



Project: Weld County, CO
Site: Sec 30-T10N-R57W
Well: Horsetail #30G-3139
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: 7.80°
Magnetic Field
Strength: 53007.3snT
Dip Angle: 67.39°
Date: 7/29/2015
Model: IGRF2010

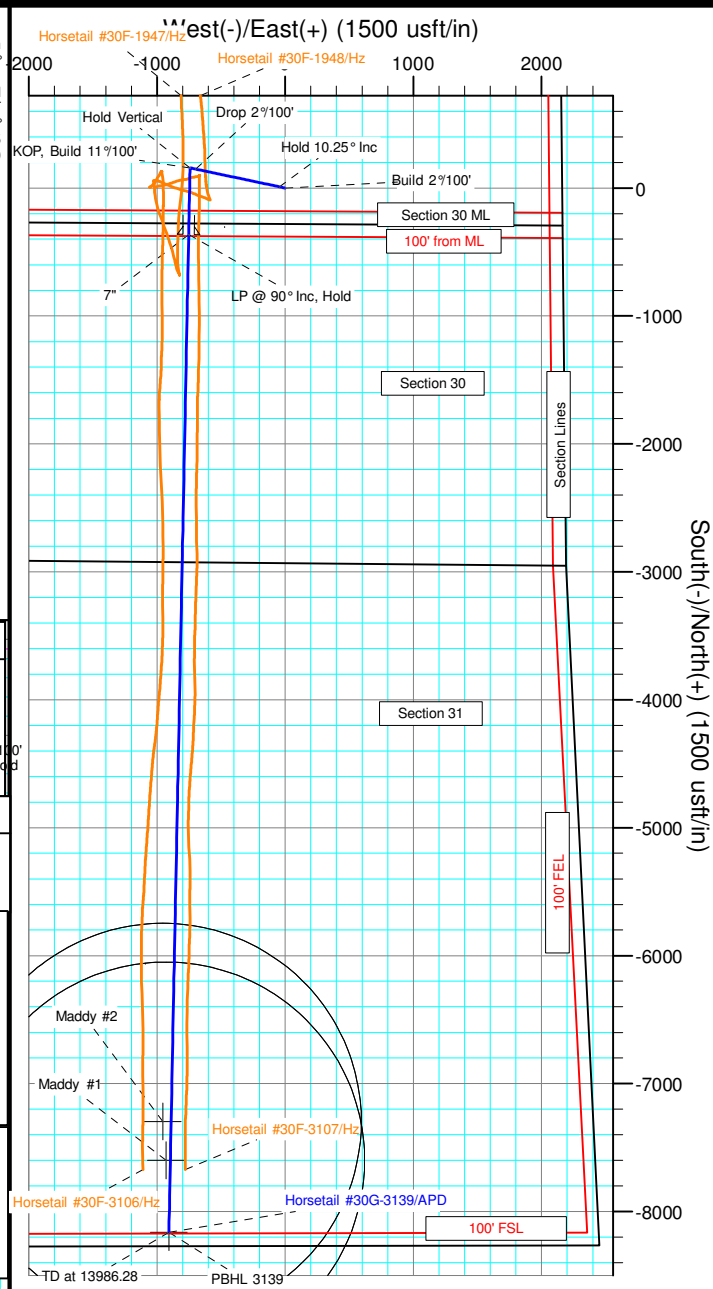
WELL DETAILS: Horsetail #30G-3139

	+N/-S	+E/-W	Northing	Ground Level:	4737.90	Longitude	Slot
	0.00	0.00	1542673.95	Easting	3472691.12	40° 48' 37.900 N	103° 47' 32.430 W

