



Survey Calculation Program

Chesapeake Operating Inc.
 Craig Bessinger 8H
 Upshur Co, WV

M.W.D. OPERATOR: T. Parrilla/M. Layfield

DIRECTIONAL DRILLERS: A. Palmer/D. Cornell

Magnetic Declination: -9.01

Job #: 4378

97-3671

Minimum Curvature Calculation

Vertical Section 165.01

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/100
Tie-In	1830	0.66	125.82	1829.73	-15.57	22.42	20.83	0.00
1	1898	0.50	107.10	1897.73	-15.89	23.02	21.30	0.36
2	2025	0.60	131.00	2024.72	-16.49	24.05	22.15	0.20
3	2151	0.80	113.20	2150.71	-17.26	25.36	23.24	0.23
4	2279	0.80	119.40	2278.70	-18.06	26.96	24.41	0.07
5	2405	0.80	110.60	2404.69	-18.80	28.55	25.54	0.10
6	2529	0.80	117.90	2528.67	-19.51	30.12	26.63	0.08
7	2656	0.90	114.60	2655.66	-20.34	31.81	27.87	0.09
8	2782	0.90	109.90	2781.65	-21.09	33.64	29.07	0.06
9	2908	0.60	289.30	2907.64	-21.20	33.95	29.26	1.19
10	3031	2.50	300.30	3030.59	-19.64	31.03	26.99	1.56
11	3155	4.60	297.40	3154.35	-15.98	24.28	21.72	1.70
12	3281	6.40	297.50	3279.76	-10.42	13.56	13.57	1.43
13	3405	7.60	302.80	3402.84	-2.78	0.54	2.83	1.10
14	3529	7.40	300.60	3525.77	5.72	-13.23	-8.95	0.28
15	3653	6.70	297.40	3648.84	13.12	-26.52	-19.53	0.65
16	3779	7.30	301.80	3773.90	20.72	-39.85	-30.32	0.64
17	3906	6.30	299.80	3900.00	28.43	-52.76	-41.11	0.81
18	4031	6.60	304.70	4024.21	35.93	-64.61	-51.42	0.50
19	4156	7.70	306.80	4148.24	45.04	-77.23	-63.48	0.90
20	4283	7.00	304.20	4274.20	54.48	-90.44	-76.02	0.61
21	4407	7.40	301.20	4397.22	62.87	-103.52	-87.50	0.44
22	4531	6.60	297.70	4520.29	70.32	-116.66	-98.10	0.73
23	4657	7.00	302.20	4645.41	77.77	-129.57	-108.64	0.53
24	4783	7.80	302.40	4770.36	86.45	-143.28	-120.57	0.64
25	4909	6.80	299.70	4895.33	94.72	-156.98	-132.11	0.84
26	5035	6.80	300.00	5020.45	102.15	-169.92	-142.62	0.03
27	5160	7.40	300.80	5144.49	109.97	-183.25	-153.63	0.49
28	5286	8.10	285.50	5269.35	116.50	-198.77	-163.95	1.72
29	5413	7.20	295.50	5395.22	122.32	-214.58	-173.66	1.26
30	5538	5.70	310.40	5519.44	129.71	-226.38	-183.85	1.79
31	5664	6.70	307.00	5644.70	138.19	-237.01	-194.79	0.85
32	5787	6.20	302.90	5766.92	146.12	-248.32	-205.38	0.55
33	5911	6.20	310.70	5890.20	154.12	-259.02	-215.87	0.68
34	6034	6.10	306.20	6012.49	162.31	-269.33	-226.45	0.40
35	6157	7.10	309.20	6134.68	170.98	-280.49	-237.71	0.86
36	6281	8.40	305.70	6257.54	181.11	-293.79	-250.93	1.11
37	6405	6.60	298.00	6380.48	189.74	-307.43	-262.80	1.66



