

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well/Wellbore Information

Well	CMU 323-33	Wellbore No.	00
Wellbore Legal Name	CMU 323-33	Common Wellbore Name	CMU 323-33
Project	KP 33-06S-90W	Site	CMU 22-33 Pad
Vertical Section Azimuth	204.05 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	8/19/2013	UWI	CMU 323-33
Active datum	KB @7,252.0ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	
Date Started	8/19/2013	Ended	
Tool Name	MWD	Engineer	

2.1.1 Tie On Point

MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)
0.0	0.00	0.00	0.00	0.00	0.00

2.1.2 Survey Stations

Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Trace (°)
8/19/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8/19/2013	NORMAL	138.0	0.66	252.05	138.00	-0.24	-0.76	0.53	0.48	0.48	0.00	252.05
	NORMAL	168.0	1.19	259.17	167.99	-0.36	-1.23	0.83	1.80	1.77	23.73	15.81
	NORMAL	198.0	1.93	243.35	197.98	-0.64	-1.98	1.39	2.83	2.47	-52.73	321.73
	NORMAL	228.0	1.89	244.05	227.97	-1.08	-2.88	2.16	0.15	-0.13	2.33	150.10
	NORMAL	258.0	2.11	235.61	257.95	-1.61	-3.78	3.01	1.22	0.73	-28.13	302.49
	NORMAL	289.0	2.90	231.48	288.92	-2.42	-4.87	4.20	2.61	2.55	-13.32	345.06
	NORMAL	319.0	3.12	237.72	318.88	-3.33	-6.15	5.55	1.31	0.73	20.80	59.26
	NORMAL	349.0	3.60	227.70	348.82	-4.40	-7.54	7.09	2.52	1.60	-33.40	304.19
	NORMAL	379.0	4.39	227.00	378.75	-5.82	-9.07	9.01	2.64	2.63	-2.33	356.12
	NORMAL	409.0	4.80	224.80	408.66	-7.49	-10.80	11.24	1.49	1.37	-7.33	335.64
	NORMAL	500.0	5.93	218.91	499.26	-13.85	-16.43	19.35	1.38	1.24	-6.47	331.06
	NORMAL	591.0	8.30	216.45	589.55	-22.80	-23.29	30.31	2.63	2.60	-2.70	351.45
	NORMAL	684.0	9.05	202.92	681.49	-34.93	-30.13	44.18	2.33	0.81	-14.55	283.40
8/20/2013	NORMAL	775.0	12.39	199.93	770.89	-50.71	-36.24	61.08	3.72	3.67	-3.29	349.07
	NORMAL	866.0	14.24	199.66	859.44	-70.43	-43.34	81.97	2.03	2.03	-0.30	357.94
	NORMAL	958.0	16.00	197.82	948.26	-93.16	-51.02	105.86	1.98	1.91	-2.00	343.86
	NORMAL	1,053.0	17.50	198.52	1,039.22	-119.17	-59.57	133.10	1.59	1.58	0.74	8.00
	NORMAL	1,127.0	19.12	198.17	1,109.48	-141.23	-66.88	156.23	2.19	2.19	-0.47	355.95
8/21/2013	NORMAL	1,253.0	20.48	196.76	1,228.02	-181.95	-79.67	198.62	1.14	1.08	-1.12	339.98
	NORMAL	1,349.0	17.80	198.61	1,318.71	-211.94	-89.20	229.89	2.86	-2.79	1.93	168.12

