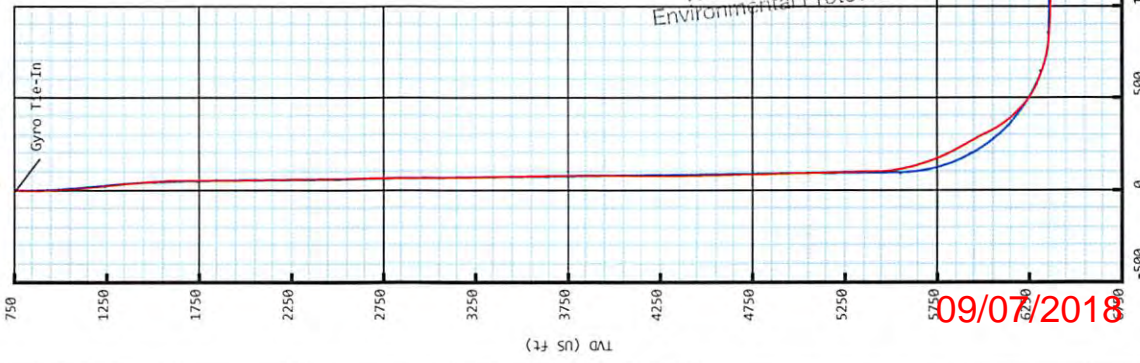
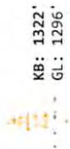




Southwestern Energy  
Mason Cottrell OHI 6H  
Ohio Co, WV  
SDC 41

Plan vs Actual



Plan Data for Mason Cottrell OHI 6H

Plan Point Information:

| MD (USft) | Inc (°) | Az (°) | TVD (USft) | +N/-S (USft) | +E/-W (USft) | VSec (USft) | Position offsets from Slot centre | DLS Toolface Comments   |
|-----------|---------|--------|------------|--------------|--------------|-------------|-----------------------------------|-------------------------|
| 0.00      | 0.00    | 0.00   | 0.00       | -0.00        | 0.00         | 0.00        | 0.00                              | 0.00                    |
| 26.00     | 0.00    | 0.00   | 26.00      | -0.00        | 0.00         | 0.00        | 0.00                              | 0.00                    |
| 800.00    | 0.00    | 0.00   | 800.00     | -0.00        | 0.00         | 0.00        | 0.00                              | 0.00                    |
| 1050.00   | 5.00    | 160.00 | 1049.68    | -10.24       | 3.73         | 10.90       | 2.00                              | 0.0 Nudge KOP           |
| 1250.00   | 5.00    | 160.00 | 1248.92    | -26.62       | 9.69         | 28.33       | 2.00                              | 160.0 Hold              |
| 1747.73   | 9.00    | 245.73 | 1743.89    | -63.10       | -18.45       | 53.09       | 2.00                              | 115.5 Hold              |
| 5604.66   | 9.00    | 245.73 | 5553.33    | -311.10      | -568.48      | 99.66       | 0.00                              | 0.0 Curve KOP 7° DLS    |
| 6608.72   | 70.00   | 155.55 | 6319.45    | -841.02      | -426.57      | 646.28      | 7.00                              | 266.6 Build/Turn 9° DLS |
| 6825.33   | 89.40   | 153.60 | 6358.00    | -1032.52     | -335.42      | 857.35      | 9.00                              | 354.1 Landing Point     |
| 12657.79  | 89.40   | 153.60 | 6419.00    | -6256.42     | 2257.79      | 6651.35     | 0.00                              | 0.0 PBHL MC6H           |

Target Set Information:  
Name: Mason Cottrell OHI 6H

Position offsets from Slot centre

| Name      | TVD (USft) | +N/-S (USft) | +E/-W (USft) | Northing (USft) | Easting (USft) | Lat (°)   | Long (°)   |
|-----------|------------|--------------|--------------|-----------------|----------------|-----------|------------|
| LP MC6H   | 6358.00    | -909.42      | -396.53      | 14553655.22     | 1746974.60     | 40.073306 | -80.619098 |
| PBHL MC6H | 6419.00    | -6256.42     | 2257.79      | 14548398.22     | 17499628.92    | 40.058591 | -80.609694 |

Plan Data for Mason Cottrell OHI 6H

Field: SOUTHWESTERN, OHIO CO, WV UTM MAD 83 (17N)  
Vertical Reference Datum (VRD): Mean Sea Level  
Projected Coordinate System: NAD83 / UTM zone 17N

Map Unit: USFt

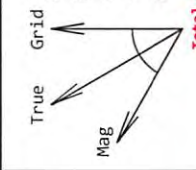
Site: Mason Cottrell Pad

Unit: USFeet TVD Reference:  
Company Name: SOUTHWESTERN ENERGY  
Northing: 14554576.20USft Latitude: 40.075830°  
Easting: 1747378.82USft Longitude: -80.617639°  
North Reference: Grid Grid Convergence: 0.25°  
Elevation Above VRD: 1295.80USft

Slot: Mason Cottrell OHI 6H  
Position:  
Offset is from Site centre  
+N/-S: -11.56USft Northing: 14554564.64USft Latitude: 40.075798°  
+E/-W: -7.70USft Easting: 1747371.13USft Longitude: -80.617667°  
Elevation Above VRD: 1296.80USft

Well: Mason Cottrell OHI 6H  
Type: Main-Well  
File Number:  
Plan Folder: P1  
Plan: P1.V4  
Vertical Section: Position offset of origin from Slot centre:  
+N/-S: -0.00USft Azimuth: 160.16°  
+E/-W: 0.00USft  
Magnetic Parameters:  
Model: Field Strength: Declination: 67.45° Date: 2017-10-16  
HDGM: 52710(NT)

