

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well Information

Well	RWF 413-14	Wellbore No.	
Well Name	RWF 413-14	Common Name	RWF 413-14
Project	RU 14-06S-094W	Site	RWF 22-14 Pad
Vertical Section Azimuth	210.85 (°)	North Reference	
Origin N/S		Origin E/W	
Spud Date	4/25/2011	UWI	RWF 413-14
Active Datum	KB @5,516.1ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	Scientific Drilling
Started	4/25/2011	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

6716

Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
4/25/2011	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/25/2011	NORMAL	77.0	0.35	343.39	77.00	0.23	-0.07	-0.16	0.45	0.45	0.00	343.39
	NORMAL	168.0	1.23	243.63	167.99	0.06	-1.02	0.47	1.47	0.97	-109.63	245.26
	NORMAL	259.0	2.64	215.60	258.94	-2.08	-3.12	3.38	1.82	1.55	-30.80	311.58
	NORMAL	351.0	5.98	200.92	350.67	-8.28	-6.06	10.22	3.79	3.63	-15.96	334.30
	NORMAL	443.0	9.15	207.69	441.86	-19.24	-11.17	22.25	3.57	3.45	7.36	19.08
	NORMAL	534.0	13.20	212.61	531.12	-34.40	-20.14	39.86	4.57	4.45	5.41	15.67
	NORMAL	625.0	17.86	209.79	618.77	-55.28	-32.68	64.21	5.19	5.12	-3.10	349.43
	NORMAL	716.0	21.11	209.18	704.55	-81.70	-47.61	94.55	3.58	3.57	-0.67	356.13
	NORMAL	787.0	24.52	209.56	769.98	-105.69	-61.11	122.07	4.81	4.80	0.54	2.65
	NORMAL	878.0	26.24	211.16	852.20	-139.33	-80.84	161.07	2.03	1.89	1.76	22.46
	NORMAL	970.0	27.01	213.06	934.44	-174.24	-102.76	202.28	1.25	0.84	2.07	48.73
	NORMAL	1,066.0	27.69	211.79	1,019.71	-211.47	-126.40	246.37	0.93	0.71	-1.32	318.80
4/26/2011	NORMAL	1,161.0	27.52	212.07	1,103.90	-248.83	-149.68	290.38	0.23	-0.18	0.29	142.77
	NORMAL	1,255.0	28.12	211.76	1,187.03	-286.07	-172.87	334.24	0.66	0.64	-0.33	346.31
	NORMAL	1,350.0	27.65	210.69	1,271.00	-324.06	-195.91	378.67	0.72	-0.49	-1.13	226.32
	NORMAL	1,445.0	26.71	211.18	1,355.51	-361.29	-218.21	422.07	1.02	-0.99	0.52	166.82
	NORMAL	1,539.0	26.81	208.77	1,439.45	-397.94	-239.35	464.38	1.16	0.11	-2.56	274.19
	NORMAL	1,635.0	27.45	208.20	1,524.88	-436.42	-260.23	508.12	0.72	0.67	-0.59	337.64
	NORMAL	1,730.0	28.09	209.32	1,608.94	-475.22	-281.53	552.35	0.87	0.67	1.18	39.69
	NORMAL	1,825.0	27.32	209.46	1,693.05	-513.70	-303.20	596.50	0.81	-0.81	0.15	175.23

