

1 General

1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

1.2 Well/Wellbore Information

Well	GM 413-21	Wellbore No.	00
Wellbore Legal Name	GM 413-21	Common Wellbore Name	GM 413-21
Project	GV 28-06S-096W	Site	GM 11-28 Pad
Vertical Section Azimuth	2.69 (°)	North reference	True
Origin N/S		Origin E/W	
Spud date	12/31/2014	UWI	GM 413-21
Active datum	KB @5,625.0ft (above Mean Sea Level)		

2 Survey Name

2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	
Date Started	12/31/2014	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)	Tface (°)
12/31/2014	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/31/2014	NORMAL	75.0	0.44	263.50	75.00	-0.03	-0.29	-0.05	0.59	0.59	0.00	263.50
	NORMAL	165.0	1.32	24.35	164.99	0.87	-0.20	0.86	1.77	0.98	134.28	134.58
	NORMAL	256.0	3.96	10.81	255.89	4.91	0.82	4.95	2.96	2.90	-14.88	339.88
1/1/2015	NORMAL	346.0	6.33	6.59	345.52	12.90	1.97	12.98	2.66	2.63	-4.69	348.82
	NORMAL	437.0	9.59	2.02	435.63	25.46	2.82	25.56	3.65	3.58	-5.02	346.74
	NORMAL	528.0	12.76	5.89	524.90	43.04	4.11	43.18	3.58	3.48	4.25	15.22
	NORMAL	618.0	16.10	0.18	612.05	65.41	5.17	65.58	4.03	3.71	-6.34	334.14
	NORMAL	709.0	20.06	1.05	698.54	93.64	5.50	93.80	4.36	4.35	0.96	4.32
	NORMAL	800.0	22.87	0.53	783.22	126.94	5.95	127.08	3.09	3.09	-0.57	355.88
	NORMAL	891.0	25.69	0.88	866.16	164.35	6.42	164.47	3.10	3.10	0.38	3.08
	NORMAL	961.0	27.44	1.78	928.77	195.64	7.15	195.76	2.57	2.50	1.29	13.36
	NORMAL	1,056.0	28.77	3.17	1,012.57	240.35	9.09	240.51	1.56	1.40	1.46	26.83
	NORMAL	1,151.0	32.10	5.20	1,094.47	288.33	12.65	288.60	3.67	3.51	2.14	18.04
	NORMAL	1,246.0	35.87	3.92	1,173.22	341.25	16.84	341.67	4.04	3.97	-1.35	348.72
	NORMAL	1,340.0	39.86	3.01	1,247.42	398.83	20.30	399.35	4.29	4.24	-0.97	351.67
	NORMAL	1,435.0	41.86	2.66	1,319.27	460.90	23.37	461.49	2.12	2.11	-0.37	353.34
1/2/2015	NORMAL	1,524.0	43.14	2.36	1,384.88	520.97	26.01	521.62	1.46	1.44	-0.34	350.89
	NORMAL	1,619.0	41.90	1.86	1,454.90	585.13	28.37	585.82	1.35	-1.31	-0.53	195.06
	NORMAL	1,714.0	42.38	1.82	1,525.34	648.84	30.42	649.55	0.51	0.51	-0.04	356.78
	NORMAL	1,808.0	42.68	2.13	1,594.61	712.34	32.61	713.09	0.39	0.32	0.33	35.05