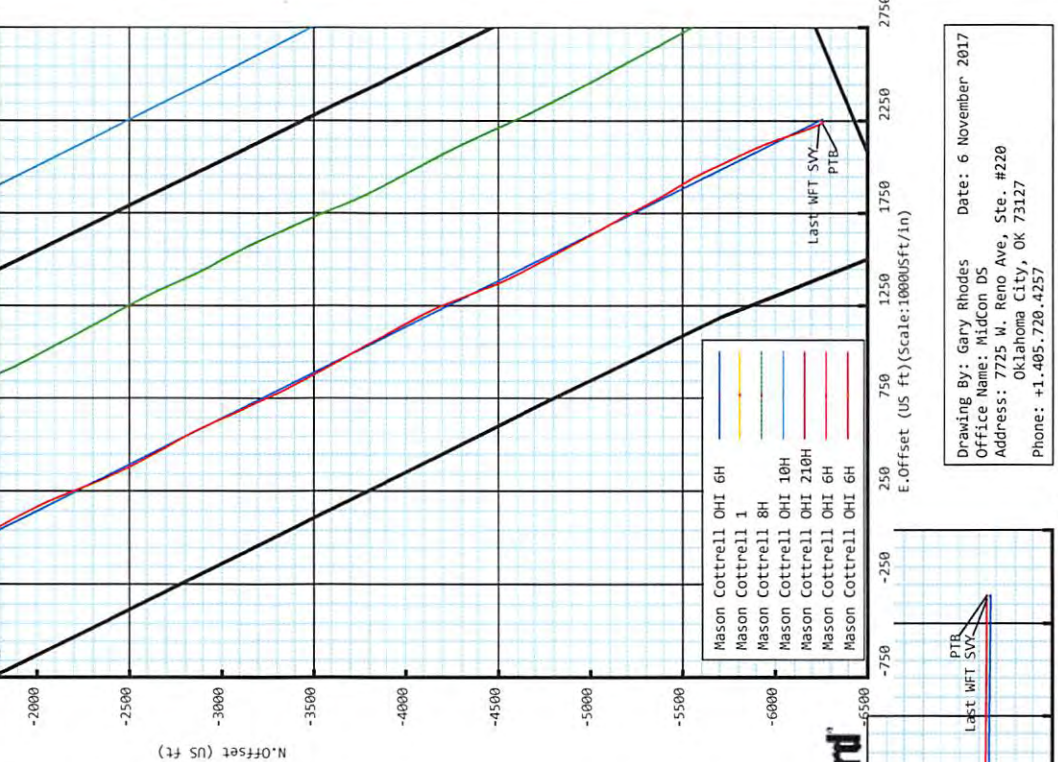
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Plan Data for Mason Cottrell OHI 6H

Formation Point Information:

| Name                | TVD (USft) | SS (USft) |
|---------------------|------------|-----------|
| Onondaga Limestone  | 6377.00    | 0.00      |
| Base of Fresh Water | 387.00     | 935.00    |
| Pittsburgh Coal     | 610.00     | 712.00    |
| Top of Salt Water   | 752.00     | 570.00    |
| Base Big Injun      | 1972.00    | -650.00   |
| Berea               | 2231.00    | -909.00   |
| Upper Rhinestreet   | 5743.00    | -4421.00  |
| Lower Rhinestreet   | 5875.00    | -4553.00  |
| Basal Rhinestreet   | 5941.00    | -4619.00  |
| Cashuaqua           | 6015.00    | -4693.00  |
| Middlesex           | 6080.00    | -4758.00  |
| Lower Middlesex     | 6111.00    | -4789.00  |
| Burket              | 6150.00    | -4828.00  |
| Tully               | 6177.00    | -4855.00  |
| Mahantango          | 6213.00    | -4891.00  |
| Levanma             | 6324.00    | -5002.00  |
| Upper Marcellus     | 6339.00    | -5017.00  |



Drawing By: Gary Rhodes  
Office Name: Midcon DS  
Address: 7725 W. Reno Ave, Ste. #220  
Oklahoma City, OK 73127  
Phone: +1.405.720.4257  
Date: 6 November 2017

09/07/2018

**5D Survey Report**

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**SOUTHWESTERN ENERGY**

**Field Name:** *SOUTHWESTERN\_OHIO CO, WV UTM NAD 83 (17N)*  
**Site Name:** *Mason Cottrell Pad*  
**Well Name:** *Mason Cottrell OHI 6H*  
**Survey:** *Definitive survey*

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29 November 2017

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## Mason Cottrell OHI 6H

|   |  |
|---|--|
| <b>Map Units:</b> US ft                             | <b>Company Name:</b> SOUTHWESTERN ENERGY                 |
| <b>Field Name:</b>                                  | <b>Vertical Reference Datum (VRD):</b> Mean Sea Level    |
| SOUTHWESTER<br>N_OHIO CO, WV<br>UTM NAD 83<br>(17N) | <b>Projected Coordinate System:</b> NAD83 / UTM zone 17N |
| <b>Comment:</b>                                     |  |

|   |   |                                    |                                |
|---|---|------------------------------------|--------------------------------|
| <b>Site:</b><br><br>Mason Cottrell<br>Pad | <b>Units:</b> US ft                       | <b>North Reference:</b> Grid       | <b>Convergence Angle:</b> 0.25 |
|   | <b>Position:</b>                          | <b>Northing:</b> 14554576.20 US ft | <b>Latitude:</b> 40.075830     |
|   |   | <b>Easting:</b> 1747378.82 US ft   | <b>Longitude:</b> -80.617639   |
|   | <b>Elevation above MSL:</b> 1295.80 US ft |                                    |                                |
| <b>Comment:</b>                           |   |                                    |                                |

|  |   |                                    |                              |
|--|---|------------------------------------|------------------------------|
| <b>Slot:</b><br><br>Mason Cottrell<br>OHI 6H | <b>Position (Relative to Site Centre)</b>   |                                    |                              |
|  | <b>+N/-S:</b> -11.56 US ft                  | <b>Northing:</b> 14554564.64 US ft | <b>Latitude:</b> 40.075798   |
|  | <b>+E/-W:</b> -7.70 US ft                   | <b>Easting:</b> 1747371.13 US ft   | <b>Longitude:</b> -80.617667 |
|  | <b>Slot TVD Reference:</b> Ground Elevation |                                    |                              |
|  | <b>Elevation above MSL:</b> 1296.00 US ft   |                                    |                              |
| <b>Comment:</b>                              |   |                                    |                              |