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 (°)
4/26/2011	NORMAL	1,918.0	27.01	211.05	1,775.79	-550.38	-324.59	638.95	0.85	-0.33	1.71	113.83
	NORMAL	2,013.0	26.36	214.01	1,860.68	-586.34	-347.52	681.59	1.56	-0.68	3.12	117.38
	NORMAL	2,080.0	26.88	214.10	1,920.58	-611.22	-364.33	711.56	0.78	0.78	0.13	4.47
4/27/2011	NORMAL	2,203.0	27.12	214.60	2,030.17	-657.32	-395.84	767.30	0.27	0.20	0.41	43.63
4/28/2011	NORMAL	2,298.0	27.97	211.25	2,114.41	-694.19	-419.69	811.18	1.86	0.89	-3.53	297.26
	NORMAL	2,393.0	27.23	209.49	2,198.60	-732.15	-441.95	855.19	1.16	-0.78	-1.85	227.00
	NORMAL	2,488.0	25.81	208.47	2,283.60	-769.25	-462.51	897.59	1.57	-1.49	-1.07	197.33
	NORMAL	2,582.0	25.41	208.14	2,368.36	-805.03	-481.77	938.18	0.45	-0.43	-0.35	199.48
	NORMAL	2,677.0	26.91	209.10	2,453.63	-841.79	-501.84	980.03	1.64	1.58	1.01	16.19
	NORMAL	2,772.0	26.71	208.97	2,538.42	-879.25	-522.64	1,022.85	0.22	-0.21	-0.14	196.28
	NORMAL	2,867.0	26.58	209.31	2,623.33	-916.46	-543.38	1,065.44	0.21	-0.14	0.36	130.60
	NORMAL	2,962.0	26.90	211.14	2,708.17	-953.39	-564.90	1,108.17	0.93	0.34	1.93	69.58
	NORMAL	3,057.0	27.14	211.94	2,792.80	-990.17	-587.48	1,151.33	0.46	0.25	0.84	56.92
	NORMAL	3,152.0	26.82	212.11	2,877.46	-1,026.71	-610.33	1,194.42	0.35	-0.34	0.18	166.52
	NORMAL	3,248.0	26.47	211.84	2,963.27	-1,063.23	-633.13	1,237.46	0.39	-0.36	-0.28	198.96
	NORMAL	3,343.0	26.47	213.34	3,048.31	-1,098.90	-655.94	1,279.78	0.70	0.00	1.58	90.67
	NORMAL	3,437.0	25.41	213.69	3,132.84	-1,133.19	-678.64	1,320.86	1.14	-1.13	0.37	171.94
	NORMAL	3,531.0	25.91	211.95	3,217.57	-1,167.39	-700.70	1,361.53	0.96	0.53	-1.85	302.78
	NORMAL	3,626.0	26.01	210.93	3,302.98	-1,202.87	-722.39	1,403.12	0.48	0.11	-1.07	282.17
	NORMAL	3,720.0	26.76	210.53	3,387.19	-1,238.78	-743.73	1,444.89	0.82	0.80	-0.43	346.49
	NORMAL	3,814.0	26.57	210.86	3,471.19	-1,275.06	-765.26	1,487.07	0.26	-0.20	0.35	142.21
	NORMAL	3,909.0	27.17	209.38	3,555.94	-1,312.20	-786.80	1,530.00	0.95	0.63	-1.56	311.23
	NORMAL	4,004.0	27.58	209.76	3,640.30	-1,350.19	-808.36	1,573.67	0.47	0.43	0.40	23.25
	NORMAL	4,099.0	26.90	209.07	3,724.76	-1,388.06	-829.72	1,617.14	0.79	-0.72	-0.73	204.61
	NORMAL	4,192.0	27.08	210.22	3,807.63	-1,424.74	-850.60	1,659.34	0.59	0.19	1.24	71.48
	NORMAL	4,288.0	27.32	209.99	3,893.02	-1,462.71	-872.61	1,703.22	0.27	0.25	-0.24	336.24
	NORMAL	4,383.0	25.93	209.48	3,977.94	-1,499.67	-893.72	1,745.78	1.48	-1.46	-0.54	189.11
	NORMAL	4,477.0	25.25	210.55	4,062.72	-1,534.83	-914.03	1,786.38	0.87	-0.72	1.14	146.28
	NORMAL	4,571.0	23.27	210.64	4,148.42	-1,568.07	-933.69	1,825.00	2.11	-2.11	0.10	178.97
4/29/2011	NORMAL	4,666.0	22.94	211.52	4,235.80	-1,600.00	-952.93	1,862.28	0.50	-0.35	0.93	134.10
	NORMAL	4,761.0	21.72	211.76	4,323.67	-1,630.73	-971.86	1,898.37	1.29	-1.28	0.25	175.84
	NORMAL	4,855.0	20.00	211.21	4,411.51	-1,659.27	-989.35	1,931.83	1.84	-1.83	-0.59	186.24
	NORMAL	4,950.0	19.89	212.77	4,500.81	-1,686.75	-1,006.51	1,964.23	0.57	-0.12	1.64	102.41
	NORMAL	5,044.0	18.77	208.80	4,589.51	-1,713.45	-1,022.45	1,995.33	1.84	-1.19	-4.22	227.70
	NORMAL	5,139.0	17.58	211.17	4,679.77	-1,739.12	-1,037.24	2,024.95	1.47	-1.25	2.49	149.27
	NORMAL	5,233.0	17.02	210.30	4,769.52	-1,763.15	-1,051.53	2,052.90	0.66	-0.60	-0.93	204.38
	NORMAL	5,327.0	15.12	210.44	4,859.84	-1,785.60	-1,064.68	2,078.92	2.02	-2.02	0.15	178.90
	NORMAL	5,421.0	12.45	212.36	4,951.13	-1,804.73	-1,076.32	2,101.31	2.88	-2.84	2.04	171.21
	NORMAL	5,516.0	12.36	213.66	5,043.91	-1,821.84	-1,087.44	2,121.71	0.31	-0.09	1.37	108.50
	NORMAL	5,610.0	11.14	213.91	5,135.94	-1,837.75	-1,098.08	2,140.82	1.30	-1.30	0.27	177.73
	NORMAL	5,703.0	10.29	212.19	5,227.32	-1,852.24	-1,107.52	2,158.10	0.98	-0.91	-1.85	199.77
4/30/2011	NORMAL	5,797.0	10.11	211.76	5,319.83	-1,866.36	-1,116.33	2,174.74	0.21	-0.19	-0.46	202.72
	NORMAL	5,890.0	8.56	204.92	5,411.60	-1,879.58	-1,123.55	2,189.79	2.05	-1.67	-7.35	212.25
	NORMAL	5,984.0	7.45	209.40	5,504.68	-1,891.23	-1,129.49	2,202.84	1.35	-1.18	4.77	152.87
5/1/2011	NORMAL	6,079.0	5.60	210.98	5,599.06	-1,900.57	-1,134.90	2,213.63	1.96	-1.95	1.66	175.24
	NORMAL	6,172.0	3.78	209.22	5,691.75	-1,907.14	-1,138.73	2,221.23	1.96	-1.96	-1.89	183.84
	NORMAL	6,265.0	2.74	209.21	5,784.60	-1,911.75	-1,141.31	2,226.52	1.12	-1.12	-0.01	180.03
	NORMAL	6,361.0	1.42	211.54	5,880.53	-1,914.77	-1,143.05	2,230.00	1.38	-1.38	2.43	177.50
	NORMAL	6,455.0	1.64	207.26	5,974.50	-1,916.96	-1,144.28	2,232.51	0.26	0.23	-4.55	330.40
	NORMAL	6,549.0	0.81	232.51	6,068.47	-1,918.56	-1,145.42	2,234.47	1.03	-0.88	26.86	159.15
5/2/2011	NORMAL	6,643.0	0.62	315.82	6,162.47	-1,918.60	-1,146.30	2,234.96	1.02	-0.20	88.63	140.15
	NORMAL	6,737.0	0.18	294.20	6,256.47	-1,918.17	-1,146.79	2,234.84	0.49	-0.47	-23.00	188.34
	NORMAL	6,831.0	0.61	254.24	6,350.46	-1,918.25	-1,147.41	2,235.22	0.52	0.46	-42.51	306.28
	NORMAL	6,926.0	0.20	254.66	6,445.46	-1,918.43	-1,148.05	2,235.71	0.43	-0.43	0.44	179.80
	NORMAL	7,021.0	0.10	288.57	6,540.46	-1,918.45	-1,148.29	2,235.85	0.14	-0.11	35.69	154.51
	NORMAL	7,116.0	0.52	341.68	6,635.46	-1,918.01	-1,148.51	2,235.58	0.49	0.44	55.91	62.97
	NORMAL	7,211.0	0.26	334.27	6,730.46	-1,917.41	-1,148.74	2,235.18	0.28	-0.27	-7.80	187.29

