



Job Number: SVPA-140131
 Company: Chesapeake Appalachia, LLC.
 Lease/Well: James Messenger Wtz 3HU (API 4710302973) Grd: West To Grid North
 Location: Wetzel County, WV
 Rig Name: Normac #337
 RKB: 22'
 G.L. or M.S.L.: GL
 State/Country: West Virginia/USA
 Declination: -8.65°
 File name: S:\2014SU-1\CHEAP-1\PA\JAMESM-13HU.SVY
 Date/Time: 17-Apr-14 / 12:55
 Curve Name: Surface - 768' M.D. (SRG)

MS SURVEY

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 311.04
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

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 Environmental Protection

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	CLOSURE			Vertical Section FT	Distance FT	Direction Deg	Dogleg Severity Deg/100
				N-S FT	E-W FT	Vertical Section FT				
00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
100.00	.43	20.23	100.00	.35	.13	.13	.38	20.23	.43	
200.00	.56	342.04	200.00	1.17	.11	.69	1.17	5.32	.35	
300.00	.47	344.10	299.99	2.03	-.15	1.45	2.03	355.65	.09	
400.00	.17	250.07	399.99	2.37	-.41	1.86	2.41	350.29	.51	
500.00	.57	301.22	499.99	2.58	-.97	2.43	2.76	339.37	.48	
600.00	.73	350.43	599.98	3.47	-1.50	3.41	3.78	336.56	.56	
700.00	.41	321.70	699.98	4.37	-1.83	4.25	4.74	337.30	.42	
Last Survey Depth Recorded				4.62	-2.01	4.55	5.04	336.48	.46	
768.00	.10	330.99	767.98	4.62	-2.01	4.55	5.04	336.48	.46	



Weatherford®

SURVEY REPORT

Report Date: 6/13/2014
 Customer: Chesapeake
 Job Name: 4032549
 Well Name: James Messenger WTZ 3H

Field: Utica
 Rig: Nomac 337
 Rig Loc: Wetzel County, WV

Survey Calculation Method:		Minimum Curvature				
Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
Grid North	311.50 deg	52570 nT	66.90 deg	-8.65 deg	-0.76 deg	-7.89 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	10400.00 ft	4.34 deg	31.75 deg	10395.63 ft	-17.17 ft	-96.26 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)			
10432.00	4.75	39.36	10427.53	-15.12	-94.78	60.97	2.28	
10509.00	7.07	46.69	10504.12	-9.40	-89.31	60.66	3.16	
10604.00	7.98	39.58	10598.30	-0.31	-80.86	60.35	1.37	
10698.00	9.32	35.56	10691.23	10.92	-72.27	61.36	1.56	
10794.00	7.76	31.56	10786.16	22.76	-64.36	63.28	1.74	
10825.00	7.62	29.98	10816.88	26.33	-62.24	64.06	0.82	
10889.00	6.58	24.22	10880.39	33.35	-58.61	65.99	1.97	
10985.00	5.54	19.65	10975.86	42.73	-54.80	69.35	1.19	
11079.00	4.29	13.38	11069.51	50.42	-52.46	72.70	1.45	
11173.00	2.87	0.01	11163.32	56.19	-51.64	75.91	1.74	
11268.00	1.21	343.69	11258.26	59.54	-51.92	78.34	1.83	
11362.00	0.64	268.87	11352.25	60.48	-52.73	79.56	1.29	
11456.00	0.85	292.19	11446.24	60.73	-53.90	80.61	0.39	
11551.00	1.36	297.26	11541.23	61.51	-55.55	82.37	0.55	
11645.00	1.67	292.96	11635.19	62.56	-57.81	84.75	0.35	
11677.00	1.67	286.61	11667.18	62.87	-58.68	85.61	0.58	
11713.00	1.85	281.21	11703.16	63.14	-59.75	86.59	0.68	
11744.00	2.11	279.16	11734.14	63.32	-60.81	87.50	0.87	
11775.00	2.33	292.15	11765.12	63.65	-61.96	88.58	1.77	
11807.00	3.19	308.00	11797.08	64.45	-63.26	90.08	3.57	
11823.00	3.88	310.12	11813.05	65.07	-64.02	91.07	4.39	
11834.00	4.29	311.81	11824.03	65.58	-64.62	91.85	3.88	
11865.00	6.12	311.52	11854.90	67.45	-66.72	94.66	5.90	
11897.00	10.39	304.82	11886.56	70.23	-70.36	99.24	13.66	
11929.00	17.20	299.74	11917.62	74.23	-76.85	106.74	21.60	
11960.00	25.32	296.04	11946.48	79.42	-86.80	117.64	26.54	
11992.00	33.10	294.77	11974.39	86.10	-100.91	132.63	24.39	
12024.00	36.22	294.05	12000.71	93.62	-117.48	150.02	9.83	
12054.00	37.28	293.96	12024.75	100.92	-133.87	167.14	3.54	
12086.00	38.65	292.37	12049.98	108.66	-151.97	185.82	5.26	
12117.00	40.44	291.37	12073.88	116.01	-170.29	204.41	6.13	
12149.00	40.95	290.71	12098.14	123.50	-189.76	223.96	2.09	
12181.00	40.14	290.49	12122.46	130.81	-209.24	243.39	2.57	
12212.00	39.51	289.85	12146.27	137.66	-227.87	261.88	2.42	
12243.00	41.19	289.48	12169.89	144.41	-246.77	280.51	5.47	
12274.00	43.32	289.98	12192.84	151.45	-266.39	299.87	6.96	
12305.00	48.94	293.37	12214.32	159.73	-287.13	320.89	19.76	
12337.00	56.03	296.93	12233.79	170.54	-310.07	345.23	23.84	
12368.00	62.63	299.69	12249.60	183.20	-333.52	371.18	22.62	