|  |   |   |
|--|---|---|
| <b>Well:</b><br><br>Mason Cottrell<br>OHI 6H | <b>Type:</b> Main well  | <b>UWI:</b>                                 |
|  | <b>File Number:</b>   | <b>Comment:</b>                             |
|  | <b>Closure Distance:</b> 6649.53 US ft                                | <b>Closure Azimuth:</b> 160.33°             |
|  | <b>Vertical Section: Position of Origin (Relative to Slot centre)</b> |   |
|  | <b>+N/-S:</b> -0.00 US ft   | <b>+E/-W:</b> 0.00 US ft <b>Az:</b> 160.16° |

|  |   |                           |                       |
|--|---|---------------------------|-----------------------|
| <b>Drill floor: Survey Name: Definitive Survey</b> |   |                           |                       |
| <b>Rig Height (Drill Floor):</b> 26.00 US ft       | <b>Elevation above MSL:</b> 1322.00 US ft | <b>Inclination:</b> 0.00° | <b>Azimuth:</b> 0.00° |

|                                       |   |                 |                 |
|---------------------------------------|---|-----------------|-----------------|
| <b>Survey Name: Definitive Survey</b> |   |                 |                 |
| <b>Date:</b> 03/Oct/2017              | <b>Survey Tool:</b> See Survey Tool Ranges below. | <b>Comment:</b> | <b>Company:</b> |

|                         |                          |                                   |                            |                    |
|-------------------------|--------------------------|-----------------------------------|----------------------------|--------------------|
| <b>Magnetic Model:</b>  |                          |                                   |                            |                    |
| <b>Model Name:</b> HDGM | <b>Date:</b> 16/Oct/2017 | <b>Field Strength:</b> 52710.0 nT | <b>Declination:</b> -8.17° | <b>Dip:</b> 67.45° |

|                       |                           |                       |                        |                                  |                                |
|-----------------------|---------------------------|-----------------------|------------------------|----------------------------------|--------------------------------|
| <b>Tie Point:</b>     |                           |                       |                        |                                  |                                |
| <b>MD:</b> 0.00 US ft | <b>Inclination:</b> 0.00° | <b>Azimuth:</b> 0.00° | <b>TVD:</b> 0.00 US ft | <b>North Offset:</b> -0.00 US ft | <b>East Offset:</b> 0.00 US ft |

| Survey Tool Ranges:   |                |              |               |
|-----------------------|----------------|--------------|---------------|
| Name                  | Start MD(usft) | End MD(usft) | Source Survey |
| GYRO_GC_WIR+DPIPE_GYD | 0.00           | 758.00       | Gyro_01       |
| MWD                   | 758.00         | 5871.00      | WFT_MWD_02    |
| MWD                   | 5871.00        | 6100.00      | WFT_HEL_01    |
| MWD                   | 6100.00        | 6898.00      | WFT_HEL_02    |
| MWD                   | 6898.00        | 12631.00     | WFT_HEL_03    |

Wellpath created using minimum curvature.

