

Thurman Speece BRK 3H
Brooke County, WV
Quail 9

Plan vs Actual

Plan Data for Thurman Speece BRK 3H

DogLeg Severity Unit: 0/100.00ft

MD (USft)	Inc (°)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	VSec (USft)	Position offsets from Slot centre (DLSU)	DLS Toolface Comments
4888.00	6.41	49.17	4888.34	181.31	144.98	116.89	0.94	61.7 Last WFT SVY
4906.00	5.66	49.17	4897.88	188.05	152.77	120.37	0.77	188.0 PTB
5198.63	5.66	49.17	5181.04	286.40	174.02	129.84	0.00	0.0 Curve KOP
6169.44	70.00	335.39	5926.46	718.61	-2.57	671.26	7.00	284.1 Build/Turn 9° DLS
6480.61	90.71	337.47	5965.08	926.40	-93.09	897.72	9.00	5.9 LP
16473.72	90.71	337.47	5841.00	10229.99	-3952.54	10967.01	0.00	0.0 PBHL T53H

Target Set Information:
Name: Thurman Speece BRK 3H
Position offsets from Slot centre
Name TVD +N/-S +E/-W Northing Easting Lat Long
LP T53H 5965.00 705.28 -0.65 14596748.85 1754878.67 40.191547 -88.590135
PBHL T53H 5841.00 10229.99 -3952.54 14606273.56 1750926.78 40.217751 -88.604133

Plan Data for Thurman Speece BRK 3H

Field: SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)
Map Unit: USFT
Projected Coordinate System: NAD83 / UTM zone 17N

Site: Thurman Speece BRK Pad
Unit: USFeet
Company Name: SOUTHWESTERN ENERGY
Northing: 14596029.99USft Latitude: 40.189573°
Easting: 1754875.81USft Longitude: -88.590157°
North Reference: Grid Grid Convergence: 0.26°
Elevation Above VRD: 1139.50USft

Slot: Thurman Speece BRK 3H
Position:
Offset is from Site centre
+N/-S: 13.58USft Northing: 14596043.57USft Latitude: 40.189610°
+E/-W: 3.51USft Easting: 1754879.32USft Longitude: -88.590144°
Elevation Above VRD: 1139.50USft

Well: Thurman Speece BRK 3H
Type: Main-Well
File Number:
Plan Folder: P2
Plan: P2:V3
Vertical Section: Position offset of origin from Slot centre:
+N/-S: -0.00USft
+E/-W: -0.00USft
Azimuth: 338.88°
Date: 2017-08-11

Magnetic Parameters:
Model: HDGM
Field Strength: 52680(nT)
Dip: 67.67°
Declination: -8.28°

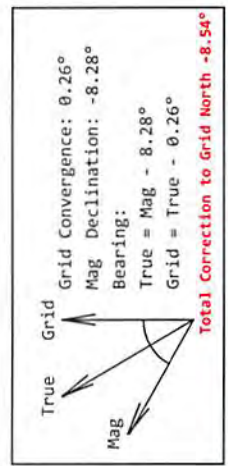
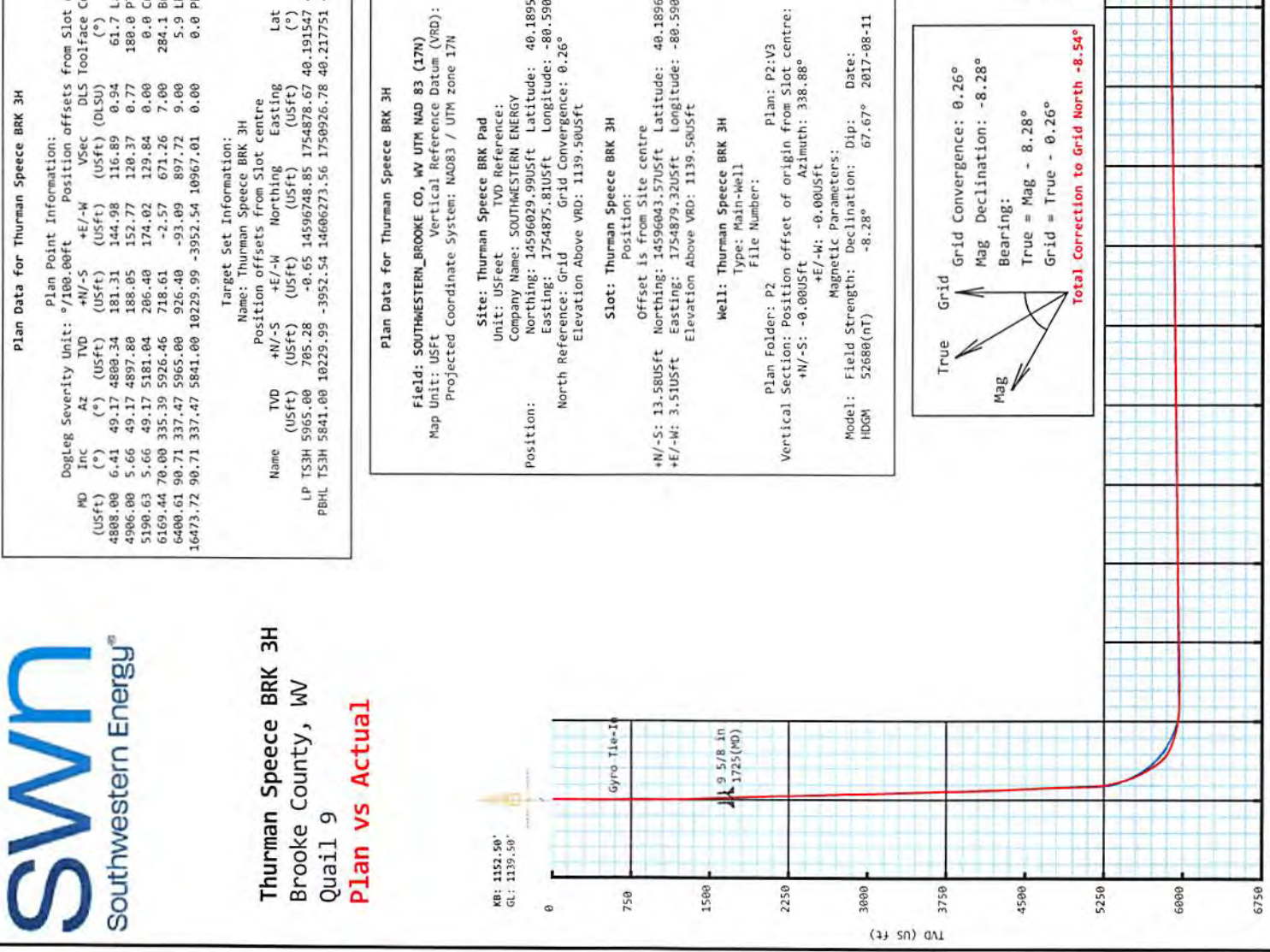


