



# WHITING PETROLEUM CORP.

Project: Weld County, CO  
Site: Sec 30-T10N-R57W  
Well: Horsetail #30G-3139  
Wellbore: Original Hole  
Design: Original Hole



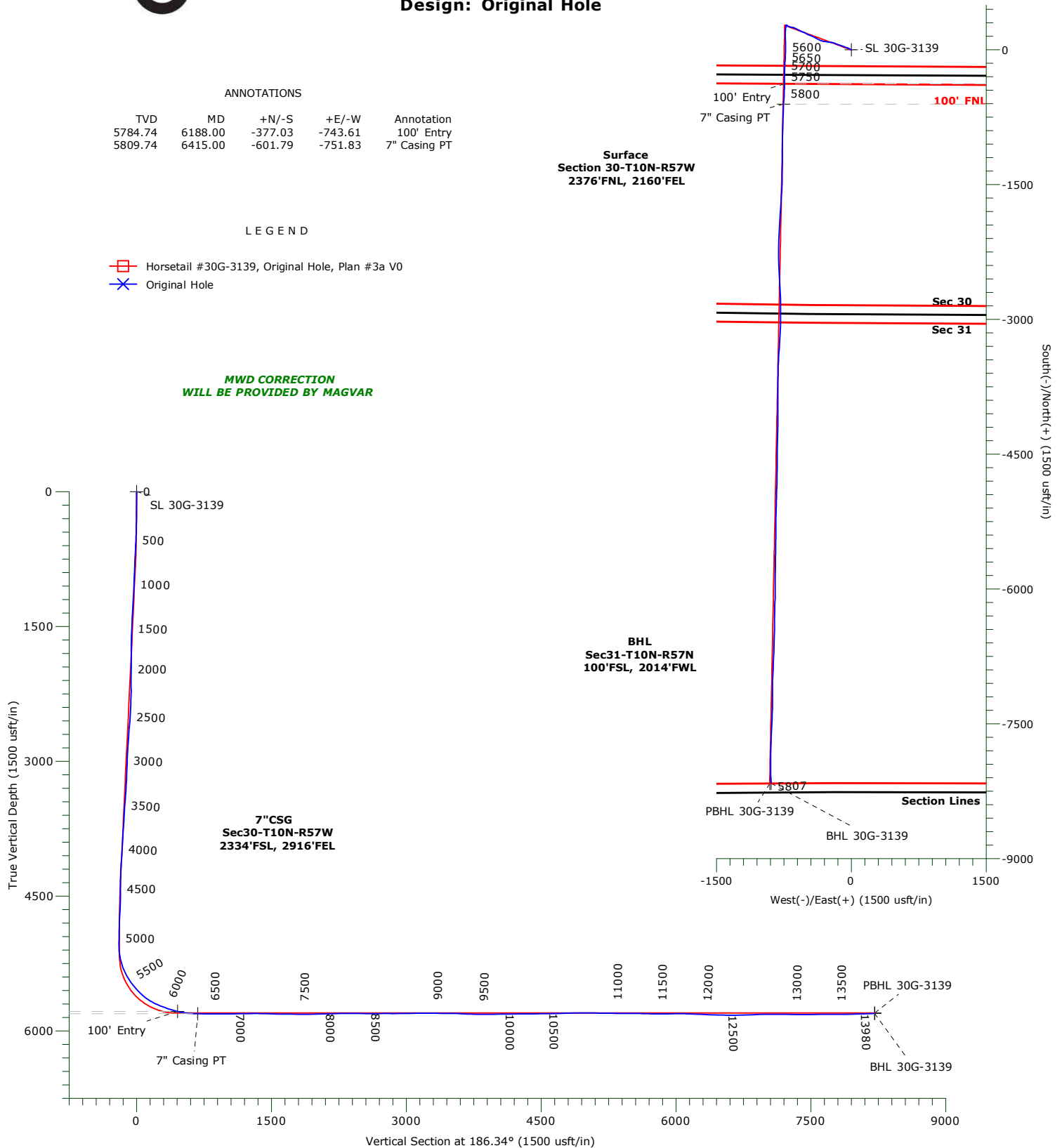
## ANNOTATIONS

TVD	MD	+N/-S	+E/-W	Annotation
5784.74	6188.00	-377.03	-743.61	100' Entry
5809.74	6415.00	-601.79	-751.83	7" Casing PT

