

M G T  
Azimuths to Grid North  
True North: 0.68°  
Magnetic North: -8.16°  
Magnetic Field  
Strength: 52995.5nT  
Dip Angle: 67.75°  
Date: 9/20/2012  
Model: IGRF2010

DESIGN TARGET DETAILS			
Ground Level:	1140.0	Latitude	38° 32' 7.066 W
+N/S	+E/W	Northing	1711305.58
0.0	0.0	Easting	40° 19' 15.478 N
0.0	0.0	664929.26	80° 32' 7.066 W

Name: WV DNR A BRK 8H PBHL  
TVD: 5702.4  
- actual wellpath misses target center by 49.1 usft at 9746.0 usft MD (5756.1 TVD, -3784.2 N, 2010.4 E)

Vertical Section at 152.00° (1500 usft/in)

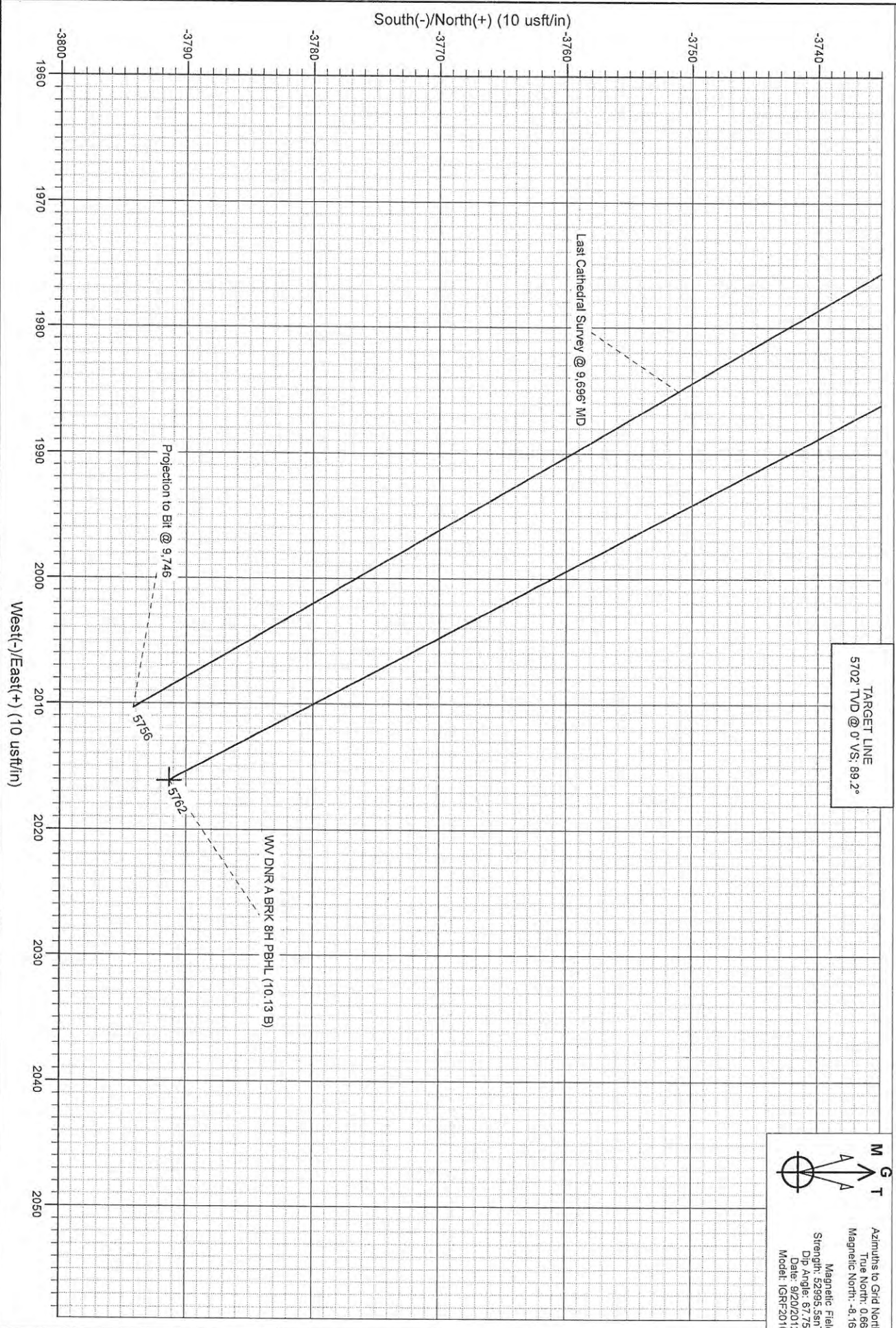
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WV GEOLOGICAL SURVEY  
MORGANTOWN, WV



