



Project: Weld County, CO
Site: Sec 8-T10N-R57W
Well: Horsetail #08C-1738
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

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1525.00	1532.20	Upper Pierre
3565.00	3586.94	Hygiene
3665.00	3687.66	Lower Pierre
5604.00	5639.51	P200 Marker
5619.00	5655.47	P300 Marker
5639.00	5677.04	P350 Marker
5654.00	5693.47	Sharon Springs
5666.00	5706.79	Niobrara
5681.00	5723.68	Top A Chalk
5723.00	5772.69	Top A Marl
5742.00	5795.88	A Marl
5748.00	5803.36	Top Upper B
5779.00	5843.41	Base Upper B
5783.00	5848.77	Top Lower B
5816.00	5895.14	Base Lower B
5831.00	5917.73	Top B Marl
5871.00	5984.75	Top C Chalk
5883.00	6007.57	Middle C Chalk
5897.00	6036.55	Middle C Marl
5918.00	6087.19	Lower C Chalk
5945.00	6182.48	Lower C Marl

WELL DETAILS: Horsetail #08C-1738

+N/-S	+E/-W	Northing	Ground Level:	4914.20	Longitude	Slot
0.00	0.00	1560748.87	Easting	3476519.98	40° 51' 35.730 N	103° 46' 38.080 W

SECTION DETAILS

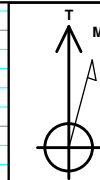
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
3	643.34	0.00	302.87	642.52	11.15	-17.26	2.00	302.87	-10.36	
4	4923.00	6.87	302.87	4891.48	288.85	-447.04	0.00	0.00	-268.23	
5	5266.34	0.00	0.00	5234.00	300.00	-464.30	2.00	180.00	-278.59	
6	5466.34	0.00	0.00	5434.00	300.00	-464.30	0.00	0.00	-278.59	
7	6284.73	90.00	180.00	5955.00	-221.00	-464.30	11.00	180.00	241.88	
8	16268.37	90.00	180.00	5955.00	-10204.64	-464.30	0.00	0.00	10215.20	PBHL 1738

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'
642.52	643.34	6.87	302.87	11.15	-17.26	-10.36	20.55	Hold 6.87° Inc
4891.48	4923.00	6.87	302.87	288.85	-447.04	-268.23	532.24	Drop 2°/100'
5234.00	5266.34	0.00	0.00	300.00	-464.30	-278.59	552.79	Hold Vertical
5434.00	5466.34	0.00	0.00	300.00	-464.30	-278.59	552.79	KOP, Build 11°/100'
5955.00	6284.73	90.00	180.00	-221.00	-464.30	241.88	1073.79	LP @ 90° Inc, Hold
5955.00	16268.37	90.00	180.00	-10204.64	-464.30	10215.20	11057.43	TD at 16268.37

DESIGN TARGET DETAILS

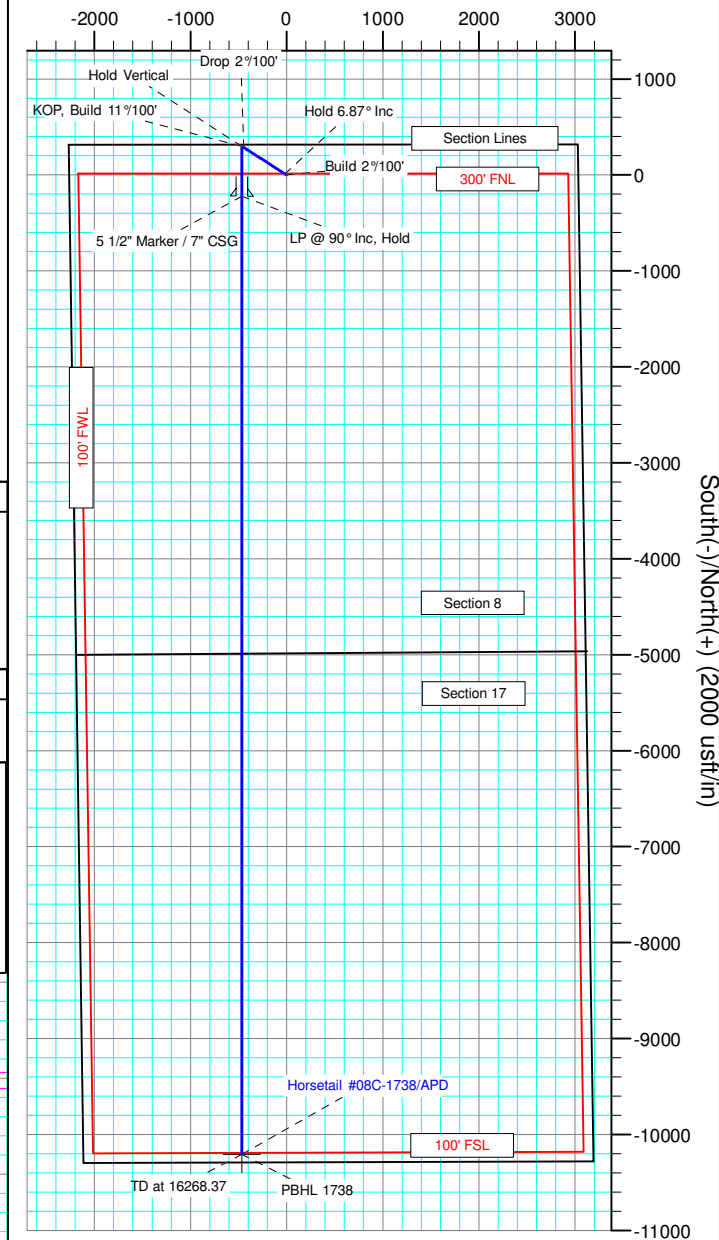
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL 1738	5955.00	-10204.64	-464.30	1550537.14	3476254.00	40° 49' 54.900 N	103° 46' 44.120 W