Plan Data for Thurman Speece BRK 3H

Formation Point Information:

Name	TVD (USft)	TVD SS (USft)	MD (USft)
Onondaga Limestone	-4824.00	0.00	-1.00
Base of Fresh Water	263.50	902.00	263.50
Pittsburgh Coal	342.50	823.00	342.51
Top of Salt Water	645.50	520.00	645.53
Maxton	1168.50	5.00	1161.19
Big Lime	1325.50	-160.00	1326.51
Big Injun	1518.50	-353.00	1520.02
Base Big Injun	1633.50	-468.00	1635.24
Berea	1972.50	-807.00	1974.70
Upper Rhinestreet	5418.50	-4253.00	5433.06
Lower Rhinestreet	5525.50	-4360.00	5549.00
Basal Rhinestreet	5586.50	-4421.00	5619.00
Cashoga	5656.50	-4491.00	5704.00
Middlesex	5706.50	-4541.00	5769.00
Lower Middlesex	5730.50	-4565.00	5802.00
Burket	5768.50	-4603.00	5857.00
Tully	5784.50	-4619.00	5881.00
Mahantango	5838.50	-4673.00	5970.00
Levanna	5937.50	-4772.00	6196.00
Upper Marcellus	5947.50	-4782.00	6232.00

Drawing By: Gary Rhodes
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Oklahoma City, OK 73127
Phone: +1.405.720.4257
Date: 29 October 2017



Thurman Speece BRK 3H

	Map Units: US ft	Company Name: SOUTHWESTERN ENERGY
Field Name:	Vertical Reference Datum (VRD):	
SOUTHWESTER N BROOKE CO, WV UTM NAD 83 (17N)	Projected Coordinate System: NAD83 / UTM zone 17N	
	Comment:	
Site:	Units: US ft	North Reference: Grid
	Position:	Convergence Angle: 0.26
	Easting: 1754875.81 US ft	Latitude: 40.189573
	Longitude: -80.590157	
Thurman Speece BRK Pad	Elevation above Field Reference: 1139.50 US ft	
	Comment:	
Slot:	Position (Relative to Site Centre)	
	+N/-S: 13.58 US ft	Northing: 14596043.57 US ft
	+E/-W: 3.51 US ft	Latitude: 40.189610
	Easting: 1754879.32 US ft	Longitude: -80.590144
Thurman Speece BRK 3H	Elevation above Field Reference: 1139.50 US ft	
	Comment:	
Well:	Type: Main well	UWI:
	File Number:	Comment:
Thurman Speece BRK 3H	Closure Distance: 10964.5 US ft	Closure Azimuth: 338.87°
	Vertical Section: Position of Origin (Relative to Slot centre)	
	+N/-S: -0.00 US ft	+E/-W: -0.00 US ft
		Az: 338.88°

Drill floor: Survey Name: Definitive Survey			
Rig Height (Drill Floor): 26.00 US ft	Elevation above Field Reference: 1165.50 US ft	Inclination: 0.00°	Azimuth: 0.00°