## LEGEND

- Horsetail #30G-3139, Original Hole, Plan #3a V0
- Original Hole

MWD CORRECTION  
WILL BE PROVIDED BY MAGVAR



## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
SL 30G-3139	0.00	0.00	0.00	1542673.95	3472691.12	40.810528°N	103.792342°W	Point
100' Entry 30G-3139	5784.74	-377.03	-743.61	1542282.67	3471954.91	40.809493°N	103.795028°W	Point
PBHL 30G-3139	5803.00	-8162.15	-906.90	1534495.85	3471941.56	40.788125°N	103.795617°W	Point
BHL 30G-3139	5807.47	-8161.32	-892.47	1534496.96	3471955.97	40.788127°N	103.795565°W	Point
7" Casing PT 30G-3139	5809.74	-601.79	-751.83	1542057.79	3471951.02	40.808876°N	103.795058°W	Point

# **WHITING PETROLEUM CORP.**

**Weld County, CO**

**Sec 30-T10N-R57W**

**Horsetail #30G-3139**

**Original Hole**

**Design: Original Hole**

## **Standard Survey Report**

**18 January, 2017**

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	WHITING PETROLEUM CORP.	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30G-3139
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Site:</b>	Sec 30-T10N-R57W	<b>MD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Well:</b>	Horsetail #30G-3139	<b>North Reference:</b>	True
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	Local2

<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-R57W		
<b>Site Position:</b>		<b>Northing:</b>	1,542,678.56 usft
<b>From:</b>	Map	<b>Easting:</b>	3,472,930.99 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.20 in
		<b>Latitude:</b>	40.810528°N
		<b>Longitude:</b>	103.791475°W
		<b>Grid Convergence:</b>	1.10 °

<b>Well</b>	Horsetail #30G-3139		
<b>Well Position</b>	<b>+N-S</b>	0.00 usft	<b>Northing:</b> 1,542,673.95 usft
	<b>+E-W</b>	0.00 usft	<b>Easting:</b> 3,472,691.12 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft
		<b>Latitude:</b>	40.810528°N
		<b>Longitude:</b>	103.792342°W
		<b>Ground Level:</b>	4,738.00 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	12/1/2016	7.77	67.34	52,765

<b>Design</b>	Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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	186.34	

<b>Survey Program</b>	<b>Date</b>	1/18/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
225.00	13,921.00	Survey #1 (Original Hole)	MWD+IFR1+MS+sag	Fixed:v2:crustal dec & 3-axis correction + sag OWSG BLIND	
13,980.00	13,980.00	Survey #2 (Original Hole)	BLIND		

<b>Survey</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>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
225.00	0.29	358.51	225.00	0.57	-0.01	-0.56	0.13	0.13	0.00	
318.00	0.50	316.81	318.00	1.10	-0.30	-1.06	0.37	0.23	-44.84	
411.00	3.21	297.72	410.94	2.61	-2.88	-2.27	2.95	2.91	-20.53	
504.00	5.24	305.13	503.68	6.26	-8.66	-5.27	2.26	2.18	7.97	
597.00	6.87	297.26	596.16	11.25	-17.08	-9.30	1.96	1.75	-8.46	
690.00	8.72	293.28	688.30	16.59	-28.50	-13.34	2.07	1.99	-4.28	
784.00	10.27	291.85	781.01	22.52	-42.82	-17.66	1.67	1.65	-1.52	
876.00	9.69	290.75	871.62	28.32	-57.68	-21.78	0.66	-0.63	-1.20	
969.00	9.72	288.43	963.29	33.57	-72.44	-25.37	0.42	0.03	-2.49	