Project: Brooke County, WV  
 Site: State of WV DNR  
 Well: State of WV DNR A BRK 8H  
 Wellbore: HZ  
 Design: HZ



**M G T**

Azimuths to Grid North  
 True North: 0.66°  
 Magnetic North: -8.16°

Magnetic Field  
 Strength: 52995.5nT  
 Dip Angle: 67.75°  
 Date: 9/20/2012  
 Model: IGRF2010

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WV GEOLOGICAL SURVEY  
 MORGANTOWN, WV

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well State of WV DNR A BRK 8H
<b>Project:</b>	Brooke County, WV	<b>TVD Reference:</b>	WELL @ 1158.0usft (Original Well Elev)
<b>Site:</b>	State of WV DNR	<b>MD Reference:</b>	WELL @ 1158.0usft (Original Well Elev)
<b>Well:</b>	State of WV DNR A BRK 8H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Brooke County, WV		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	West Virginia North 4701		Using geodetic scale factor

<b>Site</b>	State of WV DNR		
<b>Site Position:</b>		<b>Northing:</b>	664,929.27 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,711,305.58 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"
		<b>Latitude:</b>	40° 19' 15.478 N
		<b>Longitude:</b>	80° 32' 7.066 W
		<b>Grid Convergence:</b>	-0.66 °

<b>Well</b>	State of WV DNR A BRK 8H		
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b> 664,929.26 usft
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b> 1,711,305.58 usft
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	usft
		<b>Latitude:</b>	40° 19' 15.478 N
		<b>Longitude:</b>	80° 32' 7.066 W
		<b>Ground Level:</b>	1,140.0 usft

<b>Wellbore</b>	HZ		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>
	IGRF2010	9/20/2012	(°)
			-8.82
			<b>Dip Angle</b>
			(°)
			67.75
			<b>Field Strength</b>
			(nT)
			52,995

<b>Design</b>	HZ		
<b>Audit Notes:</b>			
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL
		<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			<b>Direction</b>
			(°)
			152.00

<b>Survey Program</b>	Date 10/14/2012		
<b>From</b>	<b>To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
(usft)	(usft)		
100.0	5,041.0	Gyro (HZ)	MWD
5,052.0	9,746.0	Survey #2 (HZ)	MWD
			<b>Description</b>
			Geolink MWD
			Geolink MWD

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.21	3.27	100.0	0.2	0.0	-0.2	0.21	0.21	
200.0	0.30	328.54	200.0	0.6	-0.1	-0.6	0.17	0.09	
300.0	0.02	334.73	300.0	0.8	-0.3	-0.9	0.28	-0.28	
400.0	0.16	341.61	400.0	1.0	-0.3	-1.0	0.14	0.14	
500.0	0.29	344.83	500.0	1.4	-0.4	-1.4	0.13	0.13	
600.0	0.08	353.68	600.0	1.7	-0.5	-1.7	0.21	-0.21	
700.0	0.15	98.51	700.0	1.7	-0.4	-1.7	0.19	0.07	
800.0	0.27	164.16	800.0	1.5	-0.2	-1.4	0.25	0.12	
900.0	0.11	145.61	900.0	1.2	-0.1	-1.1	0.17	-0.16	
1,000.0	0.43	139.56	1,000.0	0.8	0.2	-0.6	0.32	0.32	
1,100.0	0.30	149.17	1,100.0	0.3	0.6	0.0	0.14	-0.13	

