

# **PICEANCE HL NAD 83**

**AP 11-06S-096W**

**AP 41-11-696 Pad**

**AP 342-11-696 - Slot A7**

**AP 342-11-696**

**Survey: Survey #1 MWD 28Dec07 tf**

## **Survey Report - Geographic**

**01 April, 2011**

**Williams**  
Survey Report - Geographic

<b>Company:</b>	PICEANCE HL NAD 83	<b>Local Co-ordinate Reference:</b>	Well AP 342-11-696 - Slot A7
<b>Project:</b>	AP 11-06S-096W	<b>TVD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Site:</b>	AP 41-11-696 Pad	<b>MD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Well:</b>	AP 342-11-696	<b>North Reference:</b>	True
<b>Wellbore:</b>	AP 342-11-696	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	AP 342-11-696	<b>Database:</b>	Compass R5000 WIN AUTH

<b>Project</b>	AP 11-06S-096W, Garfield County, CO, AP 11-06S-096W		
<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 Central Zone		Using geodetic scale factor

Site		AP 41-11-696 Pad			
Site Position:		Northing:	1,632,695.86 usft	Latitude:	39° 32' 32.524 N
From:	Map	Easting:	2,275,010.02 usft	Longitude:	108° 4' 15.949 W
Position Uncertainty:	0.0 usft	Slot Radius:	0.000 in	Grid Convergence:	-1.622 °

Well	AP 342-11-696 - Slot A7					
Well Position	+N/-S	0.0 usft	Northing:	1,632,673.49 usft	Latitude:	39° 32' 32.298 N
	+E/-W	0.0 usft	Easting:	2,274,990.03 usft	Longitude:	108° 4' 16.196 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	8,540.0 usft

<b>Wellbore</b>	AP 342-11-696				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2005-10	6/4/2007	10.893	65.879	52,670

<b>Design</b>	AP 342-11-696				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0		160.64

<b>Survey Program</b>	<b>Date</b>	3/30/2011			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
151.0	10,791.0	Survey #1 MWD 28Dec07 tf (AP 342-11-6	MWD	MWD - Standard	

<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>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.0	0.00	0.00	0.0	0.0	0.0	1,632,673.49	2,274,990.03	39° 32' 32.298 N	108° 4' 16.196 W	
151.0	0.57	85.66	151.0	0.1	0.7	1,632,673.53	2,274,990.78	39° 32' 32.298 N	108° 4' 16.186 W	
160.0	0.57	85.66	160.0	0.1	0.8	1,632,673.53	2,274,990.87	39° 32' 32.298 N	108° 4' 16.185 W	
247.0	0.99	138.68	247.0	-0.5	1.8	1,632,672.97	2,274,991.78	39° 32' 32.293 N	108° 4' 16.173 W	
256.0	0.99	138.68	256.0	-0.6	1.9	1,632,672.85	2,274,991.88	39° 32' 32.292 N	108° 4' 16.172 W	
339.0	2.11	161.97	339.0	-2.6	2.8	1,632,670.83	2,274,992.77	39° 32' 32.272 N	108° 4' 16.160 W	
348.0	2.11	161.97	348.0	-2.9	2.9	1,632,670.52	2,274,992.87	39° 32' 32.269 N	108° 4' 16.159 W	
431.0	4.30	167.06	430.8	-7.4	4.1	1,632,666.00	2,274,993.91	39° 32' 32.225 N	108° 4' 16.144 W	
440.0	4.30	167.06	439.8	-8.0	4.2	1,632,665.34	2,274,994.04	39° 32' 32.218 N	108° 4' 16.142 W	
523.0	5.75	158.16	522.5	-14.9	6.5	1,632,658.39	2,274,996.09	39° 32' 32.150 N	108° 4' 16.113 W	

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Survey Report - Geographic

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<b>Site:</b>	AP 41-11-696 Pad	<b>MD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Well:</b>	AP 342-11-696	<b>North Reference:</b>	True
<b>Wellbore:</b>	AP 342-11-696	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	AP 342-11-696	<b>Database:</b>	Compass R5000 WIN AUTH