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	WHITING PETROLEUM CORP.	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30G-3139
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Site:</b>	Sec 30-T10N-R57W	<b>MD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Well:</b>	Horsetail #30G-3139	<b>North Reference:</b>	True
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	Local2

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,062.00	9.82	287.88	1,054.94	38.49	-87.44	-28.60	0.15	0.11	-0.59
1,156.00	11.57	291.62	1,147.30	44.43	-103.83	-32.69	2.00	1.86	3.98
1,249.00	12.03	291.13	1,238.34	51.36	-121.54	-37.62	0.51	0.49	-0.53
1,342.00	12.55	290.53	1,329.21	58.39	-140.05	-42.57	0.58	0.56	-0.65
1,435.00	13.29	290.39	1,419.85	65.66	-159.53	-47.64	0.80	0.80	-0.15
1,528.00	12.99	288.18	1,510.42	72.65	-179.48	-52.38	0.63	-0.32	-2.38
1,621.00	12.57	284.49	1,601.11	78.44	-199.21	-55.96	0.99	-0.45	-3.97
1,715.00	11.71	279.53	1,693.01	82.58	-218.52	-57.94	1.44	-0.91	-5.28
1,808.00	10.02	279.46	1,784.34	85.47	-235.81	-58.91	1.82	-1.82	-0.08
1,901.00	8.71	274.15	1,876.10	87.31	-250.81	-59.08	1.69	-1.41	-5.71
1,994.00	8.97	279.77	1,968.00	89.05	-264.98	-59.25	0.97	0.28	6.04
2,121.00	8.22	280.09	2,093.57	92.32	-283.68	-60.43	0.59	-0.59	0.25
2,215.00	7.32	269.81	2,186.71	93.48	-296.28	-60.19	1.76	-0.96	-10.94
2,310.00	9.94	284.18	2,280.64	95.47	-310.29	-60.62	3.55	2.76	15.13
2,405.00	12.60	290.16	2,373.80	101.05	-327.97	-64.21	3.05	2.80	6.29
2,500.00	12.06	287.86	2,466.61	107.66	-347.14	-68.67	0.77	-0.57	-2.42
2,594.00	11.80	302.38	2,558.60	115.83	-364.61	-74.85	3.20	-0.28	15.45
2,689.00	11.59	299.81	2,651.63	125.77	-381.09	-82.92	0.59	-0.22	-2.71
2,784.00	11.08	296.22	2,744.78	134.55	-397.56	-89.82	0.92	-0.54	-3.78
2,879.00	10.56	295.33	2,838.09	142.31	-413.62	-95.76	0.57	-0.55	-0.94
2,973.00	8.78	295.40	2,930.75	149.07	-427.89	-100.91	1.89	-1.89	0.07
3,068.00	7.17	291.02	3,024.83	154.31	-439.97	-104.78	1.81	-1.69	-4.61
3,162.00	8.85	293.08	3,117.91	159.25	-452.10	-108.35	1.81	1.79	2.19
3,257.00	8.66	289.78	3,211.80	164.53	-465.55	-112.11	0.57	-0.20	-3.47
3,352.00	11.27	295.53	3,305.36	170.95	-480.66	-116.83	2.94	2.75	6.05
3,446.00	11.43	297.30	3,397.53	179.18	-497.23	-123.18	0.41	0.17	1.88
3,541.00	12.78	294.70	3,490.41	187.89	-515.14	-129.86	1.53	1.42	-2.74
3,635.00	11.67	294.97	3,582.28	196.25	-533.21	-136.17	1.18	-1.18	0.29
3,730.00	10.51	295.84	3,675.50	204.08	-549.71	-142.13	1.23	-1.22	0.92
3,825.00	10.05	298.81	3,768.98	211.85	-564.78	-148.19	0.74	-0.48	3.13
3,919.00	9.27	292.60	3,861.65	218.72	-578.95	-153.45	1.38	-0.83	-6.61
4,014.00	9.92	294.06	3,955.32	224.99	-593.49	-158.08	0.73	0.68	1.54
4,109.00	11.48	298.95	4,048.67	232.91	-609.23	-164.20	1.90	1.64	5.15
4,204.00	10.52	296.79	4,141.92	241.39	-625.25	-170.87	1.10	-1.01	-2.27
4,298.00	9.98	287.87	4,234.42	247.76	-640.66	-175.50	1.78	-0.57	-9.49
4,393.00	8.71	276.90	4,328.17	251.15	-655.64	-177.21	2.30	-1.34	-11.55
4,487.00	7.29	278.28	4,421.25	252.86	-668.61	-177.48	1.52	-1.51	1.47
4,582.00	7.19	283.91	4,515.50	255.16	-680.34	-178.47	0.75	-0.11	5.93
4,676.00	7.73	292.65	4,608.70	259.01	-691.89	-181.02	1.34	0.57	9.30
4,771.00	7.50	303.26	4,702.87	264.87	-702.97	-185.62	1.50	-0.24	11.17
4,865.00	6.00	297.78	4,796.22	270.52	-712.45	-190.20	1.73	-1.60	-5.83
4,960.00	4.36	291.90	4,890.83	274.19	-720.19	-192.98	1.81	-1.73	-6.19
5,054.00	1.24	6.35	4,984.72	276.53	-723.39	-194.96	4.47	-3.32	79.20