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
12400.00	67.72	302.09	12263.03	198.11	-358.43	399.72	17.30
12431.00	69.69	304.07	12274.29	213.88	-382.62	428.29	8.71
12463.00	71.54	305.09	12284.91	231.01	-407.47	458.25	6.52
12494.00	74.89	306.87	12293.86	248.45	-431.48	487.79	12.12
12525.00	77.64	307.84	12301.22	266.72	-455.42	517.82	9.38
12557.00	81.42	309.57	12307.04	286.39	-479.97	549.24	12.95
12588.00	83.90	310.67	12311.00	306.20	-503.48	579.98	8.74
12620.00	86.43	311.53	12313.70	327.16	-527.50	611.86	8.35
12651.00	88.88	311.89	12314.96	347.77	-550.62	642.83	7.99
12682.00	89.79	312.04	12315.32	368.50	-573.67	673.83	2.98
12776.00	89.86	312.32	12315.61	431.61	-643.33	767.82	0.31
12870.00	90.42	313.57	12315.38	495.65	-712.13	861.79	1.46
12964.00	92.38	317.29	12313.08	562.58	-778.07	955.52	4.47
13058.00	90.14	316.75	12311.02	631.33	-842.13	1049.05	2.45
13152.00	90.14	317.59	12310.79	700.27	-906.03	1142.59	0.89
13246.00	89.65	316.92	12310.96	769.30	-969.84	1236.12	0.88
13340.00	89.02	313.64	12312.05	836.08	-1035.96	1329.89	3.55
13434.00	90.84	313.30	12312.17	900.74	-1104.18	1423.83	1.97
13529.00	91.12	312.41	12310.54	965.35	-1173.81	1518.79	0.98
13623.00	91.75	313.89	12308.19	1029.61	-1242.37	1612.72	1.71
13717.00	91.82	313.42	12305.26	1094.47	-1310.34	1706.61	0.51
13810.00	91.61	311.94	12302.48	1157.49	-1378.68	1799.54	1.61
13905.00	91.82	311.77	12299.63	1220.85	-1449.41	1894.50	0.28
13999.00	90.77	309.64	12297.51	1282.13	-1520.64	1988.46	2.53
14094.00	91.54	308.72	12295.59	1342.13	-1594.27	2083.36	1.26
14190.00	93.08	310.15	12291.72	1403.06	-1668.35	2179.21	2.19
14284.00	90.35	305.63	12288.91	1460.74	-1742.48	2272.95	5.62
14378.00	91.82	308.99	12287.13	1517.70	-1817.21	2366.67	3.90
14473.00	90.98	311.79	12284.81	1579.23	-1889.54	2461.61	3.08
14567.00	91.54	311.91	12282.74	1641.93	-1959.54	2555.59	0.61
14660.00	91.33	311.09	12280.41	1703.53	-2029.17	2648.56	0.91
14754.00	90.84	311.83	12278.63	1765.76	-2099.61	2742.54	0.94
14850.00	92.59	312.31	12275.76	1830.05	-2170.84	2838.49	1.89
14946.00	95.25	313.21	12269.20	1895.07	-2241.15	2934.23	2.92
15041.00	94.90	313.38	12260.79	1959.96	-2310.02	3028.81	0.41
15135.00	93.43	313.50	12253.96	2024.42	-2378.09	3122.51	1.57
15229.00	92.94	313.25	12248.74	2088.88	-2446.31	3216.31	0.59
15324.00	92.45	313.88	12244.28	2154.28	-2515.07	3311.14	0.84
15418.00	92.17	313.86	12240.49	2219.37	-2582.78	3404.99	0.30
15512.00	91.68	313.87	12237.33	2284.47	-2650.52	3498.85	0.52
15607.00	90.00	312.36	12235.94	2349.39	-2719.85	3593.80	2.38
15701.00	90.07	312.37	12235.88	2412.73	-2789.31	3687.79	0.08
15796.00	89.51	312.49	12236.23	2476.82	-2859.42	3782.78	0.60
15891.00	90.21	312.72	12236.46	2541.13	-2929.35	3877.76	0.78
15986.00	89.51	311.78	12236.69	2605.01	-2999.67	3972.75	1.23
16080.00	92.31	316.77	12235.20	2670.59	-3066.94	4066.59	6.09
16174.00	91.54	315.87	12232.04	2738.53	-3131.82	4160.20	1.26
16269.00	90.70	314.86	12230.18	2806.12	-3198.55	4254.96	1.38
16364.00	89.86	312.82	12229.72	2871.92	-3267.06	4349.88	2.32
16459.00	89.93	312.45	12229.89	2936.26	-3336.95	4444.86	0.40
16554.00	89.93	314.13	12230.01	3001.40	-3406.10	4539.81	1.77
16648.00	92.03	316.11	12228.40	3067.99	-3472.41	4633.60	3.07
16742.00	91.19	308.30	12225.76	3131.06	-3541.96	4727.48	8.35