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WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well State of WV DNR A BRK 8H
<b>Project:</b>	Brooke County, WV	<b>TVD Reference:</b>	WELL @ 1158.0usft (Original Well Elev)
<b>Site:</b>	State of WV DNR	<b>MD Reference:</b>	WELL @ 1158.0usft (Original Well Elev)
<b>Well:</b>	State of WV DNR A BRK 8H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,200.0	0.14	142.94	1,200.0	0.0	0.8	0.4	0.16	-0.16	
1,300.0	0.24	162.45	1,300.0	-0.3	1.0	0.7	0.12	0.10	
1,400.0	0.09	207.40	1,400.0	-0.6	1.0	1.0	0.19	-0.15	
1,500.0	0.39	224.50	1,500.0	-0.9	0.7	1.1	0.31	0.30	
1,600.0	0.23	252.08	1,600.0	-1.2	0.3	1.2	0.21	-0.16	
1,700.0	0.46	268.68	1,700.0	-1.3	-0.3	1.0	0.25	0.23	
1,800.0	0.40	282.62	1,800.0	-1.2	-1.1	0.6	0.12	-0.06	
1,900.0	0.46	320.45	1,900.0	-0.8	-1.6	0.0	0.28	0.06	
2,000.0	0.47	329.99	2,000.0	-0.2	-2.1	-0.8	0.08	0.01	
2,100.0	0.42	332.27	2,100.0	0.5	-2.5	-1.6	0.05	-0.05	
2,200.0	0.45	331.17	2,200.0	1.2	-2.8	-2.4	0.03	0.03	
2,300.0	0.42	330.97	2,300.0	1.8	-3.2	-3.1	0.03	-0.03	
2,400.0	0.58	357.37	2,400.0	2.7	-3.4	-4.0	0.28	0.16	
2,500.0	0.53	353.82	2,500.0	3.6	-3.5	-4.8	0.06	-0.05	
2,600.0	0.61	350.53	2,600.0	4.6	-3.6	-5.8	0.09	0.08	
2,700.0	0.59	354.86	2,699.9	5.7	-3.8	-6.8	0.05	-0.02	
2,800.0	0.59	351.49	2,799.9	6.7	-3.9	-7.7	0.03	0.00	
2,900.0	0.69	354.22	2,899.9	7.8	-4.0	-8.8	0.10	0.10	
3,000.0	0.52	356.76	2,999.9	8.8	-4.1	-9.7	0.17	-0.17	
3,100.0	0.60	349.64	3,099.9	9.8	-4.2	-10.6	0.11	0.08	
3,200.0	0.45	341.02	3,199.9	10.7	-4.4	-11.5	0.17	-0.15	
3,300.0	0.38	342.46	3,299.9	11.4	-4.7	-12.2	0.07	-0.07	
3,400.0	0.34	358.32	3,399.9	12.0	-4.8	-12.8	0.11	-0.04	
3,500.0	0.33	356.34	3,499.9	12.6	-4.8	-13.4	0.02	-0.01	
3,600.0	0.52	351.62	3,599.9	13.3	-4.9	-14.1	0.19	0.19	
3,700.0	0.36	340.08	3,699.9	14.1	-5.1	-14.8	0.18	-0.16	
3,800.0	0.60	343.46	3,799.9	14.9	-5.3	-15.6	0.24	0.24	
3,900.0	0.66	347.59	3,899.9	15.9	-5.6	-16.7	0.08	0.06	
4,000.0	0.50	334.32	3,999.9	16.9	-5.9	-17.7	0.21	-0.16	
4,100.0	0.24	330.36	4,099.9	17.5	-6.2	-18.3	0.26	-0.26	
4,200.0	0.30	326.44	4,199.9	17.9	-6.4	-18.8	0.06	0.06	
4,300.0	1.03	311.61	4,299.9	18.7	-7.3	-19.9	0.74	0.73	
4,400.0	0.92	312.84	4,399.9	19.8	-8.5	-21.5	0.11	-0.11	
4,500.0	0.74	329.31	4,499.9	20.9	-9.4	-22.9	0.30	-0.18	
4,600.0	0.58	336.03	4,599.8	21.9	-10.0	-24.0	0.18	-0.16	
4,700.0	0.50	337.72	4,699.8	22.8	-10.4	-25.0	0.08	-0.08	
4,800.0	0.48	335.70	4,799.8	23.6	-10.7	-25.8	0.03	-0.02	
4,900.0	0.24	338.30	4,899.8	24.2	-10.9	-26.5	0.24	-0.24	
5,000.0	0.12	101.12	4,999.8	24.3	-10.9	-26.6	0.32	-0.12	
5,041.0	0.17	101.15	5,040.8	24.3	-10.8	-26.5	0.12	0.12	Last Gyro Survey @ 5041' MD
5,052.0	0.30	110.30	5,051.8	24.3	-10.8	-26.5	1.23	1.18	
5,083.0	0.30	59.30	5,082.8	24.3	-10.6	-26.5	0.83	0.00	
5,114.0	2.40	113.30	5,113.8	24.1	-10.0	-25.9	7.22	6.77	
5,146.0	4.60	126.70	5,145.8	23.1	-8.3	-24.3	7.29	6.87	
5,177.0	7.50	134.60	5,176.6	20.9	-5.9	-21.2	9.71	9.35	
5,208.0	11.50	146.60	5,207.2	16.9	-2.7	-16.2	14.33	12.90	
5,238.0	16.00	152.20	5,236.3	10.7	0.8	-9.1	15.63	15.00	
5,270.0	19.60	149.30	5,266.8	2.2	5.6	0.7	11.58	11.25	
5,301.0	23.60	148.80	5,295.6	-7.6	11.5	12.1	12.92	12.90	
5,332.0	26.40	149.50	5,323.7	-18.8	18.2	25.2	9.08	9.03	
5,364.0	29.00	152.50	5,352.0	-31.8	25.4	40.0	9.22	8.12	
5,394.0	30.00	157.20	5,378.1	-45.2	31.7	54.8	8.40	3.33	
5,426.0	32.60	160.20	5,405.5	-60.7	37.7	71.3	9.47	8.12	