# Precision Drilling Corporation

## Survey Report

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<b>Site:</b>	Sec 30-T10N-R57W	<b>MD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Well:</b>	Horsetail #30G-3139	<b>North Reference:</b>	True
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	Local2

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,088.00	1.12	3.93	5,018.71	277.23	-723.33	-195.66	0.38	-0.35	-7.12	
5,183.00	3.72	182.14	5,113.66	275.07	-723.38	-193.51	5.09	2.74	187.59	
5,278.00	13.11	188.69	5,207.53	261.31	-725.13	-179.64	9.92	9.88	6.89	
5,373.00	21.80	188.17	5,298.07	233.15	-729.27	-151.19	9.15	9.15	-0.55	
5,468.00	28.69	182.12	5,383.96	192.84	-732.63	-110.76	7.74	7.25	-6.37	
5,562.00	36.04	179.54	5,463.31	142.57	-733.24	-60.73	7.95	7.82	-2.74	
5,657.00	43.17	177.41	5,536.46	82.08	-731.55	-0.80	7.64	7.51	-2.24	
5,752.00	47.89	180.37	5,603.00	14.33	-730.30	66.40	5.44	4.97	3.12	
5,847.00	57.38	182.67	5,660.59	-61.05	-732.40	141.55	10.17	9.99	2.42	
5,941.00	66.65	183.92	5,704.65	-143.82	-737.20	224.35	9.93	9.86	1.33	
6,036.00	69.42	181.37	5,740.19	-231.82	-741.25	312.25	3.83	2.92	-2.68	
6,131.00	73.94	180.86	5,770.04	-321.96	-743.00	402.04	4.79	4.76	-0.54	
6,225.00	77.61	180.14	5,793.14	-413.06	-743.79	492.67	3.97	3.90	-0.77	
6,320.00	86.62	183.51	5,806.16	-507.00	-746.81	586.37	10.11	9.48	3.55	
6,415.00	89.06	182.55	5,809.74	-601.79	-751.83	681.14	2.76	2.57	-1.01	
6,510.00	89.37	182.40	5,811.04	-696.70	-755.93	775.91	0.36	0.33	-0.16	
6,605.00	89.73	182.50	5,811.79	-791.61	-759.99	870.69	0.39	0.38	0.11	
6,699.00	89.93	181.62	5,812.07	-885.54	-763.37	964.43	0.96	0.21	-0.94	
6,794.00	90.86	180.94	5,811.41	-980.52	-765.49	1,059.05	1.21	0.98	-0.72	
6,888.00	90.94	179.47	5,809.94	-1,074.50	-765.83	1,152.50	1.57	0.09	-1.56	
6,983.00	90.76	180.27	5,808.53	-1,169.49	-765.61	1,246.88	0.86	-0.19	0.84	
7,078.00	90.11	180.59	5,807.81	-1,264.48	-766.33	1,341.37	0.76	-0.68	0.34	