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
532.0	5.75	158.16	531.4	-15.8	6.8	1,632,657.54	2,274,996.40	39° 32' 32.142 N	108° 4' 16.109 W	
615.0	8.04	157.83	613.8	-25.0	10.6	1,632,648.20	2,274,999.87	39° 32' 32.051 N	108° 4' 16.061 W	
624.0	8.04	157.83	622.7	-26.2	11.0	1,632,647.02	2,275,000.32	39° 32' 32.039 N	108° 4' 16.055 W	
707.0	8.42	151.43	704.9	-36.9	16.1	1,632,636.17	2,275,005.11	39° 32' 31.933 N	108° 4' 15.990 W	
716.0	8.42	151.43	713.8	-38.0	16.8	1,632,635.00	2,275,005.70	39° 32' 31.922 N	108° 4' 15.982 W	
799.0	8.64	151.77	795.9	-48.9	22.6	1,632,624.01	2,275,011.25	39° 32' 31.815 N	108° 4' 15.907 W	
808.0	8.64	151.77	804.8	-50.1	23.3	1,632,622.80	2,275,011.86	39° 32' 31.803 N	108° 4' 15.899 W	
891.0	6.41	155.35	887.0	-59.8	28.1	1,632,612.96	2,275,016.46	39° 32' 31.707 N	108° 4' 15.837 W	
900.0	6.41	155.35	896.0	-60.7	28.6	1,632,612.03	2,275,016.85	39° 32' 31.698 N	108° 4' 15.831 W	
983.0	6.26	161.98	978.5	-69.2	31.9	1,632,603.43	2,275,019.94	39° 32' 31.614 N	108° 4' 15.789 W	
992.0	6.26	161.98	987.4	-70.1	32.2	1,632,602.49	2,275,020.22	39° 32' 31.605 N	108° 4' 15.785 W	
1,081.0	6.99	161.58	1,075.8	-79.9	35.4	1,632,592.65	2,275,023.16	39° 32' 31.508 N	108° 4' 15.744 W	
1,090.0	6.99	161.58	1,084.8	-80.9	35.7	1,632,591.60	2,275,023.47	39° 32' 31.498 N	108° 4' 15.740 W	
1,177.0	7.51	161.94	1,171.1	-91.3	39.2	1,632,581.08	2,275,026.61	39° 32' 31.395 N	108° 4' 15.696 W	
1,186.0	7.51	161.94	1,180.0	-92.5	39.5	1,632,579.95	2,275,026.94	39° 32' 31.384 N	108° 4' 15.691 W	
1,272.0	7.52	163.79	1,265.3	-103.2	42.9	1,632,569.11	2,275,029.95	39° 32' 31.278 N	108° 4' 15.649 W	
1,281.0	7.52	163.79	1,274.2	-104.3	43.2	1,632,567.97	2,275,030.25	39° 32' 31.267 N	108° 4' 15.645 W	
1,367.0	8.32	164.44	1,359.4	-115.7	46.4	1,632,556.49	2,275,033.17	39° 32' 31.154 N	108° 4' 15.603 W	
1,376.0	8.32	164.44	1,368.3	-117.0	46.8	1,632,555.23	2,275,033.48	39° 32' 31.142 N	108° 4' 15.599 W	
1,463.0	7.44	157.01	1,454.4	-128.2	50.7	1,632,543.87	2,275,037.05	39° 32' 31.030 N	108° 4' 15.549 W	
1,472.0	7.44	157.01	1,463.4	-129.3	51.1	1,632,542.79	2,275,037.47	39° 32' 31.020 N	108° 4' 15.543 W	
1,558.0	7.70	152.99	1,548.6	-139.6	55.9	1,632,532.40	2,275,041.97	39° 32' 30.918 N	108° 4' 15.482 W	
1,567.0	7.70	152.99	1,557.5	-140.6	56.5	1,632,531.31	2,275,042.49	39° 32' 30.908 N	108° 4' 15.475 W	
1,654.0	8.01	154.52	1,643.7	-151.3	61.7	1,632,520.50	2,275,047.44	39° 32' 30.802 N	108° 4' 15.408 W	
1,663.0	8.01	154.52	1,652.6	-152.4	62.3	1,632,519.35	2,275,047.95	39° 32' 30.791 N	108° 4' 15.401 W	
1,749.0	8.07	155.62	1,737.8	-163.4	67.3	1,632,508.30	2,275,052.70	39° 32' 30.683 N	108° 4' 15.337 W	
1,758.0	8.07	155.62	1,746.7	-164.5	67.8	1,632,507.14	2,275,053.19	39° 32' 30.672 N	108° 4' 15.330 W	
1,845.0	7.19	159.14	1,832.9	-175.2	72.3	1,632,496.37	2,275,057.35	39° 32' 30.567 N	108° 4' 15.273 W	
1,854.0	7.19	159.14	1,841.9	-176.2	72.7	1,632,495.30	2,275,057.72	39° 32' 30.556 N	108° 4' 15.268 W	
1,940.0	7.37	158.35	1,927.2	-186.4	76.7	1,632,485.04	2,275,061.38	39° 32' 30.456 N	108° 4' 15.217 W	
1,949.0	7.37	158.35	1,936.1	-187.4	77.1	1,632,483.96	2,275,061.78	39° 32' 30.445 N	108° 4' 15.212 W	
2,036.0	7.67	158.75	2,022.3	-198.0	81.2	1,632,473.25	2,275,065.64	39° 32' 30.341 N	108° 4' 15.159 W	
2,045.0	7.67	158.75	2,031.3	-199.2	81.7	1,632,472.11	2,275,066.04	39° 32' 30.330 N	108° 4' 15.153 W	
2,131.0	8.53	159.61	2,116.4	-210.5	86.0	1,632,460.67	2,275,070.02	39° 32' 30.218 N	108° 4' 15.098 W	
2,140.0	8.53	159.61	2,125.3	-211.7	86.4	1,632,459.41	2,275,070.45	39° 32' 30.205 N	108° 4' 15.092 W	
2,226.0	8.50	161.73	2,210.4	-223.7	90.7	1,632,447.28	2,275,074.33	39° 32' 30.086 N	108° 4' 15.039 W	
2,235.0	8.50	161.73	2,219.3	-225.0	91.1	1,632,446.00	2,275,074.71	39° 32' 30.074 N	108° 4' 15.033 W	
2,322.0	7.54	163.04	2,305.4	-236.6	94.8	1,632,434.34	2,275,078.06	39° 32' 29.960 N	108° 4' 14.986 W	
2,331.0	7.54	163.04	2,314.3	-237.7	95.1	1,632,433.20	2,275,078.37	39° 32' 29.949 N	108° 4' 14.982 W	
2,417.0	6.12	163.98	2,399.7	-247.5	98.0	1,632,423.32	2,275,081.00	39° 32' 29.852 N	108° 4' 14.945 W	
2,426.0	6.12	163.98	2,408.7	-248.4	98.3	1,632,422.39	2,275,081.24	39° 32' 29.843 N	108° 4' 14.941 W	
2,513.0	5.56	158.91	2,495.2	-256.8	101.1	1,632,413.92	2,275,083.80	39° 32' 29.760 N	108° 4' 14.906 W	
2,522.0	5.56	158.91	2,504.2	-257.6	101.4	1,632,413.10	2,275,084.09	39° 32' 29.752 N	108° 4' 14.902 W	
2,608.0	5.75	151.51	2,589.7	-265.3	104.9	1,632,405.33	2,275,087.43	39° 32' 29.676 N	108° 4' 14.856 W	
2,617.0	5.75	151.51	2,598.7	-266.1	105.4	1,632,404.53	2,275,087.83	39° 32' 29.668 N	108° 4' 14.851 W	
2,703.0	6.53	149.89	2,684.2	-274.1	109.9	1,632,396.39	2,275,092.11	39° 32' 29.589 N	108° 4' 14.793 W	
2,712.0	6.53	149.89	2,693.2	-275.0	110.4	1,632,395.49	2,275,092.60	39° 32' 29.580 N	108° 4' 14.787 W	
2,799.0	6.98	149.82	2,779.5	-283.8	115.5	1,632,386.50	2,275,097.49	39° 32' 29.492 N	108° 4' 14.721 W	
2,808.0	6.98	149.82	2,788.5	-284.8	116.1	1,632,385.53	2,275,098.01	39° 32' 29.483 N	108° 4' 14.714 W	
2,894.0	7.84	149.72	2,873.8	-294.4	121.7	1,632,375.80	2,275,103.32	39° 32' 29.388 N	108° 4' 14.643 W	
2,903.0	7.84	149.72	2,882.7	-295.4	122.3	1,632,374.72	2,275,103.91	39° 32' 29.378 N	108° 4' 14.635 W	
2,989.0	9.60	151.05	2,967.7	-306.8	128.7	1,632,363.20	2,275,110.02	39° 32' 29.266 N	108° 4' 14.553 W	
2,998.0	9.60	151.05	2,976.6	-308.1	129.4	1,632,361.87	2,275,110.70	39° 32' 29.253 N	108° 4' 14.544 W	

