

107.01750

# End of Well Report

FOR

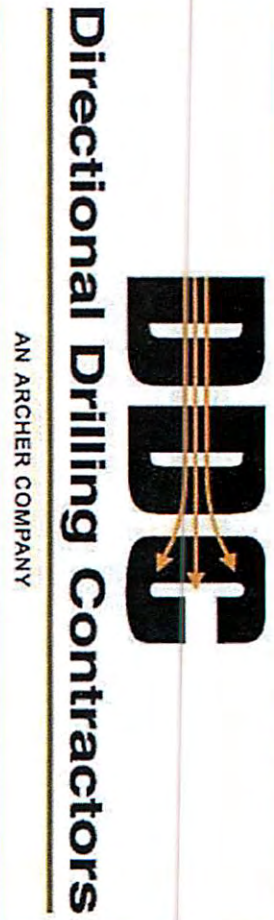
## Columbia Gas Transmission

Rockport 12593  
Wood County, WV

DR140179

Received  
Office of Oil & Gas

JAN 1 2 2015



01/23/2015

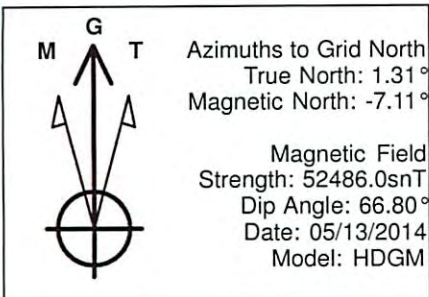
107-01750

## **Section One**

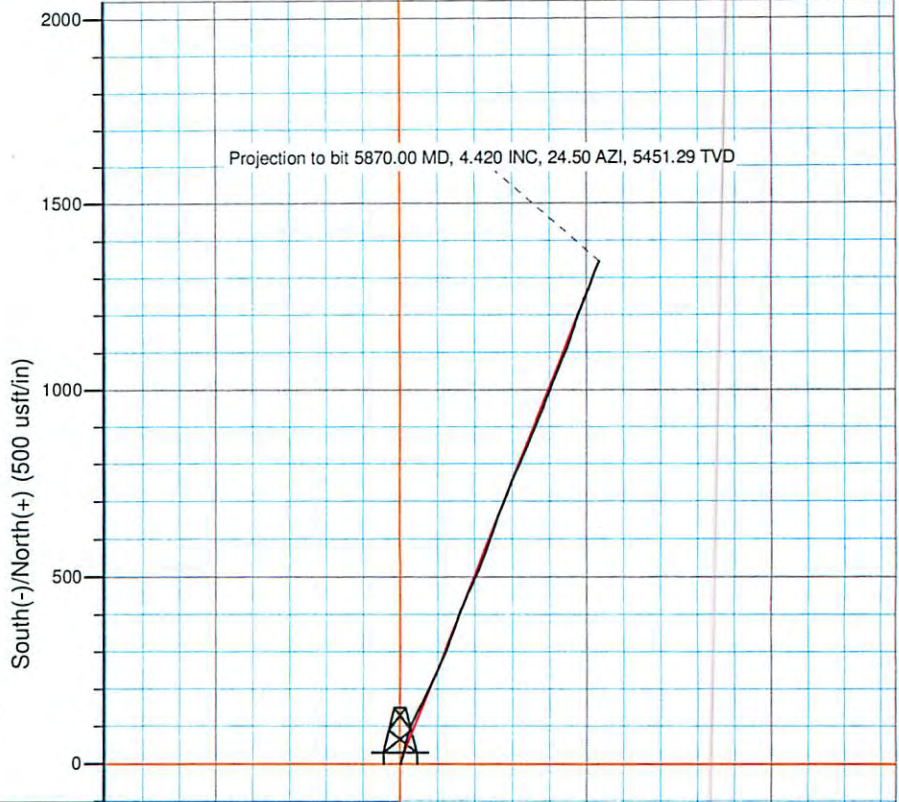
### **Directional Comparison Plot**

#### **Actual vs. Proposed**



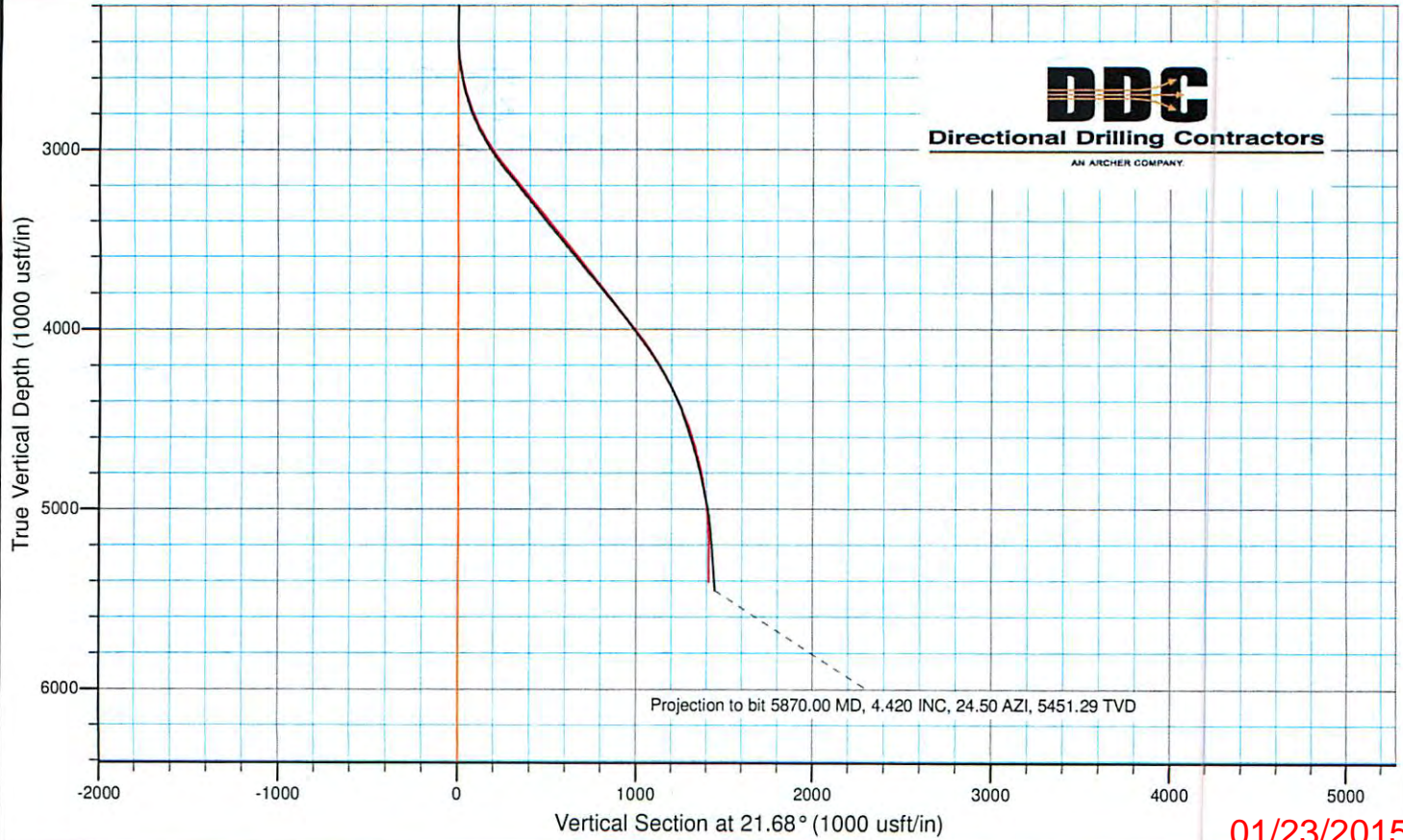


**PROJECT DETAILS: Wood County, WV**  
 Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: West Virginia Northern Zone  
 System Datum: Mean Sea Level



LEGEND

Rockport Storage Pad #2 - Well 12593, Rockport 12593 - Orig Hole, Rockport 12593 - Plan #5 V0  
 Rockport 12593 - As Drilled



107-01750

# **Columbia Gas Transmission, LLC**

Wood County, WV

Rockport Storage Pad #2

Rockport Storage Pad #2 - Well 12593

Rockport 12593 - Orig Hole

Design: Rockport 12593 - As Drilled

## **Standard Survey Report**

13 November, 2014



**Directional Drilling Contractors**

AN ARCHER COMPANY

01/23/2015



107-01750

## Directional Drilling Contractors Survey Report



<b>Company:</b> Columbia Gas Transmission, LLC	<b>Local Co-ordinate Reference:</b> Well Rockport Storage Pad #2 - Well 12593
<b>Project:</b> Wood County, WV	<b>TVD Reference:</b> WELL @ 0.00usft (Original Well Elev)
<b>Site:</b> Rockport Storage Pad #2	<b>MD Reference:</b> WELL @ 0.00usft (Original Well Elev)
<b>Well:</b> Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b> Grid
<b>Wellbore:</b> Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Rockport 12593 - As Drilled	<b>Database:</b> EDM 5000.1 Single User Db

<b>Project:</b> Wood County, WV	
<b>Map System:</b> US State Plane 1983	<b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b> North American Datum 1983	
<b>Map Zone:</b> West Virginia Northern Zone	