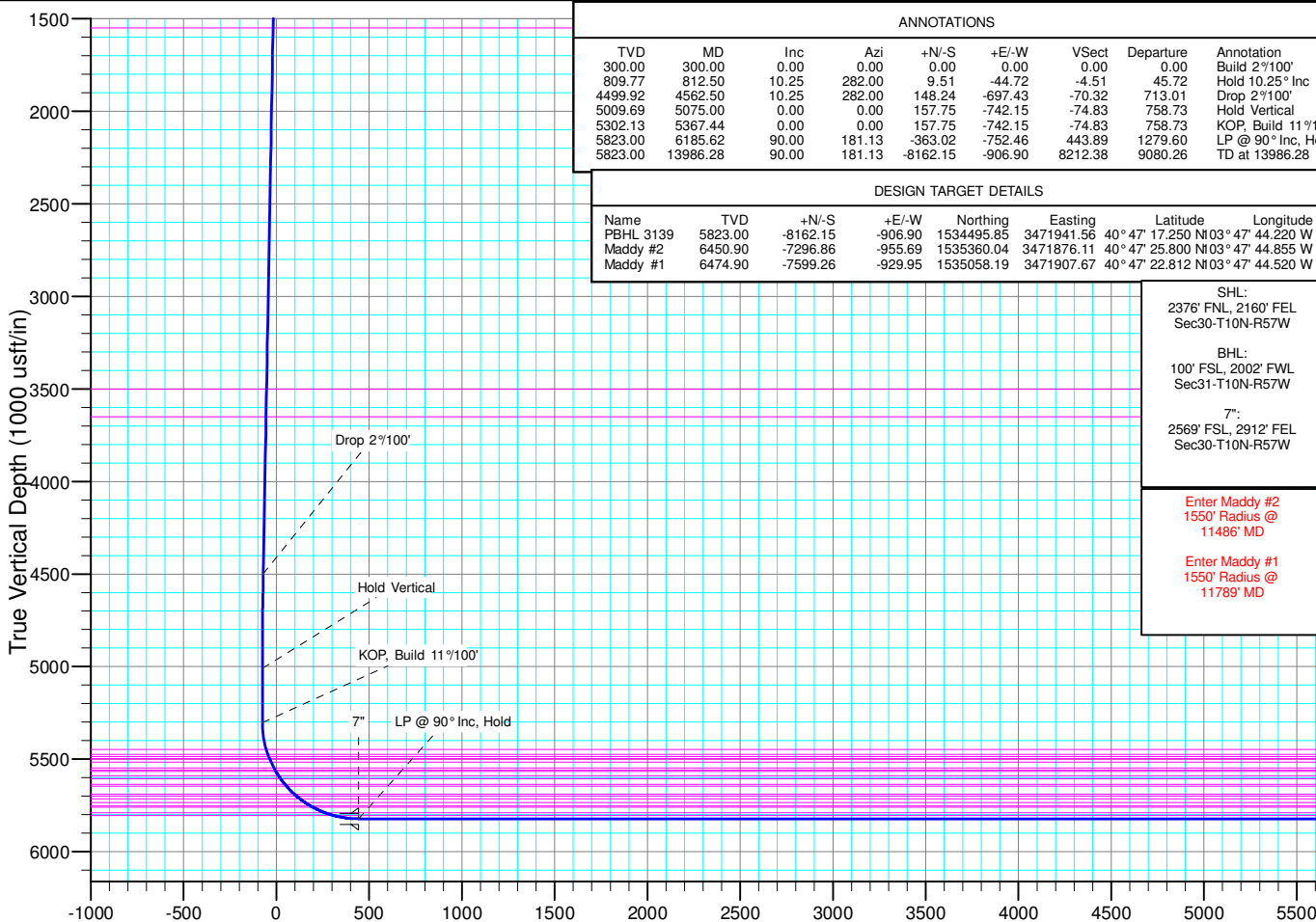
SECTION DETAILS

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	812.50	10.25	282.00	809.77	9.51	-44.72	2.00	282.00	-4.51	
4	4562.50	10.25	282.00	4499.92	148.24	-697.43	0.00	0.00	-70.32	
5	5075.00	0.00	0.00	5009.69	157.75	-742.15	2.00	180.00	-74.83	
6	5367.44	0.00	0.00	5302.13	157.75	-742.15	0.00	0.00	-74.83	
7	6185.62	90.00	181.13	5823.00	-363.02	-752.46	11.00	181.13	443.89	PBHL 3139
8	13986.28	90.00	181.13	5823.00	-8162.15	-906.90	0.00	0.00	8212.38	PBHL 3139

TVDPath	MDPath	Formation
1550.00	1564.73	Upper Pierre
3500.00	3546.36	Hygiene
3650.00	3698.79	Lower Pierre
5448.00	5515.28	P200 Marker
5475.00	5543.65	P300 Marker
5486.00	5555.36	P350 Marker
5498.00	5568.24	Sharon Springs
5500.00	5570.40	Niobrara
5516.00	5587.82	Top A Chalk
5548.00	5623.50	Top A Marl
5560.00	5637.21	A Marl
5566.00	5644.14	Top Upper B
5590.00	5672.44	Base Upper B
5606.00	5691.88	Top Lower B
5636.00	5729.85	Base Lower B
5646.00	5743.02	Top B Marl
5690.00	5804.98	Top C Chalk
5700.00	5820.21	Middle C Chalk
5714.00	5842.47	Middle C Marl
5735.00	5878.41	Lower C Chalk
5753.00	5912.45	Lower C Marl
5760.00	5926.78	Lower C Marker
5789.00	5996.37	Top Ft. Hays
5805.00	6048.28	Ft. Hays Marker