Survey Name: Definitive Survey

Date: 10/Aug/2017	Survey Tool: See Survey Tool Ranges below.	Comment:	Company:
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Magnetic Model:

Model Name: HDGM	Date: 11/Aug/2017	Field Strength: 52680.0nT	Declination: -8.28°	Dip: 67.67°
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Tie Point:

MD: 0.00 US ft	Inclination: 0.00°	Azimuth: 0.00°	TVD: -0.00 US ft	North Offset: 0.00 US ft	East Offset: 0.00 US ft
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Survey Tool Ranges:

Name	Start MD(USFt)	End MD(USFt)	Source Survey
GYRO-NS_OW	0.00	614.00	Gyro_01
MWD	614.00	1635.00	WFT MWD_02
MWD	1635.00	4808.00	WFT MWD_03
MWD	4808.00	5814.00	WFT MWD_04
MWD	5814.00	6465.00	WFT MWD_05
MWD	6465.00	16505.00	WFT MWD_06

Wellpath created using minimum curvature.

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50 Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)											Comment
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N. Offset (US ft)	E. Offset (US ft)	Latitude (° '' ''')	Longitude (° '' ''')	DLS (°/100US ft)		
0.00	0.00	0.00	-0.00	0.00	0.00	0.00	40.189610	-80.590144	0.00		
26.00	0.31	328.81	26.00	0.07	0.06	-0.04	40.189610	-80.590144	1.19		
113.00	0.38	259.25	113.00	0.35	0.21	-0.44	40.189611	-80.590145	0.46		
213.00	0.40	173.13	213.00	0.07	-0.20	-0.73	40.189610	-80.590147	0.53		
263.50	0.45	174.58	263.50	-0.29	-0.57	-0.69	40.189609	-80.590146	0.10	Base of Fresh Water :	
308.00	0.49	175.63	307.99	-0.64	-0.93	-0.66	40.189608	-80.590146	0.10		
342.51	0.32	133.50	342.50	-0.86	-1.15	-0.57	40.189607	-80.590146	0.96	Pittsburgh Coal ;	
349.00	0.32	122.36	348.99	-0.90	-1.17	-0.55	40.189607	-80.590146	0.96		
396.00	0.18	115.75	395.99	-1.06	-1.27	-0.37	40.189607	-80.590145	0.30		
438.00	0.61	150.78	437.99	-1.32	-1.50	-0.20	40.189606	-80.590145	1.13		
481.00	0.29	120.30	480.99	-1.64	-1.75	0.01	40.189605	-80.590144	0.90		
526.00	0.46	126.92	525.99	-1.88	-1.92	0.25	40.189605	-80.590143	0.39		
572.00	0.68	121.82	571.99	-2.25	-2.17	0.63	40.189604	-80.590142	0.49		
614.00	0.68	112.87	613.98	-2.63	-2.40	1.07	40.189604	-80.590140	0.25	Gyro Tie-In	
641.00	1.28	115.04	640.98	-2.95	-2.59	1.49	40.189603	-80.590139	2.23		
645.53	1.31	114.06	645.51	-3.03	-2.63	1.58	40.189603	-80.590138	0.80	Top of Salt Water :	
685.00	1.57	107.09	684.97	-3.68	-2.98	2.51	40.189602	-80.590135	0.80		
729.00	1.76	92.48	728.95	-4.32	-3.18	3.76	40.189601	-80.590130	1.05		
773.00	1.93	74.54	772.93	-4.67	-3.01	5.15	40.189602	-80.590126	1.36		
817.00	2.43	65.69	816.89	-4.69	-2.43	6.72	40.189603	-80.590120	1.37		
861.00	2.65	60.27	860.85	-4.49	-1.54	8.45	40.189606	-80.590114	0.74		
