



**WELLBORE TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Surface 12N-33HZ	0.00	0.00	0.00	14588357.34	1669116.29	40.169183°N	104.897266°W	Point
KOP 12N-33HZ	6473.91	-823.12	-1214.59	14587532.82	1667902.66	40.166923°N	104.901614°W	Point
PBHL 12N-33HZ	7170.00	4314.53	-1163.00	14592670.52	1667948.30	40.181031°N	104.901430°W	Point
460' Setback #2 Crossing 12N-33HZ	7172.53	3008.44	-1196.61	14591364.39	1667916.20	40.177444°N	104.901550°W	Point
BHL 12N-33HZ	7172.82	4313.90	-1174.08	14592669.88	1667937.22	40.181029°N	104.901470°W	Point
460' Setback #1 Crossing 12N-33HZ	7201.16	1208.31	-1208.73	14589564.26	1667906.17	40.172501°N	104.901593°W	Point
Land Box Entry 12N-33HZ	7214.31	-195.91	-1198.23	14588160.05	1667918.29	40.168645°N	104.901555°W	Point
Landing Point 12N-33HZ	7219.31	-98.31	-1204.29	14588257.63	1667912.12	40.168913°N	104.901577°W	Point

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

**3N-67W-33 Babcock 6-4HZ Pad**

**Babcock 12N-33HZ**

**Original Hole**

**Design: Original Hole**

## **Standard Survey Report**

**22 June, 2017**

# Precision Drilling Corporation

## Survey Report

<b>Company:</b> US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b> Well Babcock 12N-33HZ
<b>Project:</b> WELD-NAD83-UTMFT13N	<b>TVD Reference:</b> 4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Site:</b> 3N-67W-33 Babcock 6-4HZ Pad	<b>MD Reference:</b> 4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Well:</b> Babcock 12N-33HZ	<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> LocalDatabase

<b>Project</b> WELD-NAD83-UTMFT13N	
<b>Map System:</b> Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b> North American Datum 1983	
<b>Map Zone:</b> Zone 13N (108 W to 102 W)	

<b>Site</b> 3N-67W-33 Babcock 6-4HZ Pad		
<b>Site Position:</b>	<b>Northing:</b> 14,588,357.65 usft	<b>Latitude:</b> 40.169184°N
<b>From:</b> Lat/Long	<b>Easting:</b> 1,669,071.31 usft	<b>Longitude:</b> 104.897427°W
<b>Position Uncertainty:</b> 0.00 usft	<b>Slot Radius:</b> 13.20 in	<b>Grid Convergence:</b> 0.07 °

<b>Well</b> Babcock 12N-33HZ		
<b>Well Position</b> +N/-S 0.00 usft	<b>Northing:</b> 14,588,357.34 usft	<b>Latitude:</b> 40.169183°N
+E/-W 0.00 usft	<b>Easting:</b> 1,669,116.29 usft	<b>Longitude:</b> 104.897266°W
<b>Position Uncertainty</b> 3.28 usft	<b>Wellhead Elevation:</b> 0.00 usft	<b>Ground Level:</b> 4,886.00 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>
	IGRF2010	03/31/16	8.27	66.68	52,491.30054533

<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	0.67	

<b>Survey Program</b>		<b>Date</b> 06/22/17		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
9.00	1,793.00	Survey #1 (Original Hole)	APC_ISCWSA REV 2 MV Fixed:v2:crustal field declination	
1,926.00	12,225.00	Survey #2 (Original Hole)	APC_ISCWSA REV 2 MV Fixed:v2:crustal field declination	
12,280.00	12,280.00	Survey #3 (Original Hole)	APC_BLIND	OWSG 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	0.00
9.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145.00	0.56	266.45	145.00	-0.04	-0.66	-0.05	0.41	0.41	0.00	
247.00	0.74	270.02	246.99	-0.07	-1.82	-0.09	0.18	0.18	3.50	
336.00	1.18	232.87	335.98	-0.62	-3.12	-0.66	0.83	0.49	-41.74	
425.00	2.23	220.02	424.94	-2.50	-4.97	-2.56	1.25	1.18	-14.44	
511.00	3.39	224.88	510.83	-5.59	-7.84	-5.68	1.38	1.35	5.65	
598.00	5.08	228.48	597.59	-9.96	-12.54	-10.11	1.97	1.94	4.14	
685.00	6.26	239.43	684.17	-14.93	-19.51	-15.16	1.83	1.36	12.59	