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



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°
809.77	812.50	10.25	282.00	9.51	-44.72	-4.51	45.72	Hold 10.25° Inc
4499.92	4562.50	10.25	282.00	148.24	-697.43	-70.32	713.01	Drop 2°/100°
5009.69	5075.00	0.00	0.00	157.75	-742.15	-74.83	758.73	Hold Vertical
5302.13	5367.44	0.00	0.00	157.75	-742.15	-74.83	758.73	KOP, Build 11°/100°
5823.00	6185.62	90.00	181.13	-363.02	-752.46	443.89	1279.60	LP @ 90° Inc, Hold
5823.00	13986.28	90.00	181.13	-8162.15	-906.90	8212.38	9080.26	TD at 13986.28

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL 3139	5823.00	-8162.15	-906.90	1534495.85	3471941.56	40° 47' 17.250 N	103° 47' 44.220 W
Maddy #2	6450.90	-7296.86	-955.69	1535360.04	3471876.11	40° 47' 25.800 N	103° 47' 44.855 W
Maddy #1	6474.90	-7599.26	-929.95	1535058.19	3471907.67	40° 47' 22.812 N	103° 47' 44.520 W

SHL:
2376' FNL, 2160' FEL
Sec30-T10N-R57W

BHL:
100' FSL, 2002' FWL
Sec31-T10N-R57W

7°:
2569' FSL, 2912' FEL
Sec30-T10N-R57W

Enter Maddy #2
1550' Radius @
11486' MD

Enter Maddy #1
1550' Radius @
11789' MD



Whiting Petroleum Corp.

Weld County, CO

Sec 30-T10N-R57W

Horsetail #30G-3139

Hz

Plan: APD

Standard Planning Report

13 October, 2015



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30G-3139
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4758.90usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4758.90usft (Original Well Elev)
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	APD		

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	Sec 30-T10N-R57W			
Site Position:		Northing:	1,545,003.67 usft	Latitude: 40° 49' 1.510 N
From:	Lat/Long	Easting:	3,469,557.91 usft	Longitude: 103° 48' 12.589 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: 1.10 °

Well	Horsetail #30G-3139			
Well Position	+N/-S	-2,389.23 usft	Northing:	1,542,673.95 usft
	+E/-W	3,088.06 usft	Easting:	3,472,691.12 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 4,737.90 usft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/29/2015	7.80	67.39	53,007

Design	APD			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	186.34

Plan Sections										
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	
812.50	10.25	282.00	809.77	9.51	-44.72	2.00	2.00	0.00	282.00	
4,562.50	10.25	282.00	4,499.92	148.24	-697.43	0.00	0.00	0.00	0.00	
5,075.00	0.00	0.00	5,009.69	157.75	-742.15	2.00	-2.00	0.00	180.00	
5,367.44	0.00	0.00	5,302.13	157.75	-742.15	0.00	0.00	0.00	0.00	
6,185.62	90.00	181.13	5,823.00	-363.02	-752.46	11.00	11.00	0.00	181.13	PBHL 3139
13,986.28	90.00	181.13	5,823.00	-8,162.15	-906.90	0.00	0.00	0.00	0.00	PBHL 3139