# Williams

## Survey Report - Geographic

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<b>Project:</b>	AP 11-06S-096W	<b>TVD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Site:</b>	AP 41-11-696 Pad	<b>MD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Well:</b>	AP 342-11-696	<b>North Reference:</b>	True
<b>Wellbore:</b>	AP 342-11-696	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	AP 342-11-696	<b>Database:</b>	Compass R5000 WIN AUTH

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
3,058.0	9.60	151.05	3,035.7	-316.8	134.3	1,632,352.98	2,275,115.30	39° 32' 29.166 N	108° 4' 14.482 W	
3,067.0	9.60	151.05	3,044.6	-318.2	135.0	1,632,351.65	2,275,115.99	39° 32' 29.153 N	108° 4' 14.472 W	
3,077.0	10.99	149.83	3,054.4	-319.7	135.9	1,632,350.07	2,275,116.83	39° 32' 29.138 N	108° 4' 14.461 W	
3,086.0	10.99	149.83	3,063.3	-321.2	136.8	1,632,348.56	2,275,117.65	39° 32' 29.123 N	108° 4' 14.450 W	
3,172.0	11.13	150.95	3,147.7	-335.5	144.9	1,632,333.99	2,275,125.39	39° 32' 28.982 N	108° 4' 14.346 W	
3,181.0	11.13	150.95	3,156.5	-337.1	145.8	1,632,332.45	2,275,126.19	39° 32' 28.967 N	108° 4' 14.335 W	
3,268.0	8.95	157.58	3,242.2	-350.7	152.4	1,632,318.67	2,275,132.46	39° 32' 28.832 N	108° 4' 14.250 W	
3,277.0	8.95	157.58	3,251.0	-352.0	152.9	1,632,317.36	2,275,132.96	39° 32' 28.819 N	108° 4' 14.244 W	
3,363.0	7.45	155.06	3,336.2	-363.2	157.9	1,632,305.99	2,275,137.54	39° 32' 28.708 N	108° 4' 14.181 W	
3,372.0	7.45	155.06	3,345.1	-364.3	158.3	1,632,304.92	2,275,138.00	39° 32' 28.698 N	108° 4' 14.175 W	
3,458.0	6.34	161.79	3,430.5	-373.8	162.2	1,632,295.25	2,275,141.56	39° 32' 28.603 N	108° 4' 14.126 W	
3,467.0	6.34	161.79	3,439.4	-374.8	162.5	1,632,294.29	2,275,141.85	39° 32' 28.594 N	108° 4' 14.122 W	
3,553.0	5.55	165.54	3,525.0	-383.3	165.0	1,632,285.69	2,275,144.13	39° 32' 28.510 N	108° 4' 14.090 W	
3,562.0	5.55	165.54	3,533.9	-384.1	165.2	1,632,284.84	2,275,144.32	39° 32' 28.501 N	108° 4' 14.087 W	
3,649.0	5.60	146.62	3,620.5	-391.8	168.6	1,632,277.13	2,275,147.49	39° 32' 28.426 N	108° 4' 14.044 W	
3,658.0	5.60	146.62	3,629.5	-392.5	169.1	1,632,276.38	2,275,147.95	39° 32' 28.419 N	108° 4' 14.037 W	
3,744.0	5.87	154.43	3,715.0	-400.0	173.3	1,632,268.79	2,275,151.94	39° 32' 28.345 N	108° 4' 13.984 W	
3,753.0	5.87	154.43	3,724.0	-400.8	173.7	1,632,267.95	2,275,152.32	39° 32' 28.337 N	108° 4' 13.979 W	
3,839.0	5.21	156.72	3,809.6	-408.3	177.1	1,632,260.31	2,275,155.54	39° 32' 28.262 N	108° 4' 13.935 W	
3,848.0	5.21	156.72	3,818.5	-409.1	177.5	1,632,259.55	2,275,155.85	39° 32' 28.255 N	108° 4' 13.931 W	
3,935.0	4.94	156.25	3,905.2	-416.2	180.5	1,632,252.40	2,275,158.71	39° 32' 28.185 N	108° 4' 13.891 W	
3,944.0	4.94	156.25	3,914.2	-416.9	180.8	1,632,251.69	2,275,159.01	39° 32' 28.178 N	108° 4' 13.887 W	
4,030.0	5.76	154.32	3,999.8	-424.1	184.2	1,632,244.32	2,275,162.16	39° 32' 28.106 N	108° 4' 13.845 W	
4,039.0	5.76	154.32	4,008.8	-425.0	184.6	1,632,243.49	2,275,162.53	39° 32' 28.098 N	108° 4' 13.840 W	
