

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well Information

Well	PA 343-20	Wellbore No.	OH
Well Name	PA 343-20	Common Name	PA 343-20
Project	PA 20-06S-095W	Site	DOE 1-W-20 Pad
Vertical Section Azimuth	15.52 (°)	North Reference	True
Origin N/S		Origin E/W	
Spud Date	9/4/2011	UWI	PA 343-20
Active Datum	KB @6,255.5ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	SCIENTIFIC
Date Started	9/5/2011	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 (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
9/5/2011	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/5/2011	NORMAL	80.0	0.18	300.94	80.00	0.06	-0.11	0.14	0.23	0.23	0.00	300.94
	NORMAL	113.0	0.35	31.55	113.00	0.18	-0.10	0.14	1.20	0.52	274.58	117.70
	NORMAL	143.0	0.62	20.39	143.00	0.41	0.00	0.39	0.95	0.90	-37.20	335.08
	NORMAL	174.0	0.88	43.24	174.00	0.74	0.23	0.77	1.26	0.84	73.71	60.80
	NORMAL	204.0	1.58	24.79	203.99	1.28	0.56	1.38	2.65	2.33	-61.50	321.06
	NORMAL	235.0	2.11	21.18	234.97	2.20	0.94	2.37	1.75	1.71	-11.65	345.82
	NORMAL	265.0	2.99	26.28	264.94	3.42	1.49	3.69	3.03	2.93	17.00	17.02
	NORMAL	296.0	3.87	17.75	295.89	5.14	2.17	5.53	3.27	2.84	-27.52	325.59
	NORMAL	326.0	4.66	14.41	325.80	7.28	2.78	7.76	2.76	2.63	-11.13	340.88
	NORMAL	357.0	5.72	16.96	356.68	9.98	3.54	10.57	3.50	3.42	8.23	13.55
	NORMAL	387.0	6.86	15.03	386.50	13.14	4.44	13.85	3.86	3.80	-6.43	348.53
	NORMAL	418.0	8.09	17.23	417.23	17.01	5.57	17.88	4.07	3.97	7.10	14.19
	NORMAL	448.0	8.97	14.77	446.90	21.29	6.79	22.33	3.17	2.93	-8.20	336.26
	NORMAL	478.0	10.91	15.21	476.45	26.29	8.13	27.51	6.47	6.47	1.47	2.46
	NORMAL	508.0	11.79	15.12	505.86	31.99	9.68	33.41	2.93	2.93	-0.30	358.80
	NORMAL	539.0	12.84	13.18	536.15	38.40	11.29	40.02	3.64	3.39	-6.26	337.54
	NORMAL	569.0	13.64	14.41	565.35	45.07	12.93	46.89	2.83	2.67	4.10	20.00
	NORMAL	599.0	14.08	14.59	594.48	52.03	14.73	54.08	1.47	1.47	0.60	5.68
	NORMAL	630.0	14.96	16.17	624.49	59.52	16.79	61.85	3.11	2.84	5.10	25.00