WOG

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Project:	Weld County, CO	MD Reference:	KBE @ 4758.90usft (Original Well Elev)
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	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
Build 2°/100'									
400.00	2.00	282.00	399.98	0.36	-1.71	-0.17	2.00	2.00	0.00
500.00	4.00	282.00	499.84	1.45	-6.83	-0.69	2.00	2.00	0.00
600.00	6.00	282.00	599.45	3.26	-15.35	-1.55	2.00	2.00	0.00
700.00	8.00	282.00	698.70	5.80	-27.27	-2.75	2.00	2.00	0.00
800.00	10.00	282.00	797.47	9.05	-42.57	-4.29	2.00	2.00	0.00
812.50	10.25	282.00	809.77	9.51	-44.72	-4.51	2.00	2.00	0.00
Hold 10.25° Inc									
900.00	10.25	282.00	895.87	12.74	-59.95	-6.04	0.00	0.00	0.00
1,000.00	10.25	282.00	994.28	16.44	-77.36	-7.80	0.00	0.00	0.00
1,100.00	10.25	282.00	1,092.68	20.14	-94.76	-9.55	0.00	0.00	0.00
1,200.00	10.25	282.00	1,191.09	23.84	-112.17	-11.31	0.00	0.00	0.00
1,300.00	10.25	282.00	1,289.49	27.54	-129.57	-13.06	0.00	0.00	0.00
1,400.00	10.25	282.00	1,387.89	31.24	-146.98	-14.82	0.00	0.00	0.00
1,500.00	10.25	282.00	1,486.30	34.94	-164.38	-16.57	0.00	0.00	0.00
1,564.73	10.25	282.00	1,550.00	37.34	-175.65	-17.71	0.00	0.00	0.00
Upper Pierre									
1,600.00	10.25	282.00	1,584.70	38.64	-181.79	-18.33	0.00	0.00	0.00
1,700.00	10.25	282.00	1,683.11	42.34	-199.19	-20.08	0.00	0.00	0.00
1,800.00	10.25	282.00	1,781.51	46.04	-216.60	-21.84	0.00	0.00	0.00
1,900.00	10.25	282.00	1,879.91	49.74	-234.01	-23.59	0.00	0.00	0.00
2,000.00	10.25	282.00	1,978.32	53.44	-251.41	-25.35	0.00	0.00	0.00
2,100.00	10.25	282.00	2,076.72	57.14	-268.82	-27.10	0.00	0.00	0.00
2,200.00	10.25	282.00	2,175.13	60.84	-286.22	-28.86	0.00	0.00	0.00
2,300.00	10.25	282.00	2,273.53	64.54	-303.63	-30.61	0.00	0.00	0.00
2,400.00	10.25	282.00	2,371.94	68.24	-321.03	-32.37	0.00	0.00	0.00
2,500.00	10.25	282.00	2,470.34	71.94	-338.44	-34.12	0.00	0.00	0.00
2,600.00	10.25	282.00	2,568.74	75.64	-355.84	-35.88	0.00	0.00	0.00
2,700.00	10.25	282.00	2,667.15	79.34	-373.25	-37.63	0.00	0.00	0.00
2,800.00	10.25	282.00	2,765.55	83.04	-390.66	-39.39	0.00	0.00	0.00
2,900.00	10.25	282.00	2,863.96	86.74	-408.06	-41.14	0.00	0.00	0.00
3,000.00	10.25	282.00	2,962.36	90.44	-425.47	-42.90	0.00	0.00	0.00
3,100.00	10.25	282.00	3,060.76	94.14	-442.87	-44.65	0.00	0.00	0.00
3,200.00	10.25	282.00	3,159.17	97.83	-460.28	-46.41	0.00	0.00	0.00
3,300.00	10.25	282.00	3,257.57	101.53	-477.68	-48.16	0.00	0.00	0.00
3,400.00	10.25	282.00	3,355.98	105.23	-495.09	-49.92	0.00	0.00	0.00
3,500.00	10.25	282.00	3,454.38	108.93	-512.49	-51.67	0.00	0.00	0.00
3,546.36	10.25	282.00	3,500.00	110.65	-520.56	-52.49	0.00	0.00	0.00
Hygiene									
3,600.00	10.25	282.00	3,552.78	112.63	-529.90	-53.43	0.00	0.00	0.00
3,698.79	10.25	282.00	3,650.00	116.29	-547.09	-55.16	0.00	0.00	0.00
Lower Pierre									
3,700.00	10.25	282.00	3,651.19	116.33	-547.31	-55.18	0.00	0.00	0.00
3,800.00	10.25	282.00	3,749.59	120.03	-564.71	-56.94	0.00	0.00	0.00
3,900.00	10.25	282.00	3,848.00	123.73	-582.12	-58.69	0.00	0.00	0.00
4,000.00	10.25	282.00	3,946.40	127.43	-599.52	-60.45	0.00	0.00	0.00
4,100.00	10.25	282.00	4,044.80	131.13	-616.93	-62.20	0.00	0.00	0.00
4,200.00	10.25	282.00	4,143.21	134.83	-634.33	-63.96	0.00	0.00	0.00
4,300.00	10.25	282.00	4,241.61	138.53	-651.74	-65.71	0.00	0.00	0.00
4,400.00	10.25	282.00	4,340.02	142.23	-669.14	-67.47	0.00	0.00	0.00