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
16836.00	90.91	298.19	12224.03	3182.52	-3620.46	4820.37	10.76
16929.00	90.77	290.89	12222.66	3221.11	-3705.00	4909.25	7.85
17024.00	90.84	285.28	12221.33	3250.59	-3795.26	4996.39	5.91
17119.00	91.33	285.40	12219.53	3275.72	-3886.86	5081.64	0.53
17150.00	91.33	285.47	12218.81	3283.97	-3916.73	5109.48	0.23
17181.00	90.77	288.93	12218.24	3293.13	-3946.33	5137.72	11.30
17212.00	91.26	296.64	12217.69	3305.12	-3974.89	5167.06	24.92
17306.00	91.05	302.62	12215.79	3351.57	-4056.54	5258.99	6.36
17400.00	90.77	294.81	12214.30	3396.69	-4138.91	5350.57	8.31
17494.00	91.47	303.62	12212.46	3442.51	-4220.86	5442.31	9.40
17588.00	91.33	297.01	12210.16	3489.92	-4301.93	5534.45	7.03
17683.00	91.05	309.77	12208.18	3542.08	-4381.07	5628.28	13.43
17777.00	90.70	307.45	12206.74	3600.73	-4454.51	5722.15	2.50
17872.00	91.26	311.33	12205.12	3661.00	-4527.91	5817.05	4.13
17966.00	90.35	317.17	12203.80	3726.55	-4595.20	5910.89	6.29
18060.00	86.14	319.56	12206.67	3796.75	-4657.61	6004.15	5.15
18156.00	89.23	322.98	12210.55	3871.56	-4717.60	6098.65	4.80
18249.00	89.02	324.89	12211.97	3946.73	-4772.34	6189.45	2.07
18344.00	88.81	325.49	12213.77	4024.71	-4826.56	6281.74	0.67
18442.00	88.60	325.28	12215.99	4105.34	-4882.22	6376.85	0.30
Projected to Total Depth:							
18509.00	88.60	325.28	12217.62	4160.40	-4920.37	6441.90	0.00

Vertical Section is 6441.90 ft along the target direction of 311.50 deg at a measured depth of 18509.00 ft.
Horizontal Displacement is 6443.52 ft along the well bore azimuth of 310.22 deg.
The total correction is -7.89 deg relative to Grid North.

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