



**WELLBORE TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Surface 32N-33HZ	0.00	0.00	0.00	14588357.65	1669071.32	40.169184°N	104.897427°W	Point
KOP 32N-33HZ	6551.36	-802.64	-1676.57	14587553.08	1667395.67	40.166980°N	104.903428°W	Point
PBHL 32N-33HZ	7240.00	4319.99	-1687.03	14592675.69	1667379.29	40.181047°N	104.903467°W	Point
BHL 32N-33HZ	7240.90	4284.74	-1691.93	14592640.43	1667374.43	40.180950°N	104.903485°W	Point
460' Toe Entry 32N-33HZ	7247.66	3081.35	-1699.01	14591437.04	1667368.75	40.177646°N	104.903510°W	Point
460' Heel Exit 32N-33HZ	7257.90	1133.95	-1672.91	14589489.67	1667397.09	40.172298°N	104.903416°W	Point
Land Box Entry 32N-33HZ	7266.63	-186.51	-1692.61	14588169.19	1667378.92	40.168672°N	104.903486°W	Point
Landing Point 32N-33HZ	7277.71	-45.23	-1699.00	14588310.46	1667372.37	40.169060°N	104.903509°W	Point

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

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

**Babcock 32N-33HZ**

**Original Hole**

**Design: Original Hole**

## **Standard Survey Report**

**30 June, 2017**

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 32N-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 32N-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>From:</b>	Lat/Long	<b>Easting:</b>	1,669,071.31 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.20 in
		<b>Latitude:</b>	40.169184°N
		<b>Longitude:</b>	104.897427°W
		<b>Grid Convergence:</b>	0.07 °

<b>Well</b>	Babcock 32N-33HZ		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 14,588,357.65 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 1,669,071.31 usft
<b>Position Uncertainty</b>	3.28 usft	<b>Wellhead Elevation:</b>	0.00 usft
		<b>Latitude:</b>	40.169184°N
		<b>Longitude:</b>	104.897427°W
		<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>
	IGRF2010	03/28/16	8.27
			<b>Dip Angle (°)</b>
			66.68
			<b>Field Strength (nT)</b>
			52,492.14543220

<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>
	0.00	0.00	0.00
			<b>Direction (°)</b>
			359.94

<b>Survey Program</b>	<b>Date</b>	06/30/17		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
9.00	1,798.00	Survey #1 (Original Hole)	APC_ISCWSA REV 2 MV Fixed:v2:crustal field declination	
1,924.00	12,321.00	Survey #2 (Original Hole)	APC_ISCWSA REV 2 MV Fixed:v2:crustal field declination	
12,378.00	12,378.00	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
9.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00
174.00	0.28	310.04	174.00	0.26	-0.31	0.26	0.17	0.17	0.00
247.00	0.75	267.96	247.00	0.36	-0.92	0.36	0.79	0.64	-57.64
336.00	1.98	257.07	335.97	-0.01	-3.00	0.00	1.41	1.38	-12.24
425.00	2.98	257.50	424.89	-0.85	-6.76	-0.85	1.12	1.12	0.48
511.00	3.96	256.47	510.73	-2.03	-11.83	-2.02	1.14	1.14	-1.20
598.00	4.60	251.65	597.48	-3.83	-18.06	-3.81	0.84	0.74	-5.54
685.00	5.45	251.90	684.15	-6.21	-25.30	-6.19	0.98	0.98	0.29