	NORMAL	660.0	15.40	13.18	653.44	67.12	18.78	69.70	2.99	1.47	-9.97	297.89

2.1.2 Survey Stations (Continued)

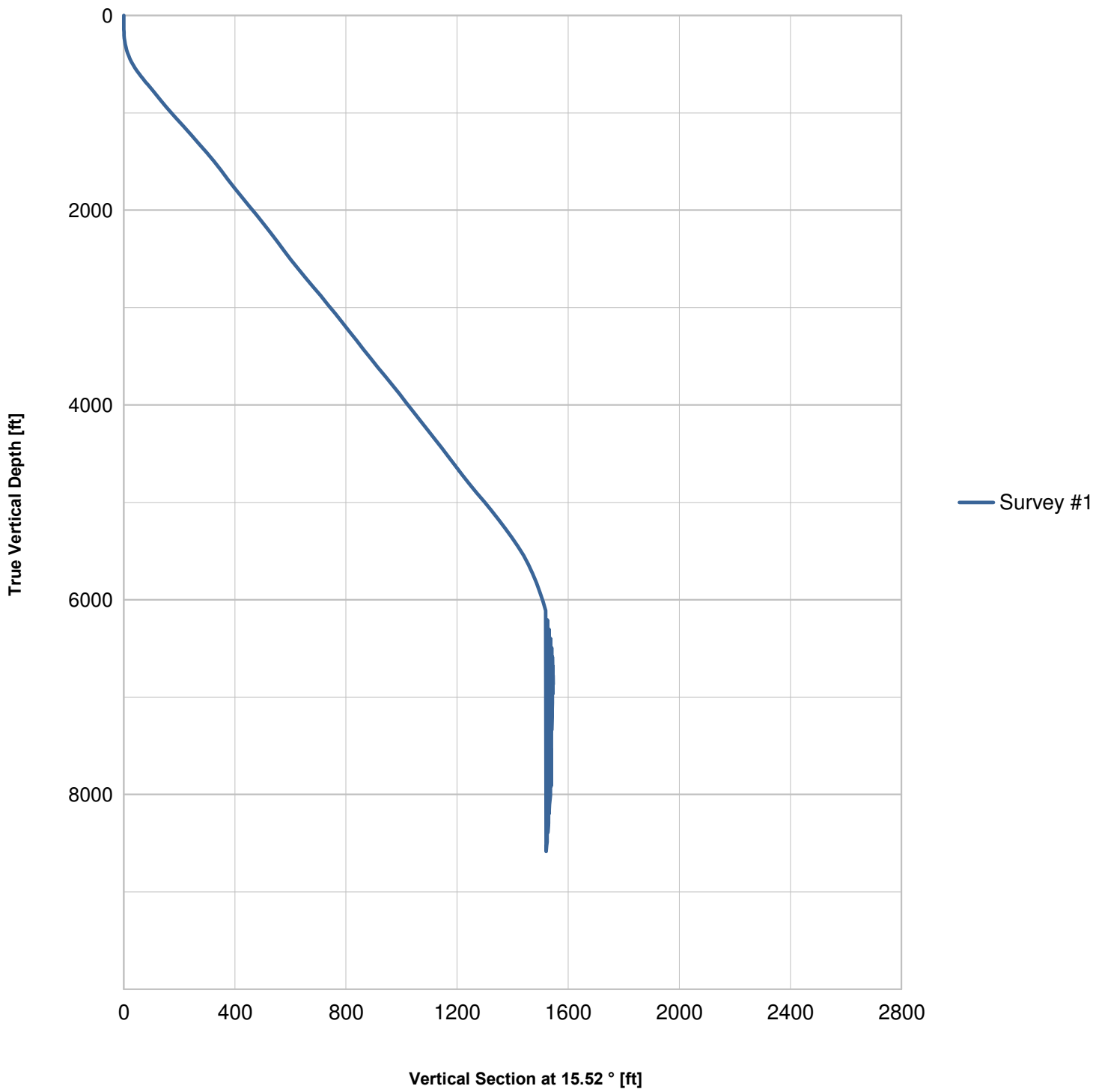
Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
9/5/2011	NORMAL	690.0	16.36	14.77	682.29	75.09	20.76	77.90	3.51	3.20	5.30	25.15
	NORMAL	721.0	16.72	14.77	712.01	83.62	23.01	86.73	1.16	1.16	0.00	0.00
	NORMAL	751.0	16.51	14.18	740.76	91.93	25.16	95.30	0.90	-0.70	-1.97	218.49
	NORMAL	794.0	15.81	13.32	782.06	103.55	28.00	107.27	1.72	-1.63	-2.00	198.46
	NORMAL	886.0	16.17	15.36	870.50	128.10	34.29	132.60	0.73	0.39	2.22	58.34
9/6/2011	NORMAL	961.0	17.06	14.64	942.37	148.81	39.83	154.04	1.22	1.19	-0.96	346.63
	NORMAL	1,069.0	17.36	14.07	1,045.53	179.77	47.75	185.99	0.32	0.28	-0.53	330.38
	NORMAL	1,164.0	17.89	12.30	1,136.07	207.77	54.31	214.73	0.79	0.56	-1.86	313.84
	NORMAL	1,259.0	16.76	14.96	1,226.76	235.26	60.95	243.00	1.45	-1.19	2.80	146.23
	NORMAL	1,354.0	16.74	13.66	1,317.73	261.79	67.72	270.37	0.39	-0.02	-1.37	266.32
	NORMAL	1,449.0	17.12	16.81	1,408.62	288.47	74.99	298.02	1.04	0.40	3.32	69.01
	NORMAL	1,544.0	15.57	13.91	1,499.78	314.24	82.10	324.75	1.84	-1.63	-3.05	206.38
	NORMAL	1,639.0	14.83	16.73	1,591.45	338.26	88.67	349.65	1.10	-0.78	2.97	136.38
	NORMAL	1,735.0	15.32	16.84	1,684.15	362.16	95.88	374.61	0.51	0.51	0.11	3.39
	NORMAL	1,830.0	15.30	15.84	1,775.78	386.23	102.94	399.69	0.28	-0.02	-1.05	265.19
	NORMAL	1,924.0	15.89	18.84	1,866.32	410.34	110.48	424.94	1.06	0.63	3.19	55.26
	NORMAL	2,019.0	16.32	17.27	1,957.59	435.39	118.64	451.26	0.64	0.45	-1.65	313.88
	NORMAL	2,114.0	16.12	16.95	2,048.81	460.76	126.45	477.79	0.23	-0.21	-0.34	203.93
	NORMAL	2,210.0	15.06	15.15	2,141.28	485.54	133.59	503.58	1.21	-1.10	-1.88	203.67
	NORMAL	2,305.0	15.17	15.49	2,232.99	509.43	140.14	528.36	0.15	0.12	0.36	39.03
	NORMAL	2,401.0	15.29	17.04	2,325.62	533.64	147.20	553.57	0.44	0.12	1.61	74.33
	NORMAL	2,497.0	14.37	16.62	2,418.42	557.16	154.32	578.13	0.96	-0.96	-0.44	186.46