<b>Site:</b> Rockport Storage Pad #2			
<b>Site Position:</b>	<b>Northing:</b> 210,628.7826 usft	<b>Latitude:</b> 39° 3' 36.094 N	
<b>From:</b> Lat/Long	<b>Easting:</b> 1,385,999.3630 usft	<b>Longitude:</b> 81° 33' 5.404 W	
<b>Position Uncertainty:</b> 0.00 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> -1.31 °	

<b>Well:</b> Rockport Storage Pad #2 - Well 12593			
<b>Well Position</b>	<b>+N/-S</b> 0.00 usft	<b>Northing:</b> 210,754.4000 usft	<b>Latitude:</b> 39° 3' 37.337 N
	<b>+E/-W</b> 0.00 usft	<b>Easting:</b> 1,386,009.2700 usft	<b>Longitude:</b> 81° 33' 5.314 W
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 0.00 usft

<b>Wellbore:</b> Rockport 12593 - Orig Hole					
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	User Defined	05/13/14	-8.42	66.80	52,486

<b>Design:</b> Rockport 12593 - As Drilled					
<b>Audit Notes:</b>					
<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL	<b>Tie On Depth:</b> 0.00			
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	21.68	

<b>Survey Program</b>		<b>Date</b> 11/13/14
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>
2,394.00	5,870.00	EM (Rockport 12593 - Orig Hole)
		<b>Tool Name</b> EMS+HDGM
		<b>Description</b> OWSG EMS + HDGM

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,394.00	0.000	360.00	2,394.00	0.00	0.00	0.00	0.00	0.00	0.00
2,419.00	1.600	32.90	2,419.00	0.29	0.19	0.34	6.40	6.40	0.00
2,450.00	3.200	27.10	2,449.97	1.43	0.82	1.63	5.21	5.16	-18.71
2,482.00	5.000	23.80	2,481.89	3.50	1.79	3.91	5.67	5.63	-10.31
2,513.00	6.900	21.30	2,512.72	6.47	3.01	7.12	6.18	6.13	-8.06
2,544.00	8.800	18.90	2,543.43	10.45	4.45	11.35	6.22	6.13	-7.74
2,575.00	10.300	17.20	2,573.99	15.34	6.04	16.49	4.92	4.84	-5.48
2,607.00	11.700	15.00	2,605.41	21.21	7.73	22.56	4.57	4.38	-6.88
2,638.00	13.200	12.70	2,635.68	27.70	9.32	29.18	5.10	4.84	-7.42