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 32N-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 32N-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	6.73	247.70	769.66	-9.40	-33.85	-9.36	1.58	1.49	-4.88
860.00	8.38	246.45	857.89	-13.97	-44.62	-13.92	1.86	1.85	-1.40
947.00	9.68	238.32	943.81	-20.34	-56.65	-20.28	2.09	1.49	-9.34
1,078.00	11.68	238.05	1,072.53	-33.14	-77.28	-33.06	1.53	1.53	-0.21
1,166.00	13.12	239.20	1,158.48	-42.97	-93.42	-42.87	1.66	1.64	1.31
1,255.00	14.54	240.53	1,244.90	-53.64	-111.82	-53.52	1.63	1.60	1.49
1,344.00	15.68	241.33	1,330.82	-64.91	-132.10	-64.77	1.30	1.28	0.90
1,430.00	17.24	241.79	1,413.29	-76.51	-153.53	-76.35	1.82	1.81	0.53
1,517.00	18.32	243.22	1,496.14	-88.76	-177.10	-88.58	1.34	1.24	1.64
1,604.00	18.79	243.53	1,578.61	-101.17	-201.85	-100.96	0.55	0.54	0.36
1,692.00	19.79	246.44	1,661.67	-113.44	-228.19	-113.20	1.58	1.14	3.31
1,781.00	19.92	247.82	1,745.38	-125.19	-256.04	-124.92	0.55	0.15	1.55
1,798.00	19.89	248.28	1,761.37	-127.35	-261.41	-127.08	0.94	-0.18	2.71
1,924.00	19.95	251.22	1,879.83	-142.20	-301.67	-141.89	0.80	0.05	2.33
2,014.00	18.72	248.67	1,964.76	-152.40	-329.66	-152.05	1.66	-1.37	-2.83
2,103.00	20.52	244.37	2,048.59	-164.34	-357.04	-163.97	2.59	2.02	-4.83
2,193.00	23.05	244.19	2,132.15	-178.84	-387.12	-178.43	2.81	2.81	-0.20
2,283.00	21.16	241.11	2,215.54	-194.36	-417.21	-193.92	2.46	-2.10	-3.42
2,372.00	21.47	245.60	2,298.46	-208.85	-446.11	-208.38	1.87	0.35	5.04
2,462.00	21.29	245.42	2,382.26	-222.45	-475.97	-221.95	0.21	-0.20	-0.20
2,551.00	22.50	241.99	2,464.84	-237.17	-505.70	-236.64	1.98	1.36	-3.85
2,641.00	22.41	246.39	2,548.03	-252.13	-536.62	-251.57	1.87	-0.10	4.89
2,731.00	23.62	244.19	2,630.86	-266.85	-568.58	-266.26	1.65	1.34	-2.44
2,820.00	22.77	242.87	2,712.67	-282.47	-599.96	-281.84	1.12	-0.96	-1.48
2,910.00	21.80	241.64	2,795.95	-298.35	-630.16	-297.69	1.20	-1.08	-1.37
3,000.00	22.39	244.89	2,879.34	-313.56	-660.39	-312.87	1.51	0.66	3.61
3,089.00	22.11	244.37	2,961.71	-328.00	-690.84	-327.28	0.38	-0.31	-0.58
3,179.00	22.99	241.90	3,044.83	-343.61	-721.62	-342.85	1.44	0.98	-2.74
3,269.00	22.90	244.37	3,127.71	-359.46	-752.91	-358.67	1.07	-0.10	2.74
3,358.00	20.46	243.14	3,210.41	-373.98	-782.40	-373.16	2.79	-2.74	-1.38
3,448.00	21.03	243.49	3,294.58	-388.30	-810.89	-387.45	0.65	0.63	0.39
3,537.00	22.52	242.35	3,377.22	-403.33	-840.28	-402.45	1.74	1.67	-1.28
3,627.00	23.05	247.97	3,460.21	-417.94	-871.88	-417.03	2.49	0.59	6.24
3,716.00	20.20	246.74	3,542.94	-430.55	-902.15	-429.60	3.24	-3.20	-1.38
3,806.00	21.07	250.25	3,627.17	-442.15	-931.66	-441.18	1.68	0.97	3.90
3,896.00	23.25	246.74	3,710.52	-454.64	-963.21	-453.63	2.83	2.42	-3.90
3,985.00	23.12	247.97	3,792.33	-468.13	-995.55	-467.08	0.56	-0.15	1.38
4,075.00	23.36	245.16	3,875.03	-482.25	-1,028.12	-481.17	1.26	0.27	-3.12
4,165.00	25.34	243.93	3,957.02	-498.21	-1,061.61	-497.10	2.27	2.20	-1.37
4,254.00	26.08	245.42	4,037.21	-514.72	-1,096.51	-513.57	1.10	0.83	1.67
4,344.00	23.36	244.37	4,118.96	-530.67	-1,130.60	-529.49	3.06	-3.02	-1.17
4,434.00	24.28	247.53	4,201.29	-545.46	-1,163.79	-544.24	1.75	1.02	3.51
4,523.00	23.71	245.77	4,282.60	-559.80	-1,197.01	-558.54	1.03	-0.64	-1.98

