

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well Information

Well	PA 421-27	Wellbore No.	OH
Well Name	PA 421-27	Common Name	PA 421-27
Project	PA 27-06S-095W	Site	DOE 1-W-27 Pad
Vertical Section Azimuth	26.65 (°)	North Reference	
Origin N/S		Origin E/W	
Spud Date	7/27/2013	UWI	PA 421-27
Active Datum	KB @5,866.0ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	
Date Started	7/27/2013	Ended	8/7/2013
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 (°)
7/27/2013	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/28/2013	NORMAL	71.0	0.18	151.70	71.00	-0.10	0.05	-0.06	0.25	0.25	0.00	151.70
	NORMAL	102.0	1.23	62.14	102.00	0.01	0.37	0.18	4.01	3.39	-288.90	262.11
	NORMAL	132.0	1.50	82.79	131.99	0.21	1.04	0.66	1.86	0.90	68.83	71.82
	NORMAL	163.0	1.41	79.37	162.98	0.34	1.82	1.12	0.40	-0.29	-11.03	222.28
	NORMAL	193.0	1.94	70.84	192.97	0.57	2.66	1.70	1.95	1.77	-28.43	330.50
	NORMAL	223.0	2.38	57.30	222.95	1.07	3.67	2.60	2.24	1.47	-45.13	303.87
	NORMAL	253.0	2.90	53.35	252.91	1.86	4.80	3.82	1.84	1.73	-13.17	338.74
	NORMAL	283.0	4.05	51.59	282.86	2.97	6.24	5.46	3.85	3.83	-5.87	353.82
	NORMAL	314.0	4.49	47.37	313.77	4.48	7.99	7.58	1.74	1.42	-13.61	322.35
	NORMAL	344.0	4.66	40.61	343.68	6.20	9.65	9.87	1.88	0.57	-22.53	284.11
	NORMAL	374.0	5.63	41.66	373.55	8.22	11.42	12.47	3.25	3.23	3.50	6.07
	NORMAL	404.0	5.45	29.09	403.42	10.57	13.09	15.31	4.08	-0.60	-41.90	255.34
	NORMAL	435.0	6.16	33.40	434.26	13.24	14.72	18.44	2.69	2.29	13.90	33.71
	NORMAL	465.0	7.92	25.22	464.03	16.45	16.49	22.10	6.74	5.87	-27.27	326.23
	NORMAL	495.0	9.50	18.90	493.68	20.67	18.17	26.62	6.15	5.27	-21.07	325.64
	NORMAL	526.0	10.56	23.03	524.21	25.70	20.11	31.99	4.13	3.42	13.32	36.21
	NORMAL	556.0	11.35	20.92	553.66	30.99	22.24	37.67	2.95	2.63	-7.03	332.05
	NORMAL	586.0	12.14	20.48	583.03	36.70	24.40	43.75	2.65	2.63	-1.47	353.32