107-01750

**Directional Drilling Contractors**  
Survey Report



<b>Company:</b>	Columbia Gas Transmission, LLC	<b>Local Co-ordinate Reference:</b>	Well Rockport Storage Pad #2 - Well 12593
<b>Project:</b>	Wood County, WV	<b>TVD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Site:</b>	Rockport Storage Pad #2	<b>MD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Well:</b>	Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Rockport 12593 - As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,669.00	14.700	10.70	2,665.76	35.01	10.83	36.54	5.08	4.84	-6.45
2,701.00	15.800	10.80	2,696.63	43.28	12.40	44.80	3.44	3.44	0.31
2,732.00	17.400	11.40	2,726.34	51.97	14.11	53.51	5.19	5.16	1.94
2,762.00	18.690	15.58	2,754.87	61.00	16.28	62.70	6.09	4.30	13.93
2,793.00	20.500	17.10	2,784.07	70.97	19.21	73.05	6.07	5.84	4.90
2,825.00	22.500	19.50	2,813.84	82.10	22.91	84.76	6.83	6.25	7.50
2,857.00	24.610	19.59	2,843.17	94.15	27.18	97.54	6.59	6.59	0.28
2,888.00	25.980	21.49	2,871.20	106.55	31.84	110.78	5.14	4.42	6.13
2,919.00	27.400	23.69	2,898.90	119.40	37.19	124.70	5.58	4.58	7.10
2,950.00	28.900	25.41	2,926.23	132.70	43.27	139.30	5.50	4.84	5.55
2,981.00	30.400	27.40	2,953.17	146.43	50.10	154.58	5.79	4.84	6.42
3,012.00	31.700	27.20	2,979.73	160.64	57.43	170.49	4.21	4.19	-0.65
3,044.00	33.400	26.10	3,006.70	176.03	65.15	187.65	5.63	5.31	-3.44
3,075.00	34.500	26.50	3,032.42	191.55	72.82	204.90	3.62	3.55	1.29
3,106.00	35.600	25.60	3,057.80	207.55	80.63	222.65	3.92	3.55	-2.90
3,137.00	37.000	25.00	3,082.78	224.14	88.48	240.97	4.66	4.52	-1.94
3,169.00	38.400	23.70	3,108.10	241.97	96.54	260.51	5.03	4.38	-4.06
3,200.00	39.600	23.30	3,132.19	259.86	104.32	280.01	3.96	3.87	-1.29
3,231.00	39.600	22.90	3,156.08	278.03	112.07	299.77	0.82	0.00	-1.29
3,262.00	39.200	22.70	3,180.03	296.17	119.70	319.44	1.35	-1.29	-0.65
3,293.00	38.700	21.50	3,204.14	314.23	127.03	338.93	2.92	-1.61	-3.87
3,325.00	38.100	20.20	3,229.22	332.80	134.10	358.80	3.14	-1.88	-4.06
3,356.00	38.310	20.78	3,253.58	350.76	140.82	377.97	1.34	0.68	1.87
3,387.00	38.000	19.59	3,277.95	368.73	147.42	397.11	2.57	-1.00	-3.84
3,419.00	38.400	18.98	3,303.10	387.41	153.96	416.88	1.72	1.25	-1.91
3,450.00	38.000	20.87	3,327.46	405.43	160.49	436.04	3.98	-1.29	6.10
3,481.00	37.910	22.50	3,351.91	423.15	167.54	455.11	3.25	-0.29	5.26
3,512.00	38.310	23.47	3,376.30	440.76	175.01	474.24	2.32	1.29	3.13
3,544.00	38.620	24.88	3,401.36	458.92	183.16	494.12	2.91	0.97	4.41
3,574.00	39.280	24.71	3,424.69	476.04	191.07	512.95	2.23	2.20	-0.57
3,604.00	40.210	24.00	3,447.75	493.52	198.98	532.11	3.45	3.10	-2.37
3,636.00	40.210	24.00	3,472.19	512.39	207.38	552.75	0.00	0.00	0.00
3,667.00	39.680	22.68	3,495.96	530.66	215.27	572.65	3.22	-1.71	-4.26
3,698.00	39.100	21.60	3,519.92	548.88	222.68	592.32	2.90	-1.87	-3.48
3,730.00	39.500	21.50	3,544.68	567.73	230.12	612.59	1.27	1.25	-0.31
3,762.00	39.100	20.70	3,569.44	586.64	237.42	632.85	2.02	-1.25	-2.50
3,793.00	38.500	19.90	3,593.60	604.86	244.16	652.27	2.52	-1.94	-2.58
3,825.00	38.900	18.40	3,618.58	623.76	250.72	672.26	3.19	1.25	-4.69
3,856.00	39.800	18.90	3,642.55	642.38	257.01	691.89	3.08	2.90	1.61
3,888.00	40.700	19.80	3,666.97	661.89	263.86	712.55	3.35	2.81	2.81
3,919.00	41.000	22.90	3,690.42	680.77	271.24	732.82	6.61	0.97	10.00
3,950.00	40.600	22.50	3,713.89	699.46	279.06	753.07	1.54	-1.29	-1.29
3,982.00	39.900	22.00	3,738.31	718.59	286.89	773.74	2.41	-2.19	-1.56
4,013.00	39.300	20.70	3,762.20	736.99	294.08	793.50	3.30	-1.94	-4.19



