.00
10,400.00	90.00	0.73	5,912.00	4,549.41	212.76	4,553.86	0.00	0.00	0.00
10,500.00	90.00	0.73	5,912.00	4,649.40	214.04	4,653.85	0.00	0.00	0.00
10,600.00	90.00	0.73	5,912.00	4,749.39	215.32	4,753.83	0.00	0.00	0.00
10,700.00	90.00	0.73	5,912.00	4,849.38	216.60	4,853.81	0.00	0.00	0.00
10,800.00	90.00	0.73	5,912.00	4,949.37	217.88	4,953.79	0.00	0.00	0.00
10,900.00	90.00	0.73	5,912.00	5,049.37	219.15	5,053.78	0.00	0.00	0.00
11,000.00	90.00	0.73	5,912.00	5,149.36	220.43	5,153.76	0.00	0.00	0.00
11,100.00	90.00	0.73	5,912.00	5,249.35	221.71	5,253.74	0.00	0.00	0.00
11,200.00	90.00	0.73	5,912.00	5,349.34	222.99	5,353.72	0.00	0.00	0.00
11,300.00	90.00	0.73	5,912.00	5,449.33	224.27	5,453.70	0.00	0.00	0.00
11,400.00	90.00	0.73	5,912.00	5,549.33	225.54	5,553.69	0.00	0.00	0.00
11,500.00	90.00	0.73	5,912.00	5,649.32	226.82	5,653.67	0.00	0.00	0.00
11,600.00	90.00	0.73	5,912.00	5,749.31	228.10	5,753.65	0.00	0.00	0.00
11,700.00	90.00	0.73	5,912.00	5,849.30	229.38	5,853.63	0.00	0.00	0.00
11,800.00	90.00	0.73	5,912.00	5,949.29	230.66	5,953.61	0.00	0.00	0.00
11,900.00	90.00	0.73	5,912.00	6,049.28	231.94	6,053.60	0.00	0.00	0.00
12,000.00	90.00	0.73	5,912.00	6,149.28	233.21	6,153.58	0.00	0.00	0.00



# WOG

## Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #30J-1910
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4859.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4859.00usft
<b>Site:</b>	Sec 30-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #30J-1910	<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)
12,100.00	90.00	0.73	5,912.00	6,249.27	234.49	6,253.56	0.00	0.00	0.00
12,200.00	90.00	0.73	5,912.00	6,349.26	235.77	6,353.54	0.00	0.00	0.00
12,300.00	90.00	0.73	5,912.00	6,449.25	237.05	6,453.52	0.00	0.00	0.00
12,400.00	90.00	0.73	5,912.00	6,549.24	238.33	6,553.51	0.00	0.00	0.00
12,500.00	90.00	0.73	5,912.00	6,649.24	239.60	6,653.49	0.00	0.00	0.00
12,600.00	90.00	0.73	5,912.00	6,749.23	240.88	6,753.47	0.00	0.00	0.00
12,700.00	90.00	0.73	5,912.00	6,849.22	242.16	6,853.45	0.00	0.00	0.00
12,800.00	90.00	0.73	5,912.00	6,949.21	243.44	6,953.44	0.00	0.00	0.00
12,900.00	90.00	0.73	5,912.00	7,049.20	244.72	7,053.42	0.00	0.00	0.00
13,000.00	90.00	0.73	5,912.00	7,149.19	245.99	7,153.40	0.00	0.00	0.00
13,100.00	90.00	0.73	5,912.00	7,249.19	247.27	7,253.38	0.00	0.00	0.00
13,200.00	90.00	0.73	5,912.00	7,349.18	248.55	7,353.36	0.00	0.00	0.00
13,300.00	90.00	0.73	5,912.00	7,449.17	249.83	7,453.35	0.00	0.00	0.00
13,400.00	90.00	0.73	5,912.00	7,549.16	251.11	7,553.33	0.00	0.00	0.00
13,500.00	90.00	0.73	5,912.00	7,649.15	252.38	7,653.31	0.00	0.00	0.00
13,600.00	90.00	0.73	5,912.00	7,749.15	253.66	7,753.29	0.00	0.00	0.00
13,700.00	90.00	0.73	5,912.00	7,849.14	254.94	7,853.27	0.00	0.00	0.00
13,800.00	90.00	0.73	5,912.00	7,949.13	256.22	7,953.26	0.00	0.00	0.00
13,900.00	90.00	0.73	5,912.00	8,049.12	257.50	8,053.24	0.00	0.00	0.00
14,000.00	90.00	0.73	5,912.00	8,149.11	258.78	8,153.22	0.00	0.00	0.00
14,022.26	90.00	0.73	5,912.00	8,171.37	259.06	8,175.47	0.00	0.00	0.00
TD at 14022.26									

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 30J-1910	0.00	0.00	5,912.00	8,171.37	259.06	1,549,478.98	3,441,317.96	40° 49' 50.900 N	103° 54' 18.770 W
- plan hits target center									
- Point									
Nelson Ranches #F-1	0.00	0.00	6,766.00	2,298.35	124.01	1,543,604.49	3,441,288.49	40° 48' 52.869 N	103° 54' 20.527 W
- plan misses target center by 856.10usft at 8147.99usft MD (5912.00 TVD, 2297.59 N, 183.98 E)									
- Circle (radius 1,550.00)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
6,282.25	5,912.00	5 1/2" Marker / 7" CSG	7.000	8.750	



# WOG Planning Report

<b>Database:</b>	LandmarkEDM	<b>Local Co-ordinate Reference:</b>	Well Razor Federal #30J-1910
<b>Company:</b>	Whiting Petroleum Corp.	<b>TVD Reference:</b>	KBE @ 4859.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	KBE @ 4859.00usft
<b>Site:</b>	Sec 30-T10N-R58W	<b>North Reference:</b>	True
<b>Well:</b>	Razor Federal #30J-1910	<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 (°)	
1,551.74	1,550.00	Upper Pierre				
3,504.71	3,500.00	Hygiene				
3,654.93	3,650.00	Lower Pierre				
5,767.57	5,715.00	P200 Marker				
5,817.90	5,750.00	P300 Marker				
5,855.15	5,774.00	P350 Marker				
5,874.84	5,786.00	Sharon Springs				
5,879.89	5,789.00	Niobrara				
5,915.08	5,809.00	Top A Chalk				
5,985.35	5,844.00	Top A Marl				
6,036.12	5,865.00	A Marl				
6,049.74	5,870.00	Top Upper B				
6,114.42	5,890.00	Base Upper B				
6,169.28	5,902.00	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'
457.90	457.82	-3.49	2.60	Hold 3.16° Inc
4,924.55	4,917.68	-200.96	149.40	Drop 2°/100'
5,082.44	5,075.50	-204.45	152.00	Hold Vertical
5,282.44	5,275.50	-204.45	152.00	KOP, Build 9°/100'
6,282.25	5,912.00	432.00	160.14	LP @ 90° Inc, Hold
14,022.26	5,912.00	8,171.37	259.06	TD at 14022.26