

## 1 General

### 1.1 Customer Information

Company	PICEANCE HL
Representative	Eric Kolstad
Address	1515 Arapahoe St., Suite 1000 Denver, CO 80202

### 1.2 Well Information

Well	RGU 413-24-198	Wellbore No.	OH
Well Name	FEDERAL RGU 413-24-198	Common Name	RGU 413-24-198
Project	RG 24-01S-098W	Site	RGU 13-24-198 Pad
Vertical Section Azimuth	258.05 (°)	North Reference	True
Origin N/S		Origin E/W	
Spud Date	9/13/2011	UWI	RGU 413-24-198
Active Datum	KB @6,560.0ft (above Mean Sea Level)		

## 2 Survey Name

### 2.1 Survey Name: Survey #1

Survey Name	Survey #1	Company	CATHEDRAL
Date Started	9/13/2011	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)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
9/13/2011	Tie On	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/13/2011	NORMAL	120.0	1.90	247.80	119.98	-0.75	-1.84	1.96	1.58	1.58	0.00	247.80
	NORMAL	213.0	2.20	222.30	212.92	-2.65	-4.47	4.92	1.02	0.32	-27.42	275.18
	NORMAL	305.0	2.80	250.00	304.84	-4.73	-7.77	8.58	1.45	0.65	30.11	77.88
	NORMAL	398.0	4.00	254.40	397.67	-6.38	-13.03	14.07	1.32	1.29	4.73	14.47
	NORMAL	490.0	4.60	259.10	489.41	-7.94	-19.74	20.96	0.76	0.65	5.11	32.78
	NORMAL	582.0	4.90	259.80	581.10	-9.33	-27.23	28.58	0.33	0.33	0.76	11.28
	NORMAL	675.0	5.00	263.10	673.75	-10.52	-35.17	36.58	0.32	0.11	3.55	72.30
	NORMAL	767.0	5.10	265.60	765.39	-11.32	-43.22	44.63	0.26	0.11	2.72	66.81
	NORMAL	860.0	5.50	258.30	857.99	-12.54	-51.71	53.18	0.84	0.43	-7.85	297.01
	NORMAL	954.0	5.80	257.50	951.54	-14.48	-60.76	62.44	0.33	0.32	-0.85	344.89
	NORMAL	1,048.0	5.20	262.30	1,045.11	-16.08	-69.62	71.44	0.80	-0.64	5.11	144.89
9/14/2011	NORMAL	1,141.0	4.70	262.20	1,137.76	-17.16	-77.57	79.44	0.54	-0.54	-0.11	180.94
	NORMAL	1,234.0	4.20	262.90	1,230.48	-18.10	-84.72	86.63	0.54	-0.54	0.75	174.15
	NORMAL	1,327.0	4.40	262.40	1,323.22	-18.99	-91.64	93.58	0.22	0.22	-0.54	349.13
	NORMAL	1,421.0	3.80	263.10	1,416.97	-19.84	-98.30	100.28	0.64	-0.64	0.74	175.58
	NORMAL	1,515.0	3.70	265.40	1,510.77	-20.46	-104.42	106.39	0.19	-0.11	2.45	124.76
	NORMAL	1,608.0	3.90	251.90	1,603.57	-21.68	-110.42	112.51	0.98	0.22	-14.52	275.81
	NORMAL	1,702.0	3.90	246.80	1,697.35	-23.94	-116.39	118.83	0.37	0.00	-5.43	267.46
	NORMAL	1,795.0	3.90	254.40	1,790.14	-26.03	-122.35	125.08	0.56	0.00	8.17	93.79