4,126.0	4.66	165.18	4,095.4	-432.3	187.4	1,632,236.06	2,275,165.12	39° 32' 28.025 N	108° 4' 13.804 W	
4,135.0	4.66	165.18	4,104.4	-433.0	187.6	1,632,235.35	2,275,165.28	39° 32' 28.018 N	108° 4' 13.801 W	
4,221.0	5.91	158.94	4,190.0	-440.5	190.1	1,632,227.78	2,275,167.55	39° 32' 27.944 N	108° 4' 13.770 W	
4,230.0	5.91	158.94	4,198.9	-441.4	190.4	1,632,226.90	2,275,167.86	39° 32' 27.935 N	108° 4' 13.765 W	
4,316.0	6.15	158.76	4,284.5	-449.8	193.7	1,632,218.39	2,275,170.88	39° 32' 27.852 N	108° 4' 13.724 W	
4,325.0	6.15	158.76	4,293.4	-450.7	194.0	1,632,217.48	2,275,171.21	39° 32' 27.843 N	108° 4' 13.719 W	
4,412.0	5.63	159.88	4,380.0	-459.1	197.2	1,632,209.04	2,275,174.12	39° 32' 27.761 N	108° 4' 13.679 W	
4,421.0	5.63	159.88	4,388.9	-459.9	197.5	1,632,208.21	2,275,174.40	39° 32' 27.753 N	108° 4' 13.675 W	
4,507.0	6.80	160.93	4,474.4	-468.7	200.6	1,632,199.35	2,275,177.27	39° 32' 27.666 N	108° 4' 13.636 W	
4,516.0	6.80	160.93	4,483.3	-469.7	200.9	1,632,198.33	2,275,177.59	39° 32' 27.656 N	108° 4' 13.631 W	
4,602.0	6.03	163.84	4,568.8	-478.8	203.9	1,632,189.10	2,275,180.25	39° 32' 27.565 N	108° 4' 13.594 W	
4,611.0	6.03	163.84	4,577.8	-479.7	204.1	1,632,188.19	2,275,180.49	39° 32' 27.556 N	108° 4' 13.590 W	
4,698.0	6.71	161.53	4,664.2	-488.9	207.0	1,632,178.90	2,275,183.11	39° 32' 27.465 N	108° 4' 13.554 W	
4,707.0	6.71	161.53	4,673.2	-489.9	207.3	1,632,177.89	2,275,183.41	39° 32' 27.456 N	108° 4' 13.549 W	
4,793.0	6.91	158.88	4,758.6	-499.5	210.8	1,632,168.21	2,275,186.59	39° 32' 27.361 N	108° 4' 13.505 W	
4,802.0	6.91	158.88	4,767.5	-500.5	211.2	1,632,167.19	2,275,186.96	39° 32' 27.351 N	108° 4' 13.500 W	
4,888.0	6.70	163.08	4,852.9	-510.2	214.5	1,632,157.47	2,275,190.01	39° 32' 27.256 N	108° 4' 13.458 W	
4,897.0	6.70	163.08	4,861.8	-511.2	214.8	1,632,156.46	2,275,190.28	39° 32' 27.246 N	108° 4' 13.454 W	
4,984.0	8.54	160.66	4,948.0	-522.1	218.4	1,632,145.41	2,275,193.59	39° 32' 27.138 N	108° 4' 13.408 W	
4,993.0	8.54	160.66	4,957.0	-523.4	218.9	1,632,144.14	2,275,194.00	39° 32' 27.125 N	108° 4' 13.402 W	
5,079.0	8.01	156.76	5,042.1	-534.9	223.3	1,632,132.48	2,275,198.15	39° 32' 27.011 N	108° 4' 13.345 W	
5,088.0	8.01	156.76	5,051.0	-536.1	223.8	1,632,131.32	2,275,198.61	39° 32' 27.000 N	108° 4' 13.339 W	
5,174.0	7.23	160.83	5,136.2	-546.7	228.0	1,632,120.59	2,275,202.45	39° 32' 26.895 N	108° 4' 13.286 W	
5,183.0	7.23	160.83	5,145.1	-547.8	228.4	1,632,119.51	2,275,202.79	39° 32' 26.884 N	108° 4' 13.281 W	
5,269.0	6.62	163.57	5,230.5	-557.6	231.5	1,632,109.56	2,275,205.69	39° 32' 26.787 N	108° 4' 13.240 W	
5,278.0	6.62	163.57	5,239.4	-558.6	231.8	1,632,108.55	2,275,205.95	39° 32' 26.777 N	108° 4' 13.237 W	
5,358.0	5.91	166.30	5,319.0	-567.0	234.1	1,632,100.07	2,275,207.99	39° 32' 26.694 N	108° 4' 13.208 W	
5,367.0	5.91	166.30	5,327.9	-567.9	234.3	1,632,099.16	2,275,208.19	39° 32' 26.685 N	108° 4' 13.205 W	
5,453.0	6.90	165.32	5,413.4	-577.2	236.7	1,632,089.80	2,275,210.28	39° 32' 26.593 N	108° 4' 13.175 W	

