

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well Information

Well	PA 524-20	Wellbore No.	OH
Well Name	PA 524-20	Common Name	PA 524-20
Project	PA 20-06S-095W	Site	DOE 1-W-20 Pad
Vertical Section Azimuth	267.59 (°)	North Reference	True
Origin N/S		Origin E/W	
Spud Date	11/18/2011	UWI	PA 524-20
Active Datum	KB @6,255.5ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	
Started	11/18/2011	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)	DLeg (°/100ft)	Bulld (°/100ft)	Turn (°/100ft)	TFace (°)
11/18/2011	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/18/2011	NORMAL	83.0	0.53	358.24	83.00	0.38	-0.01	0.00	0.64	0.64	0.00	358.24
	NORMAL	115.0	0.88	284.84	115.00	0.59	-0.25	0.23	2.78	1.09	-229.38	251.72
	NORMAL	146.0	1.94	274.39	145.99	0.70	-1.01	0.98	3.50	3.42	-33.71	341.10
	NORMAL	176.0	2.90	269.38	175.96	0.73	-2.27	2.24	3.27	3.20	-16.70	345.06
	NORMAL	207.0	4.05	258.66	206.90	0.50	-4.13	4.11	4.25	3.71	-34.58	325.11
	NORMAL	237.0	5.28	261.56	236.80	0.09	-6.53	6.52	4.17	4.10	9.67	12.30
	NORMAL	268.0	6.51	265.34	267.64	-0.26	-9.70	9.70	4.16	3.97	12.19	19.40
	NORMAL	298.0	7.39	269.03	297.42	-0.43	-13.32	13.33	3.29	2.93	12.30	28.74
	NORMAL	328.0	8.53	264.29	327.13	-0.69	-17.46	17.48	4.38	3.80	-15.80	327.71
	NORMAL	359.0	8.71	264.29	357.78	-1.15	-22.09	22.12	0.58	0.58	0.00	0.00
	NORMAL	389.0	9.33	264.99	387.41	-1.59	-26.77	26.81	2.10	2.07	2.33	10.38
	NORMAL	419.0	9.68	265.25	417.00	-2.01	-31.71	31.76	1.18	1.17	0.87	7.12
	NORMAL	449.0	10.12	264.02	446.55	-2.49	-36.84	36.91	1.63	1.47	-4.10	333.72
	NORMAL	480.0	10.91	264.11	477.03	-3.08	-42.47	42.56	2.55	2.55	0.29	1.24
	NORMAL	510.0	11.52	267.19	506.46	-3.51	-48.28	48.39	2.85	2.03	10.27	46.00
	NORMAL	540.0	12.93	270.62	535.77	-3.62	-54.63	54.74	5.28	4.70	11.43	28.94
	NORMAL	552.0	13.83	272.67	547.45	-3.54	-57.41	57.51	8.48	7.50	17.08	28.79
	NORMAL	582.0	14.94	272.67	576.51	-3.20	-64.85	64.93	3.70	3.70	0.00	0.00
	NORMAL	612.0	15.98	270.79	605.42	-2.96	-72.85	72.91	3.85	3.47	-6.27	333.36
	NORMAL	642.0	17.32	271.68	634.16	-2.77	-81.44	81.48	4.55	4.47	2.97	11.20

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
11/18/2011	NORMAL	673.0	18.44	270.09	663.67	-2.63	-90.95	90.98	3.94	3.61	-5.13	335.69
	NORMAL	703.0	19.88	270.09	692.00	-2.61	-100.80	100.82	4.80	4.80	0.00	0.00
	NORMAL	733.0	21.54	267.92	720.06	-2.80	-111.41	111.42	6.10	5.53	-7.23	334.17
	NORMAL	763.0	23.02	267.48	747.82	-3.26	-122.77	122.80	4.96	4.93	-1.47	353.37