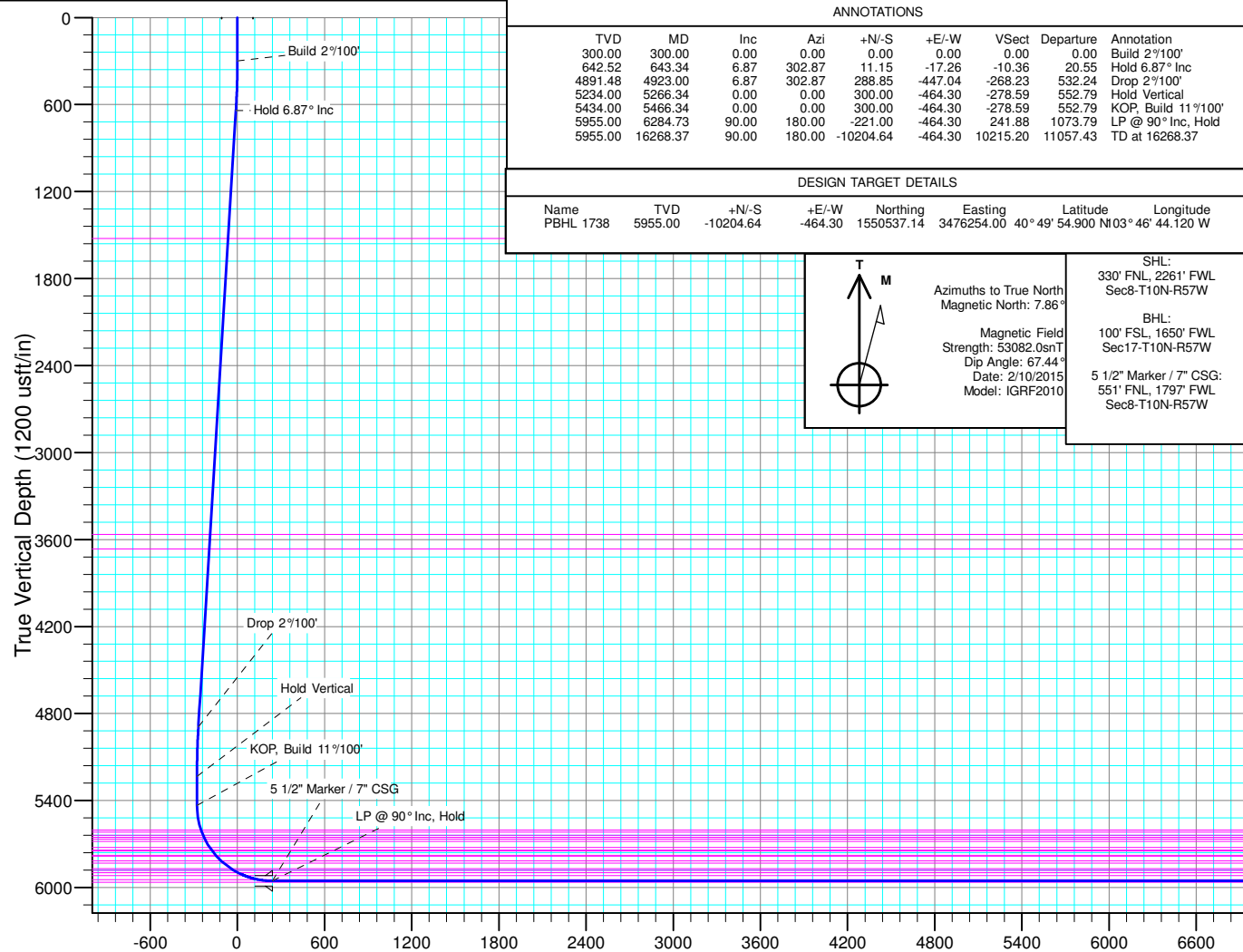
Azimuths to True North
Magnetic North: 7.86°
Magnetic Field
Strength: 53082.0snT
Dip Angle: 67.44°
Date: 2/10/2015
Model: IGRF2010