7,172.00	88.64	179.73	5,808.83	-1,358.47	-766.59	1,434.82	1.81	-1.56	-0.91	
7,267.00	87.93	181.80	5,811.67	-1,453.42	-767.86	1,529.32	2.30	-0.75	2.18	
7,362.00	89.12	183.52	5,814.12	-1,548.28	-772.27	1,624.09	2.20	1.25	1.81	
7,456.00	89.41	183.44	5,815.33	-1,642.10	-777.97	1,717.96	0.32	0.31	-0.09	
7,551.00	89.82	184.03	5,815.96	-1,736.89	-784.16	1,812.86	0.76	0.43	0.62	
7,646.00	89.56	183.34	5,816.48	-1,831.69	-790.26	1,907.76	0.78	-0.27	-0.73	
7,740.00	91.85	183.81	5,815.32	-1,925.50	-796.12	2,001.64	2.49	2.44	0.50	
7,835.00	91.69	182.36	5,812.39	-2,020.31	-801.23	2,096.44	1.53	-0.17	-1.53	
7,930.00	91.75	181.95	5,809.54	-2,115.20	-804.81	2,191.14	0.44	0.06	-0.43	
8,024.00	90.76	181.38	5,807.48	-2,209.14	-807.54	2,284.80	1.22	-1.05	-0.61	
8,119.00	90.08	178.93	5,806.78	-2,304.13	-807.79	2,379.24	2.68	-0.72	-2.58	
8,213.00	89.63	177.78	5,807.02	-2,398.09	-805.09	2,472.33	1.31	-0.48	-1.22	
8,308.00	89.04	176.12	5,808.12	-2,492.94	-800.04	2,566.04	1.85	-0.62	-1.75	
8,403.00	90.61	177.81	5,808.41	-2,587.80	-795.01	2,659.77	2.43	1.65	1.78	
8,497.00	90.28	176.82	5,807.68	-2,681.70	-790.61	2,752.60	1.11	-0.35	-1.05	
8,592.00	89.23	178.50	5,808.09	-2,776.61	-786.73	2,846.51	2.09	-1.11	1.77	
8,687.00	90.98	179.77	5,807.91	-2,871.59	-785.30	2,940.75	2.28	1.84	1.34	
8,781.00	91.84	179.92	5,805.60	-2,965.56	-785.04	3,034.12	0.93	0.91	0.16	
8,874.00	89.98	182.17	5,804.12	-3,058.53	-786.74	3,126.70	3.14	-2.00	2.42	
8,968.00	89.54	182.78	5,804.52	-3,152.44	-790.80	3,220.48	0.80	-0.47	0.65	
9,060.00	90.16	183.98	5,804.76	-3,244.28	-796.22	3,312.36	1.47	0.67	1.30	

# Precision Drilling Corporation

## Survey Report

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<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Site:</b>	Sec 30-T10N-R57W	<b>MD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Well:</b>	Horsetail #30G-3139	<b>North Reference:</b>	True
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	Local2

