



Directional Survey Data

Well Name Union Pacific 156Y29	Lease Union Pacific	Field Name Rangely	Business Unit Mid-Continent/Alaska	Surface UWI 0510311721	Surface ChevNo MH9750
Wellbore Name Original Hole	Directional Type Shallow Kick Off 'S'	Wellbore UWI 051031172100	Wellbore ChevNo MH9750-00	Kick Off Depth (ftKB) 6,600.00	Date TD Reached (wellbore) 9/11/2010 19:30
UTM Northing (Y) (ft)	UTM Easting (X) (ft)	UTM Grid Zone	Latitude (DMS)	Longitude (DMS)	Closure Direction (°) 15.60

Directional Surveys

Description Surveys	Planned? No	Definitive? No	Note Correction
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Survey Data

Survey Company	Date	MD (ftKB)	TVD (ftKB)	Incl (°)	Azm (°)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)
Scientific Drilling	9/1/2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scientific Drilling	9/1/2010	191.00	191.00	0.35	348.23	0.52	0.57	-0.12	0.18	0.18	182.32
Scientific Drilling	9/1/2010	222.00	222.00	0.53	319.31	0.68	0.77	-0.23	0.90	0.58	-93.29
Scientific Drilling	9/1/2010	313.00	312.99	1.06	1.59	1.73	1.93	-0.48	0.83	0.58	-349.14
Scientific Drilling	9/1/2010	404.00	403.97	1.23	0.80	3.49	3.75	-0.45	0.19	0.19	-0.87
Scientific Drilling	9/1/2010	495.00	494.95	1.32	351.39	5.39	5.76	-0.59	0.25	0.10	385.26
Scientific Drilling	9/1/2010	586.00	585.91	1.93	21.19	7.87	8.23	-0.19	1.12	0.67	-362.86
Scientific Drilling	9/1/2010	677.00	676.88	1.32	46.59	10.30	10.38	1.12	1.02	-0.67	27.91
Scientific Drilling	9/1/2010	769.00	768.85	1.32	43.69	12.14	11.87	2.62	0.07	0.00	-3.15
Scientific Drilling	9/1/2010	867.00	866.83	1.23	44.30	14.06	13.44	4.14	0.09	-0.09	0.62
Scientific Drilling	9/1/2010	964.00	963.81	1.32	4.57	16.07	15.30	4.96	0.90	0.09	-40.96
Scientific Drilling	9/1/2010	1,061.00	1,060.77	1.67	346.47	18.40	17.79	4.71	0.60	0.36	352.47
Scientific Drilling	9/1/2010	1,159.00	1,158.73	1.76	15.12	21.15	20.63	4.77	0.87	0.09	-338.11
Scientific Drilling	9/1/2010	1,256.00	1,255.68	2.11	20.75	24.42	23.74	5.79	0.41	0.36	5.80
Scientific Drilling	9/1/2010	1,352.00	1,351.59	2.64	15.30	28.39	27.52	7.00	0.60	0.55	-5.68
Scientific Drilling	9/1/2010	1,450.00	1,449.47	3.08	15.30	33.28	32.24	8.29	0.45	0.45	0.00
Scientific Drilling	9/1/2010	1,547.00	1,546.31	3.52	10.29	38.85	37.68	9.51	0.54	0.45	-5.16
Scientific Drilling	9/2/2010	1,644.00	1,643.11	3.87	6.51	45.05	43.86	10.42	0.44	0.36	-3.90
Scientific Drilling	9/2/2010	1,741.00	1,739.91	3.43	9.94	51.17	49.98	11.29	0.51	-0.45	3.54
Scientific Drilling	9/2/2010	1,838.00	1,836.79	2.37	17.23	56.06	54.75	12.38	1.15	-1.09	7.52
Scientific Drilling	9/5/2010	1,935.00	1,933.72	1.85	13.72	59.63	58.19	13.35	0.55	-0.54	-3.62
Scientific Drilling	9/5/2010	2,003.00	2,001.69	1.67	8.27	61.71	60.23	13.75	0.36	-0.26	-8.01
Scientific Drilling	9/5/2010	2,106.00	2,104.66	1.14	334.51	63.97	62.64	13.53	0.93	-0.51	316.74
Scientific Drilling	9/5/2010	2,300.00	2,298.50	3.43	11.87	71.22	70.07	13.89	1.35	1.18	-166.31
Scientific Drilling	9/5/2010	2,398.00	2,396.30	3.96	2.99	77.45	76.31	14.67	0.79	0.54	-9.06
Scientific Drilling	9/5/2010	2,494.00	2,491.90	6.42	21.18	86.03	84.63	16.78	3.05	2.56	18.95
Scientific Drilling	9/5/2010	2,592.00	2,588.94	9.58	28.83	99.42	96.89	22.70	3.40	3.22	7.81
Scientific Drilling	9/5/2010	2,689.00	2,684.32	11.34	29.36	116.54	112.27	31.26	1.82	1.81	0.55
Scientific Drilling	9/5/2010	2,786.00	2,779.41	11.52	19.86	135.47	129.69	39.23	1.95	0.19	-9.79
Scientific Drilling	9/5/2010	2,883.00	2,874.38	11.96	17.84	155.17	148.37	45.60	0.62	0.45	-2.08
Scientific Drilling	9/5/2010	2,980.00	2,969.44	10.99	11.25	174.43	167.01	50.48	1.68	-1.00	-6.79
Scientific Drilling	9/5/2010	3,077.00	3,064.63	11.18	12.04	193.04	185.27	54.25	0.25	0.20	0.81
Scientific Drilling	9/5/2010	3,174.00	3,159.64	12.13	19.25	212.60	204.09	59.57	1.79	0.98	7.43
Scientific Drilling	9/6/2010	3,272.00	3,255.15	13.72	18.28	234.48	224.85	66.61	1.64	1.62	-0.99
Scientific Drilling	9/6/2010	3,368.00	3,348.21	14.77	25.67	257.90	246.69	75.48	2.19	1.09	7.70
Scientific Drilling	9/6/2010	3,465.00	3,441.94	15.04	24.17	282.52	269.32	85.99	0.49	0.28	-1.55
Scientific Drilling	9/6/2010	3,563.00	3,536.78	14.16	22.33	307.00	292.01	95.75	1.01	-0.90	-1.88
Scientific Drilling	9/6/2010	3,660.00	3,630.92	13.72	22.24	330.21	313.63	104.62	0.45	-0.45	-0.09
Scientific Drilling	9/6/2010	3,757.00	3,725.28	13.10	19.43	352.60	334.64	112.63	0.93	-0.64	-2.90



