

30-015-37518

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A Gyrodata Directional Survey

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for

CHESAPEAKE OPERATING

Lease: P.L.U. Pierce Canyon 12 FED Well: # 1H, 4.5" Drillpipe

Location: Latshaw # 6, Eddy County, New Mexico

Job Number: MD0210GBM138

Run Date: 25 Feb 2010

Surveyor: Ron Bellar

Calculation Method: MINIMUM CURVATURE

Survey surface coordinates obtained from: Directional Drilling Company

Survey Latitude: 32.225478 deg. N Longitude: 103.930194 deg. W

Azimuth Correction:

Gyro: -0.21000 deg to Grid North

Proposed Well Direction: 360.000 deg

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

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Job Number: MD0210GBM138

MEASURED IN C LAZIMUTH	DOGLEG	VERTICAL	CLOSURE	HORIZONTAL
DEPTH	SEVERITY	DEPTH	DIST. AZIMUTH	COORDINATES
feet	deg.	deg.	feet deg.	feet
		deg./ 100 ft.		
0.00	0.00	0.00	0.0 0.0	0.00 N 0.00 E

0 - 8234 FT. RATE-GYROSCOPIC MULTISHOT SURVEY RUN INSIDE 4.5" DRILLPIPE
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO LATSHAW # 6 R.K.B. HT. OF 25 FT.

109.96	0.33	181.30	0.30	109.96	0.3	181.3	0.32 S	0.01 W
209.96	0.21	203.65	0.16	209.96	0.8	186.4	0.77 S	0.09 W
309.96	0.32	273.43	0.32	309.96	1.0	205.4	0.92 S	0.44 W
409.96	1.02	205.86	0.95	409.95	2.0	212.9	1.71 S	1.11 W
509.96	1.42	194.88	0.46	509.93	4.1	206.1	3.71 S	1.81 W
609.96	0.90	220.76	0.73	609.91	6.1	205.7	5.50 S	2.64 W
705.30	0.86	237.29	0.27	705.24	7.5	210.1	6.45 S	3.73 W
799.24	0.86	239.73	0.04	799.17	8.7	214.5	7.19 S	4.94 W
895.04	0.83	242.50	0.05	894.96	10.0	218.1	7.87 S	6.17 W
991.00	0.80	241.03	0.04	990.91	11.3	220.9	8.52 S	7.38 W
1086.95	0.80	240.88	0.00	1086.85	12.5	223.0	9.17 S	8.55 W
1181.86	0.80	237.55	0.05	1181.75	13.8	224.5	9.85 S	9.68 W
1277.31	0.81	235.23	0.04	1277.19	15.1	225.6	10.59 S	10.80 W
1372.75	0.83	228.40	0.10	1372.62	16.5	226.1	11.43 S	11.87 W
1468.35	0.83	222.12	0.10	1468.21	17.9	226.0	12.40 S	12.85 W
1563.97	0.85	221.49	0.02	1563.82	19.3	225.7	13.45 S	13.79 W
1659.28	0.38	241.96	0.54	1659.12	20.3	225.8	14.13 S	14.54 W
1754.82	0.44	8.45	0.77	1754.66	20.3	226.7	13.91 S	14.76 W
1850.65	0.70	25.64	0.32	1850.49	19.5	228.0	13.02 S	14.45 W
1946.45	0.78	25.10	0.08	1946.28	18.3	229.5	11.90 S	13.92 W
2042.16	0.62	1.72	0.34	2041.98	17.4	231.6	10.80 S	13.63 W
2137.41	0.65	345.04	0.20	2137.23	16.9	234.6	9.76 S	13.76 W
2233.05	0.70	336.86	0.11	2232.86	16.6	238.4	8.70 S	14.13 W
2328.49	0.76	333.76	0.08	2328.29	16.5	242.6	7.59 S	14.64 W
2423.95	0.78	338.21	0.07	2423.74	16.5	247.0	6.42 S	15.16 W
2519.48	0.75	349.80	0.16	2519.26	16.4	251.5	5.20 S	15.51 W
2614.81	0.64	47.91	0.72	2614.59	15.8	254.5	4.23 S	15.22 W
2709.96	1.15	97.93	0.93	2709.73	14.5	253.9	4.01 S	13.88 W
2805.60	1.43	108.39	0.38	2805.34	12.6	249.1	4.52 S	11.80 W
2901.22	1.66	117.78	0.36	2900.93	10.9	239.6	5.54 S	9.44 W