WOG Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30G-3139
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4758.90usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4758.90usft (Original Well Elev)
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	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	10.25	282.00	4,438.42	145.93	-686.55	-69.22	0.00	0.00	0.00	
4,562.50	10.25	282.00	4,499.92	148.24	-697.43	-70.32	0.00	0.00	0.00	
Drop 2°/100'										
4,600.00	9.50	282.00	4,536.87	149.58	-703.72	-70.95	2.00	-2.00	0.00	
4,700.00	7.50	282.00	4,635.76	152.65	-718.18	-72.41	2.00	-2.00	0.00	
4,800.00	5.50	282.00	4,735.12	155.01	-729.25	-73.53	2.00	-2.00	0.00	
4,900.00	3.50	282.00	4,834.80	156.64	-736.92	-74.30	2.00	-2.00	0.00	
5,000.00	1.50	282.00	4,934.70	157.54	-741.19	-74.73	2.00	-2.00	0.00	
5,075.00	0.00	0.00	5,009.69	157.75	-742.15	-74.83	2.00	-2.00	0.00	
Hold Vertical										
5,100.00	0.00	0.00	5,034.69	157.75	-742.15	-74.83	0.00	0.00	0.00	
5,200.00	0.00	0.00	5,134.69	157.75	-742.15	-74.83	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,234.69	157.75	-742.15	-74.83	0.00	0.00	0.00	
5,367.44	0.00	0.00	5,302.13	157.75	-742.15	-74.83	0.00	0.00	0.00	
KOP, Build 11°/100'										
5,400.00	3.58	181.13	5,334.67	156.73	-742.17	-73.81	11.00	11.00	0.00	
5,450.00	9.08	181.13	5,384.35	151.22	-742.28	-68.32	11.00	11.00	0.00	
5,500.00	14.58	181.13	5,433.27	140.97	-742.48	-58.12	11.00	11.00	0.00	
5,515.28	16.26	181.13	5,448.00	136.91	-742.56	-54.07	11.00	11.00	0.00	
P200 Marker										
5,543.65	19.38	181.13	5,475.00	128.23	-742.73	-45.43	11.00	11.00	0.00	
P300 Marker										
5,550.00	20.08	181.13	5,480.98	126.09	-742.78	-43.29	11.00	11.00	0.00	
5,555.36	20.67	181.13	5,486.00	124.22	-742.81	-41.43	11.00	11.00	0.00	
P350 Marker										
5,568.24	22.09	181.13	5,498.00	119.53	-742.91	-36.76	11.00	11.00	0.00	
Sharon Springs										
5,570.40	22.33	181.13	5,500.00	118.71	-742.92	-35.94	11.00	11.00	0.00	
Niobrara										
5,587.82	24.24	181.13	5,516.00	111.83	-743.06	-29.09	11.00	11.00	0.00	
Top A Chalk										
5,600.00	25.58	181.13	5,527.04	106.70	-743.16	-23.98	11.00	11.00	0.00	
5,623.50	28.17	181.13	5,548.00	96.08	-743.37	-13.40	11.00	11.00	0.00	
Top A Marl										
5,637.21	29.67	181.13	5,560.00	89.45	-743.50	-6.80	11.00	11.00	0.00	
A Marl										
5,644.14	30.44	181.13	5,566.00	85.98	-743.57	-3.34	11.00	11.00	0.00	
Top Upper B										
5,650.00	31.08	181.13	5,571.04	82.98	-743.63	-0.36	11.00	11.00	0.00	
5,672.44	33.55	181.13	5,590.00	70.99	-743.87	11.59	11.00	11.00	0.00	
Base Upper B										
5,691.88	35.69	181.13	5,606.00	59.95	-744.08	22.59	11.00	11.00	0.00	
Top Lower B										
5,700.00	36.58	181.13	5,612.56	55.16	-744.18	27.36	11.00	11.00	0.00	
5,729.85	39.87	181.13	5,636.00	36.70	-744.55	45.75	11.00	11.00	0.00	
Base Lower B										
5,743.02	41.31	181.13	5,646.00	28.13	-744.71	54.28	11.00	11.00	0.00	
Top B Marl										
5,750.00	42.08	181.13	5,651.21	23.49	-744.81	58.91	11.00	11.00	0.00	
5,800.00	47.58	181.13	5,686.66	-11.74	-745.50	94.00	11.00	11.00	0.00	
5,804.98	48.13	181.13	5,690.00	-15.43	-745.58	97.67	11.00	11.00	0.00	
Top C Chalk										