107-01750

**Directional Drilling Contractors**  
Survey Report



<b>Company:</b>	Columbia Gas Transmission, LLC	<b>Local Co-ordinate Reference:</b>	Well Rockport Storage Pad #2 - Well 12593
<b>Project:</b>	Wood County, WV	<b>TVD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Site:</b>	Rockport Storage Pad #2	<b>MD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Well:</b>	Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Rockport 12593 - As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,045.00	39.300	21.20	3,786.96	755.92	301.33	813.77	0.99	0.00	1.56
4,076.00	39.500	23.70	3,810.92	774.10	308.85	833.44	5.16	0.65	8.06
4,107.00	39.700	23.80	3,834.80	792.19	316.80	853.19	0.68	0.65	0.32
4,139.00	39.420	23.80	3,859.47	810.84	325.03	873.55	0.88	-0.88	0.00
4,170.00	39.420	23.40	3,883.42	828.88	332.91	893.23	0.82	0.00	-1.29
4,201.00	39.200	22.50	3,907.41	846.96	340.57	912.86	1.97	-0.71	-2.90
4,232.00	38.700	21.30	3,931.52	865.04	347.84	932.35	2.92	-1.61	-3.87
4,263.00	38.180	22.11	3,955.80	882.95	354.96	951.62	2.34	-1.68	2.61
4,294.00	38.090	22.37	3,980.18	900.67	362.21	970.76	0.59	-0.29	0.84
4,326.00	37.690	22.68	4,005.44	918.82	369.74	990.41	1.38	-1.25	0.97
4,357.00	37.210	22.90	4,030.05	936.20	377.04	1,009.26	1.61	-1.55	0.71
4,389.00	36.810	20.70	4,055.60	954.08	384.19	1,028.52	4.32	-1.25	-6.88
4,420.00	36.280	20.39	4,080.51	971.37	390.67	1,046.97	1.81	-1.71	-1.00
4,451.00	35.220	21.71	4,105.66	988.27	397.17	1,065.08	4.23	-3.42	4.26
4,482.00	34.820	21.71	4,131.05	1,004.80	403.75	1,082.87	1.29	-1.29	0.00
4,514.00	34.200	21.00	4,157.42	1,021.68	410.36	1,101.00	2.31	-1.94	-2.22
4,546.00	33.100	21.50	4,184.06	1,038.21	416.78	1,118.73	3.54	-3.44	1.56
4,577.00	31.600	21.80	4,210.25	1,053.62	422.90	1,135.32	4.87	-4.84	0.97
4,609.00	30.100	23.60	4,237.72	1,068.76	429.23	1,151.73	5.50	-4.69	5.63
4,640.00	29.800	23.40	4,264.58	1,082.96	435.40	1,167.19	1.02	-0.97	-0.65
4,674.00	28.700	23.25	4,294.24	1,098.21	441.98	1,183.80	3.24	-3.24	-0.44
4,705.00	27.620	23.10	4,321.57	1,111.66	447.73	1,198.43	3.49	-3.48	-0.48
4,736.00	26.510	19.60	4,349.18	1,124.79	452.87	1,212.52	6.26	-3.58	-11.29
4,768.00	24.790	19.30	4,378.03	1,137.85	457.49	1,226.36	5.39	-5.38	-0.94
4,799.00	23.110	18.50	4,406.36	1,149.75	461.57	1,238.93	5.52	-5.42	-2.58
4,831.00	21.300	17.60	4,435.98	1,161.25	465.32	1,251.00	5.76	-5.66	-2.81
4,862.00	20.280	16.99	4,464.96	1,171.75	468.59	1,261.97	3.36	-3.29	-1.97
4,893.00	19.180	16.90	4,494.14	1,181.76	471.64	1,272.40	3.55	-3.55	-0.29
4,925.00	18.690	18.10	4,524.41	1,191.67	474.76	1,282.76	1.96	-1.53	3.75
4,956.00	18.290	20.90	4,553.81	1,200.93	478.04	1,292.58	3.14	-1.29	9.03
4,987.00	17.990	21.00	4,583.27	1,209.95	481.49	1,302.23	0.97	-0.97	0.32
5,019.00	17.500	20.20	4,613.75	1,219.08	484.92	1,311.98	1.71	-1.53	-2.50
5,050.00	16.480	19.40	4,643.39	1,227.60	487.99	1,321.03	3.38	-3.29	-2.58
5,081.00	16.000	21.00	4,673.16	1,235.73	490.98	1,329.70	2.12	-1.55	5.16
5,112.00	15.600	23.40	4,702.99	1,243.55	494.17	1,338.14	2.47	-1.29	7.74
5,144.00	14.800	22.11	4,733.87	1,251.28	497.42	1,346.53	2.71	-2.50	-4.03
5,175.00	14.100	22.90	4,763.89	1,258.43	500.38	1,354.26	2.35	-2.26	2.55
5,204.00	13.390	23.80	4,792.05	1,264.76	503.11	1,361.15	2.56	-2.45	3.10
5,236.00	12.900	22.70	4,823.22	1,271.44	505.98	1,368.42	1.72	-1.53	-3.44
5,268.00	12.500	21.90	4,854.43	1,277.95	508.65	1,375.46	1.37	-1.25	-2.50
5,300.00	12.100	20.90	4,885.70	1,284.30	511.14	1,382.27	1.42	-1.25	-3.13
5,332.00	11.710	19.90	4,917.01	1,290.48	513.44	1,388.87	1.38	-1.22	-3.13
5,363.00	11.500	21.10	4,947.38	1,296.32	515.62	1,395.11	1.03	-0.68	3.87