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# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well State of WV DNR A BRK 8H
<b>Project:</b>	Brooke County, WV	<b>TVD Reference:</b>	WELL @ 1158.0usft (Original Well Elev)
<b>Site:</b>	State of WV DNR	<b>MD Reference:</b>	WELL @ 1158.0usft (Original Well Elev)
<b>Well:</b>	State of WV DNR A BRK 8H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
5,457.0	36.70	159.80	5,431.0	-77.2	43.7	88.7	13.25	13.23	
5,488.0	41.00	160.60	5,455.1	-95.5	50.3	108.0	13.96	13.87	
5,520.0	44.50	160.10	5,478.6	-116.0	57.6	129.5	10.99	10.94	
5,552.0	46.50	159.10	5,501.0	-137.4	65.6	152.1	6.64	6.25	
5,583.0	47.40	158.70	5,522.2	-158.5	73.7	174.6	3.05	2.90	
5,614.0	50.00	156.70	5,542.6	-180.0	82.6	197.7	9.69	8.39	
5,646.0	53.40	155.50	5,562.5	-203.0	92.8	222.8	11.02	10.62	
5,677.0	57.00	153.10	5,580.2	-225.9	103.8	248.2	13.24	11.61	
5,709.0	60.50	152.20	5,596.8	-250.2	116.4	275.6	11.20	10.94	
5,741.0	63.60	150.00	5,611.8	-275.0	130.0	303.8	11.43	9.69	
5,772.0	66.60	149.90	5,624.8	-299.3	144.1	331.9	9.68	9.68	
5,804.0	70.30	149.70	5,636.6	-325.0	159.1	361.7	11.58	11.56	
5,836.0	73.00	149.90	5,646.6	-351.3	174.4	392.0	8.46	8.44	
5,868.0	74.90	149.80	5,655.5	-377.9	189.8	422.7	5.95	5.94	
5,899.0	76.60	149.40	5,663.1	-403.8	205.0	452.8	5.62	5.48	
5,931.0	79.20	148.90	5,669.8	-430.6	221.1	484.0	8.27	8.12	
5,963.0	81.00	148.60	5,675.3	-457.6	237.4	515.5	5.70	5.62	
5,994.0	81.60	148.40	5,680.0	-483.7	253.4	546.1	2.04	1.94	
6,024.0	81.90	148.70	5,684.3	-509.0	268.9	575.7	1.41	1.00	
6,055.0	82.60	148.50	5,688.5	-535.2	284.9	606.4	2.35	2.26	
6,086.0	83.40	149.20	5,692.3	-561.6	300.8	637.1	3.42	2.58	
6,118.0	83.70	149.30	5,695.9	-588.9	317.1	668.8	0.99	0.94	
6,150.0	83.40	150.80	5,699.5	-616.5	333.0	700.6	4.75	-0.94	
6,181.0	84.00	151.90	5,702.9	-643.5	347.7	731.4	4.02	1.94	
6,211.0	84.10	153.20	5,706.0	-670.0	361.5	761.3	4.32	0.33	
6,242.0	86.10	154.90	5,708.6	-697.7	375.0	792.1	8.45	6.45	
6,273.0	88.40	154.60	5,710.1	-725.7	388.2	823.1	7.48	7.42	
6,305.0	90.20	153.60	5,710.5	-754.5	402.2	855.0	6.43	5.62	
6,368.0	91.10	152.30	5,709.8	-810.6	430.8	918.0	2.51	1.43	
6,432.0	91.20	151.70	5,708.5	-867.1	460.9	982.0	0.95	0.16	
6,495.0	91.70	151.00	5,706.9	-922.4	491.1	1,045.0	1.37	0.79	
6,557.0	90.50	151.70	5,705.7	-976.8	520.8	1,107.0	2.24	-1.94	
6,619.0	89.60	152.90	5,705.7	-1,031.7	549.6	1,169.0	2.42	-1.45	
6,680.0	88.50	152.70	5,706.7	-1,085.9	577.5	1,229.9	1.83	-1.80	
6,742.0	86.30	152.10	5,709.5	-1,140.8	606.2	1,291.9	3.68	-3.55	
6,804.0	86.00	152.30	5,713.7	-1,195.5	635.0	1,353.7	0.58	-0.48	
6,866.0	87.70	151.50	5,717.1	-1,250.1	664.2	1,415.6	3.03	2.74	
6,928.0	88.30	151.70	5,719.2	-1,304.7	693.7	1,477.6	1.02	0.97	
6,990.0	88.50	152.10	5,721.0	-1,359.3	722.9	1,539.6	0.72	0.32	
7,052.0	87.10	151.50	5,723.3	-1,413.9	752.1	1,601.5	2.46	-2.26	
7,115.0	87.00	151.00	5,726.6	-1,469.1	782.4	1,664.4	0.81	-0.16	
7,178.0	87.10	151.50	5,729.8	-1,524.2	812.7	1,727.3	0.81	0.16	
7,240.0	87.40	151.40	5,732.8	-1,578.6	842.3	1,789.3	0.51	0.48	
7,302.0	87.90	151.00	5,735.3	-1,632.9	872.1	1,851.2	1.03	0.81	
7,365.0	88.50	151.70	5,737.3	-1,688.2	902.3	1,914.2	1.46	0.95	
7,427.0	89.10	152.00	5,738.6	-1,742.8	931.5	1,976.2	1.08	0.97	
7,490.0	89.80	153.60	5,739.2	-1,798.9	960.3	2,039.2	2.77	1.11	
7,553.0	88.90	153.20	5,739.9	-1,855.2	988.5	2,102.1	1.56	-1.43	
7,616.0	89.00	153.30	5,741.1	-1,911.4	1,016.9	2,165.1	0.22	0.16	
7,679.0	89.70	152.80	5,741.8	-1,967.6	1,045.4	2,228.1	1.37	1.11	
7,742.0	88.70	152.20	5,742.7	-2,023.5	1,074.5	2,291.1	1.85	-1.59	
7,806.0	89.00	153.10	5,744.0	-2,080.3	1,103.9	2,355.1	1.48	0.47	
7,869.0	89.00	153.30	5,745.1	-2,136.5	1,132.3	2,418.0	0.32	0.00	