**Williams**  
Survey Report - Geographic

<b>Company:</b>	PICEANCE HL NAD 83	<b>Local Co-ordinate Reference:</b>	Well AP 342-11-696 - Slot A7
<b>Project:</b>	AP 11-06S-096W	<b>TVD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Site:</b>	AP 41-11-696 Pad	<b>MD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Well:</b>	AP 342-11-696	<b>North Reference:</b>	True
<b>Wellbore:</b>	AP 342-11-696	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	AP 342-11-696	<b>Database:</b>	Compass R5000 WIN AUTH

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,462.0	6.90	165.32	5,422.3	-578.3	237.0	1,632,088.75	2,275,210.52	39° 32' 26.582 N	108° 4' 13.171 W	
5,549.0	6.53	159.82	5,508.7	-588.0	240.0	1,632,078.97	2,275,213.28	39° 32' 26.487 N	108° 4' 13.133 W	
5,558.0	6.53	159.82	5,517.7	-588.9	240.3	1,632,078.00	2,275,213.61	39° 32' 26.477 N	108° 4' 13.128 W	
5,644.0	5.65	155.94	5,603.2	-597.4	243.8	1,632,069.45	2,275,216.78	39° 32' 26.394 N	108° 4' 13.084 W	
5,653.0	5.65	155.94	5,612.1	-598.2	244.1	1,632,068.63	2,275,217.12	39° 32' 26.386 N	108° 4' 13.080 W	
5,740.0	5.42	157.00	5,698.7	-605.9	247.5	1,632,060.84	2,275,220.25	39° 32' 26.310 N	108° 4' 13.037 W	
5,749.0	5.42	157.00	5,707.7	-606.7	247.8	1,632,060.05	2,275,220.56	39° 32' 26.302 N	108° 4' 13.033 W	
5,835.0	5.45	164.01	5,793.3	-614.4	250.5	1,632,052.31	2,275,223.05	39° 32' 26.226 N	108° 4' 12.998 W	
5,844.0	5.45	164.01	5,802.3	-615.2	250.7	1,632,051.49	2,275,223.26	39° 32' 26.218 N	108° 4' 12.995 W	
5,930.0	5.74	144.69	5,887.9	-622.6	254.4	1,632,043.95	2,275,226.66	39° 32' 26.144 N	108° 4' 12.949 W	
5,939.0	5.74	144.69	5,896.8	-623.3	254.9	1,632,043.20	2,275,227.16	39° 32' 26.137 N	108° 4' 12.942 W	
6,024.0	5.02	154.14	5,981.4	-630.2	259.0	1,632,036.27	2,275,231.05	39° 32' 26.070 N	108° 4' 12.890 W	
6,033.0	5.02	154.14	5,990.4	-630.9	259.3	1,632,035.56	2,275,231.37	39° 32' 26.063 N	108° 4' 12.886 W	
6,119.0	5.92	146.06	6,076.0	-637.9	263.4	1,632,028.38	2,275,235.29	39° 32' 25.993 N	108° 4' 12.833 W	
6,128.0	5.92	146.06	6,085.0	-638.7	263.9	1,632,027.59	2,275,235.78	39° 32' 25.985 N	108° 4' 12.827 W	
6,214.0	5.33	153.38	6,170.6	-646.0	268.2	1,632,020.22	2,275,239.84	39° 32' 25.914 N	108° 4' 12.772 W	
6,223.0	5.33	153.38	6,179.5	-646.7	268.6	1,632,019.47	2,275,240.19	39° 32' 25.906 N	108° 4' 12.768 W	
6,310.0	5.19	165.00	6,266.2	-654.1	271.4	1,632,011.98	2,275,242.81	39° 32' 25.833 N	108° 4' 12.732 W	
6,319.0	5.19	165.00	6,275.1	-654.9	271.6	1,632,011.18	2,275,243.00	39° 32' 25.825 N	108° 4' 12.729 W	
6,405.0	6.07	158.60	6,360.7	-662.9	274.3	1,632,003.12	2,275,245.44	39° 32' 25.746 N	108° 4' 12.695 W	
6,414.0	6.07	158.60	6,369.7	-663.8	274.6	1,632,002.23	2,275,245.76	39° 32' 25.738 N	108° 4' 12.690 W	
6,501.0	6.43	154.40	6,456.1	-672.5	278.4	1,631,993.45	2,275,249.30	39° 32' 25.652 N	108° 4' 12.642 W	
6,510.0	6.43	154.40	6,465.1	-673.4	278.9	1,631,992.53	2,275,249.71	39° 32' 25.643 N	108° 4' 12.637 W	
6,596.0	6.52	150.45	6,550.5	-682.0	283.3	1,631,983.81	2,275,253.95	39° 32' 25.558 N	108° 4' 12.579 W	