107-01750

**Directional Drilling Contractors**  
Survey Report



<b>Company:</b>	Columbia Gas Transmission, LLC	<b>Local Co-ordinate Reference:</b>	Well Rockport Storage Pad #2 - Well 12593
<b>Project:</b>	Wood County, WV	<b>TVD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Site:</b>	Rockport Storage Pad #2	<b>MD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Well:</b>	Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Rockport 12593 - As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,394.00	10.900	19.70	4,977.79	1,301.97	517.72	1,401.13	2.12	-1.94	-4.52
5,425.00	9.900	20.60	5,008.28	1,307.22	519.65	1,406.72	3.27	-3.23	2.90
5,456.00	8.480	18.90	5,038.88	1,311.88	521.33	1,411.67	4.66	-4.58	-5.48
5,487.00	6.720	19.20	5,069.60	1,315.75	522.67	1,415.76	5.68	-5.68	0.97
5,519.00	5.790	21.10	5,101.41	1,319.03	523.86	1,419.25	2.98	-2.91	5.94
5,550.00	5.210	23.70	5,132.27	1,321.78	524.99	1,422.22	2.04	-1.87	8.39
5,581.00	4.680	24.40	5,163.16	1,324.22	526.08	1,424.89	1.72	-1.71	2.26
5,613.00	4.420	24.50	5,195.05	1,326.53	527.13	1,427.42	0.81	-0.81	0.31
5,666.00	4.420	24.50	5,247.90	1,330.24	528.82	1,431.50	0.00	0.00	0.00
5,870.00	4.420	24.50	5,451.29	1,344.55	535.34	1,447.21	0.00	0.00	0.00

Projection to bit 5870.00 MD, 4.420 INC, 24.50 AZI, 5451.29 TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,870.00	5,451.29	1,344.55	535.34	Projection to bit 5870.00 MD, 4.420 INC, 24.50 AZI, 5451.29 TVD

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



107-01750

# Columbia Gas Transmission, LLC

Wood County, WV

Rockport Storage Pad #2

Rockport Storage Pad #2 - Well 12593

Rockport 12593 - Orig Hole

Design: Rockport 12593 - As Drilled

## Survey Report - Geographic

13 November, 2014



**Directional Drilling Contractors**

AN ARCHER COMPANY

01/23/2015

107-01750

**Directional Drilling Contractors**  
Survey Report - Geographic



<b>Company:</b>	Columbia Gas Transmission, LLC	<b>Local Co-ordinate Reference:</b>	Well Rockport Storage Pad #2 - Well 12593
<b>Project:</b>	Wood County, WV	<b>TVD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Site:</b>	Rockport Storage Pad #2	<b>MD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Well:</b>	Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Rockport 12593 - As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Wood County, WV		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	West Virginia Northern Zone		

<b>Site</b>	Rockport Storage Pad #2				
<b>Site Position:</b>		<b>Northing:</b>	210,628.7826 usft	<b>Latitude:</b>	39° 3' 36.094 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,385,999.3630 usft	<b>Longitude:</b>	81° 33' 5.404 W
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-1.31 °

<b>Well</b>	Rockport Storage Pad #2 - Well 12593					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	210,754.4000 usft	<b>Latitude:</b>	39° 3' 37.337 N
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,386,009.2700 usft	<b>Longitude:</b>	81° 33' 5.314 W
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	0.00 usft

<b>Wellbore</b>	Rockport 12593 - Orig Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	User Defined	05/13/14	-8.42	66.80	52,486

<b>Design</b>	Rockport 12593 - As Drilled				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	21.68	

<b>Survey Program</b>	<b>Date</b>	11/13/14			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
2,394.00	5,870.00	EM (Rockport 12593 - Orig Hole)	EMS+HDGM	OWSG EMS + HDGM	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.000	0.00	0.00	0.00	0.00	210,754.4000	1,386,009.2700	39° 3' 37.337 N	81° 33' 5.314 W
2,394.00	0.000	360.00	2,394.00	0.00	0.00	210,754.4000	1,386,009.2700	39° 3' 37.337 N	81° 33' 5.314 W
2,419.00	1.600	32.90	2,419.00	0.29	0.19	210,754.6931	1,386,009.4596	39° 3' 37.340 N	81° 33' 5.312 W
2,450.00	3.200	27.10	2,449.97	1.43	0.82	210,755.8268	1,386,010.0889	39° 3' 37.351 N	81° 33' 5.304 W
2,482.00	5.000	23.80	2,481.89	3.50	1.79	210,757.8979	1,386,011.0586	39° 3' 37.372 N	81° 33' 5.293 W
2,513.00	6.900	21.30	2,512.72	6.47	3.01	210,760.8692	1,386,012.2803	39° 3' 37.402 N	81° 33' 5.278 W
2,544.00	8.800	18.90	2,543.43	10.45	4.45	210,764.8479	1,386,013.7249	39° 3' 37.441 N	81° 33' 5.261 W
2,575.00	10.300	17.20	2,573.99	15.34	6.04	210,769.7391	1,386,015.3126	39° 3' 37.490 N	81° 33' 5.242 W
2,607.00	11.700	15.00	2,605.41	21.21	7.73	210,775.6064	1,386,016.9985	39° 3' 37.548 N	81° 33' 5.223 W
2,638.00	13.200	12.70	2,635.68	27.70	9.32	210,782.0957	1,386,018.5902	39° 3' 37.613 N	81° 33' 5.204 W
2,669.00	14.700	10.70	2,665.76	35.01	10.83	210,789.4139	1,386,020.0987	39° 3' 37.686 N	81° 33' 5.187 W
2,701.00	15.800	10.80	2,696.63	43.28	12.40	210,797.6830	1,386,021.6689	39° 3' 37.768 N	81° 33' 5.170 W