	NORMAL	2,592.0	15.04	16.41	2,510.31	580.28	161.17	602.25	0.71	0.71	-0.22	355.35
	NORMAL	2,687.0	15.87	17.96	2,601.87	604.46	168.66	627.55	0.98	0.87	1.63	27.21
	NORMAL	2,783.0	16.52	17.53	2,694.06	629.96	176.82	654.30	0.69	0.68	-0.45	349.34
	NORMAL	2,878.0	16.54	14.72	2,785.14	655.92	184.32	681.32	0.84	0.02	-2.96	270.09
	NORMAL	2,974.0	16.15	13.54	2,877.26	682.12	190.92	708.33	0.53	-0.41	-1.23	219.85
9/7/2011	NORMAL	3,070.0	15.37	14.10	2,969.23	708.91	197.58	734.39	0.83	-0.81	0.58	169.24
	NORMAL	3,165.0	15.84	14.73	3,060.73	733.66	203.94	761.48	0.53	0.49	0.66	20.13
	NORMAL	3,261.0	15.42	14.00	3,153.17	758.71	210.36	787.34	0.48	-0.44	-0.76	204.74
	NORMAL	3,356.0	15.33	12.90	3,244.78	783.21	216.22	812.51	0.32	-0.09	-1.16	252.32
	NORMAL	3,451.0	15.48	16.36	3,336.36	807.62	222.60	837.73	0.98	0.16	3.64	82.40
	NORMAL	3,547.0	14.85	15.37	3,429.02	831.77	229.46	862.84	0.71	-0.66	-1.03	201.87
	NORMAL	3,642.0	15.54	17.78	3,520.70	855.63	236.58	887.73	0.98	0.73	2.54	43.64
	NORMAL	3,738.0	16.48	17.59	3,612.98	880.85	244.62	914.19	0.98	0.98	-0.20	356.72
	NORMAL	3,833.0	16.17	17.77	3,704.15	906.30	252.73	940.87	0.33	-0.33	0.19	170.82
	NORMAL	3,928.0	15.91	17.59	3,795.45	931.30	260.70	967.10	0.28	-0.27	-0.19	190.74
	NORMAL	4,023.0	15.25	16.17	3,886.96	955.72	268.12	992.61	0.80	-0.69	-1.49	209.34
	NORMAL	4,118.0	14.83	16.40	3,978.70	979.38	275.03	1,017.26	0.45	-0.44	0.24	172.02
	NORMAL	4,214.0	15.65	16.45	4,071.32	1,003.58	282.16	1,042.49	0.85	0.85	0.05	0.94
	NORMAL	4,309.0	15.43	16.00	4,162.85	1,028.02	289.28	1,067.94	0.26	-0.23	-0.47	208.51
	NORMAL	4,405.0	15.30	14.28	4,255.42	1,052.57	295.92	1,093.37	0.49	-0.14	-1.79	253.25
	NORMAL	4,500.0	15.16	13.89	4,347.08	1,076.78	301.99	1,118.32	0.18	-0.15	-0.41	216.01
	NORMAL	4,596.0	15.59	15.88	4,439.65	1,101.37	308.54	1,143.77	0.71	0.45	2.07	51.78
	NORMAL	4,691.0	15.25	14.80	4,531.23	1,125.73	315.22	1,169.03	0.47	-0.36	-1.14	219.66