## 5D Survey Report

| Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor) |            |           |                |               |                     |                     |                     |                      |                     |  |
|---|------------|-----------|----------------|---------------|---------------------|---------------------|---------------------|----------------------|---------------------|--|
| MD<br>(US ft)   | Inc<br>(°) | Az<br>(°) | TVD<br>(US ft) | VS<br>(US ft) | N.Offset<br>(US ft) | E.Offset<br>(US ft) | Latitude<br>(° ' ") | Longitude<br>(° ' ") | DLS<br>(%/100US ft) | Comment                                      |
| 0.00  | 0.00       | 0.00      | 0.00           | -0.00         | -0.00               | 0.00                | 40.075798           | -80.617667           | 0.00                |  |
| 100.00  | 0.35       | 44.84     | 100.00         | -0.13         | 0.22                | 0.22                | 40.075799           | -80.617666           | 0.35                |  |
| 200.00  | 0.17       | 293.28    | 200.00         | -0.36         | 0.49                | 0.29                | 40.075800           | -80.617666           | 0.44                |  |
| 300.00  | 0.30       | 355.16    | 300.00         | -0.72         | 0.81                | 0.14                | 40.075800           | -80.617666           | 0.27                |  |
| 386.99  | 0.13       | 7.34      | 386.99         | -1.03         | 1.14                | 0.13                | 40.075801           | -80.617666           | 0.20                | Base of Fresh Water :                        |
| 400.00  | 0.11       | 12.27     | 400.00         | -1.05         | 1.17                | 0.13                | 40.075801           | -80.617666           | 0.20                |  |
| 500.00  | 0.14       | 281.02    | 500.00         | -1.20         | 1.28                | 0.03                | 40.075802           | -80.617667           | 0.18                |  |
| 600.00  | 0.18       | 259.59    | 600.00         | -1.28         | 1.28                | -0.24               | 40.075802           | -80.617668           | 0.07                |  |
| 609.99  | 0.16       | 286.97    | 609.99         | -1.29         | 1.28                | -0.27               | 40.075802           | -80.617668           | 0.83                | Pittsburgh Coal :                            |
| 661.00  | 0.46       | 353.75    | 661.00         | -1.54         | 1.50                | -0.36               | 40.075802           | -80.617668           | 0.83                |  |
| 751.98  | 0.41       | 352.46    | 751.98         | -2.21         | 2.19                | -0.44               | 40.075804           | -80.617668           | 0.05                | Top of Salt Water :                          |
| 758.00  | 0.41       | 352.36    | 757.99         | -2.25         | 2.24                | -0.45               | 40.075804           | -80.617668           | 0.05                | Gyro Tie-In                                  |
| 854.00  | 0.46       | 157.29    | 853.99         | -2.21         | 2.22                | -0.35               | 40.075804           | -80.617668           | 0.90                |  |
| 881.00  | 1.43       | 173.91    | 880.99         | -1.77         | 1.79                | -0.27               | 40.075803           | -80.617668           | 3.70                |  |
| 977.00  | 3.00       | 162.26    | 976.91         | 1.90          | -1.80               | 0.62                | 40.075793           | -80.617664           | 1.69                |  |
| 1073.00   | 4.67       | 159.12    | 1072.70        | 8.32          | -7.84               | 2.78                | 40.075777           | -80.617657           | 1.75                |  |
| 1168.00   | 5.67       | 160.10    | 1167.31        | 16.88         | -15.87              | 5.76                | 40.075755           | -80.617646           | 1.06                |  |
| 1264.00   | 5.98       | 165.44    | 1262.81        | 26.60         | -25.17              | 8.63                | 40.075729           | -80.617636           | 0.65                |  |
| 1360.00   | 5.38       | 176.06    | 1358.34        | 35.91         | -34.50              | 10.20               | 40.075703           | -80.617631           | 1.26                |  |
| 1455.00   | 4.99       | 184.72    | 1452.96        | 43.95         | -43.06              | 10.16               | 40.075680           | -80.617631           | 0.92                |  |
| 1551.00   | 5.63       | 215.50    | 1548.56        | 50.43         | -51.06              | 7.08                | 40.075658           | -80.617642           | 3.00                |  |
| 1646.00   | 7.24       | 242.81    | 1642.98        | 53.85         | -57.59              | -0.95               | 40.075640           | -80.617671           | 3.59                |  |
| 1743.00   | 10.08      | 252.27    | 1738.87        | 54.31         | -62.97              | -14.48              | 40.075626           | -80.617719           | 3.27                |  |
| 1839.00   | 10.83      | 249.66    | 1833.28        | 54.08         | -68.66              | -30.93              | 40.075610           | -80.617778           | 0.92                |  |
| 1947.00   | 10.15      | 246.89    | 1939.47        | 54.71         | -75.92              | -49.20              | 40.075590           | -80.617844           | 0.78                |  |
| 1980.61   | 9.85       | 245.74    | 1972.58        | 55.10         | -78.27              | -54.55              | 40.075584           | -80.617863           | 1.08                | Base Big Injun :                             |
| 2063.00   | 9.12       | 242.59    | 2053.84        | 56.51         | -84.17              | -66.76              | 40.075568           | -80.617907           | 1.08                |  |
| 2160.00   | 8.65       | 242.51    | 2149.67        | 58.49         | -91.07              | -80.06              | 40.075549           | -80.617954           | 0.48                |  |
| 2242.84   | 8.06       | 242.62    | 2231.63        | 60.08         | -96.62              | -90.74              | 40.075534           | -80.617993           | 0.71                | Berea :                                      |
| 2256.00   | 7.97       | 242.64    | 2244.66        | 60.32         | -97.46              | -92.37              | 40.075532           | -80.617998           | 0.71                |  |
| 2352.00   | 9.51       | 246.74    | 2339.55        | 61.66         | -103.65             | -105.57             | 40.075515           | -80.618046           | 1.73                |  |
| 2448.00   | 10.12      | 247.77    | 2434.14        | 62.49         | -109.98             | -120.66             | 40.075498           | -80.618100           | 0.66                |  |
| 2544.00   | 9.72       | 246.67    | 2528.71        | 63.33         | -116.38             | -135.91             | 40.075480           | -80.618154           | 0.46                |  |
| 2641.00   | 9.55       | 245.85    | 2624.34        | 64.43         | -122.91             | -150.77             | 40.075463           | -80.618208           | 0.23                |  |
| 2739.00   | 9.09       | 244.77    | 2721.04        | 65.77         | -129.54             | -165.20             | 40.075444           | -80.618259           | 0.50                |  |
| 2834.00   | 8.52       | 245.47    | 2814.92        | 67.05         | -135.66             | -178.39             | 40.075428           | -80.618306           | 0.61                |  |
| 2930.00   | 8.00       | 245.17    | 2909.93        | 68.21         | -141.42             | -190.92             | 40.075412           | -80.618351           | 0.54                |  |
| 3026.00   | 9.03       | 247.03    | 3004.87        | 69.20         | -147.16             | -203.92             | 40.075397           | -80.618398           | 1.10                | RECEIVED<br>Office of Oil and Gas            |
| 3123.00   | 8.81       | 248.09    | 3100.70        | 69.89         | -152.90             | -217.82             | 40.075381           | -80.618448           | 0.28                |  |
| 3219.00   | 8.18       | 247.33    | 3195.64        | 70.49         | -158.28             | -230.94             | 40.075366           | -80.618495           | 0.67                | AUG 3 2018                                   |
| 3315.00   | 9.30       | 244.59    | 3290.53        | 71.58         | -164.24             | -244.25             | 40.075350           | -80.618542           | 1.24                |  |
| 3411.00   | 9.81       | 244.55    | 3385.19        | 73.13         | -171.08             | -258.64             | 40.075332           | -80.618594           | 0.53                | WV Department of<br>Environmental Protection |
| 3508.00   | 9.30       | 243.92    | 3480.85        | 74.79         | -178.08             | -273.14             | 40.075312           | -80.618646           | 0.54                |  |
| 3604.00   | 9.05       | 244.37    | 3575.62        | 76.39         | -184.76             | -286.92             | 40.075294           | -80.618695           | 0.27                |  |
| 3700.00   | 8.44       | 244.14    | 3670.50        | 77.89         | -191.10             | -300.06             | 40.075277           | -80.618742           | 0.64                |  |
| 3796.00   | 7.61       | 243.71    | 3765.56        | 79.34         | -196.98             | -312.10             | 40.075261           | -80.618785           | 0.87                |  |
| 3891.00   | 8.85       | 249.17    | 3859.58        | 80.18         | -202.37             | -324.57             | 40.075246           | -80.618830           | 1.54                |  |
| 3987.00   | 8.97       | 252.26    | 3954.43        | 80.03         | -207.28             | -338.60             | 40.075233           | -80.618880           | 0.51                |  |
| 4084.00   | 8.36       | 252.68    | 4050.32        | 79.44         | -211.68             | -352.54             | 40.075221           | -80.618930           | 0.63                |  |
| 4180.00   | 9.07       | 252.41    | 4145.21        | 78.84         | -216.04             | -366.41             | 40.075209           | -80.618980           | 0.74                |  |
| 4276.00   | 8.81       | 253.29    | 4240.04        | 78.14         | -220.44             | -380.67             | 40.075197           | -80.619031           | 0.31                |  |
| 4372.00   | 9.03       | 246.28    | 4334.88        | 78.24         | -225.59             | -394.61             | 40.075183           | -80.619081           | 1.15                |  |
| 4468.00   | 8.81       | 243.04    | 4429.72        | 79.66         | -231.95             | -408.06             | 40.075166           | -80.619129           | 0.57                |  |
| 4565.00   | 8.28       | 242.21    | 4525.65        | 81.55         | -238.58             | -420.86             | 40.075148           | -80.619175           | 0.56                |  |
| 4661.00   | 9.03       | 242.09    | 4620.55        | 83.56         | -245.33             | -433.63             | 40.075130           | -80.619221           | 0.78                |  |
| 4757.00   | 8.95       | 241.30    | 4715.37        | 85.77         | -252.44             | -446.84             | 40.075110           | -80.619268           | 0.15                |  |