107.01750

## Directional Drilling Contractors

### Survey Report - Geographic



<b>Company:</b>	Columbia Gas Transmission, LLC	<b>Local Co-ordinate Reference:</b>	Well Rockport Storage Pad #2 - Well 12593
<b>Project:</b>	Wood County, WV	<b>TVD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Site:</b>	Rockport Storage Pad #2	<b>MD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Well:</b>	Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Rockport 12593 - As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
2,732.00	17.400	11.40	2,726.34	51.97	14.11	210,806.3728	1,386,023.3760	39° 3' 37.854 N	81° 33' 5.151 W	
2,762.00	18.690	15.58	2,754.87	61.00	16.28	210,815.4008	1,386,025.5538	39° 3' 37.944 N	81° 33' 5.126 W	
2,793.00	20.500	17.10	2,784.07	70.97	19.21	210,825.3744	1,386,028.4842	39° 3' 38.043 N	81° 33' 5.091 W	
2,825.00	22.500	19.50	2,813.84	82.10	22.91	210,836.5031	1,386,032.1762	39° 3' 38.154 N	81° 33' 5.048 W	
2,857.00	24.610	19.59	2,843.17	94.15	27.18	210,848.5535	1,386,036.4545	39° 3' 38.274 N	81° 33' 4.997 W	
2,888.00	25.980	21.49	2,871.20	106.55	31.84	210,860.9534	1,386,041.1065	39° 3' 38.397 N	81° 33' 4.942 W	
2,919.00	27.400	23.69	2,898.90	119.40	37.19	210,873.8042	1,386,046.4603	39° 3' 38.525 N	81° 33' 4.878 W	
2,950.00	28.900	25.41	2,926.23	132.70	43.27	210,887.1035	1,386,052.5410	39° 3' 38.658 N	81° 33' 4.804 W	
2,981.00	30.400	27.40	2,953.17	146.43	50.10	210,900.8344	1,386,059.3654	39° 3' 38.795 N	81° 33' 4.722 W	
3,012.00	31.700	27.20	2,979.73	160.64	57.43	210,915.0427	1,386,066.6983	39° 3' 38.937 N	81° 33' 4.633 W	
3,044.00	33.400	26.10	3,006.70	176.03	65.15	210,930.4314	1,386,074.4168	39° 3' 39.091 N	81° 33' 4.540 W	
3,075.00	34.500	26.50	3,032.42	191.55	72.82	210,945.9511	1,386,082.0882	39° 3' 39.246 N	81° 33' 4.447 W	
3,106.00	35.600	25.60	3,057.80	207.55	80.63	210,961.9458	1,386,089.9044	39° 3' 39.406 N	81° 33' 4.352 W	
3,137.00	37.000	25.00	3,082.78	224.14	88.48	210,978.5380	1,386,097.7457	39° 3' 39.572 N	81° 33' 4.258 W	
3,169.00	38.400	23.70	3,108.10	241.97	96.54	210,996.3662	1,386,105.8104	39° 3' 39.750 N	81° 33' 4.161 W	
3,200.00	39.600	23.30	3,132.19	259.86	104.32	211,014.2570	1,386,113.5886	39° 3' 39.928 N	81° 33' 4.067 W	
3,231.00	39.600	22.90	3,156.08	278.03	112.07	211,032.4327	1,386,121.3412	39° 3' 40.110 N	81° 33' 3.974 W	
3,262.00	39.200	22.70	3,180.03	296.17	119.70	211,050.5718	1,386,128.9663	39° 3' 40.291 N	81° 33' 3.883 W	
3,293.00	38.700	21.50	3,204.14	314.23	127.03	211,068.6267	1,386,136.2988	39° 3' 40.471 N	81° 33' 3.795 W	
3,325.00	38.100	20.20	3,229.22	332.80	134.10	211,087.2003	1,386,143.3744	39° 3' 40.656 N	81° 33' 3.711 W	
3,356.00	38.310	20.78	3,253.58	350.76	140.82	211,105.1598	1,386,150.0859	39° 3' 40.835 N	81° 33' 3.631 W	
3,387.00	38.000	19.59	3,277.95	368.73	147.42	211,123.1341	1,386,156.6945	39° 3' 41.014 N	81° 33' 3.553 W	
3,419.00	38.400	18.98	3,303.10	387.41	153.96	211,141.8127	1,386,163.2297	39° 3' 41.200 N	81° 33' 3.475 W	
3,450.00	38.000	20.87	3,327.46	405.43	160.49	211,159.8344	1,386,169.7609	39° 3' 41.380 N	81° 33' 3.398 W	
3,481.00	37.910	22.50	3,351.91	423.15	167.54	211,177.5502	1,386,176.8051	39° 3' 41.556 N	81° 33' 3.313 W	