905.00	2.84	59.53	904.80	-4.16	-0.49	10.27	40.189609	-80.590107	0.44		
994.00	3.39	54.37	993.67	-3.14	2.16	14.31	40.189616	-80.590093	0.69		
1081.00	3.96	52.44	1080.49	-1.64	5.49	18.78	40.189625	-80.590077	0.67		
1161.19	3.63	45.11	1160.50	0.16	8.98	22.78	40.189635	-80.590062	0.73	Maxton :	
1168.00	3.61	44.43	1167.30	0.34	9.28	23.08	40.189635	-80.590061	0.73		
1255.00	3.64	34.50	1254.13	3.03	13.51	26.56	40.189647	-80.590049	0.72		
1326.51	3.90	29.93	1325.48	5.84	17.49	29.06	40.189658	-80.590040	0.56	Big Lime :	
1342.00	3.96	29.02	1340.94	6.52	18.42	29.59	40.189660	-80.590038	0.56		
1431.00	4.67	28.81	1429.68	10.82	24.28	32.82	40.189676	-80.590026	0.80		
1519.00	4.03	35.90	1517.43	14.81	29.92	36.36	40.189692	-80.590013	0.95		
1520.02	4.02	35.95	1518.45	14.85	29.98	36.41	40.189692	-80.590013	0.92	Big Injun :	
1607.00	3.29	40.96	1605.25	17.68	34.33	39.83	40.189704	-80.590001	0.92		
1635.00	3.34	39.12	1633.20	18.46	35.57	40.87	40.189707	-80.589997	0.42		
1635.24	3.34	39.12	1633.44	18.46	35.58	40.88	40.189707	-80.589997	0.10	Base Big Injun :	
1725.00	3.42	39.79	1723.05	21.06	39.67	44.25	40.189719	-80.589985	0.10	9 5/8 in	
1732.00	3.43	39.84	1730.03	21.27	39.99	44.51	40.189719	-80.589984	0.10		
1820.00	3.25	38.97	1817.88	23.79	43.95	47.77	40.189730	-80.589972	0.21		
1908.00	2.70	30.75	1905.77	26.31	47.67	50.40	40.189740	-80.589963	0.79		
1974.70	2.06	23.16	1972.41	28.14	50.13	51.67	40.189747	-80.589958	1.06	Berea :	
1996.00	1.87	19.67	1993.70	28.68	50.81	51.94	40.189749	-80.589957	1.06		
2084.00	1.70	15.09	2081.65	30.82	53.42	52.76	40.189756	-80.589954	0.25		
2171.00	1.60	11.14	2168.62	32.89	55.86	53.34	40.189763	-80.589952	0.17		
2258.00	1.65	9.27	2255.58	35.00	58.29	53.77	40.189770	-80.589950	0.08		
2346.00	1.86	14.57	2343.54	37.25	60.92	54.34	40.189777	-80.589948	0.30		
2434.00	1.83	12.28	2431.49	39.58	63.67	54.99	40.189784	-80.589946	0.09		
2523.00	2.47	24.59	2520.43	42.11	66.81	56.09	40.189793	-80.589942	0.88		
2655.00	3.48	29.96	2652.25	46.61	72.86	59.28	40.189810	-80.589930	0.79		
2699.00	3.34	28.32	2696.17	48.28	75.15	60.55	40.189816	-80.589926	0.39		
2787.00	3.33	39.12	2784.03	51.22	79.39	63.38	40.189827	-80.589916	0.71		
2875.00	3.27	40.69	2871.88	53.67	83.27	66.63	40.189838	-80.589904	0.12		
2961.00	3.20	38.86	2957.74	56.03	87.00	69.74	40.189848	-80.589893	0.15		
3047.00	2.93	35.81	3043.62	58.43	90.66	72.53	40.189858	-80.589883	0.37		
3136.00	2.71	31.44	3132.51	60.95	94.29	74.96	40.189868	-80.589874	0.35		
3223.00	3.08	40.63	3219.40	63.31	97.82	77.55	40.189878	-80.589865	0.68		
3311.00	2.92	40.33	3307.28	65.50	101.33	80.54	40.189887	-80.589854	0.18		