SHL:
330' FNL, 2261' FWL
Sec8-T10N-R57W
BHL:
100' FSL, 1650' FWL
Sec17-T10N-R57W
5 1/2" Marker / 7" CSG:
551' FNL, 1797' FWL
Sec8-T10N-R57W

West(-)/East(+) (2000 usft/in)



South(-)/North(+) (2000 usft/in)



Vertical Section at 182.61° (1200 usft/in)



Whiting Petroleum Corp.

Weld County, CO

Sec 8-T10N-R57W

Horsetail #08C-1738

Hz

Plan: APD

Standard Planning Report

21 March, 2016



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #08C-1738
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4932.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4932.70usft (Original Well Elev)
Site:	Sec 8-T10N-R57W	North Reference:	True
Well:	Horsetail #08C-1738	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 8-T10N-R57W			
Site Position:		Northing:	1,561,022.64 usft	Latitude:	40° 51' 38.869 N
From:	Lat/Long	Easting:	3,474,249.13 usft	Longitude:	103° 47' 7.559 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	1.11 °

Well	Horsetail #08C-1738					
Well Position	+N/-S	-317.62 usft	Northing:	1,560,748.88 usft	Latitude:	40° 51' 35.730 N
	+E/-W	2,265.12 usft	Easting:	3,476,519.97 usft	Longitude:	103° 46' 38.080 W
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	4,914.20 usft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/10/2015	7.86	67.44	53,082

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	182.61

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	
643.34	6.87	302.87	642.52	11.15	-17.26	2.00	2.00	0.00	302.87	
4,923.00	6.87	302.87	4,891.48	288.85	-447.04	0.00	0.00	0.00	0.00	
5,266.34	0.00	0.00	5,234.00	300.00	-464.30	2.00	-2.00	0.00	180.00	
5,466.34	0.00	0.00	5,434.00	300.00	-464.30	0.00	0.00	0.00	0.00	
6,284.73	90.00	180.00	5,955.00	-221.00	-464.30	11.00	11.00	0.00	180.00	
16,268.37	90.00	180.00	5,955.00	-10,204.64	-464.30	0.00	0.00	0.00	0.00	PBHL 1738