	NORMAL	793.0	23.59	268.27	775.38	-3.70	-134.63	134.67	2.17	1.90	2.63	29.10
	NORMAL	884.0	25.00	266.53	858.32	-5.41	-172.03	172.10	1.74	1.55	-1.91	332.29
	NORMAL	944.0	25.00	266.53	912.69	-6.95	-197.34	197.45	0.00	0.00	0.00	0.00
11/19/2011	NORMAL	999.0	23.72	263.65	962.80	-8.88	-219.93	220.11	3.17	-2.33	-5.24	221.56
	NORMAL	1,063.0	23.59	262.55	1,021.42	-11.96	-245.43	245.71	0.72	-0.20	-1.72	253.08
	NORMAL	1,157.0	24.06	264.41	1,107.41	-16.27	-283.15	283.58	0.94	0.50	1.98	58.82
	NORMAL	1,252.0	23.89	266.75	1,194.22	-19.24	-321.63	322.15	1.02	-0.18	2.46	101.20
	NORMAL	1,348.0	23.65	267.70	1,282.07	-21.12	-360.27	360.84	0.47	-0.25	0.99	122.51
	NORMAL	1,442.0	23.38	267.33	1,368.27	-22.74	-397.74	398.35	0.33	-0.29	-0.39	208.50
	NORMAL	1,537.0	24.03	270.49	1,455.26	-23.46	-435.92	436.52	1.50	0.68	3.33	64.36
	NORMAL	1,633.0	22.58	272.02	1,543.42	-22.64	-473.88	474.42	1.64	-1.51	1.59	158.04
	NORMAL	1,728.0	22.27	268.33	1,631.24	-22.52	-510.11	510.60	1.52	-0.33	-3.88	255.88
	NORMAL	1,824.0	22.49	267.81	1,720.01	-23.75	-546.64	547.15	0.31	0.23	-0.54	317.77
	NORMAL	1,919.0	22.48	264.79	1,807.79	-26.10	-582.88	583.46	1.22	-0.01	-3.18	268.11
	NORMAL	2,015.0	22.16	268.41	1,896.60	-28.27	-619.26	619.90	1.47	-0.33	3.77	104.77
	NORMAL	2,110.0	21.88	268.19	1,984.67	-29.32	-654.86	655.52	0.31	-0.29	-0.23	196.31
	NORMAL	2,205.0	21.43	268.65	2,072.97	-30.29	-689.91	690.57	0.51	-0.47	0.48	159.55
	NORMAL	2,301.0	21.70	268.64	2,162.25	-31.12	-725.18	725.85	0.28	0.28	-0.01	359.22
	NORMAL	2,396.0	21.95	266.18	2,250.44	-32.72	-760.46	761.16	1.00	0.26	-2.59	284.14
	NORMAL	2,492.0	22.13	267.61	2,339.43	-34.67	-796.43	797.18	0.59	0.19	1.49	72.12
	NORMAL	2,587.0	22.42	269.12	2,427.34	-35.70	-832.42	833.18	0.68	0.31	1.59	63.83
	NORMAL	2,683.0	22.33	266.17	2,516.11	-37.20	-868.92	869.72	1.17	-0.09	-3.07	264.05
	NORMAL	2,779.0	22.45	268.11	2,604.88	-39.02	-905.44	906.28	0.78	0.12	2.02	81.67
	NORMAL	2,874.0	22.95	268.32	2,692.52	-40.16	-942.08	942.94	0.53	0.53	0.22	9.30
	NORMAL	2,970.0	22.64	265.09	2,781.02	-42.29	-979.20	980.11	1.34	-0.32	-3.36	254.60
	NORMAL	3,065.0	22.39	266.07	2,868.78	-45.10	-1,015.47	1,016.47	0.47	-0.26	1.03	124.12
	NORMAL	3,160.0	21.99	265.24	2,956.75	-47.81	-1,051.24	1,052.32	0.53	-0.42	-0.87	217.70
	NORMAL	3,256.0	22.08	264.93	3,045.73	-50.90	-1,087.13	1,088.31	0.15	0.09	-0.32	307.59
	NORMAL	3,351.0	23.11	266.16	3,133.44	-53.73	-1,123.52	1,124.78	1.19	1.08	1.29	25.22
	NORMAL	3,447.0	23.34	270.52	3,221.67	-54.81	-1,161.33	1,162.61	1.81	0.24	4.54	84.39