## 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 (°)
9/14/2011	NORMAL	1,888.0	3.80	255.50	1,882.93	-27.65	-128.38	131.32	0.13	-0.11	1.18	144.10
	NORMAL	1,980.0	3.80	257.20	1,974.73	-29.09	-134.30	137.41	0.12	0.00	1.85	90.85
	NORMAL	2,074.0	3.60	255.60	2,068.53	-30.52	-140.20	143.48	0.24	-0.21	-1.70	206.51
	NORMAL	2,168.0	3.50	255.90	2,162.35	-31.95	-145.84	149.29	0.11	-0.11	0.32	169.63
	NORMAL	2,262.0	3.30	256.60	2,256.18	-33.28	-151.25	154.86	0.22	-0.21	0.74	168.62
	NORMAL	2,355.0	3.30	258.60	2,349.03	-34.43	-156.48	160.22	0.12	0.00	2.15	91.00
	NORMAL	2,449.0	3.20	257.60	2,442.88	-35.52	-161.69	165.55	0.12	-0.11	-1.06	209.05
	NORMAL	2,542.0	3.10	260.20	2,535.74	-36.51	-166.71	170.65	0.19	-0.11	2.80	126.28
	NORMAL	2,636.0	3.00	260.10	2,629.61	-37.36	-171.64	175.65	0.11	-0.11	-0.11	183.00
	NORMAL	2,729.0	3.70	258.90	2,722.45	-38.36	-176.98	181.08	0.76	0.75	-1.29	353.68
	NORMAL	2,822.0	3.60	257.20	2,815.26	-39.59	-182.77	187.00	0.16	-0.11	-1.83	226.42
	NORMAL	2,914.0	3.60	256.20	2,907.08	-40.91	-188.39	192.78	0.07	0.00	-1.09	269.50
9/15/2011	NORMAL	3,007.0	3.20	250.00	2,999.91	-42.50	-193.67	198.27	0.58	-0.43	-6.67	219.52
	NORMAL	3,101.0	2.10	233.30	3,093.81	-44.43	-197.51	202.43	1.42	-1.17	-17.77	206.92
	NORMAL	3,194.0	3.30	238.80	3,186.71	-46.83	-201.17	206.50	1.32	1.29	5.91	14.94
	NORMAL	3,284.0	3.90	258.50	3,276.53	-48.78	-206.38	212.01	1.52	0.67	21.89	74.18
	NORMAL	3,379.0	4.00	259.90	3,371.31	-50.01	-212.81	218.55	0.15	0.11	1.47	44.66
	NORMAL	3,470.0	3.90	258.00	3,462.09	-51.21	-218.96	224.82	0.18	-0.11	-2.09	231.67
	NORMAL	3,564.0	3.70	258.00	3,555.88	-52.50	-225.06	231.05	0.21	-0.21	0.00	180.00
	NORMAL	3,657.0	4.10	261.10	3,648.67	-53.64	-231.28	237.37	0.49	0.43	3.33	29.35
	NORMAL	3,751.0	4.00	255.50	3,742.43	-54.98	-237.77	244.00	0.43	-0.11	-5.96	253.03
	NORMAL	3,810.0	3.90	259.30	3,801.29	-55.87	-241.73	248.06	0.47	-0.17	6.44	112.80
	NORMAL	3,875.0	2.70	251.60	3,866.19	-56.76	-245.36	251.79	1.96	-1.85	-11.85	196.46
	NORMAL	3,969.0	2.60	263.40	3,960.09	-57.71	-249.58	256.12	0.59	-0.11	12.55	106.24
10/2/2011	NORMAL	4,063.0	2.20	259.50	4,054.00	-58.28	-253.47	260.04	0.46	-0.43	-4.15	200.27
	NORMAL	4,156.0	2.70	251.70	4,146.92	-59.29	-257.30	264.01	0.65	0.54	-8.39	322.36
	NORMAL	4,249.0	3.80	258.10	4,239.77	-60.62	-262.40	269.26	1.24	1.18	6.88	21.47
	NORMAL	4,342.0	4.40	266.70	4,332.53	-61.46	-268.98	275.87	0.92	0.65	9.25	50.04