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 12N-33HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Site:</b>	3N-67W-33 Babcock 6-4HZ Pad	<b>MD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Well:</b>	Babcock 12N-33HZ	<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>	LocalDatabase

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)
771.00	7.62	237.56	769.54	-20.37	-28.36	-20.70	1.60	1.58	-2.17
904.00	9.55	244.76	901.04	-29.81	-45.78	-30.34	1.66	1.45	5.41
989.00	10.29	241.37	984.77	-36.45	-58.82	-37.14	1.11	0.87	-3.99
1,078.00	11.67	238.73	1,072.14	-44.93	-73.49	-45.79	1.65	1.55	-2.97
1,166.00	13.24	237.81	1,158.07	-54.92	-89.63	-55.97	1.80	1.78	-1.05
1,255.00	14.54	234.18	1,244.47	-66.89	-107.32	-68.14	1.76	1.46	-4.08
1,344.00	16.08	232.24	1,330.31	-80.98	-126.12	-82.45	1.82	1.73	-2.18
1,430.00	17.67	233.03	1,412.60	-96.12	-145.97	-97.82	1.87	1.85	0.92
1,517.00	18.58	233.80	1,495.28	-112.25	-167.70	-114.20	1.08	1.05	0.89
1,604.00	18.63	234.97	1,577.74	-128.41	-190.26	-130.63	0.43	0.06	1.34
1,692.00	18.04	236.46	1,661.27	-144.01	-213.13	-146.49	0.86	-0.67	1.69
1,781.00	18.14	236.20	1,745.87	-159.33	-236.13	-162.08	0.14	0.11	-0.29
1,793.00	18.00	236.45	1,757.28	-161.39	-239.23	-164.18	1.33	-1.17	2.08
1,926.00	17.05	235.84	1,884.10	-183.70	-272.49	-186.87	0.73	-0.71	-0.46
2,016.00	18.61	237.25	1,969.78	-198.88	-295.49	-202.32	1.80	1.73	1.57
2,105.00	19.10	240.32	2,054.00	-213.77	-320.08	-217.50	1.24	0.55	3.45
2,195.00	19.56	241.03	2,138.93	-228.36	-346.05	-232.39	0.57	0.51	0.79
2,285.00	20.02	240.06	2,223.62	-243.35	-372.59	-247.69	0.63	0.51	-1.08
2,374.00	21.38	237.60	2,306.87	-259.64	-399.49	-264.30	1.81	1.53	-2.76
2,464.00	19.49	234.61	2,391.20	-277.13	-425.58	-282.09	2.40	-2.10	-3.32
2,553.00	20.77	235.75	2,474.77	-294.61	-450.73	-299.86	1.50	1.44	1.28
2,643.00	19.60	233.56	2,559.24	-312.56	-476.06	-318.11	1.55	-1.30	-2.43
2,732.00	18.48	233.82	2,643.37	-329.75	-499.46	-335.57	1.26	-1.26	0.29
2,822.00	19.32	233.29	2,728.52	-347.07	-522.91	-353.16	0.95	0.93	-0.59
2,912.00	18.09	231.62	2,813.76	-364.65	-545.80	-371.01	1.49	-1.37	-1.86
3,002.00	17.89	235.05	2,899.36	-381.24	-568.08	-387.86	1.20	-0.22	3.81
3,091.00	18.72	232.59	2,983.86	-397.75	-590.63	-404.63	1.27	0.93	-2.76
3,181.00	19.58	235.84	3,068.88	-415.00	-614.58	-422.15	1.52	0.96	3.61
3,271.00	18.57	234.52	3,153.94	-431.78	-638.73	-439.22	1.22	-1.12	-1.47
3,360.00	18.00	235.93	3,238.45	-447.71	-661.66	-455.42	0.81	-0.64	1.58
3,450.00	18.20	238.57	3,323.99	-462.83	-685.18	-470.81	0.94	0.22	2.93
3,539.00	19.12	237.16	3,408.31	-477.98	-709.28	-486.24	1.15	1.03	-1.58
3,629.00	19.05	236.81	3,493.37	-494.02	-733.96	-502.56	0.15	-0.08	-0.39
3,718.00	19.34	238.04	3,577.42	-509.77	-758.62	-518.60	0.56	0.33	1.38
3,808.00	21.16	241.90	3,661.86	-525.31	-785.59	-534.46	2.51	2.02	4.29
3,898.00	18.64	239.80	3,746.48	-540.20	-812.36	-549.66	2.91	-2.80	-2.33
3,987.00	19.62	239.62	3,830.56	-554.91	-837.54	-564.67	1.10	1.10	-0.20
4,077.00	19.43	238.39	3,915.39	-570.40	-863.33	-580.45	0.50	-0.21	-1.37
4,166.00	20.79	238.48	3,998.96	-586.41	-889.40	-596.77	1.53	1.53	0.10
4,256.00	19.60	240.24	4,083.42	-602.26	-916.12	-612.93	1.48	-1.32	1.96
4,346.00	19.58	235.58	4,168.22	-618.28	-941.67	-629.25	1.74	-0.02	-5.18
4,435.00	18.77	236.28	4,252.28	-634.66	-965.88	-645.91	0.95	-0.91	0.79
4,525.00	19.91	235.84	4,337.20	-651.30	-990.60	-662.84	1.28	1.27	-0.49