	NORMAL	3,543.0	23.24	268.54	3,309.85	-55.12	-1,199.28	1,200.54	0.82	-0.10	-2.06	261.81
	NORMAL	3,638.0	22.40	272.46	3,397.42	-54.82	-1,236.11	1,237.32	1.83	-0.88	4.13	120.72
	NORMAL	3,734.0	22.05	270.95	3,486.29	-53.74	-1,272.40	1,273.53	0.70	-0.36	-1.57	237.80
	NORMAL	3,829.0	21.58	269.50	3,574.48	-53.60	-1,307.70	1,308.80	0.75	-0.49	-1.53	228.23
	NORMAL	3,925.0	22.01	267.35	3,663.62	-54.58	-1,343.32	1,344.43	0.94	0.45	-2.24	297.31
	NORMAL	4,020.0	23.19	269.87	3,751.33	-55.45	-1,379.81	1,380.92	1.61	1.24	2.65	40.54
	NORMAL	4,115.0	23.46	269.37	3,838.56	-55.70	-1,417.43	1,418.51	0.35	0.28	-0.53	323.52
	NORMAL	4,211.0	23.50	267.03	3,926.62	-56.90	-1,455.65	1,456.75	0.97	0.04	-2.44	271.38
	NORMAL	4,307.0	23.26	267.15	4,014.73	-58.84	-1,493.70	1,494.85	0.25	-0.25	0.12	168.83
11/20/2011	NORMAL	4,402.0	23.41	265.69	4,101.96	-61.19	-1,531.25	1,532.47	0.63	0.16	-1.54	283.87
	NORMAL	4,498.0	21.62	266.75	4,190.64	-63.62	-1,567.93	1,569.22	1.91	-1.86	1.10	167.71
	NORMAL	4,594.0	21.79	269.01	4,279.84	-64.93	-1,603.40	1,604.71	0.89	0.18	2.35	79.55
	NORMAL	4,689.0	21.73	268.67	4,368.07	-65.65	-1,638.61	1,639.92	0.15	-0.06	-0.36	244.39
	NORMAL	4,785.0	21.54	268.32	4,457.31	-66.58	-1,673.99	1,675.31	0.24	-0.20	-0.36	214.02
	NORMAL	4,880.0	20.94	266.57	4,545.85	-68.10	-1,708.37	1,709.72	0.92	-0.63	-1.84	225.76
	NORMAL	4,975.0	20.08	269.37	4,634.83	-69.30	-1,741.63	1,743.00	1.37	-0.91	2.95	132.54
	NORMAL	5,071.0	18.68	272.57	4,725.39	-68.79	-1,773.47	1,774.79	1.83	-1.46	3.33	144.32
	NORMAL	5,166.0	17.26	268.85	4,815.76	-68.39	-1,802.76	1,804.04	1.92	-1.49	-3.92	217.19
	NORMAL	5,262.0	16.60	268.48	4,907.60	-69.04	-1,830.70	1,831.99	0.70	-0.69	-0.39	189.09
	NORMAL	5,355.0	15.05	271.66	4,997.07	-69.04	-1,856.06	1,857.32	1.91	-1.67	3.42	152.30
	NORMAL	5,451.0	13.93	271.87	5,090.02	-68.30	-1,880.06	1,881.27	1.17	-1.17	0.22	177.42
	NORMAL	5,546.0	12.94	269.60	5,182.42	-68.00	-1,902.13	1,903.31	1.18	-1.04	-2.39	206.95
	NORMAL	5,641.0	11.90	268.04	5,275.19	-68.41	-1,922.56	1,923.73	1.15	-1.09	-1.64	197.12

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
11/20/2011	NORMAL	5,736.0	9.89	267.86	5,368.48	-69.05	-1,940.50	1,941.69	2.12	-2.12	-0.19	180.88
	NORMAL	5,831.0	9.53	262.15	5,462.12	-70.43	-1,956.44	1,957.67	1.08	-0.38	-6.01	246.71
11/21/2011	NORMAL	5,927.0	9.04	261.57	5,556.86	-72.62	-1,971.78	1,973.09	0.52	-0.51	-0.60	190.53
	NORMAL	6,020.0	8.38	262.71	5,648.79	-74.55	-1,985.73	1,987.10	0.73	-0.71	1.23	165.90