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<b>Design:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
7,932.0	88.90	153.20	5,746.2	-2,192.8	1,160.7	2,481.0	0.22	-0.16	
7,993.0	89.60	153.10	5,747.0	-2,247.2	1,188.2	2,542.0	1.16	1.15	
8,057.0	90.90	151.40	5,746.7	-2,303.8	1,218.0	2,606.0	3.34	2.03	
8,120.0	91.70	151.40	5,745.3	-2,359.1	1,248.2	2,669.0	1.27	1.27	
8,184.0	92.70	151.40	5,742.9	-2,415.3	1,278.8	2,732.9	1.56	1.56	
8,247.0	92.20	151.00	5,740.2	-2,470.4	1,309.1	2,795.8	1.02	-0.79	
8,309.0	92.20	150.90	5,737.8	-2,524.6	1,339.2	2,857.8	0.16	0.00	
8,372.0	90.90	151.10	5,736.1	-2,579.7	1,369.7	2,920.7	2.09	-2.06	
8,434.0	89.30	151.80	5,736.0	-2,634.1	1,399.3	2,982.7	2.82	-2.58	
8,496.0	88.60	151.10	5,737.1	-2,688.6	1,429.0	3,044.7	1.60	-1.13	
8,558.0	88.80	151.60	5,738.5	-2,743.0	1,458.7	3,106.7	0.87	0.32	
8,620.0	88.90	150.80	5,739.8	-2,797.3	1,488.5	3,168.7	1.30	0.16	
8,683.0	88.40	150.40	5,741.2	-2,852.2	1,519.5	3,231.6	1.02	-0.79	
8,745.0	88.90	151.30	5,742.7	-2,906.3	1,549.7	3,293.6	1.66	0.81	
8,806.0	88.70	152.40	5,744.0	-2,960.1	1,578.4	3,354.6	1.83	-0.33	
8,869.0	89.10	152.30	5,745.2	-3,015.9	1,607.7	3,417.6	0.65	0.63	
8,933.0	88.50	151.50	5,746.5	-3,072.3	1,637.8	3,481.6	1.56	-0.94	
8,996.0	88.60	151.30	5,748.1	-3,127.6	1,667.9	3,544.6	0.35	0.16	
9,060.0	87.70	152.90	5,750.2	-3,184.1	1,697.9	3,608.5	2.87	-1.41	
9,123.0	87.80	153.40	5,752.7	-3,240.3	1,726.3	3,671.5	0.81	0.16	
9,186.0	87.90	153.20	5,755.0	-3,296.5	1,754.6	3,734.4	0.35	0.16	
9,248.0	88.60	152.80	5,756.9	-3,351.7	1,782.7	3,796.4	1.30	1.13	
9,312.0	89.30	155.10	5,758.1	-3,409.2	1,810.8	3,860.3	3.76	1.09	
9,375.0	89.70	156.50	5,758.6	-3,466.7	1,836.6	3,923.2	2.31	0.63	
9,438.0	89.50	153.80	5,759.1	-3,523.8	1,863.1	3,986.1	4.30	-0.32	
9,501.0	89.50	153.30	5,759.6	-3,580.3	1,891.2	4,049.0	0.79	0.00	
9,564.0	90.80	152.10	5,759.5	-3,636.2	1,920.1	4,112.0	2.81	2.06	
9,628.0	90.90	150.10	5,758.5	-3,692.3	1,951.0	4,176.0	3.13	0.16	
9,691.0	91.20	149.80	5,757.4	-3,746.8	1,982.5	4,239.0	0.67	0.48	
9,696.0	91.30	149.60	5,757.2	-3,751.1	1,985.1	4,244.0	4.45	1.99	Last Cathedral Survey @ 9,696' MD
9,745.8	91.30	149.60	5,756.1	-3,794.0	2,010.2	4,293.7	0.00	0.00	WV DNR A BRK 8H PBHL (10.13)
9,746.0	91.30	149.60	5,756.1	-3,794.2	2,010.4	4,293.9	0.00	0.00	Projection to Bit @ 9,746 - WV DNR A BRK 8H P