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 32N-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 32N-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)
4,613.00	24.30	243.75	4,364.82	-575.42	-1,230.12	-574.13	1.12	0.66	-2.24
4,703.00	22.63	242.08	4,447.37	-591.71	-1,262.03	-590.39	2.00	-1.86	-1.86
4,792.00	21.51	241.82	4,529.85	-607.44	-1,291.55	-606.09	1.26	-1.26	-0.29
4,882.00	19.14	240.59	4,614.24	-622.48	-1,318.95	-621.10	2.68	-2.63	-1.37
4,998.00	20.83	239.71	4,723.25	-642.22	-1,353.32	-640.80	1.48	1.46	-0.76
5,087.00	22.31	239.01	4,806.02	-658.90	-1,381.47	-657.45	1.69	1.66	-0.79
5,177.00	22.26	243.84	4,889.30	-675.21	-1,411.42	-673.73	2.04	-0.06	5.37
5,267.00	19.89	242.17	4,973.28	-689.88	-1,440.26	-688.37	2.72	-2.63	-1.86
5,356.00	21.16	245.51	5,056.63	-703.61	-1,468.27	-702.07	1.94	1.43	3.75
5,446.00	17.54	243.05	5,141.53	-716.49	-1,495.15	-714.92	4.12	-4.02	-2.73
5,535.00	19.21	247.97	5,226.00	-728.06	-1,520.68	-726.47	2.56	1.88	5.53
5,625.00	16.70	246.48	5,311.61	-738.78	-1,546.27	-737.16	2.83	-2.79	-1.66
5,715.00	16.86	245.77	5,397.78	-749.29	-1,570.03	-747.65	0.29	0.18	-0.79
5,804.00	14.15	242.78	5,483.53	-759.57	-1,591.48	-757.90	3.17	-3.04	-3.36
5,894.00	11.71	241.82	5,571.24	-768.92	-1,609.31	-767.23	2.72	-2.71	-1.07
5,983.00	10.94	241.03	5,658.51	-777.27	-1,624.66	-775.57	0.88	-0.87	-0.89
6,073.00	10.88	238.48	5,746.88	-785.85	-1,639.37	-784.13	0.54	-0.07	-2.83
6,163.00	8.77	239.88	5,835.56	-793.73	-1,652.55	-792.00	2.36	-2.34	1.56
6,252.00	5.74	242.61	5,923.83	-799.19	-1,662.37	-797.44	3.43	-3.40	3.07
6,342.00	3.67	254.56	6,013.53	-802.02	-1,669.15	-800.28	2.53	-2.30	13.28
6,432.00	2.42	228.02	6,103.40	-804.06	-1,673.34	-802.31	2.06	-1.39	-29.49
6,521.00	0.53	296.75	6,192.37	-805.13	-1,675.10	-803.38	2.56	-2.12	77.22
6,611.00	0.51	334.19	6,282.37	-804.59	-1,675.65	-802.83	0.37	-0.02	41.60
6,700.00	0.20	325.40	6,371.37	-804.10	-1,675.91	-802.35	0.35	-0.35	-9.88
6,790.00	0.66	338.85	6,461.37	-803.49	-1,676.18	-801.73	0.52	0.51	14.94
6,880.00	0.53	331.38	6,551.36	-802.64	-1,676.57	-800.88	0.17	-0.14	-8.30
KOP									
6,969.00	6.94	14.80	6,640.13	-797.07	-1,675.39	-795.32	7.38	7.20	48.79
7,059.00	17.40	5.30	6,727.99	-778.36	-1,672.75	-776.61	11.79	11.62	-10.56
7,149.00	23.34	0.82	6,812.33	-747.11	-1,671.25	-745.36	6.82	6.60	-4.98
7,239.00	28.28	355.90	6,893.34	-707.99	-1,672.52	-706.24	5.98	5.49	-5.47
7,329.00	35.47	357.75	6,969.72	-660.57	-1,675.08	-658.81	8.06	7.99	2.06
7,418.00	42.59	0.65	7,038.82	-604.57	-1,675.75	-602.82	8.26	8.00	3.26
7,508.00	48.96	358.89	7,101.56	-540.12	-1,676.06	-538.36	7.21	7.08	-1.96
7,598.00	54.59	357.39	7,157.23	-469.49	-1,678.39	-467.73	6.39	6.26	-1.67
7,687.00	65.16	356.16	7,201.83	-392.74	-1,682.76	-390.98	11.94	11.88	-1.38
7,777.00	71.44	357.66	7,235.09	-309.28	-1,687.24	-307.52	7.15	6.98	1.67
7,866.00	77.11	357.39	7,259.21	-223.73	-1,690.94	-221.96	6.38	6.37	-0.30
7,904.00	80.36	357.47	7,266.63	-186.51	-1,692.61	-184.73	8.55	8.54	0.20
Land Box Entry									
7,956.00	84.80	357.57	7,273.34	-135.00	-1,694.85	-133.23	8.55	8.54	0.20
8,046.00	89.64	357.13	7,277.71	-45.23	-1,699.00	-43.45	5.40	5.38	-0.49
Landing Point									
8,135.00	92.01	0.47	7,276.43	43.72	-1,700.87	45.50	4.60	2.66	3.75