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,153.00	89.33	182.77	5,805.17	-3,337.11	-801.70	3,405.23	1.58	-0.89	-1.30
9,246.00	89.21	183.85	5,806.36	-3,429.95	-807.06	3,498.09	1.17	-0.13	1.16
9,339.00	87.35	181.80	5,809.15	-3,522.78	-811.65	3,590.87	2.98	-2.00	-2.20
9,433.00	87.30	181.67	5,813.54	-3,616.64	-814.49	3,684.46	0.15	-0.05	-0.14
9,526.00	88.53	180.34	5,816.92	-3,709.56	-816.12	3,776.99	1.95	1.32	-1.43
9,618.00	90.36	179.89	5,817.81	-3,801.55	-816.30	3,868.44	2.05	1.99	-0.49
9,711.00	91.12	179.90	5,816.61	-3,894.54	-816.13	3,960.85	0.82	0.82	0.01
9,804.00	91.31	179.81	5,814.64	-3,987.52	-815.90	4,053.23	0.23	0.20	-0.10
9,898.00	91.07	179.48	5,812.68	-4,081.50	-815.32	4,146.57	0.43	-0.26	-0.35
9,991.00	90.27	181.60	5,811.60	-4,174.48	-816.19	4,239.08	2.44	-0.86	2.28
10,084.00	89.79	181.30	5,811.55	-4,267.45	-818.54	4,331.74	0.61	-0.52	-0.32
10,177.00	89.78	181.09	5,811.90	-4,360.43	-820.48	4,424.37	0.23	-0.01	-0.23
10,271.00	91.75	180.96	5,810.64	-4,454.40	-822.17	4,517.95	2.10	2.10	-0.14
10,364.00	91.46	180.91	5,808.04	-4,547.35	-823.68	4,610.50	0.32	-0.31	-0.05
10,457.00	91.23	180.35	5,805.85	-4,640.32	-824.71	4,703.01	0.65	-0.25	-0.60
10,550.00	90.71	180.02	5,804.28	-4,733.31	-825.01	4,795.46	0.66	-0.56	-0.35
10,643.00	90.30	181.67	5,803.46	-4,826.29	-826.38	4,888.03	1.83	-0.44	1.77
10,736.00	91.03	182.57	5,802.38	-4,919.22	-829.82	4,980.77	1.25	0.78	0.97
10,829.00	88.48	180.77	5,802.78	-5,012.17	-832.53	5,073.45	3.36	-2.74	-1.94
10,923.00	90.06	182.10	5,803.98	-5,106.12	-834.88	5,167.09	2.20	1.68	1.41
11,016.00	89.39	181.00	5,804.42	-5,199.09	-837.40	5,259.76	1.38	-0.72	-1.18
11,109.00	88.65	179.82	5,806.01	-5,292.07	-838.06	5,352.25	1.50	-0.80	-1.27
11,202.00	90.40	181.40	5,806.78	-5,385.05	-839.05	5,444.77	2.54	1.88	1.70
11,295.00	90.09	180.38	5,806.39	-5,478.04	-840.50	5,537.35	1.15	-0.33	-1.10
11,388.00	87.26	180.22	5,808.54	-5,571.00	-840.98	5,629.80	3.05	-3.04	-0.17
11,481.00	89.40	181.38	5,811.25	-5,663.95	-842.28	5,722.32	2.62	2.30	1.25
11,573.00	90.28	181.12	5,811.50	-5,755.92	-844.29	5,813.96	1.00	0.96	-0.28
11,668.00	89.97	180.14	5,811.30	-5,850.92	-845.33	5,908.48	1.08	-0.33	-1.03
11,763.00	90.60	179.55	5,810.82	-5,945.92	-845.08	6,002.87	0.91	0.66	-0.62
11,857.00	89.63	180.93	5,810.64	-6,039.91	-845.47	6,096.34	1.79	-1.03	1.47
11,952.00	87.11	182.08	5,813.34	-6,134.83	-847.96	6,190.95	2.92	-2.65	1.21
12,046.00	87.39	181.02	5,817.85	-6,228.69	-850.50	6,284.51	1.17	0.30	-1.13
12,141.00	88.05	181.77	5,821.63	-6,323.58	-852.81	6,379.08	1.05	0.69	0.79
12,236.00	88.31	180.07	5,824.64	-6,418.52	-854.34	6,473.61	1.81	0.27	-1.79
12,331.00	89.42	181.68	5,826.53	-6,513.48	-855.79	6,568.15	2.06	1.17	1.69
12,426.00	90.82	182.08	5,826.33	-6,608.43	-858.91	6,662.86	1.53	1.47	0.42
12,520.00	91.74	181.86	5,824.23	-6,702.35	-862.14	6,756.56	1.01	0.98	-0.23
12,615.00	92.66	182.00	5,820.58	-6,797.22	-865.33	6,851.21	0.98	0.97	0.15
12,710.00	90.71	182.82	5,817.79	-6,892.09	-869.33	6,945.94	2.23	-2.05	0.86
12,804.00	90.81	182.49	5,816.54	-6,985.99	-873.68	7,039.74	0.37	0.11	-0.35
12,899.00	89.72	179.62	5,816.10	-7,080.96	-875.43	7,134.32	3.23	-1.15	-3.02
12,994.00	88.85	180.42	5,817.29	-7,175.95	-875.46	7,228.74	1.24	-0.92	0.84
13,088.00	89.21	180.01	5,818.88	-7,269.93	-875.81	7,322.19	0.58	0.38	-0.44
13,183.00	89.47	182.45	5,819.97	-7,364.90	-877.85	7,416.79	2.58	0.27	2.57