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Lease: P.L.U. Pierce Canyon 12 FED Well: # 1H, 4.5" Drillpipe

Location: Latshaw # 6, Eddy County, New Mexico

Job Number: MD0210GBM138

MEASURED IN CLAZIMUTH			DOGLEG VERTICAL		CLOSURE		HORIZONTAL	
DEPTH			SEVERITY	DEPTH	DIST.	AZIMUTH	COORDINATES	
feet	deg.	deg.	deg./ 100 ft.	feet	feet	deg.	feet	
2996.84	1.76	126.71	0.30	2996.51	10.0	224.9	7.06 S	7.04 W
3092.12	1.88	133.81	0.27	3091.74	10.2	207.7	9.02 S	4.74 W
3187.40	1.50	136.37	0.41	3186.98	11.3	194.0	11.00 S	2.75 W
3282.36	0.87	142.12	0.67	3281.92	12.6	186.6	12.47 S	1.45 W
3378.04	0.72	151.67	0.21	3377.59	13.6	183.0	13.57 S	0.72 W
3473.52	0.64	157.83	0.11	3473.06	14.6	180.9	14.60 S	0.23 W
3569.32	0.68	161.01	0.06	3568.85	15.6	179.4	15.63 S	0.15 E
3760.03	0.53	186.24	0.16	3759.55	17.6	178.6	17.58 S	0.42 E
3855.69	0.42	186.85	0.12	3855.21	18.4	179.0	18.36 S	0.33 E
3950.57	0.47	165.79	0.18	3950.09	19.1	178.8	19.09 S	0.39 E
4045.82	0.52	155.70	0.11	4045.33	19.9	178.1	19.86 S	0.66 E
4141.22	0.61	147.22	0.13	4140.73	20.7	176.9	20.68 S	1.12 E
4236.19	0.54	150.47	0.08	4235.69	21.6	175.7	21.50 S	1.61 E
4331.63	0.47	156.56	0.09	4331.13	22.3	174.9	22.25 S	1.99 E
4427.28	0.46	157.71	0.01	4426.78	23.1	174.3	22.96 S	2.29 E
4522.77	0.34	158.39	0.13	4522.27	23.7	173.9	23.58 S	2.54 E
4618.28	0.34	151.91	0.04	4617.77	24.3	173.4	24.09 S	2.78 E
4713.80	0.27	143.97	0.09	4713.29	24.7	172.9	24.52 S	3.04 E
4809.25	0.15	158.45	0.14	4808.74	25.0	172.6	24.82 S	3.22 E
4904.54	0.17	191.92	0.10	4904.03	25.3	172.6	25.08 S	3.24 E
4999.74	0.20	214.24	0.08	4999.23	25.5	173.0	25.35 S	3.11 E
5094.99	0.28	214.64	0.08	5094.48	25.8	173.6	25.68 S	2.89 E
5190.49	0.34	197.87	0.11	5189.98	26.3	174.2	26.14 S	2.67 E
5285.77	0.41	170.58	0.20	5285.26	26.9	174.4	26.75 S	2.64 E
5381.51	0.53	165.49	0.13	5380.99	27.7	174.2	27.51 S	2.81 E
5476.09	0.54	163.77	0.02	5475.57	28.5	173.9	28.37 S	3.04 E
5571.20	0.45	173.59	0.13	5570.68	29.3	173.7	29.17 S	3.21 E
5666.81	0.33	177.65	0.13	5666.28	30.0	173.8	29.82 S	3.26 E
5762.19	0.34	171.35	0.04	5761.66	30.6	173.8	30.37 S	3.31 E
5857.50	0.42	187.28	0.14	5856.97	31.2	173.9	31.00 S	3.31 E
5952.49	0.40	184.58	0.03	5951.96	31.8	174.2	31.67 S	3.24 E
6047.62	0.41	145.83	0.28	6047.09	32.5	174.0	32.28 S	3.41 E
6143.13	0.44	127.67	0.14	6142.59	33.0	173.2	32.79 S	3.89 E
6238.81	0.53	126.24	0.10	6238.27	33.6	172.2	33.27 S	4.53 E
6334.31	0.58	132.68	0.08	6333.76	34.3	171.2	33.86 S	5.24 E