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 32N-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 32N-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)
8,225.00	92.19	359.59	7,273.13	133.66	-1,700.82	135.44	1.00	0.20	-0.98
8,315.00	90.34	359.68	7,271.14	223.63	-1,701.39	225.41	2.06	-2.06	0.10
8,404.00	89.20	2.14	7,271.50	312.61	-1,699.98	314.39	3.05	-1.28	2.76
8,494.00	91.53	2.14	7,270.92	402.54	-1,696.62	404.32	2.59	2.59	0.00
8,584.00	91.70	2.14	7,268.39	492.44	-1,693.26	494.21	0.19	0.19	0.00
8,673.00	89.66	0.91	7,267.33	581.40	-1,690.89	583.17	2.68	-2.29	-1.38
8,763.00	91.86	1.96	7,266.14	671.35	-1,688.64	673.12	2.71	2.44	1.17
8,852.00	91.94	2.23	7,263.19	760.25	-1,685.39	762.01	0.32	0.09	0.30
8,942.00	91.04	1.70	7,260.85	850.16	-1,682.30	851.92	1.16	-1.00	-0.59
9,032.00	90.69	2.40	7,259.49	940.09	-1,679.08	941.85	0.87	-0.39	0.78
9,121.00	90.54	3.02	7,258.53	1,028.99	-1,674.87	1,030.74	0.72	-0.17	0.70
9,211.00	90.19	359.59	7,257.96	1,118.95	-1,672.82	1,120.70	3.83	-0.39	-3.81
9,226.00	90.23	359.74	7,257.90	1,133.95	-1,672.91	1,135.70	1.01	0.27	0.98
460' Heel Exit									
9,301.00	90.43	0.47	7,257.47	1,208.95	-1,672.78	1,210.70	1.01	0.27	0.98
9,391.00	90.03	0.38	7,257.11	1,298.94	-1,672.11	1,300.69	0.46	-0.44	-0.10
9,480.00	89.64	0.38	7,257.37	1,387.94	-1,671.52	1,389.69	0.44	-0.44	0.00
9,570.00	91.15	0.65	7,256.75	1,477.93	-1,670.71	1,479.68	1.70	1.68	0.30
9,659.00	89.81	359.50	7,256.00	1,566.93	-1,670.59	1,568.67	1.98	-1.51	-1.29
9,749.00	90.93	358.89	7,255.42	1,656.91	-1,671.86	1,658.66	1.42	1.24	-0.68
9,839.00	90.78	358.62	7,254.08	1,746.88	-1,673.81	1,748.63	0.34	-0.17	-0.30
9,928.00	91.22	358.45	7,252.52	1,835.84	-1,676.09	1,837.59	0.53	0.49	-0.19
10,018.00	90.58	357.92	7,251.11	1,925.78	-1,678.94	1,927.54	0.92	-0.71	-0.59
10,108.00	89.79	357.57	7,250.82	2,015.71	-1,682.48	2,017.47	0.96	-0.88	-0.39
10,197.00	89.40	358.62	7,251.45	2,104.66	-1,685.44	2,106.42	1.26	-0.44	1.18
10,287.00	88.78	358.27	7,252.88	2,194.61	-1,687.88	2,196.38	0.79	-0.69	-0.39
10,377.00	91.11	359.85	7,252.96	2,284.59	-1,689.36	2,286.36	3.13	2.59	1.76
10,466.00	91.64	359.33	7,250.83	2,373.56	-1,689.99	2,375.33	0.83	0.60	-0.58
10,556.00	92.47	358.71	7,247.60	2,463.49	-1,691.53	2,465.26	1.15	0.92	-0.69
10,646.00	89.66	359.85	7,245.93	2,553.46	-1,692.66	2,555.23	3.37	-3.12	1.27
10,735.00	89.66	358.98	7,246.46	2,642.45	-1,693.57	2,644.22	0.98	0.00	-0.98
10,825.00	90.21	358.45	7,246.56	2,732.43	-1,695.59	2,734.20	0.85	0.61	-0.59
10,914.00	89.55	358.01	7,246.75	2,821.38	-1,698.34	2,823.16	0.89	-0.74	-0.49
11,004.00	89.51	0.38	7,247.48	2,911.37	-1,699.60	2,913.14	2.63	-0.04	2.63
11,094.00	89.55	359.68	7,248.22	3,001.36	-1,699.56	3,003.14	0.78	0.04	-0.78
11,174.00	91.25	1.10	7,247.66	3,081.35	-1,699.01	3,083.13	2.77	2.12	1.78
460' Toe Entry									
11,183.00	91.44	1.26	7,247.45	3,090.35	-1,698.83	3,092.13	2.77	2.12	1.78
11,273.00	89.88	0.38	7,246.42	3,180.33	-1,697.54	3,182.11	1.99	-1.73	-0.98
11,363.00	90.43	359.33	7,246.17	3,270.33	-1,697.77	3,272.10	1.32	0.61	-1.17
11,452.00	89.79	0.47	7,246.00	3,359.33	-1,697.92	3,361.10	1.47	-0.72	1.28
11,542.00	90.03	359.68	7,246.14	3,449.33	-1,697.80	3,451.10	0.92	0.27	-0.88
11,632.00	90.96	359.15	7,245.37	3,539.32	-1,698.72	3,541.09	1.19	1.03	-0.59
11,722.00	88.60	359.42	7,245.71	3,629.30	-1,699.84	3,631.08	2.64	-2.62	0.30