	NORMAL	6,115.0	6.62	262.32	5,742.97	-76.17	-1,998.02	1,999.46	1.85	-1.85	-0.41	181.46
	NORMAL	6,210.0	4.33	273.78	5,837.53	-76.66	-2,007.03	2,008.48	2.66	-2.41	12.06	160.11
	NORMAL	6,305.0	2.35	296.64	5,932.37	-75.55	-2,012.35	2,013.74	2.47	-2.08	24.06	157.13
	NORMAL	6,401.0	0.89	282.48	6,028.33	-74.51	-2,014.83	2,016.19	1.57	-1.52	-14.75	188.33
	NORMAL	6,496.0	1.21	6.68	6,123.32	-73.35	-2,015.44	2,016.74	1.50	0.34	88.63	122.52
11/22/2011	NORMAL	6,592.0	1.53	10.30	6,219.29	-71.08	-2,015.09	2,016.30	0.35	0.33	3.77	16.95
	NORMAL	6,687.0	0.78	4.38	6,314.27	-69.19	-2,014.82	2,015.94	0.80	-0.79	-6.23	186.09
	NORMAL	6,782.0	0.59	342.46	6,409.26	-68.08	-2,014.91	2,015.99	0.34	-0.20	-23.07	223.43
	NORMAL	6,876.0	0.59	288.77	6,503.26	-67.46	-2,015.52	2,016.57	0.57	0.00	-57.12	243.16
	NORMAL	6,972.0	0.39	313.93	6,599.26	-67.08	-2,016.22	2,017.26	0.30	-0.21	26.21	145.02
	NORMAL	7,067.0	0.44	204.93	6,694.26	-67.18	-2,016.61	2,017.65	0.71	0.05	-114.74	217.96
	NORMAL	7,163.0	0.85	218.46	6,790.25	-68.08	-2,017.21	2,018.28	0.45	0.43	14.09	27.23
	NORMAL	7,258.0	0.81	271.22	6,885.24	-68.61	-2,018.32	2,019.42	0.78	-0.04	55.54	119.16
	NORMAL	7,353.0	0.55	29.24	6,980.24	-68.20	-2,018.76	2,019.85	1.24	-0.27	124.23	155.56
	NORMAL	7,449.0	0.62	26.57	7,076.23	-67.33	-2,018.31	2,019.35	0.08	0.07	-2.78	337.38
	NORMAL	7,544.0	0.19	38.35	7,171.23	-66.75	-2,017.98	2,019.00	0.46	-0.45	12.40	174.89
	NORMAL	7,640.0	0.65	11.42	7,267.23	-66.09	-2,017.77	2,018.77	0.51	0.48	-28.05	322.92
	NORMAL	7,735.0	0.52	312.61	7,362.22	-65.27	-2,017.98	2,018.94	0.62	-0.14	-61.91	229.44
	NORMAL	7,831.0	0.67	257.68	7,458.22	-65.10	-2,018.85	2,019.80	0.59	0.16	-57.22	256.17
11/23/2011	NORMAL	8,632.0	3.55	226.42	8,258.41	-89.15	-2,042.12	2,044.06	0.00	0.00	0.00	0.00
11/23/2011	NORMAL	7,926.0	0.87	225.50	7,553.21	-65.72	-2,019.91	2,020.89	0.49	0.21	-33.87	278.15
	NORMAL	8,022.0	1.77	216.80	7,649.18	-67.42	-2,021.32	2,022.36	0.96	0.94	-9.06	343.07
	NORMAL	8,117.0	2.73	212.90	7,744.11	-70.49	-2,023.42	2,024.60	1.02	1.01	-4.11	348.99
	NORMAL	8,212.0	2.75	227.33	7,839.00	-73.94	-2,026.33	2,027.65	0.72	0.02	15.19	95.55
	NORMAL	8,307.0	2.19	227.80	7,933.91	-76.70	-2,029.35	2,030.78	0.59	-0.59	0.49	178.16
	NORMAL	8,403.0	2.81	223.01	8,029.82	-79.65	-2,032.31	2,033.87	0.68	0.65	-4.99	338.97
	NORMAL	8,498.0	3.61	226.61	8,124.67	-83.41	-2,036.08	2,037.78	0.87	0.84	3.79	15.94
	NORMAL	8,569.0	3.55	226.42	8,195.53	-86.46	-2,039.29	2,041.12	0.09	-0.08	-0.27	191.09