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Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4932.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4932.70usft (Original Well Elev)
Site:	Sec 8-T10N-R57W	North Reference:	True
Well:	Horsetail #08C-1738	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	302.87	399.98	0.95	-1.47	-0.88	2.00	2.00	0.00
500.00	4.00	302.87	499.84	3.79	-5.86	-3.52	2.00	2.00	0.00
600.00	6.00	302.87	599.45	8.52	-13.18	-7.91	2.00	2.00	0.00
643.34	6.87	302.87	642.52	11.15	-17.26	-10.36	2.00	2.00	0.00
Hold 6.87° Inc									
700.00	6.87	302.87	698.77	14.83	-22.95	-13.77	0.00	0.00	0.00
800.00	6.87	302.87	798.05	21.32	-32.99	-19.80	0.00	0.00	0.00
900.00	6.87	302.87	897.34	27.81	-43.04	-25.82	0.00	0.00	0.00
1,000.00	6.87	302.87	996.62	34.30	-53.08	-31.85	0.00	0.00	0.00
1,100.00	6.87	302.87	1,095.90	40.78	-63.12	-37.87	0.00	0.00	0.00
1,200.00	6.87	302.87	1,195.19	47.27	-73.16	-43.90	0.00	0.00	0.00
1,300.00	6.87	302.87	1,294.47	53.76	-83.20	-49.92	0.00	0.00	0.00
1,400.00	6.87	302.87	1,393.75	60.25	-93.25	-55.95	0.00	0.00	0.00
1,500.00	6.87	302.87	1,493.03	66.74	-103.29	-61.97	0.00	0.00	0.00
1,532.20	6.87	302.87	1,525.00	68.83	-106.52	-63.92	0.00	0.00	0.00
Upper Pierre									
1,600.00	6.87	302.87	1,592.32	73.23	-113.33	-68.00	0.00	0.00	0.00
1,700.00	6.87	302.87	1,691.60	79.72	-123.37	-74.03	0.00	0.00	0.00
1,800.00	6.87	302.87	1,790.88	86.20	-133.42	-80.05	0.00	0.00	0.00
1,900.00	6.87	302.87	1,890.16	92.69	-143.46	-86.08	0.00	0.00	0.00
2,000.00	6.87	302.87	1,989.45	99.18	-153.50	-92.10	0.00	0.00	0.00
2,100.00	6.87	302.87	2,088.73	105.67	-163.54	-98.13	0.00	0.00	0.00
2,200.00	6.87	302.87	2,188.01	112.16	-173.59	-104.15	0.00	0.00	0.00
2,300.00	6.87	302.87	2,287.29	118.65	-183.63	-110.18	0.00	0.00	0.00
2,400.00	6.87	302.87	2,386.58	125.14	-193.67	-116.21	0.00	0.00	0.00
2,500.00	6.87	302.87	2,485.86	131.63	-203.71	-122.23	0.00	0.00	0.00
2,600.00	6.87	302.87	2,585.14	138.11	-213.76	-128.26	0.00	0.00	0.00
2,700.00	6.87	302.87	2,684.43	144.60	-223.80	-134.28	0.00	0.00	0.00
2,800.00	6.87	302.87	2,783.71	151.09	-233.84	-140.31	0.00	0.00	0.00
2,900.00	6.87	302.87	2,882.99	157.58	-243.88	-146.33	0.00	0.00	0.00
3,000.00	6.87	302.87	2,982.27	164.07	-253.93	-152.36	0.00	0.00	0.00
3,100.00	6.87	302.87	3,081.56	170.56	-263.97	-158.38	0.00	0.00	0.00
3,200.00	6.87	302.87	3,180.84	177.05	-274.01	-164.41	0.00	0.00	0.00
3,300.00	6.87	302.87	3,280.12	183.54	-284.05	-170.44	0.00	0.00	0.00
3,400.00	6.87	302.87	3,379.40	190.02	-294.10	-176.46	0.00	0.00	0.00
3,500.00	6.87	302.87	3,478.69	196.51	-304.14	-182.49	0.00	0.00	0.00
3,586.94	6.87	302.87	3,565.00	202.15	-312.87	-187.72	0.00	0.00	0.00
Hygiene									
3,600.00	6.87	302.87	3,577.97	203.00	-314.18	-188.51	0.00	0.00	0.00
3,687.66	6.87	302.87	3,665.00	208.69	-322.98	-193.79	0.00	0.00	0.00
Lower Pierre									
3,700.00	6.87	302.87	3,677.25	209.49	-324.22	-194.54	0.00	0.00	0.00
3,800.00	6.87	302.87	3,776.53	215.98	-334.26	-200.56	0.00	0.00	0.00
3,900.00	6.87	302.87	3,875.82	222.47	-344.31	-206.59	0.00	0.00	0.00
4,000.00	6.87	302.87	3,975.10	228.96	-354.35	-212.61	0.00	0.00	0.00
4,100.00	6.87	302.87	4,074.38	235.45	-364.39	-218.64	0.00	0.00	0.00
4,200.00	6.87	302.87	4,173.67	241.93	-374.43	-224.67	0.00	0.00	0.00
4,300.00	6.87	302.87	4,272.95	248.42	-384.48	-230.69	0.00	0.00	0.00
4,400.00	6.87	302.87	4,372.23	254.91	-394.52	-236.72	0.00	0.00	0.00