	NORMAL	617.0	12.49	24.96	613.32	42.79	26.95	50.34	3.28	1.13	14.45	72.08
	NORMAL	691.0	12.35	27.66	685.59	57.06	34.00	66.25	0.81	-0.19	3.65	104.87

2.1.2 Survey Stations (Continued)

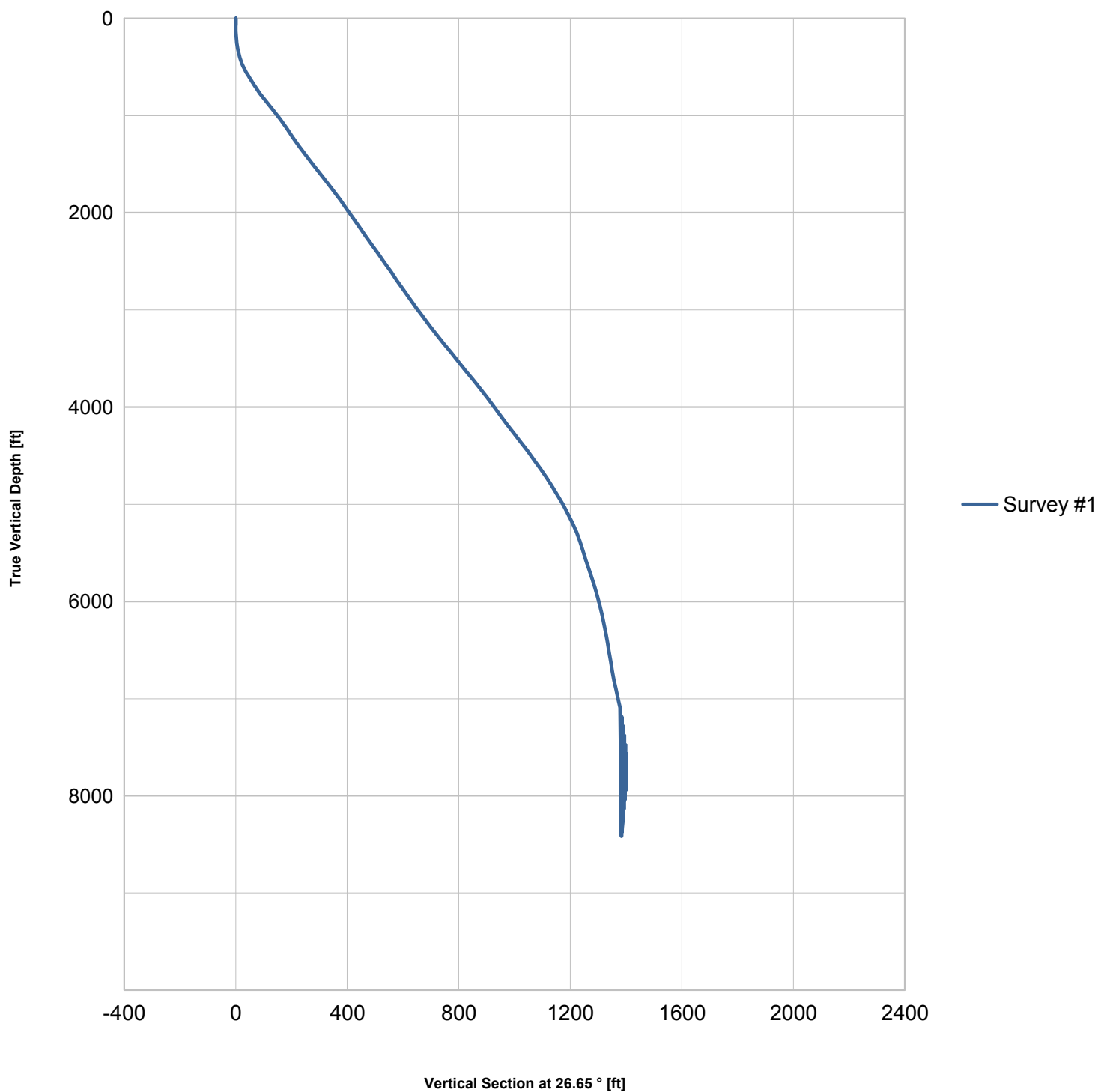
Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
7/28/2013	NORMAL	782.0	14.59	25.55	774.08	76.02	43.47	87.44	2.52	2.46	-2.32	346.60
	NORMAL	872.0	16.00	24.93	860.89	97.50	53.58	111.17	1.58	1.57	-0.69	353.08
	NORMAL	962.0	15.43	28.01	947.53	119.32	64.44	135.54	1.12	-0.63	3.42	125.82
	NORMAL	1,057.0	14.51	29.94	1,039.31	140.79	76.31	160.06	1.10	-0.97	2.03	152.48
	NORMAL	1,153.0	13.14	29.68	1,132.52	160.69	87.72	182.96	1.43	-1.43	-0.27	182.47
	NORMAL	1,248.0	13.49	29.77	1,224.97	179.69	98.57	204.81	0.37	0.37	0.09	3.43
	NORMAL	1,343.0	14.20	26.69	1,317.21	199.72	109.30	227.53	1.08	0.75	-3.24	312.43
	NORMAL	1,438.0	15.43	25.99	1,409.05	221.49	120.07	251.82	1.31	1.29	-0.74	351.38
7/29/2013	NORMAL	1,534.0	15.34	24.76	1,501.61	244.50	130.99	277.28	0.35	-0.09	-1.28	253.99
	NORMAL	1,629.0	14.42	26.16	1,593.42	266.53	141.47	301.67	1.04	-0.97	1.47	159.33
	NORMAL	1,724.0	15.74	26.52	1,685.15	288.68	152.43	326.38	1.39	1.39	0.38	4.23
	NORMAL	1,820.0	14.73	28.63	1,777.77	311.04	164.10	351.60	1.20	-1.05	2.20	152.25
	NORMAL	1,915.0	14.33	28.54	1,869.74	331.97	175.50	375.42	0.42	-0.42	-0.09	183.19
	NORMAL	2,011.0	13.23	23.70	1,962.97	352.47	185.59	398.27	1.66	-1.15	-5.04	224.01
	NORMAL	2,106.0	14.29	23.70	2,055.25	373.16	194.68	420.83	1.12	1.12	0.00	0.00
	NORMAL	2,201.0	13.10	25.99	2,147.55	393.57	204.11	443.31	1.38	-1.25	2.41	156.62
	NORMAL	2,297.0	14.11	26.69	2,240.85	413.81	214.13	465.89	1.07	1.05	0.73	9.60
	NORMAL	2,392.0	14.55	27.48	2,332.89	434.74	224.84	489.40	0.51	0.46	0.83	24.34
	NORMAL	2,486.0	13.32	26.78	2,424.13	454.88	235.17	512.04	1.32	-1.31	-0.74	187.46
7/30/2013	NORMAL	2,581.0	14.42	26.25	2,516.35	475.26	245.33	534.81	1.17	1.16	-0.56	353.15