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Tface (°)
8/21/2013	NORMAL	1,445.0	15.43	204.50	1,410.70	-237.47	-99.18	257.28	3.03	-2.47	6.14	147.40
	NORMAL	1,540.0	15.69	208.54	1,502.22	-260.26	-110.56	282.72	1.17	0.27	4.25	78.46
	NORMAL	1,636.0	14.73	205.82	1,594.86	-282.65	-122.08	307.86	1.25	-1.00	-2.83	215.32
	NORMAL	1,731.0	14.37	206.17	1,686.81	-304.10	-132.54	331.72	0.39	-0.38	0.37	166.44
	NORMAL	1,922.0	13.93	206.61	1,872.02	-345.93	-153.29	378.37	0.24	-0.23	0.23	166.48
	NORMAL	2,017.0	15.16	206.43	1,963.97	-367.28	-163.94	402.20	1.30	1.29	-0.19	357.81
	NORMAL	2,112.0	15.12	204.76	2,055.68	-389.65	-174.66	427.00	0.46	-0.04	-1.76	263.95
	NORMAL	2,208.0	14.64	203.18	2,148.46	-412.17	-184.68	451.65	0.65	-0.50	-1.65	219.45
	NORMAL	2,302.0	14.29	201.77	2,239.48	-433.87	-193.66	475.12	0.53	-0.37	-1.50	224.50
	NORMAL	2,398.0	15.08	205.11	2,332.34	-456.18	-203.35	499.45	1.21	0.82	3.48	48.61
	NORMAL	2,494.0	15.39	205.11	2,424.97	-479.02	-214.06	524.67	0.32	0.32	0.00	0.00
8/22/2013	NORMAL	2,589.0	15.16	205.03	2,516.61	-501.69	-224.66	549.70	0.24	-0.24	-0.08	185.20
	NORMAL	2,685.0	14.95	206.08	2,609.32	-524.19	-235.42	574.62	0.36	-0.22	1.09	128.10
	NORMAL	2,780.0	14.68	206.08	2,701.16	-546.01	-246.09	598.90	0.28	-0.28	0.00	180.00
	NORMAL	2,875.0	14.64	206.17	2,793.07	-567.59	-256.68	622.93	0.05	-0.04	0.09	150.38
	NORMAL	2,971.0	14.64	208.72	2,885.95	-589.12	-267.86	647.14	0.67	0.00	2.66	91.23
	NORMAL	3,067.0	15.87	202.83	2,978.57	-611.86	-278.79	672.36	2.06	1.28	-6.14	305.57
	NORMAL	3,162.0	15.91	203.53	3,069.94	-635.77	-289.02	698.36	0.21	0.04	0.74	78.55
	NORMAL	3,257.0	16.40	203.97	3,161.19	-659.96	-299.67	724.80	0.53	0.52	0.46	14.24
	NORMAL	3,352.0	15.12	205.29	3,252.62	-683.42	-310.41	750.60	1.40	-1.35	1.39	164.99
	NORMAL	3,447.0	14.95	205.38	3,344.37	-705.69	-320.96	775.23	0.18	-0.18	0.09	172.22
	NORMAL	3,543.0	14.77	206.52	3,437.16	-727.83	-331.73	799.84	0.36	-0.19	1.19	121.96
8/23/2013	NORMAL	3,639.0	14.95	202.92	3,529.95	-750.19	-342.02	824.45	0.98	0.19	-3.75	279.20
	NORMAL	3,734.0	15.08	204.50	3,621.71	-772.72	-351.91	849.06	0.45	0.14	1.66	73.14
	NORMAL	3,830.0	14.86	203.79	3,714.45	-795.35	-362.06	873.86	0.30	-0.23	-0.74	219.47
	NORMAL	3,926.0	15.03	203.79	3,807.20	-818.00	-372.05	898.61	0.18	0.18	0.00	0.00
	NORMAL	4,022.0	14.86	204.94	3,899.95	-840.55	-382.26	923.37	0.36	-0.18	1.20	120.38
	NORMAL	4,117.0	14.86	205.64	3,991.78	-862.58	-392.67	947.73	0.19	0.00	0.74	90.34