	NORMAL	4,435.0	3.50	263.50	4,425.31	-61.99	-275.36	282.23	1.00	-0.97	-3.44	192.17
	NORMAL	4,528.0	4.20	267.60	4,518.10	-62.45	-281.58	288.41	0.81	0.75	4.41	23.52
	NORMAL	4,621.0	4.10	263.80	4,610.85	-62.95	-288.29	295.08	0.31	-0.11	-4.09	248.13
	NORMAL	4,715.0	4.20	257.60	4,704.61	-64.05	-294.99	301.86	0.49	0.11	-6.60	279.46
	NORMAL	4,808.0	4.50	263.20	4,797.34	-65.22	-301.94	308.90	0.56	0.32	6.02	57.58
	NORMAL	4,902.0	4.20	262.70	4,891.07	-66.09	-309.02	316.01	0.32	-0.32	-0.53	186.96
	NORMAL	4,997.0	3.70	261.20	4,985.84	-67.00	-315.50	322.53	0.54	-0.53	-1.58	190.93
	NORMAL	5,090.0	3.10	268.20	5,078.68	-67.54	-320.98	328.00	0.78	-0.65	7.53	148.78
	NORMAL	5,184.0	3.40	268.40	5,172.53	-67.70	-326.30	333.25	0.32	0.32	0.21	2.26
	NORMAL	5,278.0	4.50	255.40	5,266.31	-68.70	-332.66	339.67	1.50	1.17	-13.83	314.24
	NORMAL	5,371.0	4.10	253.40	5,359.04	-70.57	-339.37	346.63	0.46	-0.43	-2.15	199.56
	NORMAL	5,465.0	3.90	250.00	5,452.82	-72.63	-345.60	353.15	0.33	-0.21	-3.62	228.17
	NORMAL	5,591.0	4.20	260.50	5,578.50	-74.85	-354.18	362.00	0.63	0.24	8.33	73.27
	NORMAL	5,652.0	4.10	256.50	5,639.34	-75.73	-358.50	366.41	0.50	-0.16	-6.56	248.95
	NORMAL	5,746.0	4.30	257.90	5,733.09	-77.26	-365.21	373.29	0.24	0.21	1.49	27.84
	NORMAL	5,839.0	4.50	260.20	5,825.82	-78.61	-372.22	380.43	0.29	0.22	2.47	42.57
	NORMAL	5,932.0	4.00	257.30	5,918.56	-79.94	-378.98	387.32	0.59	-0.54	-3.12	201.82
	NORMAL	6,026.0	4.30	255.00	6,012.31	-81.57	-385.58	394.11	0.36	0.32	-2.45	329.83
	NORMAL	6,120.0	4.10	258.70	6,106.06	-83.14	-392.28	400.99	0.36	-0.21	3.94	128.27
	NORMAL	6,213.0	3.30	255.70	6,198.87	-84.46	-398.13	406.99	0.88	-0.86	-3.23	192.11
	NORMAL	6,306.0	3.10	252.10	6,291.72	-85.89	-403.12	412.17	0.30	-0.22	-3.87	223.35
	NORMAL	6,399.0	3.00	254.50	6,384.59	-87.31	-407.86	417.10	0.17	-0.11	2.58	129.26
	NORMAL	6,492.0	2.50	253.70	6,477.48	-88.53	-412.15	421.55	0.54	-0.54	-0.86	183.99
	NORMAL	6,585.0	2.50	260.10	6,570.39	-89.45	-416.09	425.60	0.30	0.00	6.88	93.20
	NORMAL	6,679.0	2.40	275.20	6,664.31	-89.63	-420.07	429.53	0.69	-0.11	16.06	106.30
	NORMAL	6,773.0	1.50	288.90	6,758.25	-89.05	-423.20	432.47	1.07	-0.96	14.57	159.35
	NORMAL	6,866.0	0.70	298.50	6,851.24	-88.38	-424.85	433.94	0.88	-0.86	10.32	171.80
	NORMAL	6,960.0	0.50	274.00	6,945.23	-88.08	-425.76	434.77	0.34	-0.21	-26.06	220.24
10/4/2011	NORMAL	7,054.0	0.30	314.70	7,039.23	-87.88	-426.35	435.30	0.36	-0.21	43.30	144.33

