

# Deviation Summary

PICEANCE VLY

## 1 General

### 1.1 Customer Information

Company	PICEANCE VLY
Representative	
Address	

### 1.2 Well/Wellbore Information

Well	GM 512-21	Wellbore No.	
Wellbore Legal Name	GM 512-21	Common Wellbore Name	GM 512-21
Project	GV 20-06S-096W	Site	GM 442-20 Pad
Vertical Section Azimuth	111.72 (°)	North reference	
Origin N/S		Origin E/W	
Spud date	9/27/2014	UWI	GM 512-21
Active datum	KB @5,596.0ft (above Mean Sea Level)		

## 2 Survey Name

### 2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	Scientific Drilling
Date Started	9/27/2014	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 (°)
9/27/2014	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/27/2014	NORMAL	73.0	0.44	111.88	73.00	-0.10	0.26	0.28	0.60	0.60	0.00	111.88
	NORMAL	164.0	2.29	110.74	163.97	-0.88	2.28	2.45	2.03	2.03	-1.25	358.59
	NORMAL	255.0	5.10	114.96	254.77	-3.23	7.65	8.30	3.10	3.09	4.64	7.64
	NORMAL	345.0	7.13	112.24	344.25	-7.03	16.45	17.88	2.28	2.26	-3.02	350.52
	NORMAL	436.0	9.24	110.48	434.32	-11.73	28.52	30.84	2.33	2.32	-1.93	352.36
	NORMAL	526.0	11.79	111.01	522.80	-17.55	43.88	47.26	2.84	2.83	0.59	2.43
	NORMAL	617.0	14.87	112.24	611.34	-25.31	63.37	68.24	3.40	3.38	1.35	5.86
	NORMAL	688.0	17.27	111.18	679.56	-32.56	81.63	87.89	3.41	3.38	-1.49	352.52
	NORMAL	779.0	19.46	110.85	765.92	-42.84	108.40	116.55	2.41	2.41	-0.36	357.13
9/28/2014	NORMAL	869.0	22.24	111.60	850.02	-54.45	138.25	148.58	3.10	3.09	0.83	5.84
	NORMAL	960.0	25.22	112.29	933.32	-68.14	172.21	185.20	3.29	3.27	0.76	5.64
	NORMAL	1,054.0	27.74	112.37	1,017.45	-84.07	210.97	227.11	2.68	2.68	0.09	0.85
	NORMAL	1,149.0	29.33	111.82	1,100.91	-101.13	253.02	272.48	1.70	1.67	-0.58	350.38
9/29/2014	NORMAL	1,242.0	30.54	111.64	1,181.50	-118.31	296.13	318.89	1.30	1.30	-0.19	355.68
	NORMAL	1,336.0	30.38	111.30	1,262.53	-135.75	340.48	366.54	0.25	-0.17	-0.36	226.98
	NORMAL	1,430.0	30.36	110.56	1,343.63	-152.73	384.87	414.06	0.40	-0.02	-0.79	266.62
	NORMAL	1,524.0	29.06	111.36	1,425.27	-169.39	428.37	460.64	1.45	-1.38	0.85	163.39
	NORMAL	1,618.0	28.59	109.94	1,507.62	-185.38	470.77	505.95	0.88	-0.50	-1.51	234.91
	NORMAL	1,713.0	28.09	109.17	1,591.24	-200.47	513.27	551.02	0.65	-0.53	-0.81	215.83
	NORMAL	1,807.0	28.49	110.40	1,674.01	-215.55	555.19	595.54	0.75	0.43	1.31	56.09