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5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
3399.00	2.69	36.44	3395.18	67.68	104.70	83.22	40.189897	-80.589844	0.34	
3488.00	2.42	32.99	3484.09	69.90	107.95	85.48	40.189906	-80.589836	0.35	
3575.00	3.07	33.31	3570.99	72.33	111.44	87.76	40.189915	-80.589828	0.75	
3663.00	2.90	31.61	3658.87	75.05	115.31	90.22	40.189926	-80.589819	0.22	
3751.00	3.39	44.72	3746.74	77.46	119.05	93.22	40.189936	-80.589808	0.99	
3839.00	3.06	45.81	3834.60	79.45	122.54	96.73	40.189945	-80.589796	0.38	
3928.00	2.78	44.06	3923.48	81.29	125.74	99.94	40.189954	-80.589784	0.33	
4016.00	2.91	39.86	4011.37	83.27	128.99	102.85	40.189963	-80.589773	0.28	
4104.00	3.68	34.10	4099.23	85.96	133.04	105.87	40.189974	-80.589763	0.95	
4192.00	3.41	30.00	4187.06	89.21	137.65	108.76	40.189987	-80.589752	0.42	
4281.00	3.69	31.96	4275.89	92.60	142.37	111.60	40.190000	-80.589742	0.34	
4369.00	4.93	35.35	4363.64	96.39	147.86	115.29	40.190015	-80.589729	1.44	
4456.00	5.81	39.96	4450.25	100.58	154.28	120.28	40.190032	-80.589711	1.13	
4544.00	5.95	38.75	4537.79	105.02	161.25	125.99	40.190051	-80.589690	0.21	
4633.00	5.89	43.25	4626.32	109.31	168.18	132.01	40.190070	-80.589668	0.53	
4721.00	5.98	42.69	4713.85	113.29	174.84	138.21	40.190089	-80.589646	0.12	
4808.00	6.41	49.17	4800.34	116.93	181.34	144.96	40.190106	-80.589622	0.94	
4903.00	6.35	57.17	4894.75	119.78	187.66	153.39	40.190124	-80.589592	0.94	
4998.00	4.00	50.50	4989.36	121.89	192.61	160.36	40.190137	-80.589567	2.55	
5094.00	3.53	40.06	5085.15	124.38	197.01	164.85	40.190149	-80.589550	0.86	
5145.00	4.42	30.44	5136.03	126.35	199.90	166.85	40.190157	-80.589543	2.17	
5189.00	7.33	25.71	5179.79	129.33	203.89	168.93	40.190168	-80.589536	6.70	
5237.00	9.68	21.15	5227.26	134.41	210.42	171.71	40.190186	-80.589526	5.09	
5286.00	11.48	12.10	5275.43	141.54	219.03	174.22	40.190209	-80.589516	4.99	
5334.00	12.81	353.67	5322.37	150.68	228.99	174.64	40.190237	-80.589515	8.50	
5382.00	14.25	338.96	5369.06	161.74	239.80	171.93	40.190267	-80.589524	7.75	
5430.00	16.50	336.36	5415.34	174.46	251.56	167.07	40.190299	-80.589542	4.90	
5432.69	16.63	336.59	5417.91	175.23	252.26	166.77	40.190301	-80.589543	5.38	Upper Rhinestreet :
5479.00	18.88	340.11	5462.02	189.34	265.39	161.59	40.190337	-80.589561	5.38	
5527.00	21.42	343.86	5507.08	205.84	281.12	156.51	40.190380	-80.589579	5.93	
5546.08	22.48	344.50	5524.78	212.94	287.98	154.56	40.190399	-80.589586	5.71	Lower Rhinestreet :
5575.00	24.10	345.37	5551.34	224.31	299.02	151.59	40.190429	-80.589596	5.71	
5612.96	26.31	346.56	5585.68	240.35	314.71	147.68	40.190473	-80.589610	5.98	Basal Rhinestreet :
5623.00	26.90	346.84	5594.66	244.81	319.08	146.64	40.190485	-80.589614	5.98	
5671.00	29.52	347.91	5636.95	267.24	341.22	141.69	40.190545	-80.589631	5.56	
5692.51	30.75	348.08	5655.55	277.91	351.78	139.45	40.190574	-80.589639	5.74	Cashaqua :
5719.00	32.27	348.28	5678.14	291.57	365.34	136.61	40.190612	-80.589649	5.74	
5751.67	34.31	348.90	5705.44	309.24	382.91	133.07	40.190660	-80.589661	6.32	Middlesex :
5766.00	35.20	349.15	5717.22	317.28	390.93	131.51	40.190682	-80.589667	6.32	
5780.97	36.14	349.70	5729.38	325.87	399.51	129.91	40.190706	-80.589672	6.65	Lower Middlesex :
5814.00	38.23	350.83	5755.69	345.43	419.19	126.54	40.190760	-80.589684	6.65	
5828.86	39.24	350.31	5767.28	354.54	428.36	125.02	40.190785	-80.589689	7.11	Burket :
5841.00	40.06	349.91	5776.63	362.14	435.99	123.69	40.190806	-80.589694	7.11	
5849.71	41.23	349.69	5783.24	367.70	441.57	122.68	40.190821	-80.589697	13.50	Tully :
5873.00	44.35	349.15	5800.33	383.26	457.12	119.78	40.190864	-80.589707	13.50	
5905.00	49.16	347.56	5822.25	406.24	479.94	115.06	40.190927	-80.589724	15.46	
5928.43	52.50	346.86	5837.04	424.21	497.65	111.04	40.190975	-80.589738	14.46	Mahantango :
5937.00	53.73	346.62	5842.19	431.01	504.32	109.47	40.190994	-80.589744	14.46	
5985.00	60.77	342.95	5868.14	471.13	543.23	98.83	40.191101	-80.589781	16.01	
6034.00	66.47	339.69	5889.91	514.96	584.78	84.75	40.191215	-80.589831	13.07	
6082.00	70.11	336.29	5907.67	559.54	626.11	68.03	40.191329	-80.589890	10.04	
6129.00	73.37	334.36	5922.39	604.08	666.65	49.39	40.191440	-80.589956	7.96	
6177.00	76.00	336.98	5935.07	650.29	708.83	30.33	40.191556	-80.590024	7.60	
6177.73	76.03	336.98	5935.25	651.00	709.48	30.05	40.191558	-80.590025	4.09	WV Department of Environmental Protection Levanna :
6221.26	77.81	337.07	5945.10	693.37	748.52	13.50	40.191665	-80.590083	4.09	Upper Marcellus :