3,512.00	38.310	23.47	3,376.30	440.76	175.01	211,195.1628	1,386,184.2766	39° 3' 41.732 N	81° 33' 3.224 W	
3,544.00	38.620	24.88	3,401.36	458.92	183.16	211,213.3208	1,386,192.4285	39° 3' 41.913 N	81° 33' 3.126 W	
3,574.00	39.280	24.71	3,424.69	476.04	191.07	211,230.4415	1,386,200.3374	39° 3' 42.084 N	81° 33' 3.030 W	
3,604.00	40.210	24.00	3,447.75	493.52	198.98	211,247.9157	1,386,208.2462	39° 3' 42.259 N	81° 33' 2.935 W	
3,636.00	40.210	24.00	3,472.19	512.39	207.38	211,266.7886	1,386,216.6490	39° 3' 42.447 N	81° 33' 2.834 W	
3,667.00	39.680	22.68	3,495.96	530.66	215.27	211,285.0621	1,386,224.5353	39° 3' 42.629 N	81° 33' 2.740 W	
3,698.00	39.100	21.60	3,519.92	548.88	222.68	211,303.2829	1,386,231.9500	39° 3' 42.811 N	81° 33' 2.651 W	
3,730.00	39.500	21.50	3,544.68	567.73	230.12	211,322.1343	1,386,239.3947	39° 3' 42.999 N	81° 33' 2.562 W	
3,762.00	39.100	20.70	3,569.44	586.64	237.42	211,341.0429	1,386,246.6916	39° 3' 43.188 N	81° 33' 2.475 W	
3,793.00	38.500	19.90	3,593.60	604.86	244.16	211,359.2605	1,386,253.4314	39° 3' 43.369 N	81° 33' 2.395 W	
3,825.00	38.900	18.40	3,618.58	623.76	250.72	211,378.1602	1,386,259.9933	39° 3' 43.557 N	81° 33' 2.317 W	
3,856.00	39.800	18.90	3,642.55	642.38	257.01	211,396.7832	1,386,266.2796	39° 3' 43.743 N	81° 33' 2.243 W	
3,888.00	40.700	19.80	3,666.97	661.89	263.86	211,416.2901	1,386,273.1315	39° 3' 43.937 N	81° 33' 2.162 W	
3,919.00	41.000	22.90	3,690.42	680.77	271.24	211,435.1696	1,386,280.5131	39° 3' 44.125 N	81° 33' 2.074 W	
3,950.00	40.600	22.50	3,713.89	699.46	279.06	211,453.8563	1,386,288.3302	39° 3' 44.312 N	81° 33' 1.980 W	
3,982.00	39.900	22.00	3,738.31	718.59	286.89	211,472.9922	1,386,296.1597	39° 3' 44.503 N	81° 33' 1.886 W	
4,013.00	39.300	20.70	3,762.20	736.99	294.08	211,491.3949	1,386,303.3546	39° 3' 44.686 N	81° 33' 1.800 W	
4,045.00	39.300	21.20	3,786.96	755.92	301.33	211,510.3230	1,386,310.6015	39° 3' 44.875 N	81° 33' 1.714 W	
4,076.00	39.500	23.70	3,810.92	774.10	308.85	211,528.5049	1,386,318.1151	39° 3' 45.056 N	81° 33' 1.624 W	
4,107.00	39.700	23.80	3,834.80	792.19	316.80	211,546.5916	1,386,326.0734	39° 3' 45.237 N	81° 33' 1.528 W	
4,139.00	39.420	23.80	3,859.47	810.84	325.03	211,565.2388	1,386,334.2978	39° 3' 45.423 N	81° 33' 1.429 W	
4,170.00	39.420	23.40	3,883.42	828.88	332.91	211,583.2773	1,386,342.1786	39° 3' 45.603 N	81° 33' 1.335 W	
4,201.00	39.200	22.50	3,907.41	846.96	340.57	211,601.3612	1,386,349.8366	39° 3' 45.783 N	81° 33' 1.243 W	
4,232.00	38.700	21.30	3,931.52	865.04	347.84	211,619.4416	1,386,357.1060	39° 3' 45.963 N	81° 33' 1.156 W	
4,263.00	38.180	22.11	3,955.80	882.95	354.96	211,637.3476	1,386,364.2327	39° 3' 46.142 N	81° 33' 1.071 W	
4,294.00	38.090	22.37	3,980.18	900.67	362.21	211,655.0665	1,386,371.4780	39° 3' 46.319 N	81° 33' 0.984 W	
4,326.00	37.690	22.68	4,005.44	918.82	369.74	211,673.2200	1,386,379.0064	39° 3' 46.500 N	81° 33' 0.894 W	
4,357.00	37.210	22.90	4,030.05	936.20	377.04	211,690.5985	1,386,386.3079	39° 3' 46.673 N	81° 33' 0.806 W	
4,389.00	36.810	20.70	4,055.60	954.08	384.19	211,708.4803	1,386,393.4620	39° 3' 46.851 N	81° 33' 0.721 W	
4,420.00	36.280	20.39	4,080.51	971.37	390.67	211,725.7651	1,386,399.9403	39° 3' 47.024 N	81° 33' 0.644 W	