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)	Bulld (°/100ft)	Turn (°/100ft)	TFace (°)
5/2/2011	NORMAL	7,304.0	0.57	208.25	6,823.46	-1,917.63	-1,149.05	2,235.53	0.81	0.33	-135.51	217.76
	NORMAL	7,398.0	0.58	193.03	6,917.45	-1,918.50	-1,149.38	2,236.45	0.16	0.01	-16.19	266.11
	NORMAL	7,492.0	0.88	204.72	7,011.44	-1,919.62	-1,149.78	2,237.62	0.35	0.32	12.44	32.33
5/3/2011	NORMAL	7,586.0	0.75	204.21	7,105.43	-1,920.84	-1,150.34	2,238.95	0.14	-0.14	-0.54	182.94
	NORMAL	7,680.0	0.46	172.96	7,199.43	-1,921.77	-1,150.54	2,239.86	0.46	-0.31	-33.24	213.78
	NORMAL	7,776.0	0.53	184.16	7,295.43	-1,922.60	-1,150.53	2,240.56	0.12	0.07	11.67	59.80
	NORMAL	7,869.0	0.59	200.56	7,388.42	-1,923.48	-1,150.73	2,241.41	0.18	0.06	17.63	77.81
	NORMAL	7,962.0	1.23	218.35	7,481.41	-1,924.71	-1,151.52	2,242.87	0.74	0.69	19.13	32.89
	NORMAL	8,056.0	1.38	233.33	7,575.39	-1,926.17	-1,153.05	2,244.92	0.39	0.16	15.94	73.87
	NORMAL	8,151.0	0.35	262.20	7,670.37	-1,926.90	-1,154.26	2,246.16	1.14	-1.08	30.39	171.05
5/4/2011	NORMAL	8,245.0	0.42	42.24	7,764.37	-1,926.68	-1,154.31	2,246.00	0.77	0.07	148.98	158.13
	NORMAL	8,339.0	0.53	204.46	7,858.37	-1,926.82	-1,154.26	2,246.09	1.00	0.12	172.57	170.07
	NORMAL	8,434.0	2.09	176.97	7,953.34	-1,928.95	-1,154.35	2,247.97	1.72	1.64	-28.94	323.92
	NORMAL	8,527.0	3.52	176.16	8,046.23	-1,933.49	-1,154.07	2,251.73	1.54	1.54	-0.87	358.01
	NORMAL	8,565.0	4.48	179.59	8,084.14	-1,936.14	-1,153.98	2,253.95	2.60	2.53	9.03	15.71
	NORMAL	8,625.0	6.00	185.01	8,143.89	-1,941.61	-1,154.23	2,258.78	2.66	2.53	9.03	20.75