	NORMAL	4,787.0	14.45	15.18	4,624.02	1,149.50	321.58	1,193.63	0.84	-0.83	0.40	173.24
	NORMAL	4,882.0	15.15	12.70	4,715.87	1,173.05	327.42	1,217.88	0.99	0.74	-2.61	316.65
	NORMAL	4,978.0	16.09	14.24	4,808.32	1,198.18	333.45	1,243.71	1.07	0.98	1.60	24.55
	NORMAL	5,074.0	16.47	17.33	4,900.48	1,224.07	340.77	1,270.61	0.99	0.40	3.22	67.80
	NORMAL	5,169.0	16.24	16.17	4,991.63	1,249.68	348.48	1,297.36	0.42	-0.24	-1.22	234.29
	NORMAL	5,265.0	15.61	15.49	5,083.95	1,275.02	355.67	1,323.70	0.68	-0.66	-0.71	196.17
	NORMAL	5,360.0	15.17	14.82	5,175.54	1,299.35	362.26	1,348.91	0.50	-0.46	-0.71	201.68
	NORMAL	5,456.0	14.47	14.60	5,268.35	1,323.10	368.50	1,373.46	0.73	-0.73	-0.23	184.49
9/8/2011	NORMAL	5,550.0	13.94	12.56	5,359.47	1,345.52	373.92	1,396.51	0.78	-0.56	-2.17	222.38
	NORMAL	5,646.0	13.30	15.88	5,452.78	1,367.43	379.46	1,419.10	1.05	-0.67	3.46	130.91
	NORMAL	5,741.0	11.38	18.96	5,545.58	1,386.80	385.49	1,439.39	2.14	-2.02	3.24	162.58
	NORMAL	5,837.0	9.90	17.13	5,639.92	1,403.65	391.00	1,457.09	1.58	-1.54	-1.91	191.96

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
9/8/2011	NORMAL	5,932.0	8.47	16.69	5,733.70	1,418.16	395.42	1,472.25	1.51	-1.51	-0.46	182.59
	NORMAL	6,027.0	7.70	14.16	5,827.76	1,431.03	398.98	1,485.61	0.89	-0.81	-2.66	203.55
	NORMAL	6,123.0	6.89	16.32	5,922.98	1,442.79	402.18	1,497.80	0.89	-0.84	2.25	162.36
	NORMAL	6,218.0	6.51	15.80	6,017.33	1,453.44	405.24	1,508.88	0.41	-0.40	-0.55	188.81
	NORMAL	6,313.0	4.51	18.34	6,111.89	1,462.17	407.89	1,518.00	2.12	-2.11	2.67	174.31
	NORMAL	6,408.0	3.69	10.83	6,206.65	1,468.72	409.64	1,524.77	1.03	-0.86	-7.91	209.51
	NORMAL	6,504.0	3.26	5.24	6,302.47	1,474.47	410.46	1,530.54	0.57	-0.45	-5.82	215.47
	NORMAL	6,599.0	3.14	10.69	6,397.32	1,479.72	411.19	1,535.79	0.34	-0.13	5.74	114.23
	NORMAL	6,694.0	2.05	29.59	6,492.22	1,483.75	412.52	1,540.03	1.44	-1.15	19.89	151.05
	NORMAL	6,788.0	1.69	38.70	6,586.17	1,486.30	414.21	1,542.93	0.50	-0.38	9.69	144.94