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Job Number: MD0210GBM138

MEASURED IN C LAZIMUTH			DOGLEG VERTICAL		CLOSURE		HORIZONTAL	
DEPTH			SEVERITY	DEPTH	DIST.	AZIMUTH	COORDINATES	
feet	deg.	deg.	deg./ 100 ft.	feet	feet	deg.	feet	
6429.60	0.48	145.19	0.16	6429.05	35.0	170.4	34.52 S	5.82 E
6525.43	0.55	163.06	0.18	6524.88	35.8	170.1	35.29 S	6.19 E
6621.15	0.60	169.86	0.09	6620.59	36.8	170.0	36.22 S	6.41 E
6715.61	0.76	157.57	0.23	6715.05	37.9	169.8	37.29 S	6.74 E
6809.76	1.05	154.06	0.31	6809.18	39.3	169.2	38.64 S	7.35 E
6904.17	0.98	171.66	0.34	6903.58	41.0	169.0	40.21 S	7.85 E
6998.35	0.97	184.35	0.23	6997.75	42.5	169.3	41.81 S	7.90 E
7092.41	0.69	201.60	0.40	7091.80	43.8	170.0	43.13 S	7.63 E
7186.42	0.45	239.80	0.46	7185.80	44.4	170.8	43.84 S	7.11 E
7280.63	0.57	261.53	0.24	7280.01	44.5	171.8	44.09 S	6.32 E
7374.86	0.66	260.61	0.10	7374.23	44.6	173.1	44.25 S	5.32 E
7468.99	0.50	230.59	0.36	7468.36	44.8	174.3	44.60 S	4.47 E
7562.83	0.72	196.77	0.44	7562.19	45.6	175.0	45.43 S	3.99 E
7656.94	1.17	230.89	0.75	7656.29	46.7	176.2	46.60 S	3.07 E
7750.92	2.16	203.57	1.32	7750.23	48.9	178.1	48.83 S	1.62 E
7845.02	1.92	214.93	0.50	7844.27	51.7	180.0	51.74 S	0.00 E
7938.95	1.73	234.96	0.70	7938.15	53.9	182.2	53.85 S	2.06 W
8032.90	2.42	247.96	0.88	8032.04	55.6	185.2	55.41 S	5.06 W
8126.82	2.17	251.04	0.30	8125.89	57.4	188.6	56.73 S	8.58 W
8189.38	2.02	242.05	0.58	8188.41	58.6	190.5	57.63 S	10.67 W
8234.38	1.90	241.29	0.27	8233.38	59.6	191.6	58.36 S	12.03 W

Final Station Closure: Distance: 59.59 ft Az: 191.64 deg.