WOG

Planning Report

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Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	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)	
5,820.21	49.81	181.13	5,700.00	-26.92	-745.80	109.12	11.00	11.00	0.00	
Middle C Chalk										
5,842.47	52.25	181.13	5,714.00	-44.22	-746.15	126.35	11.00	11.00	0.00	
Middle C Marl										
5,850.00	53.08	181.13	5,718.56	-50.21	-746.27	132.31	11.00	11.00	0.00	
5,878.41	56.21	181.13	5,735.00	-73.37	-746.72	155.38	11.00	11.00	0.00	
Lower C Chalk										
5,900.00	58.58	181.13	5,746.64	-91.55	-747.08	173.50	11.00	11.00	0.00	
5,912.46	59.95	181.13	5,753.00	-102.26	-747.30	184.16	11.00	11.00	0.00	
Lower C Marl										
5,926.78	61.53	181.13	5,760.00	-114.75	-747.54	196.60	11.00	11.00	0.00	
Lower C Marker										
5,950.00	64.08	181.13	5,770.61	-135.40	-747.95	217.17	11.00	11.00	0.00	
5,996.37	69.18	181.13	5,789.00	-177.95	-748.80	259.55	11.00	11.00	0.00	
Top Ft. Hays										
6,000.00	69.58	181.13	5,790.28	-181.34	-748.86	262.93	11.00	11.00	0.00	
6,048.28	74.89	181.13	5,805.00	-227.29	-749.77	308.70	11.00	11.00	0.00	
Ft. Hays Marker										
6,050.00	75.08	181.13	5,805.45	-228.95	-749.81	310.36	11.00	11.00	0.00	
6,100.00	80.58	181.13	5,815.98	-277.80	-750.77	359.01	11.00	11.00	0.00	
6,150.00	86.08	181.13	5,821.78	-327.44	-751.76	408.45	11.00	11.00	0.00	
6,185.62	90.00	181.13	5,823.00	-363.02	-752.46	443.90	11.00	11.00	0.00	
LP @ 90° Inc, Hold - 7"										
6,200.00	90.00	181.13	5,823.00	-377.40	-752.75	458.22	0.00	0.00	0.00	
6,300.00	90.00	181.13	5,823.00	-477.38	-754.72	557.80	0.00	0.00	0.00	
6,400.00	90.00	181.13	5,823.00	-577.36	-756.70	657.39	0.00	0.00	0.00	
6,500.00	90.00	181.13	5,823.00	-677.34	-758.68	756.98	0.00	0.00	0.00	
6,600.00	90.00	181.13	5,823.00	-777.32	-760.66	856.57	0.00	0.00	0.00	
6,700.00	90.00	181.13	5,823.00	-877.30	-762.64	956.15	0.00	0.00	0.00	
6,800.00	90.00	181.13	5,823.00	-977.28	-764.62	1,055.74	0.00	0.00	0.00	
6,900.00	90.00	181.13	5,823.00	-1,077.26	-766.60	1,155.33	0.00	0.00	0.00	
7,000.00	90.00	181.13	5,823.00	-1,177.24	-768.58	1,254.92	0.00	0.00	0.00	
7,100.00	90.00	181.13	5,823.00	-1,277.22	-770.56	1,354.50	0.00	0.00	0.00	
7,200.00	90.00	181.13	5,823.00	-1,377.20	-772.54	1,454.09	0.00	0.00	0.00	
7,300.00	90.00	181.13	5,823.00	-1,477.18	-774.52	1,553.68	0.00	0.00	0.00	
7,400.00	90.00	181.13	5,823.00	-1,577.16	-776.50	1,653.27	0.00	0.00	0.00	
7,500.00	90.00	181.13	5,823.00	-1,677.14	-778.48	1,752.85	0.00	0.00	0.00	
7,600.00	90.00	181.13	5,823.00	-1,777.12	-780.46	1,852.44	0.00	0.00	0.00	
7,700.00	90.00	181.13	5,823.00	-1,877.10	-782.44	1,952.03	0.00	0.00	0.00	
7,800.00	90.00	181.13	5,823.00	-1,977.08	-784.42	2,051.62	0.00	0.00	0.00	
7,900.00	90.00	181.13	5,823.00	-2,077.07	-786.40	2,151.20	0.00	0.00	0.00	
8,000.00	90.00	181.13	5,823.00	-2,177.05	-788.38	2,250.79	0.00	0.00	0.00	
8,100.00	90.00	181.13	5,823.00	-2,277.03	-790.36	2,350.38	0.00	0.00	0.00	
8,200.00	90.00	181.13	5,823.00	-2,377.01	-792.34	2,449.97	0.00	0.00	0.00	
8,300.00	90.00	181.13	5,823.00	-2,476.99	-794.32	2,549.55	0.00	0.00	0.00	
8,400.00	90.00	181.13	5,823.00	-2,576.97	-796.30	2,649.14	0.00	0.00	0.00	
8,500.00	90.00	181.13	5,823.00	-2,676.95	-798.28	2,748.73	0.00	0.00	0.00	
8,600.00	90.00	181.13	5,823.00	-2,776.93	-800.26	2,848.32	0.00	0.00	0.00	
8,700.00	90.00	181.13	5,823.00	-2,876.91	-802.24	2,947.90	0.00	0.00	0.00	
8,800.00	90.00	181.13	5,823.00	-2,976.89	-804.22	3,047.49	0.00	0.00	0.00	
8,900.00	90.00	181.13	5,823.00	-3,076.87	-806.20	3,147.08	0.00	0.00	0.00	
9,000.00	90.00	181.13	5,823.00	-3,176.85	-808.18	3,246.67	0.00	0.00	0.00	
9,100.00	90.00	181.13	5,823.00	-3,276.83	-810.16	3,346.25	0.00	0.00	0.00	