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Levanna :

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (%/100US ft)	Comment
6225.00	77.96	337.08	5945.89	697.03	751.89	12.08	40.191675	-80.590088	4.09	
6257.00	79.27	337.16	5952.20	728.38	780.79	-0.12	40.191754	-80.590131	4.10	
6289.00	81.46	336.45	5957.56	759.91	809.79	-12.54	40.191834	-80.590175	7.18	
6322.00	83.57	334.46	5961.86	792.57	839.54	-26.13	40.191916	-80.590224	8.75	
6370.00	88.52	335.21	5965.17	840.32	882.87	-46.49	40.192035	-80.590296	10.43	
6417.00	89.82	332.76	5965.85	887.14	925.10	-67.10	40.192151	-80.590369	5.90	
6465.00	89.14	332.52	5966.28	934.85	967.73	-89.16	40.192269	-80.590447	1.50	
6536.00	88.27	332.05	5967.89	1005.36	1030.57	-122.17	40.192442	-80.590564	1.39	
6632.00	90.86	332.81	5968.62	1100.74	1115.65	-166.60	40.192676	-80.590722	2.81	
6728.00	91.05	334.00	5967.02	1196.29	1201.48	-209.57	40.192912	-80.590874	1.26	
6824.00	90.80	334.78	5965.47	1291.98	1288.04	-251.06	40.193150	-80.591022	0.85	
6921.00	91.11	335.39	5963.85	1388.75	1376.00	-291.91	40.193392	-80.591166	0.71	
7007.00	90.93	335.32	5962.32	1474.58	1454.15	-327.77	40.193608	-80.591294	0.22	
7094.00	90.86	335.09	5960.96	1561.39	1533.12	-364.25	40.193825	-80.591423	0.28	
7181.00	90.86	336.10	5959.66	1648.23	1612.34	-400.19	40.194043	-80.591550	1.16	
7268.00	91.17	339.84	5958.11	1735.19	1692.96	-432.82	40.194265	-80.591666	4.31	
7354.00	91.17	340.26	5956.36	1821.16	1773.78	-462.15	40.194487	-80.591769	0.49	
7441.00	91.05	341.44	5954.67	1908.09	1855.95	-490.69	40.194713	-80.591870	1.36	
7527.00	91.05	340.93	5953.10	1994.00	1937.34	-518.42	40.194937	-80.591968	0.97	
7613.00	90.74	340.01	5951.75	2079.96	2018.38	-547.16	40.195160	-80.592070	1.13	
7700.00	90.68	338.77	5950.68	2166.95	2099.81	-577.79	40.195384	-80.592178	1.43	
7787.00	90.80	339.02	5949.55	2253.94	2180.97	-609.11	40.195607	-80.592289	0.32	
7873.00	90.80	339.10	5948.35	2339.93	2261.28	-639.84	40.195828	-80.592398	0.09	
7960.00	90.74	338.08	5947.18	2426.92	2342.27	-671.60	40.196051	-80.592510	1.17	
8047.00	90.62	338.39	5946.15	2513.91	2423.06	-703.85	40.196273	-80.592624	0.38	
8134.00	90.71	338.94	5945.14	2600.90	2504.09	-735.50	40.196496	-80.592736	0.64	
8220.00	90.25	338.17	5944.42	2686.90	2584.13	-766.95	40.196716	-80.592848	1.04	
8307.00	90.31	336.92	5943.99	2773.87	2664.53	-800.17	40.196937	-80.592965	1.44	
8394.00	90.49	336.14	5943.39	2860.80	2744.33	-834.82	40.197157	-80.593088	0.92	
8481.00	90.74	336.72	5942.45	2947.71	2824.07	-869.61	40.197376	-80.593211	0.73	
8567.00	90.68	338.45	5941.39	3033.68	2903.56	-902.40	40.197595	-80.593327	2.01	
8654.00	90.49	338.76	5940.50	3120.67	2984.56	-934.13	40.197818	-80.593440	0.42	
8741.00	90.49	334.84	5939.75	3207.60	3064.51	-968.40	40.198038	-80.593561	4.51	
8827.00	90.55	334.26	5938.97	3293.35	3142.16	-1005.35	40.198251	-80.593692	0.68	
8914.00	90.80	336.51	5937.95	3380.17	3221.24	-1041.59	40.198469	-80.593821	2.60	
9001.00	90.92	337.65	5936.64	3467.12	3301.37	-1075.46	40.198689	-80.593941	1.32	
9090.00	90.86	337.65	5935.26	3556.09	3383.67	-1109.30	40.198916	-80.594060	0.07	
9179.00	90.93	339.35	5933.87	3645.07	3466.46	-1141.92	40.199144	-80.594176	1.91	
9265.00	90.80	339.86	5932.57	3731.05	3547.06	-1171.88	40.199365	-80.594282	0.61	
9352.00	90.93	338.40	5931.26	3818.04	3628.34	-1202.87	40.199589	-80.594392	1.68	
9439.00	90.92	336.36	5929.85	3905.00	3708.64	-1236.33	40.199810	-80.594510	2.34	
9526.00	90.86	334.94	5928.50	3991.84	3787.89	-1272.19	40.200028	-80.594637	1.63	
9615.00	90.80	334.38	5927.21	4080.59	3868.31	-1310.28	40.200249	-80.594772	0.63	
9702.00	90.80	335.62	5926.00	4167.38	3947.15	-1347.04	40.200466	-80.594903	1.43	
9788.00	90.80	336.34	5924.80	4253.27	4025.70	-1382.05	40.200682	-80.595027	0.84	
9875.00	90.80	336.09	5923.58	4340.16	4105.30	-1417.13	40.200901	-80.595151	0.29	
9962.00	90.80	335.95	5922.37	4427.05	4184.78	-1452.49	40.201120	-80.595276	0.16	
10049.00	90.99	336.95	5921.01	4513.96	4264.53	-1487.24	40.201339	-80.595400	1.17	
10136.00	90.62	338.77	5919.79	4600.93	4345.10	-1520.03	40.201561	-80.595516	2.13	
10222.00	90.55	338.77	5918.91	4686.92	4425.26	-1551.17	40.201782	-80.595626	0.08	
10309.00	90.49	338.93	5918.12	4773.92	4506.40	-1582.55	40.202005	-80.595737	0.20	
10396.00	90.80	338.76	5917.14	4860.92	4587.53	-1613.95	40.202228	-80.595848	0.41	
10483.00	90.62	339.76	5916.06	4947.91	4668.88	-1644.76	40.202452	-80.595957	1.17	
10569.00	90.56	339.76	5915.18	5033.89	4749.57	-1674.51	40.202674	-80.596062	0.07	
10656.00	91.17	337.18	5913.86	5120.87	4830.48	-1706.43	40.202896	-80.596175	3.05	
10744.00	90.99	337.47	5912.20	5208.82	4911.66	-1740.35	40.203120	-80.596295	0.39	
10831.00	90.86	338.81	5910.80	5295.80	4992.40	-1772.73	40.203342	-80.596410	1.55	
10918.00	90.97	338.94	5909.41	5382.79	5073.54	-1804.09	40.203565	-80.596521	0.20	
11005.00	90.86	338.57	5908.02	5469.78	5154.62	-1835.61	40.203788	-80.596633	0.44	