9/9/2011	NORMAL	73.5	0.45	311.78	73.55	0.19	-0.22	0.13	0.61	0.61	0.00	311.78
	NORMAL	6,882.0	0.91	73.49	6,680.15	1,487.59	415.80	1,544.60	1.14	-0.83	37.01	151.15
	NORMAL	6,977.0	0.86	97.82	6,775.14	1,487.71	417.22	1,545.10	0.40	-0.05	25.61	109.63
	NORMAL	7,071.0	0.64	133.02	6,869.13	1,487.25	418.31	1,544.95	0.53	-0.23	37.45	132.41
	NORMAL	7,166.0	1.07	191.86	6,964.12	1,486.02	418.51	1,543.82	0.97	0.45	61.94	95.38
	NORMAL	7,260.0	0.71	174.88	7,058.11	1,484.58	418.38	1,542.40	0.47	-0.38	-18.06	207.94
	NORMAL	7,450.0	0.77	260.03	7,248.10	1,483.19	417.23	1,540.75	0.53	0.03	44.82	130.05
	NORMAL	7,545.0	0.62	261.18	7,343.09	1,483.00	416.10	1,540.26	0.16	-0.16	1.21	175.26
	NORMAL	7,640.0	1.19	231.92	7,438.08	1,482.31	414.81	1,539.26	0.75	0.60	-30.80	305.72
	NORMAL	7,735.0	1.15	231.92	7,533.06	1,481.12	413.28	1,537.70	0.04	-0.04	0.00	180.00
9/10/2011	NORMAL	7,830.0	1.28	279.55	7,628.04	1,480.71	411.49	1,536.82	1.04	0.14	50.14	106.90
	NORMAL	7,925.0	1.34	334.76	7,723.02	1,481.89	409.97	1,537.55	1.28	0.06	58.12	115.09
	NORMAL	8,020.0	0.66	56.92	7,818.01	1,483.19	409.95	1,538.80	1.48	-0.72	86.48	152.38
	NORMAL	8,115.0	1.16	183.90	7,913.00	1,482.53	410.35	1,538.27	1.73	0.53	133.66	145.68
	NORMAL	8,210.0	2.02	192.79	8,007.97	1,479.94	409.91	1,535.66	0.94	0.91	9.36	20.48
	NORMAL	8,305.0	1.61	190.74	8,102.92	1,476.99	409.29	1,532.65	0.44	-0.43	-2.16	187.98
	NORMAL	8,401.0	1.08	156.43	8,198.89	1,474.84	409.40	1,530.61	0.98	-0.55	-35.74	220.30
	NORMAL	8,496.0	1.21	182.33	8,293.87	1,473.02	409.72	1,528.94	0.56	0.14	27.26	89.08
	NORMAL	8,592.0	1.81	202.84	8,389.84	1,470.61	409.09	1,526.44	0.83	0.63	21.36	52.57
	NORMAL	8,687.0	1.84	203.84	8,484.79	1,467.83	407.89	1,523.45	0.05	0.03	1.05	47.21
	NORMAL	8,728.0	2.22	208.18	8,525.77	1,466.53	407.25	1,522.02	1.00	0.93	10.59	24.20
	NORMAL	8,785.0	2.22	208.18	8,582.72	1,464.58	406.21	1,519.87	0.00	0.00	0.00	0.00

3 Charts

3.1 Vertical Section View



3.2 Plan View