	NORMAL	4,212.0	15.03	204.32	4,083.56	-884.79	-403.01	972.22	0.40	0.18	-1.39	295.90
	NORMAL	4,307.0	14.95	205.20	4,175.33	-907.10	-413.30	996.79	0.25	-0.08	0.93	109.79
	NORMAL	4,403.0	15.03	205.99	4,268.06	-929.50	-424.03	1,021.61	0.23	0.08	0.82	69.00
	NORMAL	4,592.0	14.86	206.78	4,450.67	-973.16	-445.69	1,070.31	0.14	-0.09	0.42	130.22
	NORMAL	4,688.0	15.96	203.97	4,543.22	-996.21	-456.59	1,095.81	1.38	1.15	-2.93	324.47
	NORMAL	4,783.0	15.65	205.64	4,634.63	-1,019.70	-467.45	1,121.68	0.58	-0.33	1.76	125.08
	NORMAL	4,878.0	15.96	201.07	4,726.04	-1,043.44	-477.69	1,147.53	1.35	0.33	-4.81	281.78
	NORMAL	4,974.0	16.04	202.30	4,818.32	-1,068.02	-487.46	1,173.97	0.36	0.08	1.28	77.31
	NORMAL	5,068.0	15.82	201.95	4,908.71	-1,091.92	-497.18	1,199.75	0.26	-0.23	-0.37	203.42
	NORMAL	5,163.0	15.25	202.65	5,000.24	-1,115.46	-506.83	1,225.18	0.63	-0.60	0.74	162.13
	NORMAL	5,259.0	15.25	203.35	5,092.86	-1,138.71	-516.70	1,250.43	0.19	0.00	0.73	90.34
	NORMAL	5,355.0	15.16	203.79	5,185.50	-1,161.79	-526.77	1,275.61	0.15	-0.09	0.46	128.16
	NORMAL	5,451.0	13.85	204.06	5,278.44	-1,183.76	-536.52	1,299.65	1.37	-1.36	0.28	177.18
	NORMAL	5,546.0	13.41	204.59	5,370.77	-1,204.16	-545.74	1,322.04	0.48	-0.46	0.56	164.41
	NORMAL	5,641.0	11.82	200.72	5,463.47	-1,223.28	-553.76	1,342.77	1.89	-1.67	-4.07	206.12
	NORMAL	5,737.0	11.16	202.39	5,557.55	-1,241.07	-560.78	1,361.87	0.77	-0.69	1.74	154.07
	NORMAL	5,832.0	10.77	202.92	5,650.81	-1,257.75	-567.74	1,379.93	0.42	-0.41	0.56	165.77
	NORMAL	5,928.0	9.05	203.79	5,745.38	-1,272.92	-574.28	1,398.45	1.80	-1.79	0.91	175.45
8/24/2013	NORMAL	6,024.0	9.05	205.55	5,840.16	-1,286.71	-580.61	1,411.55	0.29	0.00	1.83	90.87
	NORMAL	6,120.0	8.53	199.66	5,935.03	-1,300.23	-586.26	1,426.28	1.08	-0.54	-6.14	237.10
	NORMAL	6,215.0	6.68	202.04	6,029.20	-1,311.99	-590.71	1,438.83	1.97	-1.95	2.51	171.52
	NORMAL	6,310.0	5.67	196.67	6,123.64	-1,321.60	-594.13	1,449.00	1.22	-1.06	-5.65	207.11
	NORMAL	6,405.0	4.18	192.10	6,218.29	-1,329.49	-596.20	1,457.05	1.62	-1.57	-4.81	192.48
	NORMAL	6,501.0	3.47	194.48	6,314.08	-1,335.72	-597.66	1,463.33	0.76	-0.74	2.48	168.58
	NORMAL	6,596.0	2.33	187.45	6,408.95	-1,340.42	-598.63	1,468.02	1.25	-1.20	-7.40	193.84
	NORMAL	6,692.0	2.29	192.02	6,504.88	-1,344.23	-599.28	1,471.77	0.20	-0.04	4.76	104.53
8/25/2013	NORMAL	6,785.0	1.01	223.31	6,597.84	-1,346.64	-600.23	1,474.36	1.63	-1.38	33.65	159.81
	NORMAL	6,881.0	1.14	232.62	6,693.82	-1,347.84	-601.57	1,475.99	0.23	0.14	9.70	58.06