## 2.1.2 Survey Stations (Continued)

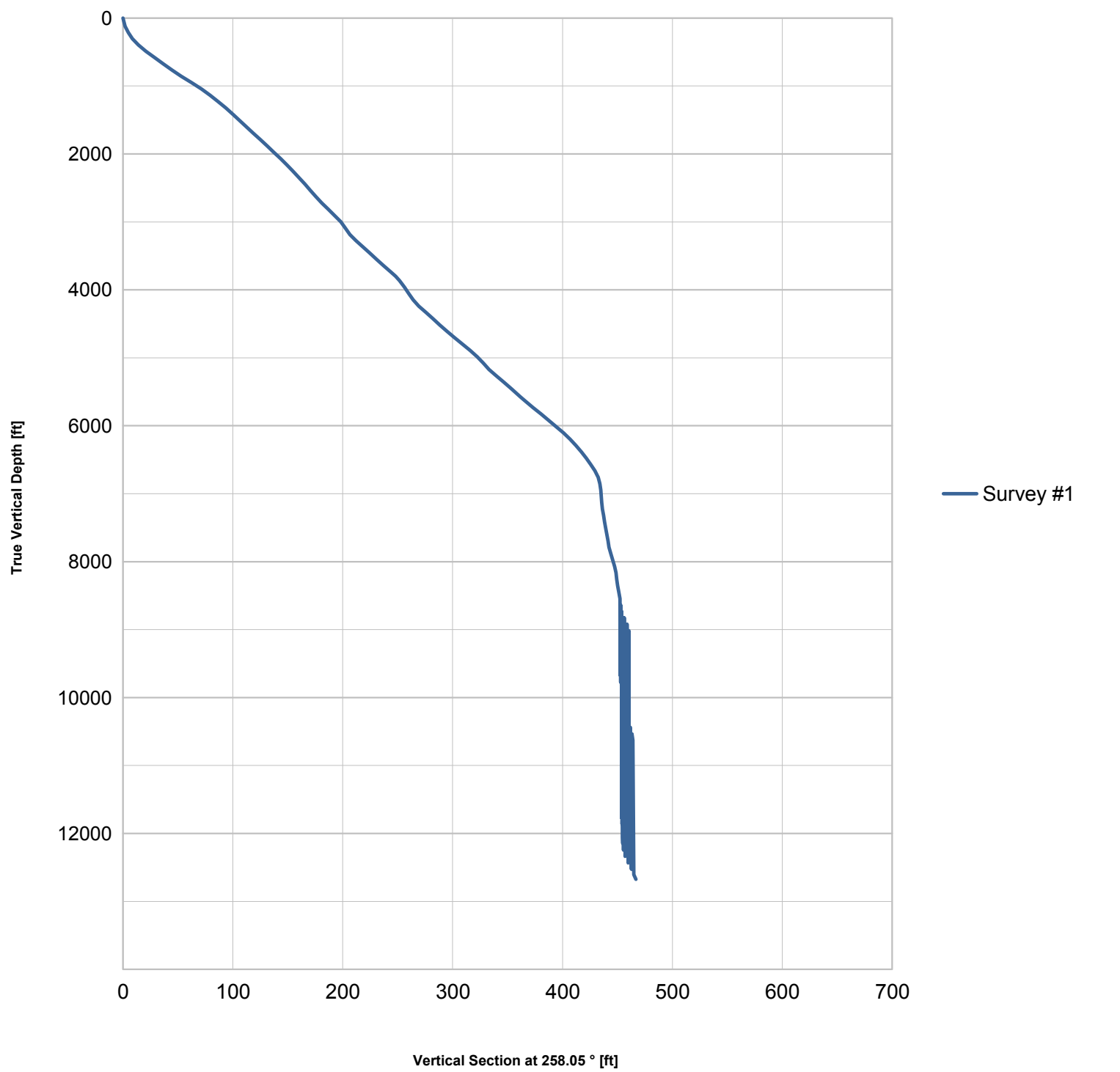
Date	Type	MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLS (°/100ft)	Build Rate (°/100ft)	Turn (°/100ft)	TFace (°)
10/4/2011	NORMAL	7,147.0	0.40	288.80	7,132.23	-87.60	-426.83	435.72	0.20	0.11	-27.85	288.90
	NORMAL	7,242.0	0.50	274.30	7,227.22	-87.47	-427.55	436.40	0.16	0.11	-15.26	303.88
	NORMAL	7,336.0	0.70	287.10	7,321.22	-87.27	-428.51	437.29	0.25	0.21	13.62	40.34
	NORMAL	7,429.0	0.70	285.50	7,414.21	-86.95	-429.60	438.30	0.02	0.00	-1.72	269.20
	NORMAL	7,523.0	0.70	280.50	7,508.21	-86.69	-430.72	439.34	0.06	0.00	-5.32	267.50
	NORMAL	7,617.0	0.70	259.40	7,602.20	-86.69	-431.85	440.44	0.27	0.00	-22.45	259.45
	NORMAL	7,710.0	0.50	281.30	7,695.19	-86.72	-432.81	441.38	0.32	-0.22	23.55	141.69
	NORMAL	7,804.0	1.00	300.50	7,789.19	-86.22	-433.91	442.36	0.59	0.53	20.43	36.50
	NORMAL	7,898.0	1.30	289.20	7,883.17	-85.45	-435.63	443.88	0.40	0.32	-12.02	317.17
	NORMAL	7,992.0	1.20	291.70	7,977.14	-84.74	-437.55	445.61	0.12	-0.11	2.66	152.64
10/5/2011	NORMAL	8,085.0	1.30	286.70	8,070.12	-84.07	-439.47	447.35	0.16	0.11	-5.38	310.00
	NORMAL	8,179.0	0.60	305.50	8,164.11	-83.48	-440.89	448.62	0.81	-0.74	20.00	165.20
	NORMAL	8,275.0	0.60	293.80	8,260.10	-82.99	-441.76	449.37	0.13	0.00	-12.19	264.15
	NORMAL	8,370.0	0.50	254.40	8,355.10	-82.90	-442.61	450.18	0.40	-0.11	-41.47	236.05
	NORMAL	8,464.0	0.80	247.70	8,449.09	-83.26	-443.61	451.24	0.33	0.32	-7.13	342.42
	NORMAL	8,559.0	0.50	230.20	8,544.09	-83.77	-444.54	452.26	0.38	-0.32	-18.42	204.95
	NORMAL	8,653.0	0.30	255.70	8,638.08	-84.10	-445.10	452.87	0.28	-0.21	27.13	150.60
	NORMAL	8,747.0	1.00	237.00	8,732.08	-84.60	-446.02	453.88	0.77	0.74	-19.89	333.65
	NORMAL	8,842.0	1.80	254.00	8,827.05	-85.47	-448.15	456.14	0.94	0.84	17.89	36.11