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc. (")	Azl. (")	TVD (ft)	N/S (ft)	E/W (ft)	V. sec. (ft)	DLS ("/100usft)	Build Rate ("/100usft)	Turn ("/100usft)	Tface (")
1/2/2015	NORMAL	1,901.0	42.74	2.28	1,662.95	775.38	35.04	776.17	0.13	0.06	0.16	59.53
	NORMAL	1,995.0	44.14	3.53	1,731.20	839.92	38.32	840.80	1.75	1.49	1.33	32.00
1/3/2015	NORMAL	2,089.0	44.24	3.71	1,798.60	905.31	42.46	906.31	0.17	0.11	0.19	51.51
	NORMAL	2,181.0	43.32	3.04	1,865.03	968.86	46.21	969.96	1.12	-1.00	-0.73	206.50
	NORMAL	2,274.0	42.27	1.99	1,933.27	1,031.97	48.99	1,033.14	1.36	-1.13	-1.13	213.81
	NORMAL	2,368.0	42.13	2.48	2,002.91	1,095.07	51.45	1,096.28	0.38	-0.15	0.52	113.22
	NORMAL	2,461.0	42.46	3.09	2,071.70	1,157.58	54.49	1,158.86	0.57	0.35	0.66	51.43
	NORMAL	2,555.0	41.84	2.94	2,141.39	1,220.57	57.81	1,221.94	0.67	-0.66	-0.16	189.17
	NORMAL	2,649.0	42.91	3.97	2,210.83	1,283.81	61.63	1,285.28	1.36	1.14	1.10	33.36
	NORMAL	2,743.0	42.74	4.06	2,279.77	1,347.55	66.11	1,349.17	0.19	-0.18	0.10	160.24
	NORMAL	2,836.0	42.27	4.15	2,348.33	1,410.22	70.60	1,411.98	0.51	-0.51	0.10	172.66
	NORMAL	2,931.0	42.39	3.01	2,418.57	1,474.07	74.60	1,475.94	0.82	0.13	-1.20	278.46
	NORMAL	3,025.0	41.47	1.86	2,488.50	1,536.82	77.27	1,538.75	1.28	-0.98	-1.22	219.44
	NORMAL	3,120.0	40.80	1.69	2,560.05	1,599.28	79.21	1,601.24	0.72	-0.71	-0.18	189.41
	NORMAL	3,213.0	40.27	1.35	2,630.73	1,659.71	80.81	1,661.67	0.62	-0.57	-0.37	202.50
	NORMAL	3,307.0	39.71	1.34	2,702.75	1,720.10	82.23	1,722.06	0.60	-0.60	-0.01	180.65
	NORMAL	3,399.0	39.69	2.18	2,773.53	1,778.84	84.04	1,780.82	0.58	-0.02	0.91	92.46
	NORMAL	3,493.0	39.91	3.13	2,845.75	1,838.94	86.82	1,840.99	0.69	0.23	1.01	70.48
	NORMAL	3,587.0	38.87	2.70	2,918.40	1,898.51	89.86	1,900.64	1.14	-1.11	-0.46	194.54
	NORMAL	3,681.0	38.69	2.66	2,991.68	1,957.32	92.61	1,959.51	0.19	-0.19	-0.04	187.91
	NORMAL	3,776.0	38.78	2.62	3,065.78	2,016.70	95.35	2,018.96	0.10	0.09	-0.04	344.44
	NORMAL	3,871.0	38.25	2.04	3,140.11	2,075.81	97.76	2,078.11	0.68	-0.56	-0.61	214.05
	NORMAL	3,965.0	39.04	2.92	3,213.53	2,134.46	100.30	2,136.81	1.02	0.84	0.94	35.17
	NORMAL	4,060.0	38.78	2.22	3,287.45	2,194.07	102.98	2,196.48	0.54	-0.27	-0.74	239.13
	NORMAL	4,155.0	38.36	0.89	3,361.73	2,253.27	104.59	2,255.70	0.98	-0.44	-1.40	242.62
	NORMAL	4,250.0	36.03	1.49	3,437.40	2,310.68	105.77	2,313.10	2.48	-2.45	0.63	171.39
	NORMAL	4,342.0	35.42	2.31	3,512.09	2,364.37	107.55	2,366.81	0.84	-0.66	0.89	142.20
	NORMAL	4,437.0	33.33	3.33	3,590.49	2,417.94	110.18	2,420.45	2.28	-2.20	1.07	165.01
	NORMAL	4,531.0	32.45	2.91	3,669.43	2,468.91	112.96	2,471.49	0.97	-0.94	-0.45	194.35
	NORMAL	4,624.0	29.90	3.10	3,748.99	2,516.98	115.48	2,519.63	2.74	-2.74	0.20	177.87
	NORMAL	4,719.0	29.61	3.47	3,831.46	2,564.05	118.18	2,566.77	0.36	-0.31	0.39	147.82
	NORMAL	4,812.0	27.83	3.25	3,913.02	2,608.66	120.80	2,611.46	1.92	-1.91	-0.24	183.30
1/4/2015	NORMAL	4,907.0	26.06	3.53	3,997.70	2,651.63	123.34	2,654.50	1.87	-1.86	0.29	176.02
	NORMAL	5,002.0	24.69	2.97	4,083.54	2,692.28	125.66	2,695.21	1.46	-1.44	-0.59	189.68
	NORMAL	5,095.0	23.57	2.92	4,168.41	2,730.24	127.61	2,733.23	1.20	-1.20	-0.05	181.02
	NORMAL	5,190.0	21.72	3.27	4,256.08	2,766.77	129.58	2,769.80	1.95	-1.95	0.37	176.00
	NORMAL	5,284.0	18.55	4.15	4,344.33	2,799.05	131.65	2,802.15	3.39	-3.37	0.94	174.95
	NORMAL	5,378.0	16.88	3.53	4,433.87	2,827.59	133.58	2,830.74	1.79	-1.78	-0.66	186.15
	NORMAL	5,472.0	15.62	2.61	4,524.11	2,853.85	134.99	2,857.05	1.37	-1.34	-0.98	191.11
	NORMAL	5,567.0	14.78	2.44	4,615.78	2,878.74	136.09	2,881.95	0.89	-0.88	-0.18	182.96
	NORMAL	5,660.0	13.10	2.57	4,706.04	2,901.12	137.07	2,904.36	1.81	-1.81	0.14	179.00
	NORMAL	5,754.0	12.08	2.48	4,797.78	2,921.59	137.97	2,924.85	1.09	-1.09	-0.10	181.06
	NORMAL	5,848.0	11.08	6.96	4,889.87	2,940.38	139.49	2,943.69	1.43	-1.06	4.77	140.21
	NORMAL	5,942.0	9.32	7.81	4,982.38	2,956.89	141.62	2,960.28	1.88	-1.87	0.90	175.53
1/5/2015	NORMAL	6,037.0	8.51	7.88	5,076.23	2,971.48	143.61	2,974.94	0.85	-0.85	0.07	179.27
	NORMAL	6,131.0	6.85	5.77	5,169.38	2,983.94	145.13	2,987.47	1.79	-1.77	-2.24	188.60
	NORMAL	6,224.0	5.41	12.04	5,261.85	2,993.75	146.60	2,997.33	1.71	-1.55	6.74	158.16
	NORMAL	6,320.0	4.40	24.11	5,357.50	3,001.54	149.05	3,005.23	1.50	-1.05	12.57	140.29
	NORMAL	6,411.0	3.14	28.30	5,448.30	3,006.92	151.66	3,010.72	1.42	-1.38	4.60	169.75
	NORMAL	6,506.0	1.76	45.10	5,543.21	3,010.24	153.93	3,014.15	1.62	-1.45	17.68	160.73
1/6/2015	NORMAL	6,600.0	0.35	344.11	5,637.20	3,011.54	154.87	3,015.49	1.72	-1.50	-64.86	190.90
	NORMAL	6,692.0	0.24	231.74	5,729.20	3,011.69	154.64	3,015.63	0.54	-0.12	-122.14	208.70
	NORMAL	6,785.0	0.97	252.39	5,822.19	3,011.33	153.74	3,015.22	0.81	0.78	22.20	27.13
	NORMAL	6,879.0	0.81	223.04	5,916.18	3,010.60	152.53	3,014.44	0.51	-0.17	-31.22	236.38
	NORMAL	6,973.0	0.93	248.96	6,010.17	3,009.84	151.36	3,013.63	0.43	0.13	27.57	86.28
	NORMAL	7,067.0	1.85	235.04	6,104.14	3,008.70	149.40	3,012.40	1.04	0.98	-14.81	332.80