## 2.1.2 Survey Stations (Continued)

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 (°)
9/29/2014	NORMAL	1,901.0	28.53	112.06	1,756.61	-231.80	597.00	640.40	0.84	0.04	1.77	87.84
	NORMAL	1,997.0	28.24	110.81	1,841.07	-248.48	639.48	686.04	0.69	-0.30	-1.30	243.44
	NORMAL	2,091.0	28.80	112.21	1,923.66	-264.94	681.23	730.91	0.93	0.60	1.49	50.66
	NORMAL	2,185.0	29.55	113.26	2,005.74	-282.65	723.49	776.73	0.97	0.80	1.12	34.77
	NORMAL	2,278.0	29.16	111.83	2,086.80	-300.13	765.59	822.31	0.86	-0.42	-1.54	240.29
	NORMAL	2,374.0	29.02	114.14	2,170.69	-318.35	808.56	868.97	1.18	-0.15	2.41	98.11
	NORMAL	2,468.0	28.64	113.03	2,253.04	-336.49	850.10	914.27	0.70	-0.40	-1.18	234.14
	NORMAL	2,562.0	29.37	114.40	2,335.25	-354.83	891.82	959.82	1.05	0.78	1.46	42.90
	NORMAL	2,654.0	28.52	113.44	2,415.76	-372.89	932.52	1,004.31	1.05	-0.92	-1.04	208.24
	NORMAL	2,748.0	27.79	113.26	2,498.64	-390.47	973.24	1,048.64	0.78	-0.78	-0.19	186.56
	NORMAL	2,844.0	27.40	110.98	2,583.72	-407.21	1,014.43	1,093.10	1.17	-0.41	-2.38	248.72
	NORMAL	2,937.0	27.61	110.72	2,666.21	-422.50	1,054.56	1,136.05	0.26	0.23	-0.28	330.12
	NORMAL	3,031.0	26.41	109.78	2,749.95	-437.28	1,094.61	1,178.72	1.35	-1.28	-1.00	199.16
	NORMAL	3,125.0	24.99	109.88	2,834.65	-451.11	1,132.96	1,219.46	1.51	-1.51	0.11	178.30
	NORMAL	3,220.0	25.83	109.56	2,920.46	-464.86	1,171.33	1,260.20	0.90	0.88	-0.34	350.57
	NORMAL	3,313.0	25.34	108.91	3,004.34	-478.09	1,209.25	1,300.32	0.61	-0.53	-0.70	209.51
	NORMAL	3,407.0	24.79	110.62	3,089.49	-491.55	1,246.72	1,340.12	0.97	-0.59	1.82	127.98
9/30/2014	NORMAL	3,501.0	23.76	113.95	3,175.18	-506.18	1,282.48	1,378.75	1.82	-1.10	3.54	128.47
	NORMAL	3,595.0	23.54	113.49	3,261.29	-521.35	1,317.00	1,416.43	0.31	-0.23	-0.49	219.78
	NORMAL	3,688.0	21.45	114.22	3,347.21	-535.73	1,349.54	1,451.99	2.27	-2.25	0.78	172.73
	NORMAL	3,781.0	21.10	114.37	3,433.87	-549.61	1,380.30	1,485.70	0.38	-0.38	0.16	171.23
	NORMAL	3,876.0	19.92	114.57	3,522.84	-563.40	1,410.59	1,518.94	1.24	-1.24	0.21	176.70
	NORMAL	3,972.0	18.20	113.61	3,613.58	-576.21	1,439.21	1,550.26	1.82	-1.79	-1.00	189.88
	NORMAL	4,066.0	17.32	107.42	3,703.11	-586.27	1,466.01	1,578.89	2.21	-0.94	-6.59	242.09
	NORMAL	4,159.0	16.80	106.49	3,792.01	-594.23	1,492.11	1,606.08	0.63	-0.56	-1.00	207.24
	NORMAL	4,254.0	16.65	109.21	3,883.00	-602.61	1,518.12	1,633.35	0.84	-0.16	2.86	102.15
	NORMAL	4,346.0	15.12	109.48	3,971.48	-610.95	1,541.88	1,658.51	1.66	-1.66	0.29	177.36
	NORMAL	4,440.0	14.41	110.44	4,062.38	-619.12	1,564.40	1,682.45	0.80	-0.76	1.02	161.45
	NORMAL	4,533.0	13.63	110.01	4,152.60	-626.91	1,585.54	1,704.97	0.85	-0.84	-0.46	187.40
	NORMAL	4,626.0	13.40	111.48	4,243.03	-634.61	1,605.87	1,726.70	0.44	-0.25	1.58	124.52