	NORMAL	8,936.0	1.40	251.40	8,921.01	-86.24	-450.66	458.75	0.43	-0.43	-2.77	188.99
10/6/2011	NORMAL	9,030.0	0.70	221.00	9,015.00	-87.04	-452.13	460.35	0.93	-0.74	-32.34	203.98
	NORMAL	9,125.0	0.70	90.00	9,109.99	-87.48	-451.93	460.25	1.34	0.00	-137.89	204.50
	NORMAL	9,221.0	1.50	89.50	9,205.98	-87.47	-450.08	458.44	0.83	0.83	-0.52	359.06
	NORMAL	9,315.0	1.40	88.60	9,299.95	-87.43	-447.71	456.11	0.11	-0.11	-0.96	192.38
	NORMAL	9,411.0	1.10	91.30	9,395.92	-87.42	-445.61	454.06	0.32	-0.31	2.81	170.24
	NORMAL	9,506.0	0.40	116.90	9,490.91	-87.59	-444.41	452.91	0.80	-0.74	26.95	166.84
	NORMAL	9,600.0	0.40	159.10	9,584.91	-88.05	-444.00	452.60	0.31	0.00	44.89	111.10
	NORMAL	9,694.0	0.50	180.30	9,678.91	-88.76	-443.88	452.64	0.20	0.11	22.55	69.90
	NORMAL	9,789.0	0.60	185.90	9,773.90	-89.67	-443.93	452.88	0.12	0.11	5.89	31.08
	NORMAL	9,884.0	1.10	215.10	9,868.89	-90.91	-444.51	453.70	0.68	0.53	30.74	56.13
10/7/2011	NORMAL	9,979.0	1.50	201.10	9,963.87	-92.82	-445.48	455.05	0.53	0.42	-14.74	314.41
	NORMAL	10,073.0	1.30	211.00	10,057.84	-94.88	-446.47	456.44	0.33	-0.21	10.53	134.46
	NORMAL	10,167.0	1.40	207.60	10,151.82	-96.81	-447.55	457.90	0.14	0.11	-3.62	319.60
	NORMAL	10,262.0	1.10	209.40	10,246.79	-98.64	-448.54	459.24	0.32	-0.32	1.89	173.44
	NORMAL	10,358.0	1.60	192.00	10,342.77	-100.75	-449.27	460.40	0.67	0.52	-18.13	311.74
	NORMAL	10,453.0	1.80	201.90	10,437.72	-103.43	-450.10	461.77	0.37	0.21	10.42	60.76
	NORMAL	10,548.0	0.80	239.50	10,532.70	-105.15	-451.23	463.23	1.33	-1.05	39.58	157.29
	NORMAL	10,643.0	1.10	344.20	10,627.69	-104.61	-452.05	463.92	1.60	0.32	110.21	135.40
	NORMAL	10,737.0	2.60	14.90	10,721.64	-101.68	-451.75	463.01	1.86	1.60	32.66	49.44
	NORMAL	10,832.0	2.50	8.70	10,816.55	-97.55	-450.88	461.31	0.31	-0.11	-6.53	246.99
10/8/2011	NORMAL	10,927.0	2.30	2.10	10,911.47	-93.60	-450.50	460.12	0.36	-0.21	-6.95	230.84