WOG Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #08C-1738
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4932.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4932.70usft (Original Well Elev)
Site:	Sec 8-T10N-R57W	North Reference:	True
Well:	Horsetail #08C-1738	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	6.87	302.87	4,471.51	261.40	-404.56	-242.74	0.00	0.00	0.00	
4,600.00	6.87	302.87	4,570.80	267.89	-414.60	-248.77	0.00	0.00	0.00	
4,700.00	6.87	302.87	4,670.08	274.38	-424.65	-254.79	0.00	0.00	0.00	
4,800.00	6.87	302.87	4,769.36	280.87	-434.69	-260.82	0.00	0.00	0.00	
4,900.00	6.87	302.87	4,868.64	287.36	-444.73	-266.84	0.00	0.00	0.00	
4,923.00	6.87	302.87	4,891.48	288.85	-447.04	-268.23	0.00	0.00	0.00	
Drop 2°/100'										
5,000.00	5.33	302.87	4,968.04	293.29	-453.91	-272.35	2.00	-2.00	0.00	
5,100.00	3.33	302.87	5,067.75	297.38	-460.25	-276.15	2.00	-2.00	0.00	
5,200.00	1.33	302.87	5,167.66	299.58	-463.66	-278.20	2.00	-2.00	0.00	
5,266.34	0.00	0.00	5,234.00	300.00	-464.30	-278.59	2.00	-2.00	0.00	
Hold Vertical										
5,300.00	0.00	0.00	5,267.66	300.00	-464.30	-278.59	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,367.66	300.00	-464.30	-278.59	0.00	0.00	0.00	
5,466.34	0.00	0.00	5,434.00	300.00	-464.30	-278.59	0.00	0.00	0.00	
KOP, Build 11°/100'										
5,500.00	3.70	180.00	5,467.63	298.91	-464.30	-277.50	11.00	11.00	0.00	
5,600.00	14.70	180.00	5,566.20	282.95	-464.30	-261.55	11.00	11.00	0.00	
5,639.51	19.04	180.00	5,604.00	271.48	-464.30	-250.10	11.00	11.00	0.00	
P200 Marker										
5,655.47	20.80	180.00	5,619.00	266.05	-464.30	-244.67	11.00	11.00	0.00	
P300 Marker										
5,677.04	23.17	180.00	5,639.00	257.97	-464.30	-236.60	11.00	11.00	0.00	
P350 Marker										
5,693.47	24.98	180.00	5,654.00	251.27	-464.30	-229.91	11.00	11.00	0.00	
Sharon Springs										
5,700.00	25.70	180.00	5,659.90	248.48	-464.30	-227.12	11.00	11.00	0.00	
5,706.79	26.44	180.00	5,666.00	245.49	-464.30	-224.14	11.00	11.00	0.00	
Niobrara										
5,723.68	28.30	180.00	5,681.00	237.73	-464.30	-216.38	11.00	11.00	0.00	
Top A Chalk										
5,772.69	33.69	180.00	5,723.00	212.50	-464.30	-191.17	11.00	11.00	0.00	
Top A Marl										
5,795.88	36.24	180.00	5,742.00	199.21	-464.30	-177.90	11.00	11.00	0.00	
A Marl										
5,800.00	36.69	180.00	5,745.31	196.76	-464.30	-175.46	11.00	11.00	0.00	
5,803.36	37.06	180.00	5,748.00	194.75	-464.30	-173.44	11.00	11.00	0.00	
Top Upper B										
5,843.41	41.47	180.00	5,779.00	169.40	-464.30	-148.13	11.00	11.00	0.00	
Base Upper B										
5,848.77	42.06	180.00	5,783.00	165.83	-464.30	-144.56	11.00	11.00	0.00	
Top Lower B										
5,895.14	47.16	180.00	5,816.00	133.28	-464.30	-112.04	11.00	11.00	0.00	
Base Lower B										
5,900.00	47.69	180.00	5,819.29	129.70	-464.30	-108.47	11.00	11.00	0.00	
5,917.73	49.64	180.00	5,831.00	116.39	-464.30	-95.17	11.00	11.00	0.00	
Top B Marl										
5,984.75	57.01	180.00	5,871.00	62.68	-464.30	-41.51	11.00	11.00	0.00	
Top C Chalk										
6,000.00	58.69	180.00	5,879.12	49.76	-464.30	-28.61	11.00	11.00	0.00	
6,007.57	59.52	180.00	5,883.00	43.27	-464.30	-22.12	11.00	11.00	0.00	
Middle C Chalk										