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Survey Data											
Survey Company	Date	MD (ftKB)	TVD (ftKB)	Incl (°)	Azm (°)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)
Scientific Drilling	9/6/2010	3,854.00	3,819.75	13.10	15.38	374.57	355.61	119.20	0.95	0.00	-4.18
Scientific Drilling	9/6/2010	3,951.00	3,914.14	13.54	15.38	396.91	377.16	125.13	0.45	0.45	0.00
Scientific Drilling	9/6/2010	4,048.00	4,008.27	14.42	14.59	420.34	399.80	131.18	0.93	0.91	-0.81
Scientific Drilling	9/6/2010	4,145.00	4,102.52	12.93	9.49	443.21	422.19	136.01	1.97	-1.54	-5.26
Scientific Drilling	9/6/2010	4,242.00	4,196.86	13.98	8.00	465.62	444.50	139.43	1.14	1.08	-1.54
Scientific Drilling	9/6/2010	4,340.00	4,291.91	14.25	14.15	489.41	467.92	144.03	1.55	0.28	6.28
Scientific Drilling	9/6/2010	4,437.00	4,385.94	14.16	18.81	513.19	490.72	150.77	1.18	-0.09	4.80
Scientific Drilling	9/6/2010	4,534.00	4,479.75	15.30	18.28	537.82	514.11	158.61	1.18	1.18	-0.55
Scientific Drilling	9/6/2010	4,631.00	4,573.09	16.27	17.49	564.19	539.22	166.71	1.02	1.00	-0.81
Scientific Drilling	9/7/2010	4,729.00	4,666.98	17.06	16.96	592.28	566.06	175.03	0.82	0.81	-0.54
Scientific Drilling	9/7/2010	4,826.00	4,760.05	15.65	20.22	619.55	591.95	183.70	1.73	-1.45	3.36
Scientific Drilling	9/7/2010	4,923.00	4,853.58	15.12	19.78	645.21	616.13	192.51	0.56	-0.55	-0.45
Scientific Drilling	9/7/2010	5,020.00	4,947.95	11.52	21.36	667.47	637.07	200.32	3.73	-3.71	1.63
Scientific Drilling	9/7/2010	5,117.00	5,043.23	10.11	29.71	685.36	653.48	208.07	2.17	-1.45	8.61
Scientific Drilling	9/7/2010	5,215.00	5,139.95	8.44	30.50	700.66	667.15	215.98	1.71	-1.70	0.81
Scientific Drilling	9/7/2010	5,312.00	5,235.97	8.00	12.39	714.28	679.88	221.04	2.70	-0.45	-18.67
Scientific Drilling	9/7/2010	5,409.00	5,332.01	8.09	3.69	727.70	693.28	222.93	1.26	0.09	-8.97
Scientific Drilling	9/7/2010	5,506.00	5,428.14	7.30	6.33	740.46	706.22	224.05	0.89	-0.81	2.72
Scientific Drilling	9/7/2010	5,603.00	5,524.37	7.12	5.10	752.45	718.33	225.26	0.24	-0.19	-1.27
Scientific Drilling	9/7/2010	5,700.00	5,620.61	7.30	12.48	764.51	730.34	227.13	0.97	0.19	7.61
Scientific Drilling	9/8/2010	5,797.00	5,716.65	8.79	11.95	778.06	743.61	229.99	1.54	1.54	-0.55
Scientific Drilling	9/8/2010	5,848.00	5,766.91	10.73	9.67	786.68	752.10	231.60	3.88	3.80	-4.47
Scientific Drilling	9/11/2010	→ 5,989.00	5,905.39	10.99	6.51	813.00	778.39	235.33	0.46	0.18	-2.24
Scientific Drilling	9/11/2010	6,044.00	5,959.40	10.73	10.46	823.28	788.64	236.85	1.43	-0.47	7.18
Scientific Drilling	9/11/2010	6,141.00	6,054.75	10.46	4.92	840.93	806.29	239.25	1.09	-0.28	-5.71
Scientific Drilling	9/11/2010	6,238.00	6,150.30	9.41	3.96	857.35	822.97	240.55	1.10	-1.08	-0.99
Scientific Drilling	9/11/2010	6,335.00	6,246.02	9.23	3.61	872.72	838.65	241.59	0.19	-0.19	-0.36
Scientific Drilling	9/11/2010	6,433.00	6,342.77	9.06	2.73	887.93	854.20	242.45	0.22	-0.17	-0.90
Scientific Drilling	9/11/2010	6,531.00	6,439.58	8.79	2.37	902.74	869.39	243.13	0.28	-0.28	-0.37
Scientific Drilling	9/11/2010	6,542.00	6,450.45	8.88	2.02	904.39	871.08	243.19	0.95	0.82	-3.18