	NORMAL	2,676.0	13.10	23.53	2,608.63	495.74	254.86	557.39	1.55	-1.39	-2.86	204.79
	NORMAL	2,761.0	13.14	25.20	2,691.41	513.32	262.82	576.67	0.45	0.05	1.96	84.79
8/1/2013	NORMAL	2,868.0	14.33	24.32	2,795.35	536.39	273.45	602.06	1.13	1.11	-0.82	349.61
	NORMAL	2,962.0	13.67	21.33	2,886.56	557.33	282.28	624.74	1.04	-0.70	-3.18	226.18
	NORMAL	3,058.0	14.20	26.08	2,979.73	578.48	291.58	647.81	1.31	0.55	4.95	67.46
	NORMAL	3,153.0	15.03	27.22	3,071.66	599.90	302.34	671.78	0.92	0.87	1.20	19.67
	NORMAL	3,248.0	14.73	25.73	3,163.47	621.73	313.22	696.17	0.51	-0.32	-1.57	231.18
	NORMAL	3,343.0	15.69	27.92	3,255.15	643.96	324.48	721.09	1.18	1.01	2.31	31.96
	NORMAL	3,439.0	15.60	25.64	3,347.59	667.07	336.14	746.98	0.65	-0.09	-2.38	260.58
	NORMAL	3,535.0	15.74	29.94	3,440.02	689.99	348.23	772.88	1.22	0.15	4.48	85.20
	NORMAL	3,630.0	15.39	28.63	3,531.54	712.22	360.70	798.35	0.52	-0.37	-1.38	224.49
	NORMAL	3,725.0	16.18	31.61	3,622.96	734.56	373.68	824.13	1.19	0.83	3.14	47.18
	NORMAL	3,821.0	15.96	30.03	3,715.21	757.38	387.29	850.63	0.51	-0.23	-1.65	242.54
	NORMAL	3,916.0	15.34	29.06	3,806.69	779.67	399.93	876.23	0.71	-0.65	-1.02	202.42
	NORMAL	4,011.0	14.99	28.01	3,898.38	801.50	411.81	901.06	0.47	-0.37	-1.11	217.62
	NORMAL	4,107.0	14.24	28.63	3,991.27	822.83	423.29	925.27	0.80	-0.78	0.65	168.52
	NORMAL	4,202.0	13.98	27.66	4,083.40	843.25	434.22	948.43	0.37	-0.27	-1.02	221.82
	NORMAL	4,298.0	15.25	28.89	4,176.30	864.57	445.70	972.64	1.36	1.32	1.28	14.33
	NORMAL	4,393.0	14.77	28.36	4,268.06	886.17	457.49	997.23	0.53	-0.51	-0.56	195.70
	NORMAL	4,489.0	15.39	23.26	4,360.75	908.64	468.33	1,022.17	1.52	0.65	-5.31	292.57
8/2/2013	NORMAL	4,584.0	14.77	23.26	4,452.48	931.35	478.09	1,046.85	0.65	-0.65	0.00	180.00
	NORMAL	4,679.0	14.33	23.09	4,544.43	953.29	487.49	1,070.67	0.47	-0.46	-0.18	185.46