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 12N-33HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Site:</b>	3N-67W-33 Babcock 6-4HZ Pad	<b>MD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Well:</b>	Babcock 12N-33HZ	<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>	LocalDatabase

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)
4,615.00	18.68	233.29	4,422.15	-668.52	-1,014.84	-680.34	1.66	-1.37	-2.83
4,705.00	18.94	230.30	4,507.34	-686.47	-1,037.63	-698.55	1.11	0.29	-3.32
4,794.00	19.84	235.31	4,591.30	-704.29	-1,061.17	-716.65	2.12	1.01	5.63
4,884.00	18.00	232.77	4,676.43	-721.40	-1,084.80	-734.03	2.24	-2.04	-2.82
4,974.00	16.53	231.71	4,762.38	-737.74	-1,105.92	-750.63	1.67	-1.63	-1.18
5,087.00	15.49	240.06	4,871.01	-755.24	-1,131.62	-768.42	2.23	-0.92	7.39
5,177.00	14.90	239.18	4,957.86	-767.17	-1,151.97	-780.58	0.70	-0.66	-0.98
5,266.00	11.54	236.19	5,044.49	-777.98	-1,169.20	-791.60	3.85	-3.78	-3.36
5,356.00	10.48	235.84	5,132.83	-787.59	-1,183.45	-801.38	1.18	-1.18	-0.39
5,446.00	7.47	234.17	5,221.72	-795.61	-1,194.97	-809.53	3.36	-3.34	-1.86
5,535.00	6.97	233.38	5,310.01	-802.22	-1,204.00	-816.24	0.57	-0.56	-0.89
5,625.00	4.75	251.57	5,399.55	-806.66	-1,211.91	-820.77	3.19	-2.47	20.21
5,714.00	4.07	250.61	5,488.28	-808.87	-1,218.39	-823.06	0.77	-0.76	-1.08
5,804.00	2.94	227.84	5,578.12	-811.48	-1,223.11	-825.73	1.97	-1.26	-25.30
5,893.00	2.44	128.79	5,667.06	-814.20	-1,223.33	-828.45	4.61	-0.56	-111.29
5,983.00	1.78	118.77	5,756.99	-816.07	-1,220.61	-830.29	0.84	-0.73	-11.13
6,073.00	1.27	109.28	5,846.96	-817.08	-1,218.44	-831.27	0.63	-0.57	-10.54
6,163.00	0.40	181.08	5,936.95	-817.72	-1,217.51	-831.90	1.34	-0.97	79.78
6,252.00	0.70	165.35	6,025.95	-818.56	-1,217.38	-832.73	0.37	0.34	-17.67
6,341.00	0.97	159.46	6,114.94	-819.79	-1,216.98	-833.96	0.32	0.30	-6.62
6,431.00	0.88	155.77	6,204.93	-821.13	-1,216.42	-835.30	0.12	-0.10	-4.10
6,521.00	0.64	141.27	6,294.92	-822.15	-1,215.83	-836.31	0.34	-0.27	-16.11
6,611.00	0.46	123.61	6,384.92	-822.74	-1,215.21	-836.90	0.27	-0.20	-19.62
6,700.00	0.48	118.42	6,473.91	-823.12	-1,214.59	-837.27	0.05	0.02	-5.83
6,790.00	5.27	0.29	6,563.79	-819.16	-1,214.23	-833.31	6.13	5.32	-131.26
6,879.00	13.12	1.88	6,651.58	-804.96	-1,213.88	-819.10	8.82	8.82	1.79
6,969.00	18.39	2.23	6,738.17	-780.55	-1,212.99	-794.68	5.86	5.86	0.39
7,059.00	24.13	3.98	6,822.01	-747.98	-1,211.16	-762.09	6.42	6.38	1.94
7,149.00	31.23	1.09	6,901.66	-706.25	-1,209.44	-720.34	8.03	7.89	-3.21
7,239.00	40.15	9.52	6,974.73	-654.17	-1,204.18	-668.20	11.30	9.91	9.37
7,328.00	49.18	7.15	7,037.97	-592.32	-1,195.23	-606.26	10.32	10.15	-2.66
7,418.00	57.84	3.02	7,091.45	-520.33	-1,188.97	-534.20	10.30	9.62	-4.59
7,508.00	64.12	1.79	7,135.09	-441.74	-1,185.69	-455.58	7.08	6.98	-1.37
7,597.00	68.39	358.45	7,170.93	-360.31	-1,185.56	-374.15	5.90	4.80	-3.75
7,687.00	75.22	354.49	7,199.02	-275.05	-1,190.88	-288.95	8.66	7.59	-4.40
7,777.00	83.88	354.93	7,215.33	-187.00	-1,199.02	-201.01	9.63	9.62	0.49
7,866.00	91.00	358.27	7,219.31	-98.31	-1,204.29	-112.39	8.83	8.00	3.75
7,956.00	90.71	357.92	7,217.96	-8.37	-1,207.28	-22.49	0.51	-0.32	-0.39
8,045.00	90.21	357.75	7,217.25	80.56	-1,210.64	66.40	0.59	-0.56	-0.19
8,135.00	90.52	0.56	7,216.68	170.54	-1,211.97	156.35	3.14	0.34	3.12
8,225.00	90.82	0.73	7,215.62	260.53	-1,210.95	246.35	0.38	0.33	0.19
8,314.00	90.49	0.21	7,214.61	349.52	-1,210.22	335.34	0.69	-0.37	-0.58
8,404.00	89.88	0.38	7,214.32	439.52	-1,209.76	425.34	0.70	-0.68	0.19

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 12N-33HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Site:</b>	3N-67W-33 Babcock 6-4HZ Pad	<b>MD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Well:</b>	Babcock 12N-33HZ	<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>	LocalDatabase