6,605.0	6.52	150.45	6,559.5	-682.8	283.8	1,631,982.91	2,275,254.43	39° 32' 25.549 N	108° 4' 12.573 W	
6,692.0	6.32	146.02	6,645.9	-691.1	289.0	1,631,974.50	2,275,259.31	39° 32' 25.467 N	108° 4' 12.508 W	
6,701.0	6.32	146.02	6,654.9	-691.9	289.5	1,631,973.66	2,275,259.84	39° 32' 25.459 N	108° 4' 12.500 W	
6,787.0	6.07	148.19	6,740.4	-699.7	294.6	1,631,965.74	2,275,264.66	39° 32' 25.382 N	108° 4' 12.436 W	
6,796.0	6.07	148.19	6,749.3	-700.5	295.1	1,631,964.91	2,275,265.13	39° 32' 25.374 N	108° 4' 12.430 W	
6,885.0	6.31	152.19	6,837.8	-708.9	299.8	1,631,956.46	2,275,269.66	39° 32' 25.292 N	108° 4' 12.369 W	
6,894.0	6.31	152.19	6,846.7	-709.7	300.3	1,631,955.57	2,275,270.10	39° 32' 25.283 N	108° 4' 12.363 W	
6,983.0	6.01	154.00	6,935.2	-718.2	304.6	1,631,946.94	2,275,274.18	39° 32' 25.199 N	108° 4' 12.308 W	
6,992.0	6.01	154.00	6,944.2	-719.1	305.0	1,631,946.08	2,275,274.57	39° 32' 25.191 N	108° 4' 12.303 W	
7,079.0	6.04	158.75	7,030.7	-727.5	308.7	1,631,937.62	2,275,277.98	39° 32' 25.108 N	108° 4' 12.256 W	
7,088.0	6.04	158.75	7,039.7	-728.3	309.0	1,631,936.73	2,275,278.30	39° 32' 25.100 N	108° 4' 12.252 W	
7,175.0	5.93	160.07	7,126.2	-736.8	312.2	1,631,928.15	2,275,281.25	39° 32' 25.016 N	108° 4' 12.211 W	
7,184.0	5.93	160.07	7,135.1	-737.7	312.5	1,631,927.27	2,275,281.54	39° 32' 25.007 N	108° 4' 12.207 W	
7,269.0	6.79	159.99	7,219.6	-746.5	315.7	1,631,918.33	2,275,284.51	39° 32' 24.919 N	108° 4' 12.166 W	
7,278.0	6.79	159.99	7,228.5	-747.5	316.1	1,631,917.32	2,275,284.84	39° 32' 24.910 N	108° 4' 12.161 W	
7,364.0	6.58	164.29	7,314.0	-757.1	319.2	1,631,907.72	2,275,287.65	39° 32' 24.816 N	108° 4' 12.122 W	
7,373.0	6.58	164.29	7,322.9	-758.1	319.5	1,631,906.72	2,275,287.90	39° 32' 24.806 N	108° 4' 12.118 W	
7,460.0	6.11	161.52	7,409.4	-767.3	322.3	1,631,897.45	2,275,290.45	39° 32' 24.715 N	108° 4' 12.082 W	
7,469.0	6.11	161.52	7,418.3	-768.2	322.6	1,631,896.53	2,275,290.73	39° 32' 24.706 N	108° 4' 12.078 W	
7,555.0	7.07	160.66	7,503.7	-777.5	325.8	1,631,887.11	2,275,293.67	39° 32' 24.614 N	108° 4' 12.038 W	
7,564.0	7.07	160.66	7,512.7	-778.5	326.1	1,631,886.06	2,275,294.01	39° 32' 24.603 N	108° 4' 12.033 W	
7,650.0	6.79	159.06	7,598.0	-788.3	329.7	1,631,876.22	2,275,297.30	39° 32' 24.507 N	108° 4' 11.987 W	
7,659.0	6.79	159.06	7,607.0	-789.3	330.1	1,631,875.21	2,275,297.65	39° 32' 24.497 N	108° 4' 11.982 W	
7,746.0	6.58	160.82	7,693.4	-798.8	333.6	1,631,865.61	2,275,300.86	39° 32' 24.403 N	108° 4' 11.938 W	
7,755.0	6.58	160.82	7,702.3	-799.8	333.9	1,631,864.63	2,275,301.17	39° 32' 24.394 N	108° 4' 11.934 W	
7,841.0	5.63	158.31	7,787.8	-808.3	337.1	1,631,855.97	2,275,304.10	39° 32' 24.309 N	108° 4' 11.893 W	
7,850.0	5.63	158.31	7,796.8	-809.2	337.4	1,631,855.14	2,275,304.40	39° 32' 24.301 N	108° 4' 11.889 W	
7,936.0	5.62	158.68	7,882.4	-817.0	340.5	1,631,847.21	2,275,307.27	39° 32' 24.223 N	108° 4' 11.850 W	
7,945.0	5.62	158.68	7,891.3	-817.8	340.8	1,631,846.38	2,275,307.57	39° 32' 24.215 N	108° 4' 11.845 W	