## 5D Survey Report

| Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor) |            |           |                |               |                     |                     |                     |                      |                     |  |
|---|------------|-----------|----------------|---------------|---------------------|---------------------|---------------------|----------------------|---------------------|--|
| MD<br>(US ft)   | Inc<br>(°) | Az<br>(°) | TVD<br>(US ft) | VS<br>(US ft) | N.Offset<br>(US ft) | E.Offset<br>(US ft) | Latitude<br>(° ' ") | Longitude<br>(° ' ") | DLS<br>(°/100US ft) | Comment                                      |
| 4854.00   | 8.87       | 241.07    | 4811.20        | 88.11         | -259.68             | -460.00             | 40.075091           | -80.619315           | 0.09                |  |
| 4950.00   | 8.77       | 243.04    | 4906.07        | 90.19         | -266.58             | -473.00             | 40.075072           | -80.619362           | 0.33                |  |
| 5046.00   | 8.51       | 242.82    | 5000.98        | 92.00         | -273.14             | -485.84             | 40.075054           | -80.619408           | 0.27                |  |
| 5143.00   | 9.33       | 241.34    | 5096.81        | 94.12         | -280.19             | -499.13             | 40.075035           | -80.619455           | 0.88                |  |
| 5239.00   | 9.46       | 239.97    | 5191.52        | 96.71         | -287.87             | -512.79             | 40.075014           | -80.619504           | 0.27                |  |
| 5335.00   | 9.37       | 239.74    | 5286.22        | 99.52         | -295.76             | -526.37             | 40.074992           | -80.619553           | 0.10                |  |
| 5431.00   | 8.97       | 240.01    | 5381.00        | 102.25        | -303.43             | -539.60             | 40.074971           | -80.619600           | 0.42                |  |
| 5479.00   | 8.93       | 237.56    | 5428.41        | 103.72        | -307.30             | -545.98             | 40.074961           | -80.619623           | 0.80                |  |
| 5528.00   | 9.71       | 224.21    | 5476.77        | 106.36        | -312.31             | -552.08             | 40.074947           | -80.619645           | 4.68                |  |
| 5560.00   | 11.60      | 214.17    | 5508.22        | 109.43        | -316.90             | -555.77             | 40.074935           | -80.619658           | 8.26                |  |
| 5592.00   | 13.74      | 206.59    | 5539.44        | 113.94        | -322.96             | -559.27             | 40.074918           | -80.619671           | 8.46                |  |
| 5624.00   | 15.87      | 201.80    | 5570.38        | 119.83        | -330.43             | -562.60             | 40.074898           | -80.619683           | 7.67                |  |
| 5672.00   | 17.77      | 194.34    | 5616.33        | 130.80        | -343.62             | -566.85             | 40.074861           | -80.619698           | 5.98                |  |
| 5720.00   | 18.80      | 187.40    | 5661.91        | 143.74        | -358.39             | -569.66             | 40.074821           | -80.619709           | 5.01                |  |
| 5768.00   | 20.36      | 181.24    | 5707.14        | 158.41        | -374.41             | -570.84             | 40.074777           | -80.619713           | 5.39                |  |
| 5808.40   | 22.05      | 177.34    | 5744.80        | 172.21        | -389.01             | -570.64             | 40.074737           | -80.619712           | 5.45                | Upper<br>Rhinstreet :                        |
| 5816.00   | 22.38      | 176.67    | 5751.84        | 174.96        | -391.88             | -570.49             | 40.074729           | -80.619712           | 5.45                |  |
| 5871.00   | 25.45      | 173.15    | 5802.11        | 196.52        | -414.07             | -568.47             | 40.074668           | -80.619705           | 6.15                |  |
| 5909.00   | 27.14      | 170.46    | 5836.18        | 213.01        | -430.73             | -566.06             | 40.074622           | -80.619697           | 5.44                |  |
| 5955.84   | 29.27      | 168.12    | 5877.46        | 234.86        | -452.47             | -561.93             | 40.074562           | -80.619682           | 5.12                | Lower<br>Rhinstreet :                        |
| 5958.00   | 29.37      | 168.02    | 5879.34        | 235.91        | -453.51             | -561.71             | 40.074559           | -80.619682           | 5.12                |  |
| 6006.00   | 28.98      | 165.32    | 5921.25        | 259.15        | -476.27             | -556.32             | 40.074497           | -80.619663           | 2.86                |  |
| 6031.82   | 28.96      | 164.60    | 5943.84        | 271.61        | -488.35             | -553.08             | 40.074464           | -80.619651           | 1.34                | Basal<br>Rhinstreet :                        |
| 6054.00   | 28.94      | 163.99    | 5963.25        | 282.32        | -498.69             | -550.17             | 40.074435           | -80.619641           | 1.34                |  |
| 6100.00   | 25.67      | 160.80    | 6004.12        | 303.39        | -518.80             | -543.83             | 40.074380           | -80.619619           | 7.79                |  |
| 6115.68   | 25.80      | 159.45    | 6018.25        | 310.20        | -525.20             | -541.51             | 40.074362           | -80.619610           | 3.83                | Cashaqua :                                   |
| 6131.00   | 25.93      | 158.14    | 6032.03        | 316.88        | -531.43             | -539.09             | 40.074345           | -80.619602           | 3.83                |  |
| 6163.00   | 29.43      | 155.48    | 6060.37        | 331.71        | -545.08             | -533.22             | 40.074308           | -80.619581           | 11.60               |  |
| 6190.09   | 32.33      | 154.60    | 6083.62        | 345.56        | -557.68             | -527.35             | 40.074273           | -80.619560           | 10.85               | Middlesex :                                  |
| 6195.00   | 32.86      | 154.45    | 6087.75        | 348.19        | -560.07             | -526.22             | 40.074266           | -80.619556           | 10.85               |  |
| 6227.00   | 35.82      | 154.20    | 6114.17        | 366.15        | -576.34             | -518.39             | 40.074222           | -80.619529           | 9.26                |  |
| 6227.82   | 35.89      | 154.20    | 6114.84        | 366.63        | -576.77             | -518.18             | 40.074221           | -80.619528           | 8.81                | Lower<br>Middlesex :                         |
| 6259.00   | 38.64      | 154.29    | 6139.65        | 385.41        | -593.77             | -509.98             | 40.074174           | -80.619499           | 8.81                |  |
| 6277.76   | 40.05      | 154.74    | 6154.16        | 397.24        | -604.51             | -504.86             | 40.074144           | -80.619481           | 7.68                | Burket :                                     |
| 6291.00   | 41.05      | 155.04    | 6164.22        | 405.81        | -612.30             | -501.21             | 40.074123           | -80.619468           | 7.68                |  |
| 6314.21   | 43.35      | 155.33    | 6181.41        | 421.34        | -626.46             | -494.67             | 40.074084           | -80.619445           | 9.94                | Tully :                                      |
| 6323.00   | 44.22      | 155.44    | 6187.75        | 427.40        | -631.98             | -492.14             | 40.074069           | -80.619436           | 9.94                |  |
| 6355.00   | 47.66      | 155.33    | 6210.00        | 450.32        | -652.89             | -482.56             | 40.074011           | -80.619402           | 10.75               |  |
| 6366.72   | 48.92      | 155.42    | 6217.81        | 459.04        | -660.84             | -478.91             | 40.073989           | -80.619389           | 10.73               | Mahantango<br>Office of Oil and Gas          |
| 6387.00   | 51.09      | 155.57    | 6230.84        | 474.52        | -674.98             | -472.47             | 40.073950           | -80.619366           | 10.73               | RECEIVED                                     |
| 6418.00   | 55.26      | 155.06    | 6249.41        | 499.24        | -697.52             | -462.11             | 40.073888           | -80.619329           | 13.52               | Office of Oil and Gas                        |
| 6450.00   | 59.57      | 154.71    | 6266.64        | 526.08        | -721.92             | -450.67             | 40.073821           | -80.619289           | 13.50               | AUG 3 2018                                   |
| 6482.00   | 63.48      | 154.49    | 6281.90        | 554.07        | -747.33             | -438.60             | 40.073751           | -80.619246           | 12.23               | WV Department of<br>Environmental Protection |
| 6514.00   | 66.69      | 154.50    | 6295.38        | 582.95        | -773.52             | -426.11             | 40.073679           | -80.619202           | 10.03               |  |
| 6562.00   | 69.72      | 155.64    | 6313.20        | 627.34        | -813.93             | -407.33             | 40.073568           | -80.619135           | 6.69                |  |
| 6610.00   | 73.35      | 156.78    | 6328.40        | 672.75        | -855.59             | -388.97             | 40.073453           | -80.619070           | 7.89                |  |
| 6619.77   | 74.02      | 156.77    | 6331.14        | 682.11        | -864.20             | -385.27             | 40.073430           | -80.619057           | 6.81                | Levanna :                                    |
| 6658.00   | 76.62      | 156.75    | 6340.83        | 719.02        | -898.18             | -370.68             | 40.073336           | -80.619006           | 6.81                |  |
| 6686.05   | 78.75      | 156.83    | 6346.81        | 746.38        | -923.37             | -359.88             | 40.073267           | -80.618967           | 7.59                | Upper<br>Marcellus :                         |
| 6706.00   | 80.26      | 156.88    | 6350.45        | 765.96        | -941.40             | -352.17             | 40.073217           | -80.618940           | 7.59                |  |
| 6757.00   | 84.69      | 155.70    | 6357.13        | 816.39        | -987.68             | -331.84             | 40.073090           | -80.618868           | 8.98                |  |
| 6802.00   | 86.49      | 153.82    | 6360.59        | 861.06        | -1028.26            | -312.71             | 40.072978           | -80.618800           | 5.77                |  |
| 6850.00   | 87.65      | 154.74    | 6363.04        | 908.74        | -1071.45            | -291.91             | 40.072859           | -80.618727           | 3.08                |  |
| 6898.00   | 88.46      | 155.10    | 6364.67        | 956.51        | -1114.90            | -271.58             | 40.072740           | -80.618655           | 1.85                |  |