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc. (")	Azi. (")	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS ("/100usft)	Bulld Rate ("/100usft)	Turn ("/100usft)	Tface (")
8/25/2013	NORMAL	6,977.0	0.97	249.32	6,789.81	-1,348.71	-603.09	1,477.40	0.36	-0.18	17.40	127.11
	NORMAL	7,072.0	0.75	246.33	6,884.79	-1,349.24	-604.41	1,478.43	0.24	-0.23	-3.15	190.04
	NORMAL	7,167.0	0.48	15.88	6,979.79	-1,349.11	-604.87	1,478.50	1.18	-0.28	136.37	160.68
	NORMAL	7,262.0	0.79	5.43	7,074.79	-1,348.07	-604.70	1,477.48	0.35	0.33	-11.00	334.24
	NORMAL	7,357.0	0.75	354.88	7,169.78	-1,346.80	-604.69	1,476.32	0.15	-0.04	-11.11	249.01
	NORMAL	7,453.0	0.97	339.23	7,265.77	-1,345.41	-605.04	1,475.19	0.33	0.23	-16.30	305.12
8/26/2013	NORMAL	7,548.0	1.27	355.58	7,360.75	-1,343.61	-605.41	1,473.70	0.46	0.32	17.21	55.18
	NORMAL	7,644.0	0.57	0.06	7,456.74	-1,342.07	-605.49	1,472.33	0.73	-0.73	4.67	176.37
	NORMAL	7,739.0	0.79	347.50	7,551.73	-1,340.96	-605.63	1,471.37	0.28	0.23	-13.22	319.49
	NORMAL	7,834.0	1.27	50.60	7,646.72	-1,339.66	-604.96	1,469.90	1.21	0.51	66.42	100.76
	NORMAL	7,930.0	1.01	25.29	7,742.70	-1,338.21	-603.77	1,468.10	0.58	-0.27	-26.36	230.42
	NORMAL	8,025.0	0.97	349.08	7,837.69	-1,336.67	-603.57	1,466.61	0.65	-0.04	-38.12	248.36
	NORMAL	8,118.0	1.32	305.92	7,930.67	-1,335.27	-604.58	1,465.74	0.97	0.38	-46.41	269.55
	NORMAL	8,213.0	1.41	295.64	8,025.64	-1,334.12	-606.52	1,465.48	0.27	0.09	-10.82	284.99
	NORMAL	8,308.0	2.64	305.31	8,120.58	-1,332.35	-609.36	1,465.02	1.34	1.29	10.18	20.39
8/27/2013	NORMAL	8,404.0	1.80	314.10	8,216.51	-1,330.02	-612.25	1,464.08	0.94	-0.88	9.16	162.29
	NORMAL	8,500.0	1.63	343.72	8,312.47	-1,327.66	-613.72	1,462.52	0.93	-0.18	30.85	115.42
	NORMAL	8,595.0	0.31	337.30	8,407.45	-1,326.13	-614.19	1,461.31	1.39	-1.39	-6.76	181.50
8/28/2013	NORMAL	8,690.0	0.22	108.52	8,502.45	-1,325.95	-614.12	1,461.12	0.51	-0.09	138.13	160.01
	NORMAL	8,785.0	0.44	2.54	8,597.45	-1,325.64	-613.93	1,460.76	0.57	0.23	-111.56	231.11
	NORMAL	8,880.0	1.10	2.78	8,692.44	-1,324.37	-613.87	1,459.57	0.69	0.69	0.25	0.40
	NORMAL	8,976.0	1.19	235.44	8,788.43	-1,324.01	-614.65	1,459.56	2.14	0.09	-132.64	207.45
	NORMAL	9,072.0	1.50	209.24	8,884.41	-1,325.67	-616.08	1,461.67	0.71	0.32	-27.29	283.25
	NORMAL	9,167.0	2.20	156.07	8,979.37	-1,328.43	-615.95	1,464.13	1.86	0.74	-55.97	264.14
8/29/2013	NORMAL	9,263.0	1.98	163.45	9,075.30	-1,331.70	-614.73	1,466.62	0.36	-0.23	7.69	132.91
	NORMAL	9,358.0	2.33	176.55	9,170.24	-1,335.20	-614.15	1,469.58	0.63	0.37	13.79	61.27
	NORMAL	9,453.0	2.15	176.72	9,265.16	-1,338.91	-613.93	1,472.87	0.19	-0.19	0.18	177.97
8/30/2013	NORMAL	9,548.0	1.71	186.30	9,360.11	-1,342.09	-613.98	1,475.81	0.57	-0.46	10.08	148.47
	NORMAL	9,644.0	1.71	192.02	9,456.07	-1,344.92	-614.44	1,478.57	0.18	0.00	5.96	92.86
	NORMAL	9,740.0	1.67	206.34	9,552.03	-1,347.57	-615.36	1,481.37	0.44	-0.04	14.92	102.54
	NORMAL	9,835.0	1.76	199.84	9,646.98	-1,350.19	-616.47	1,484.21	0.23	0.09	-6.84	291.56
	NORMAL	9,931.0	1.32	213.73	9,742.95	-1,352.49	-617.58	1,486.77	0.60	-0.46	14.47	146.49
	NORMAL	10,026.0	1.05	153.26	9,837.93	-1,354.18	-617.80	1,488.40	1.28	-0.28	-63.65	228.71
	NORMAL	10,120.0	0.75	141.04	9,931.92	-1,355.43	-617.02	1,489.22	0.38	-0.32	-13.00	208.60
8/31/2013	NORMAL	10,215.0	0.35	191.05	10,026.92	-1,356.20	-616.69	1,489.79	0.62	-0.42	52.64	152.95
	NORMAL	10,311.0	1.01	265.58	10,122.91	-1,356.55	-617.59	1,490.47	1.02	0.69	77.64	94.73
	NORMAL	10,405.0	1.45	270.59	10,216.89	-1,356.60	-619.60	1,491.34	0.48	0.47	5.33	16.25
	NORMAL	10,500.0	2.33	267.25	10,311.84	-1,356.68	-622.73	1,492.69	0.93	0.93	-3.52	351.19
	NORMAL	10,595.0	2.77	265.32	10,406.74	-1,356.96	-626.95	1,494.67	0.47	0.46	-2.03	347.99
	NORMAL	10,691.0	3.47	266.72	10,502.60	-1,357.32	-632.16	1,497.12	0.73	0.73	1.46	6.91
	NORMAL	10,771.0	3.87	266.90	10,582.44	-1,357.60	-637.27	1,499.46	0.50	0.50	0.23	1.74
	NORMAL	10,816.0	3.87	266.90	10,627.33	-1,357.77	-640.31	1,500.84	0.00	0.00	0.00	0.00