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)	
8,494.00	90.96	1.35	7,213.66	529.50	-1,208.40	515.33	1.61	1.20	1.08	
8,583.00	90.34	1.09	7,212.65	618.47	-1,206.51	604.32	0.76	-0.70	-0.29	
8,673.00	91.55	0.82	7,211.16	708.45	-1,205.01	694.31	1.38	1.34	-0.30	
8,763.00	91.15	0.12	7,209.04	798.42	-1,204.27	784.28	0.90	-0.44	-0.78	
8,852.00	91.20	359.33	7,207.22	887.40	-1,204.70	873.25	0.89	0.06	-0.89	
8,942.00	91.33	359.24	7,205.23	977.37	-1,205.82	963.20	0.18	0.14	-0.10	
9,032.00	91.00	359.42	7,203.40	1,067.34	-1,206.87	1,053.16	0.42	-0.37	0.20	
9,121.00	90.87	359.15	7,201.95	1,156.33	-1,207.98	1,142.12	0.34	-0.15	-0.30	
9,211.00	90.85	359.24	7,200.60	1,246.31	-1,209.25	1,232.08	0.10	-0.02	0.10	
9,301.00	90.23	358.80	7,199.75	1,336.29	-1,210.79	1,322.04	0.84	-0.69	-0.49	
9,390.00	89.81	0.29	7,199.72	1,425.28	-1,211.49	1,411.02	1.74	-0.47	1.67	
9,480.00	89.18	359.77	7,200.51	1,515.28	-1,211.44	1,501.01	0.91	-0.70	-0.58	
9,570.00	90.30	0.47	7,200.92	1,605.28	-1,211.26	1,591.00	1.47	1.24	0.78	
9,659.00	89.73	0.29	7,200.90	1,694.27	-1,210.67	1,680.00	0.67	-0.64	-0.20	
9,749.00	90.80	0.65	7,200.48	1,784.27	-1,209.93	1,770.00	1.25	1.19	0.40	
9,839.00	90.98	1.44	7,199.08	1,874.24	-1,208.29	1,859.98	0.90	0.20	0.88	
9,928.00	90.08	1.09	7,198.26	1,963.21	-1,206.32	1,948.97	1.09	-1.01	-0.39	
10,018.00	91.15	3.19	7,197.29	2,053.14	-1,202.96	2,038.93	2.62	1.19	2.33	
10,108.00	92.19	2.14	7,194.67	2,143.00	-1,198.78	2,128.84	1.64	1.16	-1.17	
10,197.00	91.35	1.61	7,191.92	2,231.91	-1,195.87	2,217.77	1.12	-0.94	-0.60	
10,287.00	93.04	1.17	7,188.47	2,321.82	-1,193.69	2,307.70	1.94	1.88	-0.49	
10,376.00	92.32	0.47	7,184.31	2,410.71	-1,192.41	2,396.60	1.13	-0.81	-0.79	