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5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (#/100US ft)	Comment
11091.00	91.05	337.02	5906.59	5555.75	5234.22	-1868.10	40.204007	-80.596748	1.82	
11178.00	90.71	335.77	5905.25	5642.66	5313.93	-1902.94	40.204226	-80.596871	1.49	
11265.00	90.92	335.28	5904.01	5729.50	5393.11	-1938.98	40.204444	-80.596999	0.61	
11352.00	90.93	335.37	5902.61	5816.32	5472.15	-1975.29	40.204662	-80.597128	0.10	
11438.00	90.86	335.70	5901.27	5902.16	5550.42	-2010.90	40.204877	-80.597254	0.39	
11525.00	90.99	336.15	5899.86	5989.03	5629.84	-2046.39	40.205096	-80.597380	0.54	
11612.00	90.99	337.88	5898.36	6075.97	5709.92	-2080.35	40.205316	-80.597500	1.99	
11698.00	90.88	337.71	5896.95	6161.95	5789.53	-2112.85	40.205535	-80.597615	0.24	
11785.00	90.92	337.94	5895.59	6248.92	5870.09	-2145.68	40.205757	-80.597732	0.27	
11872.00	90.97	339.47	5894.15	6335.91	5951.14	-2177.27	40.205980	-80.597843	1.76	
11959.00	91.05	340.86	5892.62	6422.87	6032.96	-2206.79	40.206205	-80.597948	1.60	
12045.00	91.11	341.34	5891.00	6508.79	6114.31	-2234.64	40.206428	-80.598046	0.56	
12132.00	90.93	341.14	5889.45	6595.70	6196.67	-2262.62	40.206655	-80.598145	0.31	
12219.00	91.05	338.90	5887.95	6682.66	6278.42	-2292.34	40.206880	-80.598250	2.58	
12306.00	90.93	337.31	5886.44	6769.64	6359.13	-2324.77	40.207102	-80.598365	1.83	
12393.00	90.88	336.83	5885.07	6856.59	6439.24	-2358.67	40.207322	-80.598485	0.55	
12479.00	90.92	335.37	5883.72	6942.47	6517.86	-2393.50	40.207538	-80.598609	1.70	
12566.00	90.88	334.18	5882.35	7029.24	6596.55	-2430.57	40.207755	-80.598740	1.37	
12653.00	90.88	334.54	5881.02	7115.96	6674.97	-2468.22	40.207971	-80.598874	0.41	
12740.00	90.62	332.90	5879.88	7202.59	6752.97	-2506.73	40.208186	-80.599010	1.91	
12827.00	90.62	333.48	5878.93	7289.16	6830.62	-2545.97	40.208399	-80.599150	0.67	
12913.00	90.44	335.77	5878.14	7374.91	6908.31	-2582.82	40.208613	-80.599280	2.67	
13000.00	90.86	338.31	5877.15	7461.85	6988.41	-2616.75	40.208833	-80.599401	2.96	
13087.00	90.56	339.33	5876.07	7548.85	7069.52	-2648.18	40.209057	-80.599512	1.22	
13174.00	90.56	339.41	5875.22	7635.84	7150.94	-2678.83	40.209280	-80.599620	0.09	
13260.00	90.62	339.32	5874.34	7721.83	7231.42	-2709.14	40.209502	-80.599728	0.13	
13347.00	90.31	339.14	5873.63	7808.83	7312.76	-2739.99	40.209726	-80.599837	0.41	
13434.00	90.35	339.30	5873.13	7895.82	7394.10	-2770.86	40.209949	-80.599946	0.19	
13521.00	90.37	339.17	5872.58	7982.82	7475.45	-2801.70	40.210173	-80.600055	0.15	
13607.00	90.49	338.51	5871.94	8068.82	7555.65	-2832.74	40.210394	-80.600165	0.78	
13693.00	90.55	337.64	5871.16	8154.80	7635.42	-2864.85	40.210613	-80.600279	1.01	
13780.00	90.37	337.51	5870.46	8241.78	7715.84	-2898.04	40.210834	-80.600396	0.26	
13867.00	91.11	339.22	5869.34	8328.76	7796.70	-2930.11	40.211057	-80.600510	2.14	