**Williams**  
Survey Report - Geographic

<b>Company:</b>	PICEANCE HL NAD 83	<b>Local Co-ordinate Reference:</b>	Well AP 342-11-696 - Slot A7
<b>Project:</b>	AP 11-06S-096W	<b>TVD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Site:</b>	AP 41-11-696 Pad	<b>MD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Well:</b>	AP 342-11-696	<b>North Reference:</b>	True
<b>Wellbore:</b>	AP 342-11-696	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	AP 342-11-696	<b>Database:</b>	Compass R5000 WIN AUTH

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
8,032.0	4.64	162.05	7,978.0	-825.1	343.5	1,631,838.99	2,275,309.99	39° 32' 24.143 N	108° 4' 11.812 W	
8,041.0	4.64	162.05	7,987.0	-825.8	343.7	1,631,838.29	2,275,310.20	39° 32' 24.136 N	108° 4' 11.809 W	
8,127.0	4.72	166.78	8,072.7	-832.6	345.6	1,631,831.49	2,275,311.89	39° 32' 24.069 N	108° 4' 11.785 W	
8,136.0	4.72	166.78	8,081.7	-833.3	345.7	1,631,830.76	2,275,312.04	39° 32' 24.062 N	108° 4' 11.783 W	
8,222.0	5.24	168.11	8,167.3	-840.6	347.4	1,631,823.43	2,275,313.45	39° 32' 23.990 N	108° 4' 11.762 W	
8,231.0	5.24	168.11	8,176.3	-841.4	347.5	1,631,822.63	2,275,313.59	39° 32' 23.982 N	108° 4' 11.760 W	
8,318.0	5.33	167.67	8,262.9	-849.2	349.2	1,631,814.75	2,275,315.05	39° 32' 23.905 N	108° 4' 11.739 W	
8,327.0	5.33	167.67	8,271.9	-850.0	349.4	1,631,813.92	2,275,315.21	39° 32' 23.897 N	108° 4' 11.736 W	
8,413.0	5.20	145.47	8,357.5	-857.2	352.4	1,631,806.73	2,275,318.07	39° 32' 23.826 N	108° 4' 11.697 W	
8,422.0	5.20	145.47	8,366.5	-857.8	352.9	1,631,806.04	2,275,318.51	39° 32' 23.820 N	108° 4' 11.691 W	
8,508.0	2.03	140.50	8,452.3	-862.2	356.1	1,631,801.57	2,275,321.56	39° 32' 23.776 N	108° 4' 11.651 W	
8,517.0	2.03	140.50	8,461.3	-862.5	356.3	1,631,801.32	2,275,321.76	39° 32' 23.774 N	108° 4' 11.648 W	
8,604.0	2.54	153.05	8,548.2	-865.4	358.1	1,631,798.36	2,275,323.53	39° 32' 23.745 N	108° 4' 11.624 W	
8,613.0	2.54	153.05	8,557.2	-865.7	358.3	1,631,798.00	2,275,323.70	39° 32' 23.742 N	108° 4' 11.622 W	
8,699.0	2.47	160.19	8,643.1	-869.2	359.8	1,631,794.51	2,275,325.09	39° 32' 23.708 N	108° 4' 11.603 W	
8,708.0	2.47	160.19	8,652.1	-869.5	359.9	1,631,794.15	2,275,325.22	39° 32' 23.704 N	108° 4' 11.601 W	
8,794.0	2.22	161.38	8,738.1	-872.9	361.1	1,631,790.79	2,275,326.28	39° 32' 23.671 N	108° 4' 11.587 W	
8,803.0	2.22	161.38	8,747.1	-873.2	361.2	1,631,790.46	2,275,326.38	39° 32' 23.668 N	108° 4' 11.585 W	
8,890.0	2.49	167.00	8,834.0	-876.6	362.2	1,631,787.00	2,275,327.25	39° 32' 23.634 N	108° 4' 11.573 W	
8,899.0	2.49	167.00	8,843.0	-877.0	362.3	1,631,786.61	2,275,327.33	39° 32' 23.630 N	108° 4' 11.572 W	
9,167.0	2.67	177.87	9,110.7	-888.9	363.8	1,631,774.66	2,275,328.53	39° 32' 23.512 N	108° 4' 11.552 W	
9,176.0	2.67	177.87	9,119.7	-889.3	363.8	1,631,774.24	2,275,328.53	39° 32' 23.508 N	108° 4' 11.552 W	
9,325.0	2.89	179.99	9,268.5	-896.6	364.0	1,631,767.02	2,275,328.46	39° 32' 23.437 N	108° 4' 11.550 W	
9,334.0	2.89	179.99	9,277.5	-897.0	364.0	1,631,766.57	2,275,328.45	39° 32' 23.432 N	108° 4' 11.550 W	
9,421.0	3.07	185.25	9,364.4	-901.5	363.7	1,631,762.06	2,275,328.11	39° 32' 23.388 N	108° 4' 11.553 W	
9,430.0	3.07	185.25	9,373.4	-902.0	363.7	1,631,761.58	2,275,328.05	39° 32' 23.383 N	108° 4' 11.554 W	
9,516.0	3.04	189.67	9,459.3	-906.6	363.1	1,631,757.06	2,275,327.33	39° 32' 23.338 N	108° 4' 11.561 W	
9,525.0	3.04	189.67	9,468.2	-907.0	363.0	1,631,756.59	2,275,327.23	39° 32' 23.334 N	108° 4' 11.562 W	