## 5D Survey Report

| Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor) |            |           |                |               |                     |                     |                     |                      |                     |                         |
|---|------------|-----------|----------------|---------------|---------------------|---------------------|---------------------|----------------------|---------------------|-------------------------|
| MD<br>(US ft)   | Inc<br>(°) | Az<br>(°) | TVD<br>(US ft) | VS<br>(US ft) | N.Offset<br>(US ft) | E.Offset<br>(US ft) | Latitude<br>(° ' ") | Longitude<br>(° ' ") | DLS<br>(%/100US ft) | Comment                 |
| 7013.00   | 88.64      | 155.04    | 6367.58        | 1071.02       | -1219.15            | -223.12             | 40.072453           | -80.618483           | 0.16                |                         |
| 7110.00   | 89.14      | 154.80    | 6369.46        | 1167.60       | -1306.99            | -182.01             | 40.072211           | -80.618337           | 0.57                |                         |
| 7206.00   | 89.01      | 155.86    | 6371.01        | 1263.25       | -1394.21            | -141.94             | 40.071971           | -80.618195           | 1.11                |                         |
| 7303.00   | 89.07      | 155.58    | 6372.63        | 1359.94       | -1482.62            | -102.06             | 40.071728           | -80.618054           | 0.30                |                         |
| 7399.00   | 89.57      | 153.63    | 6373.77        | 1455.48       | -1569.33            | -60.90              | 40.071489           | -80.617908           | 2.10                |                         |
| 7495.00   | 89.51      | 152.70    | 6374.54        | 1550.76       | -1654.99            | -17.56              | 40.071254           | -80.617755           | 0.97                |                         |
| 7591.00   | 89.32      | 151.65    | 6375.52        | 1645.83       | -1739.88            | 27.24               | 40.071020           | -80.617596           | 1.11                |                         |
| 7688.00   | 88.95      | 151.87    | 6376.99        | 1741.77       | -1825.33            | 73.13               | 40.070785           | -80.617433           | 0.44                |                         |
| 7688.69   | 88.95      | 151.87    | 6377.00        | 1742.46       | -1825.94            | 73.46               | 40.070783           | -80.617432           | 0.44                | Onondaga<br>Limestone : |
| 7783.00   | 89.32      | 151.67    | 6378.42        | 1835.75       | -1909.02            | 118.07              | 40.070555           | -80.617274           | 0.44                |                         |
| 7878.00   | 89.32      | 153.89    | 6379.55        | 1929.95       | -1993.49            | 161.51              | 40.070322           | -80.617120           | 2.34                |                         |
| 7974.00   | 89.01      | 156.54    | 6380.95        | 2025.57       | -2080.63            | 201.75              | 40.070082           | -80.616978           | 2.78                |                         |
| 8070.00   | 89.88      | 158.47    | 6381.88        | 2121.46       | -2169.31            | 238.48              | 40.069838           | -80.616848           | 2.21                |                         |
| 8167.00   | 89.82      | 159.43    | 6382.13        | 2218.44       | -2259.84            | 273.32              | 40.069589           | -80.616724           | 0.99                |                         |
| 8263.00   | 89.38      | 157.15    | 6382.80        | 2314.38       | -2349.02            | 308.82              | 40.069344           | -80.616599           | 2.42                |                         |
| 8359.00   | 89.69      | 155.19    | 6383.58        | 2410.14       | -2436.83            | 347.61              | 40.069102           | -80.616462           | 2.07                |                         |
| 8455.00   | 90.00      | 153.07    | 6383.84        | 2505.60       | -2523.20            | 389.49              | 40.068865           | -80.616313           | 2.23                |                         |
| 8551.00   | 90.06      | 151.35    | 6383.79        | 2600.68       | -2608.13            | 434.25              | 40.068631           | -80.616155           | 1.79                |                         |
| 8647.00   | 89.82      | 150.86    | 6383.89        | 2695.48       | -2692.18            | 480.64              | 40.068400           | -80.615990           | 0.57                |                         |
| 8743.00   | 89.75      | 150.37    | 6384.25        | 2790.15       | -2775.83            | 527.74              | 40.068169           | -80.615823           | 0.52                |                         |
| 8838.00   | 89.88      | 153.04    | 6384.56        | 2884.11       | -2859.47            | 572.77              | 40.067939           | -80.615663           | 2.81                |                         |
| 8935.00   | 90.06      | 155.69    | 6384.61        | 2980.61       | -2946.91            | 614.73              | 40.067698           | -80.615515           | 2.74                |                         |
| 9031.00   | 90.00      | 156.07    | 6384.56        | 3076.34       | -3034.53            | 653.96              | 40.067457           | -80.615376           | 0.40                |                         |
| 9127.00   | 89.69      | 155.19    | 6384.82        | 3172.04       | -3121.97            | 693.57              | 40.067217           | -80.615236           | 0.97                |                         |
| 9224.00   | 90.25      | 155.69    | 6384.87        | 3268.71       | -3210.20            | 733.89              | 40.066974           | -80.615093           | 0.77                |                         |
| 9320.00   | 89.63      | 155.13    | 6384.97        | 3364.38       | -3297.49            | 773.84              | 40.066734           | -80.614951           | 0.87                |                         |
| 9417.00   | 89.57      | 153.05    | 6385.65        | 3460.83       | -3384.73            | 816.22              | 40.066494           | -80.614801           | 2.15                |                         |