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 32N-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 32N-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)
11,811.00	88.34	358.36	7,248.09	3,718.25	-1,701.57	3,720.03	1.23	-0.29	-1.19
11,901.00	87.86	358.19	7,251.07	3,808.16	-1,704.28	3,809.94	0.57	-0.53	-0.19
11,990.00	90.65	2.14	7,252.23	3,897.13	-1,704.02	3,898.91	5.43	3.13	4.44
12,080.00	91.09	2.32	7,250.86	3,987.05	-1,700.52	3,988.83	0.53	0.49	0.20
12,170.00	91.20	1.61	7,249.06	4,076.98	-1,697.43	4,078.75	0.80	0.12	-0.79
12,259.00	92.25	1.35	7,246.39	4,165.91	-1,695.13	4,167.68	1.22	1.18	-0.29
12,321.00	92.78	1.61	7,243.67	4,227.82	-1,693.53	4,229.60	0.95	0.85	0.42
12,378.00	92.78	1.61	7,240.90	4,284.74	-1,691.93	4,286.50	0.00	0.00	0.00

### Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Surface 32N-33HZ - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,588,357.65	1,669,071.31	40.169184°N	104.897427°W
KOP 32N-33HZ - actual wellpath hits target center - Point	0.00	0.00	6,551.36	-802.64	-1,676.57	14,587,553.07	1,667,395.67	40.166980°N	104.903429°W
PBHL 32N-33HZ - actual wellpath misses target center by 35.61usft at 12378.00usft MD (7240.90 TVD, 4284.74 N, -1691.93 E) - Point	0.00	0.00	7,240.00	4,319.99	-1,687.03	14,592,675.69	1,667,379.29	40.181047°N	104.903467°W
BHL 32N-33HZ - actual wellpath hits target center - Point	0.00	0.00	7,240.90	4,284.74	-1,691.93	14,592,640.43	1,667,374.43	40.180950°N	104.903485°W
460' Toe Entry 32N-33 - actual wellpath hits target center - Point	0.00	0.00	7,247.66	3,081.35	-1,699.01	14,591,437.04	1,667,368.74	40.177646°N	104.903510°W
460' Heel Exit 32N-33 - actual wellpath hits target center - Point	0.00	0.00	7,257.90	1,133.95	-1,672.91	14,589,489.67	1,667,397.09	40.172298°N	104.903416°W
Land Box Entry 32N-33 - actual wellpath hits target center - Point	0.00	0.00	7,266.63	-186.51	-1,692.61	14,588,169.19	1,667,378.92	40.168672°N	104.903486°W
Landing Point 32N-33 - actual wellpath hits target center - Point	0.00	0.00	7,277.71	-45.23	-1,699.00	14,588,310.46	1,667,372.36	40.169060°N	104.903509°W

# Precision Drilling Corporation

## Survey Report

<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>Local Co-ordinate Reference:</b>	Well Babcock 32N-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 32N-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

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,880.00	6,551.36	-802.64	-1,676.57	KOP
7,904.00	7,266.63	-186.51	-1,692.61	Land Box Entry
8,046.00	7,277.71	-45.23	-1,699.00	Landing Point
9,226.00	7,257.90	1,133.95	-1,672.91	460' Heel Exit
11,174.00	7,247.66	3,081.35	-1,699.01	460' Toe Entry

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