	NORMAL	4,775.0	13.80	21.77	4,637.56	974.85	496.39	1,093.94	0.65	-0.55	-1.38	210.55
	NORMAL	4,870.0	13.36	19.05	4,729.90	995.75	504.18	1,116.10	0.82	-0.46	-2.86	234.12
	NORMAL	4,965.0	11.96	27.39	4,822.60	1,014.86	512.29	1,136.83	2.42	-1.47	8.78	131.47
	NORMAL	5,060.0	11.60	26.43	4,915.60	1,032.16	521.07	1,156.22	0.43	-0.38	-1.01	208.10
	NORMAL	5,155.0	10.95	26.34	5,008.76	1,048.79	529.32	1,174.80	0.68	-0.68	-0.09	181.51
	NORMAL	5,251.0	10.15	27.66	5,103.14	1,064.46	537.30	1,192.37	0.87	-0.83	1.38	163.84
	NORMAL	5,346.0	9.54	25.02	5,196.74	1,079.01	544.51	1,208.61	0.80	-0.64	-2.78	215.21
	NORMAL	5,441.0	8.09	23.62	5,290.61	1,092.27	550.52	1,223.16	1.54	-1.53	-1.47	187.73
8/3/2013	NORMAL	5,536.0	6.59	22.21	5,384.83	1,103.44	555.26	1,235.27	1.59	-1.58	-1.48	186.15
	NORMAL	5,632.0	6.20	18.34	5,480.24	1,113.46	558.97	1,245.89	0.61	-0.41	-4.03	225.95
	NORMAL	5,727.0	6.15	23.18	5,574.69	1,123.01	562.59	1,256.04	0.55	-0.05	5.09	97.89
	NORMAL	5,822.0	7.12	23.79	5,669.05	1,133.07	566.97	1,267.00	1.02	1.02	0.64	4.46
	NORMAL	5,917.0	6.55	22.38	5,763.37	1,143.47	571.41	1,278.29	0.63	-0.60	-1.48	195.70
	NORMAL	6,012.0	6.11	21.15	5,857.79	1,153.19	575.29	1,288.72	0.48	-0.46	-1.29	196.52
	NORMAL	6,108.0	5.45	24.85	5,953.31	1,162.10	579.05	1,298.37	0.79	-0.69	3.85	152.38

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 (°)
8/3/2013	NORMAL	6,203.0	4.88	29.50	6,047.92	1,169.71	582.94	1,306.91	0.74	-0.60	4.89	146.01
	NORMAL	6,297.0	4.48	28.27	6,141.61	1,176.42	586.65	1,314.57	0.44	-0.43	-1.31	193.47
8/4/2013	NORMAL	6,393.0	3.69	26.60	6,237.36	1,182.48	589.81	1,321.41	0.83	-0.82	-1.74	187.73
	NORMAL	6,488.0	3.78	27.21	6,332.16	1,188.00	592.61	1,327.60	0.10	0.09	0.64	24.13
	NORMAL	6,584.0	3.30	27.57	6,427.98	1,193.27	595.33	1,333.53	0.50	-0.50	0.38	177.53
	NORMAL	6,678.0	3.69	29.33	6,521.80	1,198.30	598.07	1,339.25	0.43	0.41	1.87	16.26