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30G-3139
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4758.90usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4758.90usft (Original Well Elev)
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	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)	
9,200.00	90.00	181.13	5,823.00	-3,376.81	-812.14	3,445.84	0.00	0.00	0.00	
9,300.00	90.00	181.13	5,823.00	-3,476.79	-814.12	3,545.43	0.00	0.00	0.00	
9,400.00	90.00	181.13	5,823.00	-3,576.77	-816.10	3,645.02	0.00	0.00	0.00	
9,500.00	90.00	181.13	5,823.00	-3,676.75	-818.08	3,744.60	0.00	0.00	0.00	
9,600.00	90.00	181.13	5,823.00	-3,776.73	-820.06	3,844.19	0.00	0.00	0.00	
9,700.00	90.00	181.13	5,823.00	-3,876.71	-822.04	3,943.78	0.00	0.00	0.00	
9,800.00	90.00	181.13	5,823.00	-3,976.69	-824.02	4,043.37	0.00	0.00	0.00	
9,900.00	90.00	181.13	5,823.00	-4,076.67	-826.00	4,142.96	0.00	0.00	0.00	
10,000.00	90.00	181.13	5,823.00	-4,176.65	-827.98	4,242.54	0.00	0.00	0.00	
10,100.00	90.00	181.13	5,823.00	-4,276.63	-829.96	4,342.13	0.00	0.00	0.00	
10,200.00	90.00	181.13	5,823.00	-4,376.61	-831.94	4,441.72	0.00	0.00	0.00	
10,300.00	90.00	181.13	5,823.00	-4,476.59	-833.92	4,541.31	0.00	0.00	0.00	
10,400.00	90.00	181.13	5,823.00	-4,576.58	-835.90	4,640.89	0.00	0.00	0.00	
10,500.00	90.00	181.13	5,823.00	-4,676.56	-837.88	4,740.48	0.00	0.00	0.00	
10,600.00	90.00	181.13	5,823.00	-4,776.54	-839.86	4,840.07	0.00	0.00	0.00	
10,700.00	90.00	181.13	5,823.00	-4,876.52	-841.84	4,939.66	0.00	0.00	0.00	
10,800.00	90.00	181.13	5,823.00	-4,976.50	-843.82	5,039.24	0.00	0.00	0.00	
10,900.00	90.00	181.13	5,823.00	-5,076.48	-845.80	5,138.83	0.00	0.00	0.00	
11,000.00	90.00	181.13	5,823.00	-5,176.46	-847.78	5,238.42	0.00	0.00	0.00	
11,100.00	90.00	181.13	5,823.00	-5,276.44	-849.76	5,338.01	0.00	0.00	0.00	
11,200.00	90.00	181.13	5,823.00	-5,376.42	-851.74	5,437.59	0.00	0.00	0.00	
11,300.00	90.00	181.13	5,823.00	-5,476.40	-853.72	5,537.18	0.00	0.00	0.00	
11,400.00	90.00	181.13	5,823.00	-5,576.38	-855.70	5,636.77	0.00	0.00	0.00	
11,500.00	90.00	181.13	5,823.00	-5,676.36	-857.68	5,736.36	0.00	0.00	0.00	
11,600.00	90.00	181.13	5,823.00	-5,776.34	-859.66	5,835.94	0.00	0.00	0.00	
11,700.00	90.00	181.13	5,823.00	-5,876.32	-861.64	5,935.53	0.00	0.00	0.00	
11,800.00	90.00	181.13	5,823.00	-5,976.30	-863.61	6,035.12	0.00	0.00	0.00	
11,900.00	90.00	181.13	5,823.00	-6,076.28	-865.59	6,134.71	0.00	0.00	0.00	
12,000.00	90.00	181.13	5,823.00	-6,176.26	-867.57	6,234.29	0.00	0.00	0.00	
12,100.00	90.00	181.13	5,823.00	-6,276.24	-869.55	6,333.88	0.00	0.00	0.00	
12,200.00	90.00	181.13	5,823.00	-6,376.22	-871.53	6,433.47	0.00	0.00	0.00	
12,300.00	90.00	181.13	5,823.00	-6,476.20	-873.51	6,533.06	0.00	0.00	0.00	
12,400.00	90.00	181.13	5,823.00	-6,576.18	-875.49	6,632.64	0.00	0.00	0.00	
12,500.00	90.00	181.13	5,823.00	-6,676.16	-877.47	6,732.23	0.00	0.00	0.00	
12,600.00	90.00	181.13	5,823.00	-6,776.14	-879.45	6,831.82	0.00	0.00	0.00	
12,700.00	90.00	181.13	5,823.00	-6,876.12	-881.43	6,931.41	0.00	0.00	0.00	
12,800.00	90.00	181.13	5,823.00	-6,976.10	-883.41	7,030.99	0.00	0.00	0.00	
12,900.00	90.00	181.13	5,823.00	-7,076.09	-885.39	7,130.58	0.00	0.00	0.00	
13,000.00	90.00	181.13	5,823.00	-7,176.07	-887.37	7,230.17	0.00	0.00	0.00	
13,100.00	90.00	181.13	5,823.00	-7,276.05	-889.35	7,329.76	0.00	0.00	0.00	
13,200.00	90.00	181.13	5,823.00	-7,376.03	-891.33	7,429.34	0.00	0.00	0.00	
13,300.00	90.00	181.13	5,823.00	-7,476.01	-893.31	7,528.93	0.00	0.00	0.00	
13,400.00	90.00	181.13	5,823.00	-7,575.99	-895.29	7,628.52	0.00	0.00	0.00	
13,500.00	90.00	181.13	5,823.00	-7,675.97	-897.27	7,728.11	0.00	0.00	0.00	
13,600.00	90.00	181.13	5,823.00	-7,775.95	-899.25	7,827.69	0.00	0.00	0.00	
13,700.00	90.00	181.13	5,823.00	-7,875.93	-901.23	7,927.28	0.00	0.00	0.00	
13,800.00	90.00	181.13	5,823.00	-7,975.91	-903.21	8,026.87	0.00	0.00	0.00	
13,900.00	90.00	181.13	5,823.00	-8,075.89	-905.19	8,126.46	0.00	0.00	0.00	
13,986.28	90.00	181.13	5,823.00	-8,162.15	-906.90	8,212.38	0.00	0.00	0.00	
TD at 13986.28										