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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)
6,036.55	62.71	180.00	5,897.00	17.90	-464.30	3.22	11.00	11.00	0.00
Middle C Marl									
6,087.19	68.28	180.00	5,918.00	-28.17	-464.30	49.24	11.00	11.00	0.00
Lower C Chalk									
6,100.00	69.69	180.00	5,922.59	-40.12	-464.30	61.18	11.00	11.00	0.00
6,182.49	78.76	180.00	5,945.00	-119.41	-464.30	140.39	11.00	11.00	0.00
Lower C Marl									
6,200.00	80.68	180.00	5,948.13	-136.65	-464.30	157.61	11.00	11.00	0.00
6,284.73	90.00	180.00	5,955.00	-221.00	-464.30	241.88	11.00	11.00	0.00
LP @ 90° Inc, Hold - 5 1/2" Marker / 7" CSG									
6,300.00	90.00	180.00	5,955.00	-236.27	-464.30	257.13	0.00	0.00	0.00
6,400.00	90.00	180.00	5,955.00	-336.27	-464.30	357.03	0.00	0.00	0.00
6,500.00	90.00	180.00	5,955.00	-436.27	-464.30	456.93	0.00	0.00	0.00
6,600.00	90.00	180.00	5,955.00	-536.27	-464.30	556.82	0.00	0.00	0.00
6,700.00	90.00	180.00	5,955.00	-636.27	-464.30	656.72	0.00	0.00	0.00
6,800.00	90.00	180.00	5,955.00	-736.27	-464.30	756.62	0.00	0.00	0.00
6,900.00	90.00	180.00	5,955.00	-836.27	-464.30	856.51	0.00	0.00	0.00
7,000.00	90.00	180.00	5,955.00	-936.27	-464.30	956.41	0.00	0.00	0.00
7,100.00	90.00	180.00	5,955.00	-1,036.27	-464.30	1,056.31	0.00	0.00	0.00
7,200.00	90.00	180.00	5,955.00	-1,136.27	-464.30	1,156.20	0.00	0.00	0.00
7,300.00	90.00	180.00	5,955.00	-1,236.27	-464.30	1,256.10	0.00	0.00	0.00
7,400.00	90.00	180.00	5,955.00	-1,336.27	-464.30	1,356.00	0.00	0.00	0.00
7,500.00	90.00	180.00	5,955.00	-1,436.27	-464.30	1,455.89	0.00	0.00	0.00
7,600.00	90.00	180.00	5,955.00	-1,536.27	-464.30	1,555.79	0.00	0.00	0.00
7,700.00	90.00	180.00	5,955.00	-1,636.27	-464.30	1,655.69	0.00	0.00	0.00
7,800.00	90.00	180.00	5,955.00	-1,736.27	-464.30	1,755.58	0.00	0.00	0.00
7,900.00	90.00	180.00	5,955.00	-1,836.27	-464.30	1,855.48	0.00	0.00	0.00
8,000.00	90.00	180.00	5,955.00	-1,936.27	-464.30	1,955.38	0.00	0.00	0.00
8,100.00	90.00	180.00	5,955.00	-2,036.27	-464.30	2,055.27	0.00	0.00	0.00
8,200.00	90.00	180.00	5,955.00	-2,136.27	-464.30	2,155.17	0.00	0.00	0.00
8,300.00	90.00	180.00	5,955.00	-2,236.27	-464.30	2,255.07	0.00	0.00	0.00
8,400.00	90.00	180.00	5,955.00	-2,336.27	-464.30	2,354.96	0.00	0.00	0.00
8,500.00	90.00	180.00	5,955.00	-2,436.27	-464.30	2,454.86	0.00	0.00	0.00
8,600.00	90.00	180.00	5,955.00	-2,536.27	-464.30	2,554.76	0.00	0.00	0.00
8,700.00	90.00	180.00	5,955.00	-2,636.27	-464.30	2,654.65	0.00	0.00	0.00
8,800.00	90.00	180.00	5,955.00	-2,736.27	-464.30	2,754.55	0.00	0.00	0.00
8,900.00	90.00	180.00	5,955.00	-2,836.27	-464.30	2,854.45	0.00	0.00	0.00
9,000.00	90.00	180.00	5,955.00	-2,936.27	-464.30	2,954.34	0.00	0.00	0.00
9,100.00	90.00	180.00	5,955.00	-3,036.27	-464.30	3,054.24	0.00	0.00	0.00
9,200.00	90.00	180.00	5,955.00	-3,136.27	-464.30	3,154.13	0.00	0.00	0.00
9,300.00	90.00	180.00	5,955.00	-3,236.27	-464.30	3,254.03	0.00	0.00	0.00
9,400.00	90.00	180.00	5,955.00	-3,336.27	-464.30	3,353.93	0.00	0.00	0.00
9,500.00	90.00	180.00	5,955.00	-3,436.27	-464.30	3,453.82	0.00	0.00	0.00
9,600.00	90.00	180.00	5,955.00	-3,536.27	-464.30	3,553.72	0.00	0.00	0.00
9,700.00	90.00	180.00	5,955.00	-3,636.27	-464.30	3,653.62	0.00	0.00	0.00
9,800.00	90.00	180.00	5,955.00	-3,736.27	-464.30	3,753.51	0.00	0.00	0.00
9,900.00	90.00	180.00	5,955.00	-3,836.27	-464.30	3,853.41	0.00	0.00	0.00
10,000.00	90.00	180.00	5,955.00	-3,936.27	-464.30	3,953.31	0.00	0.00	0.00
10,100.00	90.00	180.00	5,955.00	-4,036.27	-464.30	4,053.20	0.00	0.00	0.00
10,200.00	90.00	180.00	5,955.00	-4,136.27	-464.30	4,153.10	0.00	0.00	0.00
10,300.00	90.00	180.00	5,955.00	-4,236.27	-464.30	4,253.00	0.00	0.00	0.00
10,400.00	90.00	180.00	5,955.00	-4,336.27	-464.30	4,352.89	0.00	0.00	0.00
10,500.00	90.00	180.00	5,955.00	-4,436.27	-464.30	4,452.79	0.00	0.00	0.00