Survey Report

MIN. CURVATURE CALCULATIONS (SPE-3362)

OPERATOR: Chesapeake
WELL: PLU Pierce Canyon 12 Fed#1H
LOCATION: Pierce Canyon

START: 2/28/2010
FINISH: 3/12/2010
JOB #: 2010007

PROPOSED DIRECTION: 336.10

MAGNETIC TO TRUE: 7.9

STATION NUMBER	SURVEY DEPTH	INC	AZMTH	TVD	N-S	E-W	VERT. SECTION	DLS/ 100
Tie-In	7469.00	0.50	230.59	7468.36	-44.61	4.48		
1	7507.00	2.60	334.90	7506.35	-43.93	3.99	-41.78	7.28
2	7539.00	8.30	339.40	7538.19	-41.11	2.86	-38.75	17.85
3	7570.00	14.60	339.20	7568.56	-35.36	0.69	-32.61	20.32
4	7601.00	20.70	338.80	7598.08	-26.59	-2.68	-23.22	19.68
5	7633.00	25.70	338.30	7627.49	-14.86	-7.30	-10.63	15.64
6	7664.00	29.70	337.50	7654.93	-1.52	-12.72	3.77	12.96
7	7695.00	33.80	336.80	7681.28	13.51	-19.06	20.07	13.28
8	7727.00	37.90	336.80	7707.22	30.73	-26.44	38.81	12.81
9	7758.00	41.80	337.80	7731.01	49.05	-34.10	58.66	12.75
10	7789.00	44.90	337.70	7753.55	68.75	-42.16	79.93	10.00
11	7821.00	48.00	336.60	7775.60	90.11	-51.17	103.12	10.00
12	7852.00	50.20	335.60	7795.89	111.53	-60.66	126.55	7.50
13	7884.00	52.00	334.20	7815.99	134.08	-71.23	151.44	6.57
14	7915.00	55.00	335.60	7834.42	156.65	-81.79	176.35	10.34
15	7946.00	58.30	336.80	7851.47	180.34	-92.24	202.24	11.13
16	7978.00	62.20	336.80	7867.34	205.87	-103.18	230.02	12.19
17	8009.00	66.30	336.80	7880.81	231.53	-114.18	257.93	13.23
18	8041.00	70.20	337.50	7892.66	258.91	-125.71	287.64	12.36
19	8072.00	74.20	337.50	7902.14	286.18	-137.01	317.15	12.90
20	8103.00	78.10	337.10	7909.56	313.94	-148.62	347.23	12.64
21	8135.00	81.90	337.00	7915.11	342.95	-160.91	378.74	11.88
22	8166.00	85.70	336.50	7918.46	371.26	-173.07	409.55	12.36
23	8260.00	91.10	335.30	7921.08	457.00	-211.43	503.47	5.88
24	8354.00	89.70	335.60	7920.43	542.50	-250.48	597.46	1.52
25	8448.00	90.40	335.70	7920.34	628.14	-289.24	691.46	0.75
26	8543.00	91.10	335.60	7919.10	714.68	-328.40	786.45	0.74
27	8636.00	90.40	336.70	7917.88	799.73	-366.00	879.44	1.40
28	8730.00	90.60	336.60	7917.06	886.03	-403.26	973.43	0.24
29	8824.00	90.20	337.20	7916.41	972.49	-440.14	1067.42	0.77
30	8919.00	90.50	337.30	7915.83	1060.09	-476.87	1162.40	0.33
31	9012.00	89.90	337.20	7915.50	1145.86	-512.84	1255.38	0.65
32	9106.00	90.50	337.60	7915.17	1232.64	-548.96	1349.35	0.77
33	9201.00	88.90	336.40	7915.67	1320.08	-586.08	1444.33	2.11
34	9295.00	89.30	336.30	7917.15	1406.17	-623.78	1538.32	0.44
35	9388.00	90.40	337.00	7917.39	1491.56	-660.64	1631.31	1.40
36	9483.00	88.50	336.40	7918.30	1578.80	-698.21	1726.30	2.10
37	9577.00	89.60	336.10	7919.86	1664.83	-736.06	1820.28	1.21
38	9670.00	89.80	335.60	7920.35	1749.69	-774.11	1913.28	0.58
39	9764.00	90.30	335.60	7920.27	1835.29	-812.94	2007.28	0.53
40	9858.00	91.30	335.70	7918.95	1920.92	-851.70	2101.26	1.07