107-01750

**Directional Drilling Contractors**  
Survey Report - Geographic



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<b>Project:</b>	Wood County, WV	<b>TVD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Site:</b>	Rockport Storage Pad #2	<b>MD Reference:</b>	WELL @ 0.00usft (Original Well Elev)
<b>Well:</b>	Rockport Storage Pad #2 - Well 12593	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Rockport 12593 - Orig Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Rockport 12593 - As Drilled	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,451.00	35.220	21.71	4,105.66	988.27	397.17	211,742.6681	1,386,406.4428	39° 3' 47.192 N	81° 33' 0.566 W
4,482.00	34.820	21.71	4,131.05	1,004.80	403.75	211,759.1959	1,386,413.0234	39° 3' 47.357 N	81° 33' 0.488 W
4,514.00	34.200	21.00	4,157.42	1,021.68	410.36	211,776.0801	1,386,419.6259	39° 3' 47.525 N	81° 33' 0.409 W
4,546.00	33.100	21.50	4,184.06	1,038.21	416.78	211,792.6062	1,386,426.0514	39° 3' 47.690 N	81° 33' 0.332 W
4,577.00	31.600	21.80	4,210.25	1,053.62	422.90	211,808.0236	1,386,432.1702	39° 3' 47.844 N	81° 33' 0.259 W
4,609.00	30.100	23.60	4,237.72	1,068.76	429.23	211,823.1621	1,386,438.4966	39° 3' 47.995 N	81° 33' 0.183 W
4,640.00	29.800	23.40	4,264.58	1,082.96	435.40	211,837.3549	1,386,444.6680	39° 3' 48.136 N	81° 33' 0.109 W
4,674.00	28.700	23.25	4,294.24	1,098.21	441.98	211,852.6099	1,386,451.2461	39° 3' 48.289 N	81° 33' 0.030 W
4,705.00	27.620	23.10	4,321.57	1,111.66	447.73	211,866.0591	1,386,457.0038	39° 3' 48.423 N	81° 32' 59.961 W
4,736.00	26.510	19.60	4,349.18	1,124.79	452.87	211,879.1877	1,386,462.1444	39° 3' 48.554 N	81° 32' 59.900 W
4,768.00	24.790	19.30	4,378.03	1,137.85	457.49	211,892.2482	1,386,466.7578	39° 3' 48.684 N	81° 32' 59.845 W
4,799.00	23.110	18.50	4,406.36	1,149.75	461.57	211,904.1522	1,386,470.8365	39° 3' 48.802 N	81° 32' 59.797 W
4,831.00	21.300	17.60	4,435.98	1,161.25	465.32	211,915.6486	1,386,474.5869	39° 3' 48.917 N	81° 32' 59.753 W
4,862.00	20.280	16.99	4,464.96	1,171.75	468.59	211,926.1537	1,386,477.8593	39° 3' 49.021 N	81° 32' 59.714 W
4,893.00	19.180	16.90	4,494.14	1,181.76	471.64	211,936.1643	1,386,480.9096	39° 3' 49.121 N	81° 32' 59.678 W
4,925.00	18.690	18.10	4,524.41	1,191.67	474.76	211,946.0675	1,386,484.0306	39° 3' 49.220 N	81° 32' 59.642 W
4,956.00	18.290	20.90	4,553.81	1,200.93	478.04	211,955.3331	1,386,487.3091	39° 3' 49.312 N	81° 32' 59.603 W
4,987.00	17.990	21.00	4,583.27	1,209.95	481.49	211,964.3466	1,386,490.7599	39° 3' 49.402 N	81° 32' 59.562 W
5,019.00	17.500	20.20	4,613.75	1,219.08	484.92	211,973.4755	1,386,494.1922	39° 3' 49.493 N	81° 32' 59.521 W
5,050.00	16.480	19.40	4,643.39	1,227.60	487.99	211,981.9973	1,386,497.2622	39° 3' 49.578 N	81° 32' 59.484 W
5,081.00	16.000	21.00	4,673.16	1,235.73	490.98	211,990.1334	1,386,500.2539	39° 3' 49.659 N	81° 32' 59.449 W
5,112.00	15.600	23.40	4,702.99	1,243.55	494.17	211,997.9476	1,386,503.4404	39° 3' 49.737 N	81° 32' 59.411 W
5,144.00	14.800	22.11	4,733.87	1,251.28	497.42	212,005.6832	1,386,506.6876	39° 3' 49.814 N	81° 32' 59.372 W
5,175.00	14.100	22.90	4,763.89	1,258.43	500.38	212,012.8299	1,386,509.6473	39° 3' 49.885 N	81° 32' 59.336 W
5,204.00	13.390	23.80	4,792.05	1,264.76	503.11	212,019.1564	1,386,512.3769	39° 3' 49.948 N	81° 32' 59.304 W
5,236.00	12.900	22.70	4,823.22	1,271.44	505.98	212,025.8419	1,386,515.2506	39° 3' 50.015 N	81° 32' 59.269 W
5,268.00	12.500	21.90	4,854.43	1,277.95	508.65	212,032.3503	1,386,517.9208	39° 3' 50.080 N	81° 32' 59.237 W
5,300.00	12.100	20.90	4,885.70	1,284.30	511.14	212,038.6967	1,386,520.4089	39° 3' 50.143 N	81° 32' 59.207 W
5,332.00	11.710	19.90	4,917.01	1,290.48	513.44	212,044.8834	1,386,522.7107	39° 3' 50.205 N	81° 32' 59.180 W
5,363.00	11.500	21.10	4,947.38	1,296.32	515.62	212,050.7245	1,386,524.8940	39° 3' 50.263 N	81° 32' 59.154 W
5,394.00	10.900	19.70	4,977.79	1,301.97	517.72	212,056.3670	1,386,526.9945	39° 3' 50.319 N	81° 32' 59.129 W
5,425.00	9.900	20.60	5,008.28	1,307.22	519.65	212,061.6210	1,386,528.9202	39° 3' 50.372 N	81° 32' 59.106 W
5,456.00	8.480	18.90	5,038.88	1,311.88	521.33	212,066.2783	1,386,530.5983	39° 3' 50.418 N	81° 32' 59.086 W
5,487.00	6.720	19.20	5,069.60	1,315.75	522.67	212,070.1539	1,386,531.9352	39° 3' 50.457 N	81° 32' 59.070 W
5,519.00	5.790	21.10	5,101.41	1,319.03	523.86	212,073.4280	1,386,533.1321	39° 3' 50.489 N	81° 32' 59.056 W
5,550.00	5.210	23.70	5,132.27	1,321.78	524.99	212,076.1757	1,386,534.2607	39° 3' 50.517 N	81° 32' 59.043 W
5,581.00	4.680	24.40	5,163.16	1,324.22	526.08	212,078.6162	1,386,535.3489	39° 3' 50.541 N	81° 32' 59.030 W
5,613.00	4.420	24.50	5,195.05	1,326.53	527.13	212,080.9271	1,386,536.3996	39° 3' 50.564 N	81° 32' 59.017 W
5,666.00	4.420	24.50	5,247.90	1,330.24	528.82	212,084.6439	1,386,538.0934	39° 3' 50.601 N	81° 32' 58.997 W
5,870.00	4.420	24.50	5,451.29	1,344.55	535.34	212,098.9500	1,386,544.6131	39° 3' 50.744 N	81° 32' 58.918 W

Projection to bit 5870.00 MD, 4.420 INC, 24.50 AZI, 5451.29 TVD

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,870.00	5,451.29	1,344.55	535.34	Projection to bit 5870.00 MD, 4.420 INC, 24.50 AZI, 5451.29 TVD

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



107-01750

**Section Two**  
**Daily Drilling Activity Reports**

01/23/2015