10,466.00	92.45	359.94	7,180.57	2,500.63	-1,192.09	2,486.52	0.61	0.14	-0.59	
10,556.00	92.91	359.50	7,176.36	2,590.53	-1,192.53	2,576.41	0.71	0.51	-0.49	
10,645.00	90.71	359.68	7,173.55	2,679.48	-1,193.17	2,665.34	2.48	-2.47	0.20	
10,735.00	89.88	359.33	7,173.08	2,769.47	-1,193.95	2,755.32	1.00	-0.92	-0.39	
10,825.00	89.35	358.80	7,173.69	2,859.46	-1,195.41	2,845.28	0.83	-0.59	-0.59	
10,914.00	91.02	359.94	7,173.40	2,948.45	-1,196.39	2,934.25	2.27	1.88	1.28	
11,004.00	90.45	359.50	7,172.25	3,038.44	-1,196.83	3,024.23	0.80	-0.63	-0.49	
11,094.00	90.49	1.79	7,171.51	3,128.42	-1,195.82	3,114.22	2.54	0.04	2.54	
11,183.00	89.70	1.35	7,171.36	3,217.39	-1,193.38	3,203.21	1.02	-0.89	-0.49	
11,273.00	89.22	1.09	7,172.21	3,307.36	-1,191.47	3,293.20	0.61	-0.53	-0.29	
11,363.00	91.37	1.00	7,171.75	3,397.34	-1,189.82	3,383.20	2.39	2.39	-0.10	
11,452.00	91.35	0.82	7,169.63	3,486.31	-1,188.41	3,472.17	0.20	-0.02	-0.20	
11,542.00	91.37	0.29	7,167.50	3,576.28	-1,187.54	3,562.14	0.59	0.02	-0.59	
11,632.00	91.64	0.12	7,165.13	3,666.24	-1,187.22	3,652.11	0.35	0.30	-0.19	
11,722.00	90.58	1.96	7,163.39	3,756.21	-1,185.58	3,742.09	2.36	-1.18	2.04	
11,811.00	90.41	1.79	7,162.62	3,845.16	-1,182.67	3,831.06	0.27	-0.19	-0.19	
11,901.00	89.79	1.44	7,162.46	3,935.12	-1,180.14	3,921.05	0.79	-0.69	-0.39	
11,990.00	88.91	1.35	7,163.47	4,024.09	-1,177.97	4,010.04	0.99	-0.99	-0.10	
12,080.00	88.36	1.00	7,165.62	4,114.04	-1,176.12	4,100.01	0.72	-0.61	-0.39	
12,170.00	87.84	0.56	7,168.60	4,203.98	-1,174.90	4,189.96	0.76	-0.58	-0.49	
12,225.00	87.79	0.38	7,170.70	4,258.94	-1,174.45	4,244.92	0.34	-0.09	-0.33	
12,280.00	87.79	0.38	7,172.82	4,313.90	-1,174.08	4,299.87	0.00	0.00	0.00	