Survey Report

MIN. CURVATURE CALCULATIONS (SPE-3362)

OPERATOR: Chesapeake
WELL: PLU Pierce Canyon 12 Fed#1H
LOCATION: Pierce Canyon

START: 2/28/2010
FINISH: 3/12/2010
JOB #: 2010007

PROPOSED DIRECTION: 336.10
MAGNETIC TO TRUE: 7.9

STATION NUMBER	SURVEY DEPTH	INC	AZMTH	TVD	N-S	E-W	VERT. SECTION	DLS/ 100
41	9952.00	90.60	335.70	7917.40	2006.58	-890.37	2195.25	0.74
42	10046.00	90.10	336.00	7916.82	2092.35	-928.83	2289.25	0.62
43	10140.00	89.90	336.30	7916.82	2178.32	-966.84	2383.25	0.38
44	10234.00	90.30	336.20	7916.66	2264.36	-1004.70	2477.24	0.44
45	10328.00	91.30	336.20	7915.34	2350.36	-1042.63	2571.23	1.06
46	10422.00	90.00	335.40	7914.28	2436.09	-1081.16	2665.22	1.62
47	10516.00	89.80	334.80	7914.44	2521.35	-1120.73	2759.21	0.67
48	10610.00	90.30	334.20	7914.36	2606.19	-1161.20	2853.17	0.83
49	10704.00	89.40	334.40	7914.61	2690.89	-1201.96	2947.12	0.98
50	10798.00	90.60	334.50	7914.61	2775.70	-1242.51	3041.08	1.28
51	10892.00	92.00	334.90	7912.47	2860.66	-1282.67	3135.03	1.55
52	10986.00	90.60	335.20	7910.34	2945.86	-1322.31	3228.99	1.52
53	11080.00	90.50	335.80	7909.44	3031.39	-1361.29	3322.98	0.65
54	11174.00	88.50	335.20	7910.26	3116.92	-1400.26	3416.96	2.22
55	11268.00	88.80	335.10	7912.47	3202.19	-1439.75	3510.92	0.34
56	11362.00	91.50	336.10	7912.23	3287.79	-1478.58	3604.91	3.06
57	11456.00	91.40	336.70	7909.85	3373.90	-1516.20	3698.88	0.65
58	11550.00	92.90	336.70	7906.32	3460.17	-1553.36	3792.80	1.60
59	11644.00	91.70	337.50	7902.55	3546.69	-1589.90	3886.71	1.53
60	11738.00	91.90	336.80	7899.60	3633.27	-1626.39	3980.65	0.77
61	11832.00	89.70	337.00	7898.29	3719.72	-1663.26	4074.62	2.35
62	11926.00	89.70	336.10	7898.78	3805.95	-1700.67	4168.62	0.96
63	12019.00	90.30	336.20	7898.78	3891.01	-1738.27	4261.62	0.65
64	12113.00	89.30	336.20	7899.11	3977.02	-1776.20	4355.62	1.06
65	12208.00	89.70	336.00	7899.93	4063.87	-1814.69	4450.61	0.47
66	12302.00	90.00	336.00	7900.18	4149.74	-1852.92	4544.61	0.32
67	12396.00	91.20	335.50	7899.20	4235.44	-1891.53	4638.60	1.38
68	12490.00	89.70	334.90	7898.46	4320.76	-1930.95	4732.59	1.72
69	12584.00	90.40	334.30	7898.38	4405.68	-1971.27	4826.55	0.98
70	12678.00	90.40	334.10	7897.72	4490.30	-2012.18	4920.50	0.21
71	12772.00	91.30	333.80	7896.33	4574.75	-2053.46	5014.42	1.01
72	12887.00	91.20	333.60	7893.82	4677.82	-2104.40	5129.29	0.19
PBHL	12934.00	91.20	333.60	7892.83	4719.91	-2125.29	5176.24	0.00