	NORMAL	6,774.0	3.17	28.01	6,617.63	1,203.34	600.83	1,344.99	0.55	-0.54	-1.38	187.98
	NORMAL	6,869.0	3.34	30.73	6,712.48	1,208.04	603.47	1,350.38	0.24	0.18	2.86	43.62
	NORMAL	6,964.0	4.18	30.73	6,807.27	1,213.39	606.66	1,356.59	0.88	0.88	0.00	0.00
	NORMAL	7,059.0	4.40	31.61	6,902.00	1,219.47	610.34	1,363.68	0.24	0.23	0.93	17.10
	NORMAL	7,154.0	4.62	30.82	6,996.71	1,225.86	614.21	1,371.12	0.24	0.23	-0.83	343.84
	NORMAL	7,250.0	4.09	29.94	7,092.43	1,232.15	617.90	1,378.40	0.56	-0.55	-0.92	186.75
8/5/2013	NORMAL	7,344.0	3.43	22.65	7,186.23	1,237.65	620.65	1,384.55	0.87	-0.70	-7.76	212.32
	NORMAL	7,439.0	2.94	23.00	7,281.08	1,242.51	622.70	1,389.82	0.52	-0.52	0.37	177.90
	NORMAL	7,534.0	2.37	16.67	7,375.98	1,246.64	624.21	1,394.18	0.67	-0.60	-6.66	204.08
	NORMAL	7,630.0	1.67	18.87	7,471.92	1,249.86	625.24	1,397.52	0.73	-0.73	2.29	174.78
	NORMAL	7,725.0	1.19	18.87	7,566.89	1,252.11	626.00	1,399.87	0.51	-0.51	0.00	180.00
	NORMAL	7,820.0	0.66	358.57	7,661.88	1,253.59	626.31	1,401.33	0.65	-0.56	-21.37	201.85
	NORMAL	7,916.0	0.35	281.49	7,757.88	1,254.20	626.01	1,401.74	0.70	-0.32	-80.29	210.39
	NORMAL	8,011.0	1.10	222.07	7,852.87	1,253.58	625.11	1,400.79	1.02	0.79	-62.55	282.48
	NORMAL	8,106.0	1.63	216.54	7,947.84	1,251.82	623.70	1,398.58	0.57	0.56	-5.82	343.27
	NORMAL	8,201.0	2.07	223.65	8,042.79	1,249.49	621.71	1,395.61	0.52	0.46	7.48	31.13
8/6/2013	NORMAL	8,297.0	1.89	231.48	8,138.73	1,247.25	619.27	1,392.51	0.34	-0.19	8.16	127.51
	NORMAL	8,392.0	1.98	233.59	8,233.68	1,245.30	616.73	1,389.63	0.12	0.09	2.22	39.42
	NORMAL	8,487.0	1.93	232.71	8,328.62	1,243.35	614.13	1,386.73	0.06	-0.05	-0.93	210.54
	NORMAL	8,530.0	2.02	230.77	8,371.60	1,242.44	612.97	1,385.38	0.26	0.21	-4.51	322.42
	NORMAL	8,575.0	2.02	230.77	8,416.57	1,241.43	611.74	1,383.94	0.00	0.00	0.00	0.00

3 Charts

3.1 Vertical Section View



3.2 Plan View