| 9513.00   | 89.88      | 152.22    | 6386.11        | 3556.00       | -3469.99            | 860.34              | 40.066259           | -80.614645           | 0.92                |                         |
| 9610.00   | 89.75      | 150.91    | 6386.42        | 3651.91       | -3555.28            | 906.53              | 40.066024           | -80.614481           | 1.36                |                         |
| 9706.00   | 89.44      | 150.34    | 6387.10        | 3746.58       | -3638.94            | 953.62              | 40.065794           | -80.614314           | 0.68                |                         |
| 9802.00   | 89.63      | 149.89    | 6387.88        | 3841.11       | -3722.17            | 1001.45             | 40.065565           | -80.614145           | 0.51                |                         |
| 9898.00   | 89.69      | 151.91    | 6388.45        | 3935.85       | -3806.05            | 1048.14             | 40.065334           | -80.613979           | 2.11                |                         |
| 9994.00   | 89.69      | 151.35    | 6388.97        | 4030.79       | -3890.51            | 1093.75             | 40.065102           | -80.613817           | 0.58                |                         |
| 10090.00  | 89.51      | 151.58    | 6389.64        | 4125.68       | -3974.85            | 1139.61             | 40.064869           | -80.613655           | 0.30                |                         |
| 10186.00  | 89.75      | 152.34    | 6390.26        | 4220.70       | -4059.58            | 1184.74             | 40.064636           | -80.613495           | 0.83                |                         |
| 10282.00  | 89.20      | 154.78    | 6391.14        | 4316.05       | -4145.53            | 1227.48             | 40.064400           | -80.613343           | 2.61                |                         |
| 10379.00  | 89.94      | 157.85    | 6391.87        | 4412.82       | -4234.34            | 1266.43             | 40.064155           | -80.613205           | 3.26                |                         |
| 10475.00  | 89.94      | 158.45    | 6391.97        | 4508.76       | -4323.45            | 1302.16             | 40.063910           | -80.613079           | 0.62                |                         |
| 10571.00  | 89.82      | 160.06    | 6392.17        | 4604.74       | -4413.22            | 1336.17             | 40.063663           | -80.612959           | 1.68                |                         |
| 10668.00  | 90.00      | 156.70    | 6392.32        | 4701.68       | -4503.38            | 1371.90             | 40.063415           | -80.612833           | 3.47                |                         |
| 10764.00  | 90.00      | 154.07    | 6392.32        | 4797.34       | -4590.65            | 1411.88             | 40.063175           | -80.612691           | 2.74                |                         |
| 10860.00  | 90.00      | 152.27    | 6392.32        | 4892.62       | -4676.31            | 1455.21             | 40.062939           | -80.612538           | 1.88                |                         |
| 10957.00  | 90.06      | 151.71    | 6392.27        | 4988.64       | -4761.95            | 1500.76             | 40.062704           | -80.612376           | 0.58                |                         |
| 11053.00  | 90.18      | 151.73    | 6392.07        | 5083.60       | -4846.49            | 1546.25             | 40.062471           | -80.612215           | 0.13                |                         |
| 11149.00  | 90.55      | 152.01    | 6391.46        | 5178.60       | -4931.15            | 1591.51             | 40.062238           | -80.612054           | 0.48                |                         |
| 11245.00  | 90.31      | 151.43    | 6390.74        | 5273.55       | -5015.69            | 1636.99             | 40.062005           | -80.611893           | 0.65                |                         |
| 11341.00  | 89.51      | 150.31    | 6390.89        | 5368.29       | -5099.55            | 1683.72             | 40.061774           | -80.611728           | 1.43                |                         |
| 11438.00  | 89.63      | 151.41    | 6391.62        | 5464.02       | -5184.26            | 1730.95             | 40.061541           | -80.611560           | 1.14                |                         |
| 11534.00  | 89.63      | 153.19    | 6392.24        | 5559.11       | -5269.26            | 1775.57             | 40.061307           | -80.611402           | 1.85                |                         |
| 11630.00  | 89.63      | 151.94    | 6392.86        | 5654.26       | -5354.46            | 1819.80             | 40.061073           | -80.611245           | 1.30                |                         |
| 11726.00  | 89.57      | 149.02    | 6393.53        | 5748.89       | -5437.98            | 1867.10             | 40.060843           | -80.611077           | 3.04                |                         |
| 11822.00  | 89.69      | 149.49    | 6394.15        | 5843.15       | -5520.49            | 1916.17             | 40.060616           | -80.610903           | 0.51                |                         |
| 11918.00  | 89.51      | 153.97    | 6394.82        | 5938.09       | -5605.01            | 1961.63             | 40.060383           | -80.610742           | 4.67                |                         |
| 12015.00  | 89.57      | 155.39    | 6395.59        | 6034.64       | -5692.69            | 2003.11             | 40.060142           | -80.610595           | 1.47                |                         |
| 12111.00  | 89.51      | 154.21    | 6396.37        | 6130.21       | -5779.55            | 2043.98             | 40.059903           | -80.610451           | 1.23                |                         |
| 12207.00  | 89.63      | 155.51    | 6397.09        | 6225.80       | -5866.45            | 2084.77             | 40.059664           | -80.610306           | 1.36                |                         |
| 12303.00  | 89.88      | 158.17    | 6397.50        | 6321.63       | -5954.71            | 2122.52             | 40.059421           | -80.610173           | 2.78                |                         |
| 12400.00  | 89.63      | 161.26    | 6397.91        | 6418.61       | -6045.68            | 2156.14             | 40.059171           | -80.610054           | 3.20                |                         |