	NORMAL	4,722.0	12.22	107.90	4,336.64	-641.80	1,625.89	1,747.97	1.48	-1.23	-3.73	212.19
	NORMAL	4,817.0	10.99	108.96	4,429.70	-647.84	1,644.02	1,767.04	1.31	-1.29	1.12	170.68
	NORMAL	4,911.0	10.29	109.31	4,522.08	-653.52	1,660.42	1,784.38	0.75	-0.74	0.37	174.90
	NORMAL	5,005.0	9.11	109.50	4,614.73	-658.78	1,675.35	1,800.21	1.26	-1.26	0.20	178.54
	NORMAL	5,099.0	7.63	109.33	4,707.73	-663.33	1,688.26	1,813.88	1.57	-1.57	-0.18	180.87
10/1/2014	NORMAL	5,194.0	7.50	107.92	4,801.90	-667.33	1,700.11	1,826.37	0.24	-0.14	-1.48	234.30
	NORMAL	5,288.0	6.42	101.57	4,895.21	-670.27	1,711.09	1,837.66	1.41	-1.15	-6.76	212.35
	NORMAL	5,382.0	6.31	104.23	4,988.63	-672.60	1,721.25	1,847.96	0.33	-0.12	2.83	111.77
	NORMAL	5,477.0	5.43	97.78	5,083.13	-674.49	1,730.76	1,857.49	1.16	-0.93	-6.79	213.68
	NORMAL	5,571.0	4.93	97.90	5,176.75	-675.64	1,739.17	1,865.73	0.53	-0.53	0.13	178.82
	NORMAL	5,665.0	4.89	97.13	5,270.40	-676.70	1,747.15	1,873.53	0.08	-0.04	-0.82	238.36
10/2/2014	NORMAL	5,759.0	3.39	98.82	5,364.16	-677.62	1,753.87	1,880.12	1.60	-1.60	1.80	176.19
	NORMAL	5,852.0	2.60	113.45	5,457.03	-678.88	1,758.52	1,884.91	1.18	-0.85	15.73	143.09
	NORMAL	5,947.0	0.10	129.79	5,552.00	-679.79	1,760.56	1,887.14	2.64	-2.63	17.20	179.36
	NORMAL	6,040.0	0.15	245.68	5,645.00	-679.89	1,760.51	1,887.13	0.23	0.05	124.61	140.81
	NORMAL	6,134.0	0.35	198.87	5,739.00	-680.22	1,760.31	1,887.06	0.29	0.21	-49.80	289.34
	NORMAL	6,228.0	1.16	209.99	5,832.99	-681.31	1,759.74	1,886.94	0.87	0.86	11.83	15.85
	NORMAL	6,321.0	0.60	254.22	5,925.98	-682.26	1,758.80	1,886.42	0.90	-0.60	47.56	150.17
	NORMAL	6,416.0	1.19	278.59	6,020.96	-682.25	1,757.35	1,885.06	0.73	0.62	25.65	45.41
	NORMAL	6,510.0	1.34	283.79	6,114.94	-681.84	1,755.32	1,883.02	0.20	0.16	5.53	40.05
	NORMAL	6,603.0	1.58	276.64	6,207.91	-681.43	1,752.99	1,880.71	0.32	0.26	-7.69	319.19
	NORMAL	6,698.0	2.42	269.30	6,302.85	-681.31	1,749.68	1,877.59	0.92	0.88	-7.73	339.35
	NORMAL	6,792.0	2.55	263.55	6,396.76	-681.56	1,745.62	1,873.91	0.30	0.14	-6.12	294.65
	NORMAL	6,886.0	2.91	256.74	6,490.66	-682.35	1,741.22	1,870.11	0.51	0.38	-7.24	314.55
	NORMAL	6,981.0	3.02	257.32	6,585.53	-683.45	1,736.43	1,866.07	0.12	0.12	0.61	15.55
10/3/2014	NORMAL	7,075.0	3.06	259.47	6,679.40	-684.45	1,731.55	1,861.91	0.13	0.04	2.29	71.74

## 2.1.2 Survey Stations (Continued)

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 (°)
10/3/2014	NORMAL	7,170.0	2.64	264.26	6,774.28	-685.13	1,726.88	1,857.82	0.51	-0.44	5.04	152.82
	NORMAL	7,264.0	2.64	268.56	6,868.18	-685.40	1,722.56	1,853.91	0.21	0.00	4.57	92.15
	NORMAL	7,302.0	2.25	267.25	6,906.15	-685.46	1,720.94	1,852.43	1.04	-1.03	-3.45	187.50
	NORMAL	7,367.0	2.25	267.25	6,971.10	-685.58	1,718.39	1,850.10	0.00	0.00	0.00	0.00