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	WHITING PETROLEUM CORP.	<b>Local Co-ordinate Reference:</b>	Well Horsetail #30G-3139
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Site:</b>	Sec 30-T10N-R57W	<b>MD Reference:</b>	4738'GL+21'KB @ 4759.00usft (Unit 406)
<b>Well:</b>	Horsetail #30G-3139	<b>North Reference:</b>	True
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	Local2

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,277.00	91.00	182.22	5,819.59	-7,458.82	-881.68	7,510.56	1.65	1.63	-0.24
13,372.00	92.11	182.31	5,817.01	-7,553.71	-885.44	7,605.28	1.17	1.17	0.09
13,467.00	89.17	182.88	5,815.95	-7,648.59	-889.74	7,700.07	3.15	-3.09	0.60
13,562.00	89.90	181.66	5,816.72	-7,743.51	-893.50	7,794.82	1.50	0.77	-1.28
13,656.00	90.94	180.70	5,816.03	-7,837.49	-895.43	7,888.43	1.51	1.11	-1.02
13,751.00	91.22	180.19	5,814.24	-7,932.47	-896.17	7,982.91	0.61	0.29	-0.54
13,846.00	91.53	179.35	5,811.96	-8,027.44	-895.79	8,077.26	0.94	0.33	-0.88
13,921.00	92.07	178.28	5,809.60	-8,102.38	-894.24	8,151.58	1.60	0.72	-1.43
13,980.00	92.07	178.28	5,807.47	-8,161.32	-892.47	8,209.96	0.00	0.00	0.00

### Design Targets

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SL 30G-3139	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,542,673.95	3,472,691.12	40.810528°N	103.792342°W
100' Entry 30G-3139	- actual wellpath misses target center by 0.01usft at 6188.00usft MD (5784.75 TVD, -377.03 N, -743.61 E)	0.00	0.00	5,784.74	-377.03	-743.61	1,542,282.68	3,471,954.91	40.809493°N	103.795028°W
PBHL 30G-3139	- actual wellpath misses target center by 15.13usft at 13980.00usft MD (5807.47 TVD, -8161.32 N, -892.47 E)	0.00	0.00	5,803.00	-8,162.15	-906.90	1,534,495.85	3,471,941.56	40.788125°N	103.795617°W
BHL 30G-3139	- actual wellpath hits target center	0.00	0.00	5,807.47	-8,161.32	-892.47	1,534,496.96	3,471,955.97	40.788127°N	103.795565°W
7" Casing PT 30G-3139	- actual wellpath hits target center	0.00	0.00	5,809.74	-601.79	-751.83	1,542,057.80	3,471,951.02	40.808876°N	103.795058°W

### Design Annotations

	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
			+N/-S (usft)	+E/-W (usft)	
	6,188.00	5,784.74	-377.03	-743.61	100' Entry
	6,415.00	5,809.74	-601.79	-751.83	7" Casing PT

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_