WOG Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30G-3139
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4758.90usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4758.90usft (Original Well Elev)
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	APD		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
PBHL 3139	0.00	0.00	5,823.00	-8,162.15	-906.90	1,534,495.85	3,471,941.56	40° 47' 17.250 N	103° 47' 44.220 W
- plan hits target center									
- Point									
Maddy #2	0.00	0.00	6,450.90	-7,296.86	-955.69	1,535,360.05	3,471,876.11	40° 47' 25.800 N	103° 47' 44.855 W
- plan misses target center by 631.35usft at 13122.12usft MD (5823.00 TVD, -7298.16 N, -889.79 E)									
- Circle (radius 1,550.00)									
Maddy #1	0.00	0.00	6,474.90	-7,599.26	-929.95	1,535,058.20	3,471,907.67	40° 47' 22.812 N	103° 47' 44.520 W
- plan misses target center by 652.79usft at 13423.95usft MD (5823.00 TVD, -7599.93 N, -895.77 E)									
- Circle (radius 1,550.00)									

Casing Points					
Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter
(usft)	(usft)	Name		(in)	(in)
6,185.62	5,823.00	7"		7.000	8.750

Formations						
Measured Depth	Vertical Depth				Dip	Dip Direction
(usft)	(usft)	Name	Lithology		(°)	(°)
1,564.73	1,550.00	Upper Pierre				
3,546.36	3,500.00	Hygiene				
3,698.79	3,650.00	Lower Pierre				
5,515.28	5,448.00	P200 Marker				
5,543.65	5,475.00	P300 Marker				
5,555.36	5,486.00	P350 Marker				
5,568.24	5,498.00	Sharon Springs				
5,570.40	5,500.00	Niobrara				
5,587.82	5,516.00	Top A Chalk				
5,623.50	5,548.00	Top A Marl				
5,637.21	5,560.00	A Marl				
5,644.14	5,566.00	Top Upper B				
5,672.44	5,590.00	Base Upper B				
5,691.88	5,606.00	Top Lower B				
5,729.85	5,636.00	Base Lower B				
5,743.02	5,646.00	Top B Marl				
5,804.98	5,690.00	Top C Chalk				
5,820.21	5,700.00	Middle C Chalk				
5,842.47	5,714.00	Middle C Marl				
5,878.41	5,735.00	Lower C Chalk				
5,912.46	5,753.00	Lower C Marl				
5,926.78	5,760.00	Lower C Marker				
5,996.37	5,789.00	Top Ft. Hays				
6,048.28	5,805.00	Ft. Hays Marker				



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #30G-3139
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4758.90usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4758.90usft (Original Well Elev)
Site:	Sec 30-T10N-R57W	North Reference:	True
Well:	Horsetail #30G-3139	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	APD		

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'
812.50	809.77	9.51	-44.72	Hold 10.25° Inc
4,562.50	4,499.92	148.24	-697.43	Drop 2°/100'
5,075.00	5,009.69	157.75	-742.15	Hold Vertical
5,367.44	5,302.13	157.75	-742.15	KOP, Build 11°/100'
6,185.62	5,823.00	-363.02	-752.46	LP @ 90° Inc, Hold
13,986.28	5,823.00	-8,162.15	-906.90	TD at 13986.28