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #08C-1738
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4932.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4932.70usft (Original Well Elev)
Site:	Sec 8-T10N-R57W	North Reference:	True
Well:	Horsetail #08C-1738	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)
10,600.00	90.00	180.00	5,955.00	-4,536.27	-464.30	4,552.69	0.00	0.00	0.00
10,700.00	90.00	180.00	5,955.00	-4,636.27	-464.30	4,652.58	0.00	0.00	0.00
10,800.00	90.00	180.00	5,955.00	-4,736.27	-464.30	4,752.48	0.00	0.00	0.00
10,900.00	90.00	180.00	5,955.00	-4,836.27	-464.30	4,852.38	0.00	0.00	0.00
11,000.00	90.00	180.00	5,955.00	-4,936.27	-464.30	4,952.27	0.00	0.00	0.00
11,100.00	90.00	180.00	5,955.00	-5,036.27	-464.30	5,052.17	0.00	0.00	0.00
11,200.00	90.00	180.00	5,955.00	-5,136.27	-464.30	5,152.07	0.00	0.00	0.00
11,300.00	90.00	180.00	5,955.00	-5,236.27	-464.30	5,251.96	0.00	0.00	0.00
11,400.00	90.00	180.00	5,955.00	-5,336.27	-464.30	5,351.86	0.00	0.00	0.00
11,500.00	90.00	180.00	5,955.00	-5,436.27	-464.30	5,451.76	0.00	0.00	0.00
11,600.00	90.00	180.00	5,955.00	-5,536.27	-464.30	5,551.65	0.00	0.00	0.00
11,700.00	90.00	180.00	5,955.00	-5,636.27	-464.30	5,651.55	0.00	0.00	0.00
11,800.00	90.00	180.00	5,955.00	-5,736.27	-464.30	5,751.45	0.00	0.00	0.00
11,900.00	90.00	180.00	5,955.00	-5,836.27	-464.30	5,851.34	0.00	0.00	0.00
12,000.00	90.00	180.00	5,955.00	-5,936.27	-464.30	5,951.24	0.00	0.00	0.00
12,100.00	90.00	180.00	5,955.00	-6,036.27	-464.30	6,051.14	0.00	0.00	0.00
12,200.00	90.00	180.00	5,955.00	-6,136.27	-464.30	6,151.03	0.00	0.00	0.00
12,300.00	90.00	180.00	5,955.00	-6,236.27	-464.30	6,250.93	0.00	0.00	0.00
12,400.00	90.00	180.00	5,955.00	-6,336.27	-464.30	6,350.83	0.00	0.00	0.00
12,500.00	90.00	180.00	5,955.00	-6,436.27	-464.30	6,450.72	0.00	0.00	0.00
12,600.00	90.00	180.00	5,955.00	-6,536.27	-464.30	6,550.62	0.00	0.00	0.00
12,700.00	90.00	180.00	5,955.00	-6,636.27	-464.30	6,650.52	0.00	0.00	0.00
12,800.00	90.00	180.00	5,955.00	-6,736.27	-464.30	6,750.41	0.00	0.00	0.00
12,900.00	90.00	180.00	5,955.00	-6,836.27	-464.30	6,850.31	0.00	0.00	0.00
13,000.00	90.00	180.00	5,955.00	-6,936.27	-464.30	6,950.21	0.00	0.00	0.00
13,100.00	90.00	180.00	5,955.00	-7,036.27	-464.30	7,050.10	0.00	0.00	0.00
13,200.00	90.00	180.00	5,955.00	-7,136.27	-464.30	7,150.00	0.00	0.00	0.00
13,300.00	90.00	180.00	5,955.00	-7,236.27	-464.30	7,249.90	0.00	0.00	0.00
13,400.00	90.00	180.00	5,955.00	-7,336.27	-464.30	7,349.79	0.00	0.00	0.00
13,500.00	90.00	180.00	5,955.00	-7,436.27	-464.30	7,449.69	0.00	0.00	0.00
13,600.00	90.00	180.00	5,955.00	-7,536.27	-464.30	7,549.59	0.00	0.00	0.00
13,700.00	90.00	180.00	5,955.00	-7,636.27	-464.30	7,649.48	0.00	0.00	0.00
13,800.00	90.00	180.00	5,955.00	-7,736.27	-464.30	7,749.38	0.00	0.00	0.00
13,900.00	90.00	180.00	5,955.00	-7,836.27	-464.30	7,849.28	0.00	0.00	0.00
14,000.00	90.00	180.00	5,955.00	-7,936.27	-464.30	7,949.17	0.00	0.00	0.00
14,100.00	90.00	180.00	5,955.00	-8,036.27	-464.30	8,049.07	0.00	0.00	0.00
14,200.00	90.00	180.00	5,955.00	-8,136.27	-464.30	8,148.97	0.00	0.00	0.00
14,300.00	90.00	180.00	5,955.00	-8,236.27	-464.30	8,248.86	0.00	0.00	0.00
14,400.00	90.00	180.00	5,955.00	-8,336.27	-464.30	8,348.76	0.00	0.00	0.00
14,500.00	90.00	180.00	5,955.00	-8,436.27	-464.30	8,448.66	0.00	0.00	0.00
14,600.00	90.00	180.00	5,955.00	-8,536.27	-464.30	8,548.55	0.00	0.00	0.00
14,700.00	90.00	180.00	5,955.00	-8,636.27	-464.30	8,648.45	0.00	0.00	0.00
14,800.00	90.00	180.00	5,955.00	-8,736.27	-464.30	8,748.35	0.00	0.00	0.00
14,900.00	90.00	180.00	5,955.00	-8,836.27	-464.30	8,848.24	0.00	0.00	0.00
15,000.00	90.00	180.00	5,955.00	-8,936.27	-464.30	8,948.14	0.00	0.00	0.00
15,100.00	90.00	180.00	5,955.00	-9,036.27	-464.30	9,048.04	0.00	0.00	0.00
15,200.00	90.00	180.00	5,955.00	-9,136.27	-464.30	9,147.93	0.00	0.00	0.00
15,300.00	90.00	180.00	5,955.00	-9,236.27	-464.30	9,247.83	0.00	0.00	0.00
15,400.00	90.00	180.00	5,955.00	-9,336.27	-464.30	9,347.73	0.00	0.00	0.00
15,500.00	90.00	180.00	5,955.00	-9,436.27	-464.30	9,447.62	0.00	0.00	0.00
15,600.00	90.00	180.00	5,955.00	-9,536.27	-464.30	9,547.52	0.00	0.00	0.00
15,700.00	90.00	180.00	5,955.00	-9,636.27	-464.30	9,647.42	0.00	0.00	0.00
15,800.00	90.00	180.00	5,955.00	-9,736.27	-464.30	9,747.31	0.00	0.00	0.00
15,900.00	90.00	180.00	5,955.00	-9,836.27	-464.30	9,847.21	0.00	0.00	0.00