2.1.2 Survey Stations (Continued)

Date	Type	MD (ft)	Inc. (°)	Azi. (°)	TVD (ft)	N/S (ft)	EW (ft)	V. sec. (ft)	DLS (°/100usft)	Build Rate (°/100usft)	Turn (°/100usft)	Tface (°)
1/6/2015	NORMAL	7,161.0	1.87	243.57	6,198.09	3,007.15	146.79	3,010.72	0.30	0.02	9.07	90.14
	NORMAL	7,254.0	1.53	246.73	6,291.05	3,005.98	144.29	3,009.44	0.38	-0.37	3.40	166.16
	NORMAL	7,349.0	1.93	244.18	6,386.01	3,004.78	141.68	3,008.12	0.43	0.42	-2.68	347.83
	NORMAL	7,442.0	1.49	234.07	6,478.97	3,003.39	139.29	3,006.62	0.57	-0.47	-10.87	209.45
	NORMAL	7,535.0	1.77	260.50	6,571.93	3,002.44	136.90	3,005.56	0.85	0.30	28.42	83.12
	NORMAL	7,630.0	1.81	240.86	6,666.88	3,001.47	134.14	3,004.46	0.64	0.04	-20.67	263.88
	NORMAL	7,724.0	1.77	242.53	6,760.84	3,000.08	131.56	3,002.95	0.07	-0.04	1.78	128.31
	NORMAL	7,818.0	2.10	264.15	6,854.79	2,999.23	128.56	3,001.96	0.85	0.35	23.00	76.74
	NORMAL	7,901.0	2.36	268.94	6,937.72	2,999.05	125.33	3,001.63	0.39	0.31	5.77	38.04
	NORMAL	7,966.0	2.36	268.94	7,002.67	2,999.00	122.66	3,001.45	0.00	0.00	0.00	0.00