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## 5D Survey Report

| Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor) |            |           |                |               |                     |                     |                     |                      |                     |                 |
|---|------------|-----------|----------------|---------------|---------------------|---------------------|---------------------|----------------------|---------------------|-----------------|
| MD<br>(US ft)   | Inc<br>(°) | Az<br>(°) | TVD<br>(US ft) | VS<br>(US ft) | N.Offset<br>(US ft) | E.Offset<br>(US ft) | Latitude<br>(° ' ") | Longitude<br>(° ' ") | DLS<br>(°/100US ft) | Comment         |
| 12496.00  | 89.75      | 159.92    | 6398.43        | 6514.61       | -6136.22            | 2188.05             | 40.058922           | -80.609941           | 1.40                |                 |
| 12592.00  | 89.57      | 157.21    | 6399.00        | 6610.56       | -6225.57            | 2223.12             | 40.058676           | -80.609817           | 2.83                |                 |
| 12608.00  | 89.69      | 156.78    | 6399.10        | 6626.54       | -6240.30            | 2229.38             | 40.058635           | -80.609795           | 2.79                | Last WFT<br>SVY |
| 12631.00  | 89.69      | 156.78    | 6399.23        | 6649.50       | -6261.43            | 2238.45             | 40.058577           | -80.609763           | 0.00                | PTB             |

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