9,611.0	3.33	190.32	9,554.1	-911.7	362.2	1,631,751.91	2,275,326.27	39° 32' 23.287 N	108° 4' 11.573 W	
9,620.0	3.33	190.32	9,563.1	-912.2	362.1	1,631,751.40	2,275,326.16	39° 32' 23.282 N	108° 4' 11.574 W	
9,707.0	3.35	191.18	9,649.9	-917.2	361.2	1,631,746.45	2,275,325.07	39° 32' 23.233 N	108° 4' 11.586 W	
9,716.0	3.35	191.18	9,658.9	-917.7	361.1	1,631,745.94	2,275,324.96	39° 32' 23.228 N	108° 4' 11.587 W	
9,802.0	3.59	193.76	9,744.8	-922.8	359.9	1,631,740.89	2,275,323.69	39° 32' 23.177 N	108° 4' 11.602 W	
9,811.0	3.59	193.76	9,753.8	-923.4	359.8	1,631,740.35	2,275,323.54	39° 32' 23.172 N	108° 4' 11.603 W	
9,898.0	3.88	195.60	9,840.6	-928.8	358.4	1,631,734.91	2,275,321.94	39° 32' 23.118 N	108° 4' 11.622 W	
9,907.0	3.88	195.60	9,849.5	-929.4	358.2	1,631,734.33	2,275,321.76	39° 32' 23.112 N	108° 4' 11.624 W	
9,993.0	4.02	197.12	9,935.3	-935.1	356.5	1,631,728.69	2,275,319.93	39° 32' 23.056 N	108° 4' 11.645 W	
10,002.0	4.02	197.12	9,944.3	-935.7	356.3	1,631,728.10	2,275,319.73	39° 32' 23.050 N	108° 4' 11.648 W	
10,088.0	4.13	197.39	10,030.1	-941.6	354.5	1,631,722.31	2,275,317.75	39° 32' 22.992 N	108° 4' 11.671 W	
10,097.0	4.13	197.39	10,039.1	-942.2	354.3	1,631,721.70	2,275,317.54	39° 32' 22.986 N	108° 4' 11.673 W	
10,184.0	4.08	196.19	10,125.9	-948.1	352.5	1,631,715.79	2,275,315.57	39° 32' 22.927 N	108° 4' 11.696 W	
10,193.0	4.08	196.19	10,134.8	-948.7	352.3	1,631,715.18	2,275,315.38	39° 32' 22.921 N	108° 4' 11.698 W	
10,279.0	4.34	198.59	10,220.6	-954.8	350.5	1,631,709.22	2,275,313.32	39° 32' 22.862 N	108° 4' 11.723 W	
10,288.0	4.34	198.59	10,229.6	-955.4	350.2	1,631,708.58	2,275,313.08	39° 32' 22.855 N	108° 4' 11.725 W	
10,374.0	4.38	199.32	10,315.3	-961.6	348.1	1,631,702.46	2,275,310.79	39° 32' 22.794 N	108° 4' 11.752 W	
10,383.0	4.38	199.32	10,324.3	-962.2	347.9	1,631,701.82	2,275,310.54	39° 32' 22.788 N	108° 4' 11.755 W	
10,470.0	4.22	199.22	10,411.1	-968.4	345.7	1,631,695.72	2,275,308.21	39° 32' 22.727 N	108° 4' 11.783 W	
10,479.0	4.22	199.22	10,420.0	-969.0	345.5	1,631,695.10	2,275,307.98	39° 32' 22.721 N	108° 4' 11.786 W	
10,565.0	4.47	207.56	10,505.8	-975.0	342.9	1,631,689.22	2,275,305.22	39° 32' 22.662 N	108° 4' 11.819 W	
10,574.0	4.47	207.56	10,514.8	-975.6	342.6	1,631,688.61	2,275,304.88	39° 32' 22.656 N	108° 4' 11.823 W	
10,782.0	4.47	207.56	10,722.1	-990.0	335.1	1,631,674.45	2,275,296.97	39° 32' 22.514 N	108° 4' 11.919 W	
10,791.0	4.47	207.56	10,731.1	-990.6	334.8	1,631,673.84	2,275,296.63	39° 32' 22.507 N	108° 4' 11.923 W	

**Williams**  
Survey Report - Geographic

<b>Company:</b>	PICEANCE HL NAD 83	<b>Local Co-ordinate Reference:</b>	Well AP 342-11-696 - Slot A7
<b>Project:</b>	AP 11-06S-096W	<b>TVD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Site:</b>	AP 41-11-696 Pad	<b>MD Reference:</b>	KELLY BUSHING @ 8568.0usft (Grey Wolf 51 (28' RKB))
<b>Well:</b>	AP 342-11-696	<b>North Reference:</b>	True
<b>Wellbore:</b>	AP 342-11-696	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	AP 342-11-696	<b>Database:</b>	Compass R5000 WIN AUTH

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)		
Top Gas (25' Radius) AF	0.00	0.00	8,887.0	-903.1	360.9	1,631,760.56	2,275,325.23	39° 32' 23.372 N	108° 4' 11.589 W
- survey misses target center by 24.3usft at 8944.1usft MD (8888.1 TVD, -878.9 N, 362.7 E)									
- Circle (radius 25.0)									

Checked By: _____	Approved By: _____	Date: _____
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