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #08C-1738
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4932.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4932.70usft (Original Well Elev)
Site:	Sec 8-T10N-R57W	North Reference:	True
Well:	Horsetail #08C-1738	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)
16,000.00	90.00	180.00	5,955.00	-9,936.27	-464.30	9,947.11	0.00	0.00	0.00
16,100.00	90.00	180.00	5,955.00	-10,036.27	-464.30	10,047.00	0.00	0.00	0.00
16,200.00	90.00	180.00	5,955.00	-10,136.27	-464.30	10,146.90	0.00	0.00	0.00
16,268.37	90.00	180.00	5,955.00	-10,204.64	-464.30	10,215.20	0.00	0.00	0.00
TD at 16268.37									

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 1738	0.00	0.00	5,955.00	-10,204.64	-464.30	1,550,537.14	3,476,254.00	40° 49' 54.900 N	103° 46' 44.120 W
- plan hits target center									
- Point									

Casing Points						Casing Diameter (in)	Hole Diameter (in)
Measured Depth (usft)	Vertical Depth (usft)	Name					
6,284.73	5,955.00	5 1/2" Marker / 7" CSG				7.000	8.750

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,532.20	1,525.00	Upper Pierre				
3,586.94	3,565.00	Hygiene				
3,687.66	3,665.00	Lower Pierre				
5,639.51	5,604.00	P200 Marker				
5,655.47	5,619.00	P300 Marker				
5,677.04	5,639.00	P350 Marker				
5,693.47	5,654.00	Sharon Springs				
5,706.79	5,666.00	Niobrara				
5,723.68	5,681.00	Top A Chalk				
5,772.69	5,723.00	Top A Marl				
5,795.88	5,742.00	A Marl				
5,803.36	5,748.00	Top Upper B				
5,843.41	5,779.00	Base Upper B				
5,848.77	5,783.00	Top Lower B				
5,895.14	5,816.00	Base Lower B				
5,917.73	5,831.00	Top B Marl				
5,984.75	5,871.00	Top C Chalk				
6,007.57	5,883.00	Middle C Chalk				
6,036.55	5,897.00	Middle C Marl				
6,087.19	5,918.00	Lower C Chalk				
6,182.49	5,945.00	Lower C Marl				



WOG

Planning Report

Database:	LandmarkEDM	Local Co-ordinate Reference:	Well Horsetail #08C-1738
Company:	Whiting Petroleum Corp.	TVD Reference:	KBE @ 4932.70usft (Original Well Elev)
Project:	Weld County, CO	MD Reference:	KBE @ 4932.70usft (Original Well Elev)
Site:	Sec 8-T10N-R57W	North Reference:	True
Well:	Horsetail #08C-1738	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'
643.34	642.52	11.15	-17.26	Hold 6.87° Inc
4,923.00	4,891.48	288.85	-447.04	Drop 2°/100'
5,266.34	5,234.00	300.00	-464.30	Hold Vertical
5,466.34	5,434.00	300.00	-464.30	KOP, Build 11°/100'
6,284.73	5,955.00	-221.00	-464.30	LP @ 90° Inc, Hold
16,268.37	5,955.00	-10,204.64	-464.30	TD at 16268.37