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 12N-33HZ
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>TVD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Site:</b>	3N-67W-33 Babcock 6-4HZ Pad	<b>MD Reference:</b>	4886'GL + 21'KB @ 4907.00usft (PD464)
<b>Well:</b>	Babcock 12N-33HZ	<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>	LocalDatabase

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)

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Surface 12N-33HZ - hit/miss target - Shape	0.00	0.00	0.00	0.00	0.00	14,588,357.34	1,669,116.29	40.169183°N	104.897266°W
- actual wellpath hits target center									
- Point									
KOP 12N-33HZ - actual wellpath hits target center - Point	0.00	0.00	6,473.91	-823.12	-1,214.59	14,587,532.81	1,667,902.66	40.166923°N	104.901614°W
PBHL 12N-33HZ - actual wellpath misses target center by 11.45usft at 12280.00usft MD (7172.82 TVD, 4313.90 N, -1174.08 E) - Point	0.00	0.00	7,170.00	4,314.53	-1,163.00	14,592,670.52	1,667,948.30	40.181031°N	104.901430°W
460' Setback #2 Cros: - actual wellpath hits target center - Point	0.00	0.00	7,172.53	3,008.44	-1,196.61	14,591,364.39	1,667,916.20	40.177445°N	104.901550°W
BHL 12N-33HZ - actual wellpath hits target center - Point	0.00	0.00	7,172.82	4,313.90	-1,174.08	14,592,669.87	1,667,937.22	40.181029°N	104.901470°W
460' Setback #1 Cros: - actual wellpath hits target center - Point	0.00	0.00	7,201.16	1,208.31	-1,208.73	14,589,564.25	1,667,906.16	40.172501°N	104.901593°W
Land Box Entry 12N-33 - actual wellpath misses target center by 0.01usft at 7768.01usft MD (7214.31 TVD, -195.89 N, -1198.23 E) - Point	0.00	0.00	7,214.31	-195.91	-1,198.23	14,588,160.05	1,667,918.29	40.168645°N	104.901555°W
Landing Point 12N-33 - actual wellpath hits target center - Point	0.00	0.00	7,219.31	-98.31	-1,204.29	14,588,257.63	1,667,912.12	40.168913°N	104.901577°W

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
6,700.00	6,473.91	-823.12	-1,214.59	KOP
7,768.00	7,214.31	-195.91	-1,198.23	Land Box Entry
7,866.00	7,219.31	-98.31	-1,204.29	Landing Point
9,173.00	7,201.16	1,208.31	-1,208.73	460' Setback #1 Crossing
10,974.00	7,172.53	3,008.44	-1,196.61	460' Setback #2 Crossing

Checked By: _____	Approved By: _____	Date: _____
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