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WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

# Cathedral Energy Services

## Survey Report

<b>Company:</b> Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b> Well State of WV DNR A BRK 8H
<b>Project:</b> Brooke County, WV	<b>TVD Reference:</b> WELL @ 1158.0usft (Original Well Elev)
<b>Site:</b> State of WV DNR	<b>MD Reference:</b> WELL @ 1158.0usft (Original Well Elev)
<b>Well:</b> State of WV DNR A BRK 8H	<b>North Reference:</b> Grid
<b>Wellbore:</b> HZ	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> HZ	<b>Database:</b> USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
WV DNR A BRK 8H PBF - actual wellpath misses target center by 49.1usft at 9746.0usft MD (5756.1 TVD, -3794.2 N, 2010.4 E) - Point	0.00	360.00	5,707.4	-3,791.3	2,016.1	661,137.86	1,713,321.70	40° 18' 38.243 N	80° 31' 40.480 W
WV DNR A BRK 8H PBF - actual wellpath misses target center by 29.5usft at 9745.8usft MD (5756.1 TVD, -3794.0 N, 2010.2 E) - Point	0.00	360.00	5,784.9	-3,791.3	2,016.1	661,137.86	1,713,321.70	40° 18' 38.243 N	80° 31' 40.480 W
WV DNR A BRK 8H PBF - actual wellpath misses target center by 8.7usft at 9746.0usft MD (5756.1 TVD, -3794.2 N, 2010.4 E) - Point	0.00	360.00	5,762.0	-3,791.3	2,016.1	661,137.86	1,713,321.70	40° 18' 38.243 N	80° 31' 40.480 W
WV DNR A BRK 8H PBF - actual wellpath misses target center by 24.5usft at 9746.0usft MD (5756.1 TVD, -3794.2 N, 2010.4 E) - Point	0.00	360.00	5,732.5	-3,791.3	2,016.1	661,137.86	1,713,321.70	40° 18' 38.243 N	80° 31' 40.480 W

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
5,041.0	5,040.8	24.3	-10.8	Last Gyro Survey @ 5041' MD	
9,696.0	5,757.2	-3,751.1	1,985.1	Last Cathedral Survey @ 9,696' MD	
9,746.0	5,756.1	-3,794.2	2,010.4	Projection to Bit @ 9,746	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

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