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Vertical Section 165.01

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/ 100
38	6533	6.30	304.30	6507.67	197.15	-319.73	-273.14	0.60
39	6653	7.80	298.40	6626.76	204.73	-332.33	-283.73	1.39
40	6702	8.50	294.30	6675.27	207.81	-338.56	-288.30	1.86
41	6734	6.80	270.70	6706.99	208.80	-342.61	-290.31	11.05
42	6765	7.00	231.80	6737.78	207.66	-345.93	-290.07	14.80
43	6797	8.40	200.30	6769.50	204.26	-348.28	-287.39	13.69
44	6829	9.10	190.40	6801.13	199.58	-349.54	-283.19	5.18
45	6861	11.40	191.10	6832.62	193.98	-350.61	-278.07	7.20
46	6893	14.20	181.00	6863.83	186.95	-351.29	-271.45	11.17
47	6924	17.60	176.20	6893.64	178.47	-351.04	-263.20	11.75
48	6954	20.40	174.10	6922.00	168.74	-350.21	-253.58	9.61
49	6986	23.30	171.70	6951.70	156.93	-348.72	-241.79	9.48
50	7017	26.30	168.70	6979.84	144.13	-346.49	-228.84	10.49
51	7048	29.80	166.90	7007.19	129.88	-343.39	-214.28	11.61
52	7079	33.20	164.50	7033.62	114.20	-339.38	-198.09	11.69
53	7110	36.80	163.50	7059.01	97.11	-334.47	-180.32	11.76
54	7141	39.00	165.40	7083.47	78.77	-329.38	-161.28	8.03
55	7172	40.70	165.40	7107.27	59.54	-324.37	-141.42	5.48
56	7203	43.60	165.40	7130.25	39.41	-319.12	-120.61	9.35
57	7234	47.30	163.70	7152.00	18.13	-313.23	-98.53	12.56
58	7265	51.00	163.10	7172.27	-4.34	-306.53	-75.09	12.02
59	7296	54.20	163.30	7191.10	-27.91	-299.41	-50.48	10.34
60	7327	57.70	164.50	7208.45	-52.59	-292.30	-24.81	11.74
61	7358	60.80	165.70	7224.30	-78.33	-285.45	1.83	10.54
62	7389	63.00	166.60	7238.90	-104.88	-278.91	29.17	7.54
63	7420	65.30	168.00	7252.42	-132.09	-272.78	57.04	8.46
64	7451	69.00	169.70	7264.45	-160.11	-267.26	85.54	12.96
65	7482	72.00	170.60	7274.80	-188.90	-262.27	114.64	10.06
66	7513	75.40	169.90	7283.50	-218.22	-257.23	144.26	11.18
67	7545	79.50	168.00	7290.45	-248.87	-251.24	175.42	14.06
68	7577	82.60	165.90	7295.43	-279.66	-244.10	207.00	11.66
69	7592	80.70	167.20	7297.61	-294.09	-240.65	221.84	15.30
70	7623	80.90	167.80	7302.56	-323.97	-234.02	252.41	2.02
71	7655	80.40	167.80	7307.76	-354.83	-227.35	283.95	1.56
72	7686	83.10	167.20	7312.21	-384.78	-220.71	314.60	8.92
73	7718	86.10	167.00	7315.22	-415.83	-213.60	346.43	9.40
74	7750	90.40	167.30	7316.20	-447.00	-206.49	378.38	13.47
75	7781	93.90	166.10	7315.04	-477.15	-199.36	409.34	11.93