	NORMAL	11,022.0	1.10	10.10	11,006.42	-90.80	-450.27	459.31	1.28	-1.26	8.42	172.79
	NORMAL	11,117.0	1.90	3.60	11,101.39	-88.33	-450.01	458.55	0.86	0.84	-6.84	344.73
	NORMAL	11,212.0	1.00	12.70	11,196.36	-85.95	-449.73	457.78	0.97	-0.95	9.58	170.17
	NORMAL	11,307.0	1.30	18.80	11,291.34	-84.12	-449.20	456.88	0.34	0.32	6.42	25.27
	NORMAL	11,402.0	1.40	357.30	11,386.31	-81.94	-448.91	456.14	0.54	0.11	-22.63	270.29
	NORMAL	11,498.0	1.10	330.10	11,482.29	-79.97	-449.42	456.24	0.68	-0.31	-28.33	230.02
	NORMAL	11,594.0	1.00	70.90	11,578.28	-78.89	-449.09	455.69	1.69	-0.10	105.00	142.65
	NORMAL	11,689.0	0.60	76.90	11,673.27	-78.51	-447.82	454.37	0.43	-0.42	6.32	171.16
	NORMAL	11,784.0	0.10	139.90	11,768.27	-78.46	-447.28	453.84	0.59	-0.53	66.32	170.87
10/9/2011	NORMAL	11,879.0	0.70	303.90	11,863.27	-78.20	-447.71	454.20	0.84	0.63	172.63	165.98
	NORMAL	11,974.0	0.40	153.40	11,958.27	-78.17	-448.04	454.52	1.12	-0.32	-158.42	190.64
	NORMAL	12,069.0	0.20	235.60	12,053.26	-78.56	-448.03	454.59	0.44	-0.21	86.53	152.01
	NORMAL	12,164.0	0.30	220.10	12,148.26	-78.85	-448.33	454.94	0.13	0.11	-16.32	318.02
	NORMAL	12,259.0	0.70	201.00	12,243.26	-79.58	-448.70	455.45	0.45	0.42	-20.11	327.64
	NORMAL	12,354.0	1.70	234.40	12,338.24	-80.94	-450.05	457.06	1.24	1.05	35.16	52.45
	NORMAL	12,449.0	1.70	243.70	12,433.20	-82.39	-452.46	459.71	0.29	0.00	9.79	94.65
	NORMAL											
	NORMAL											
	NORMAL											

### 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 (°)
10/11/2011	NORMAL	12,544.0	2.00	242.10	12,528.15	-83.79	-455.19	462.67	0.32	0.32	-1.68	349.43
	NORMAL	12,620.0	1.50	245.70	12,604.11	-84.82	-457.27	464.92	0.67	-0.66	4.74	169.39
	NORMAL	12,690.0	1.50	245.70	12,674.09	-85.57	-458.94	466.71	0.00	0.00	0.00	0.00

3 Charts

3.1 Vertical Section View



3.2 Plan View