13954.00	90.99	338.87	5867.74	8415.75	7877.93	-2961.22	40.211280	-80.600620	0.43	
14041.00	90.68	338.24	5866.47	8502.74	7958.90	-2993.02	40.211503	-80.600733	0.81	
14128.00	90.80	337.84	5865.35	8589.72	8039.58	-3025.56	40.211725	-80.600848	0.48	
14214.00	90.62	336.99	5864.28	8675.69	8118.98	-3058.58	40.211943	-80.600965	1.01	
14301.00	90.62	334.54	5863.34	8762.55	8198.30	-3094.29	40.212162	-80.601091	2.82	
14387.00	90.44	333.30	5862.55	8848.22	8275.54	-3132.09	40.212374	-80.601226	1.46	
14474.00	90.19	333.55	5862.07	8934.82	8353.35	-3171.01	40.212588	-80.601364	0.41	
14562.00	90.31	334.70	5861.69	9022.52	8432.52	-3209.42	40.212806	-80.601500	1.31	
14649.00	90.31	336.36	5861.21	9109.36	8511.70	-3245.45	40.213024	-80.601628	1.91	
14736.00	90.68	337.88	5860.46	9196.32	8591.85	-3279.28	40.213245	-80.601748	1.80	
14822.00	90.49	339.25	5859.58	9282.31	8671.90	-3310.70	40.213465	-80.601859	1.61	
14909.00	90.37	339.16	5858.93	9369.31	8753.23	-3341.59	40.213689	-80.601968	0.17	
14996.00	90.56	339.61	5858.23	9456.30	8834.66	-3372.22	40.213913	-80.602077	0.56	
15082.00	90.37	338.82	5857.53	9542.29	8915.06	-3402.74	40.214134	-80.602185	0.94	
15169.00	90.43	338.21	5856.92	9629.29	8996.01	-3434.60	40.214356	-80.602298	0.70	
15255.00	90.68	335.87	5856.09	9715.24	9075.19	-3468.14	40.214574	-80.602416	2.74	
15342.00	90.62	335.69	5855.10	9802.10	9154.52	-3503.83	40.214793	-80.602543	0.22	
15429.00	90.62	336.97	5854.16	9889.01	9234.20	-3538.76	40.215012	-80.602667	1.47	
15515.00	90.37	337.27	5853.42	9974.97	9313.43	-3572.19	40.215230	-80.602785	0.45	
15605.00	90.55	337.59	5852.69	10064.93	9396.53	-3606.73	40.215458	-80.602908	0.41	
15692.00	90.43	337.22	5851.95	10151.90	9476.85	-3640.16	40.215679	-80.603026	0.45	
15779.00	90.31	336.81	5851.39	10238.85	9556.94	-3674.13	40.215900	-80.603147	0.49	
15865.00	90.37	336.63	5850.88	10324.79	9635.94	-3708.12	40.216117	-80.603267	0.22	
15952.00	90.49	336.44	5850.22	10411.72	9715.74	-3742.76	40.216337	-80.603390	0.26	
16039.00	90.25	337.03	5849.66	10498.65	9795.67	-3777.12	40.216557	-80.603512	0.73	
16126.00	90.31	337.07	5849.24	10585.61	9875.78	-3811.05	40.216777	-80.603632	0.08	

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SD Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
16212.00	90.43	337.50	5848.68	10671.57	9955.11	-3844.26	40.216995	-80.603750	0.52	
16299.00	90.25	338.06	5848.17	10758.55	10035.64	-3877.16	40.217217	-80.603866	0.68	
16386.00	90.49	338.79	5847.60	10845.55	10116.55	-3909.15	40.217439	-80.603979	0.88	
16473.00	90.31	339.12	5847.00	10932.55	10197.74	-3940.39	40.217663	-80.604090	0.43	
16482.00	90.31	339.18	5846.95	10941.55	10206.15	-3943.59	40.217686	-80.604101	0.67	Last WFT SVY
16505.00	90.31	339.18	5846.82	10964.54	10227.65	-3951.76	40.217745	-80.604130	0.00	Proj. to TD

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