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76	7845	94.20	164.20	7310.52	-538.85	-183.00	473.18	3.00
77	7909	90.90	163.20	7307.67	-600.21	-165.06	537.09	5.39
78	7972	90.40	161.90	7306.95	-660.30	-146.17	600.03	2.21
79	8036	92.70	164.10	7305.22	-721.48	-127.47	663.96	4.97
80	8099	90.40	162.20	7303.52	-781.74	-109.21	726.89	4.73
81	8162	90.20	163.80	7303.19	-841.99	-90.79	789.85	2.56
82	8289	88.90	164.80	7304.19	-964.24	-56.43	916.83	1.29
83	8416	91.40	165.70	7303.85	-1087.04	-24.10	1043.82	2.09
84	8543	92.20	164.50	7299.86	-1209.71	8.54	1170.75	1.14
85	8670	93.40	163.80	7293.66	-1331.73	43.18	1297.58	1.09
86	8797	92.70	162.90	7286.90	-1453.23	79.52	1424.35	0.90
87	8923	93.20	162.00	7280.42	-1573.21	117.46	1550.06	0.82
88	9049	91.00	164.50	7275.80	-1693.76	153.75	1675.89	2.64
89	9176	91.50	165.30	7273.03	-1816.35	186.82	1802.86	0.74
90	9303	91.70	166.20	7269.48	-1939.39	218.07	1929.80	0.73
91	9430	90.80	167.50	7266.71	-2063.03	246.96	2056.70	1.24
92	9557	91.10	167.40	7264.61	-2186.98	274.55	2183.57	0.25
93	9684	91.80	166.20	7261.39	-2310.58	303.54	2310.46	1.09
94	9812	92.60	167.40	7256.48	-2435.10	332.74	2438.30	1.13
95	9939	91.60	166.90	7251.83	-2558.84	360.97	2565.13	0.88
96	10066	91.20	168.90	7248.72	-2682.97	387.58	2691.92	1.61
97	10193	89.10	168.30	7248.39	-2807.46	412.68	2818.66	1.72
98	10319	89.80	169.60	7249.60	-2931.11	436.83	2944.36	1.17
99	10446	91.70	172.00	7247.94	-3056.45	457.13	3070.68	2.41
100	10573	90.00	171.00	7246.05	-3182.04	475.90	3196.85	1.55
101	10701	85.20	164.20	7251.42	-3306.83	503.33	3324.49	6.50
102	10828	85.50	160.40	7261.72	-3427.40	541.80	3450.91	2.99
103	10956	88.50	159.10	7268.42	-3547.31	586.04	3578.18	2.55
104	11083	91.10	161.20	7268.86	-3666.75	629.16	3704.70	2.63
105	11209	90.40	159.10	7267.21	-3785.24	671.94	3830.23	1.76
106	11335	92.30	161.10	7264.24	-3903.67	714.81	3955.72	2.19
107	11462	91.30	162.70	7260.25	-4024.32	754.25	4082.47	1.49
108	11589	93.70	164.80	7254.71	-4146.12	789.75	4209.30	2.51
109	11715	90.80	163.70	7249.77	-4267.28	823.92	4335.17	2.46
110	11842	94.60	166.70	7243.78	-4389.89	856.32	4461.99	3.81
111	11969	91.70	165.20	7236.81	-4512.89	887.10	4588.77	2.57
112	12096	90.60	166.10	7234.26	-4635.90	918.57	4715.73	1.12
113	12223	90.40	167.10	7233.15	-4759.43	948.00	4842.68	0.80
114	12350	91.10	165.40	7231.49	-4882.78	978.19	4969.63	1.45



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Vertical Section 165.01

No.	Survey Depth	INC	AZM	TVD	N-S	E-W	Vertical Section	DLS/ 100
115	12476	89.80	164.90	7230.50	-5004.56	1010.48	5095.62	1.11
116	12600	91.40	163.90	7229.20	-5123.98	1043.82	5219.60	1.52
117	12727	89.90	163.30	7227.76	-5245.80	1079.67	5346.55	1.27
118	12854	91.40	162.50	7226.32	-5367.18	1117.01	5473.45	1.34
119	12980	90.30	162.20	7224.45	-5487.23	1155.21	5599.30	0.90
120	13108	91.30	164.10	7222.66	-5609.72	1192.31	5727.22	1.68
121	13234	90.40	163.60	7220.79	-5730.73	1227.35	5853.17	0.82
122	13361	91.80	163.70	7218.35	-5852.57	1263.09	5980.11	1.11
123	13488	91.10	161.90	7215.14	-5973.84	1300.64	6106.97	1.52
124	13540	89.70	160.80	7214.78	-6023.11	1317.26	6158.86	3.42
PTB	13582	89.70	160.80	7215.00	-6062.77	1331.08	6200.75	0.00