

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-009-00224 County BROOKE District BUFFALO
Quad BETHANY Pad Name WORTHLEY BRK PAD Field/Pool Name PANHANDLE FIELD WET
Farm name KIMBERLY CARMAN WORTHLEY Well Number WORTHLEY BRK 1H
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,451,762.43 Easting 537,844.27
Landing Point of Curve Northing 4,451,789.02 Easting 537,568.47
Bottom Hole Northing 4,453,344.22 Easting 537,022.03

Elevation (ft) 1156.51 GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
SOBM

Date permit issued 10/11/2017 Date drilling commenced 05/14/2018 Date drilling ceased 06/12/2018
Date completion activities began 08/27/2018 Date completion activities ceased 10/17/2018
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 183 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 800 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 329 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

C. [Signature] 1.17.18

Reviewed by:
[Signature] 1.17.18

API 47- 009 - 00224 Farm name KIMBERLY CARMAN WORTHLEY Well number WORTHLEY BRK 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	36	30	126	NEW	PLS2/234.29#		Y
Surface	26	20	418	NEW	J-55/94#	288.8', 247.1'	Y, 37 BBLs
Coal	SEE SURFACE						
Intermediate 1	17.50	13.375	596	NEW	J-55/54.50#		Y, 25 BBLs
Intermediate 2	12.25	9.625	1738	NEW	J-55/36#		Y, 30 BBLs
Intermediate 3							
Production	8.75/8.50	5.5	12040	NEW	HCP-110/20#		Y, 75 BBLs
Tubing		2.375	6338	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE				SURFACE	24
Surface	CLASS A	792	15.60	1.19	942.48	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	705	15.60	1.20	846	SURFACE	8
Intermediate 2	CLASS A	705	15.60	1.19	838.95	SURFACE	8
Intermediate 3							
Production	CLASS A	2,815	15.60	1.19	3,349.85	SURFACE	24
Tubing							

Drillers TD (ft) 12040 Loggers TD (ft) 12040
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5.264

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

SURFACE: 7 CENTRALIZERS - EVERY THIRD JOINT OF CASING

INTERMEDIATE: 24 CENTRALIZERS - EVERY THIRD JOINT OF CASING

PRODUCTION: 181 CENTRALIZERS - EVERY THIRD JOINT FROM SURFACE TO TOP OF CURVE, THEN EVERY JOINT UNTIL TD

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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SOUTHWESTERN ENERGY

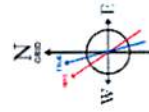
Location: Brooke County, WV
 Field: Brooke
 Facility: Worthley BRK Pad

Slot: Slot #01H
 Well: Worthley BRK 1H
 Wellbore: Worthley BRK 1H PWB

Photoreference wellpath is Worthley BRK 1H PWB Rev-B.0	Grid System: NAD83 / UTM Zone 17 North, US feet
True vertical depths are referenced to SDC 41 (RKB)	* = Wellpath was transformed from a different geoidic datum
Measured depths are referenced to SDC 41 (RKB)	North Reference: Grid north
SDC 41 (RKB) to Mean Sea Level: -1182.3 feet	Scale: True distance
Mean Sea Level to Ground level (At Slot Slot #01H): -1156.3 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: thomstutz on 2018-06-25
	Diabase: WA_Pennsylvania



True Vertical Depth (ft)



Use magnetic dip of 6.5° East, 5/18/2018
 Magnetic North is 37° West of True North (at 6/9/2018)
 Grid North is 0.28 degrees East of True North
 To correct azimuth from True to Grid subtract 0.28 degrees
 To correct azimuth from Magnetic to Grid subtract 6.58 degrees

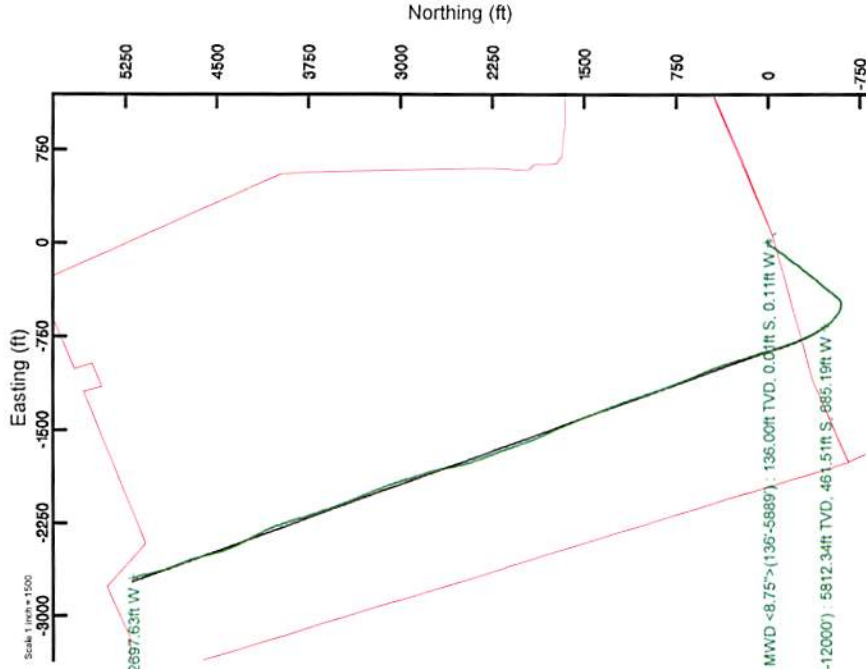


Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Worthley BRK Pad	1766046.204	14605439.176	40°12'55.014"N	80°33'18.013"W
Slot	Local E (ft)	Local N (ft)	Latitude	Longitude
Slot #01H	-69.46	1764576.863	40°12'55.525"N	80°33'18.905"W
SDC 41 (RKB) to Ground level (At Slot Slot #01H)		14605480.519	26R	
Mean Sea Level to Ground level (At Slot Slot #01H)		-1156.3ft		
SDC 41 (RKB) to Mean Sea Level		1182.3ft		

Comments

APL 47-009-00224-0000
 BH Job #: 9173350
 Rig: SDC 41
 Duration: 06/09/2018 - 06/10/2018



Vertical Section (ft)

Projection to Bit: 90.28° Inc, 12040.00ft MD, 5953.79ft TVD, 5848.78ft VS



Azimuth 332.29° with reference 0.00 N, 0.00 E

Actual Wellpath Report

Worthley BRK 1H AWP Proj: 12040'MD

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

REPORT SETUP INFORMATION			
Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Thomsuzc
Scale	0.999618	Report Generated	6/25/2018 at 10:25:51 AM
Convergence at slot	0.29° East	Database/Source file	WA_Pennsylvania/Worthley_BRK_1H_AWP_Proj__12040_MD.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	51.36	-69.46	1764576.86	14605490.52	40°12'55.525"N	80°33'18.905"W
Facility Reference Pt			1764646.29	14605439.18	40°12'55.014"N	80°33'18.013"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM			
Calculation method	Minimum curvature	SDC 41 (RKB) to Facility Vertical Datum	1182.30ft
Horizontal Reference Pt	Slot	SDC 41 (RKB) to Mean Sea Level	1182.30ft
Vertical Reference Pt	SDC 41 (RKB)	SDC 41 (RKB) to Ground Level at Slot (Slot #01H)	26.00ft
MD Reference Pt	SDC 41 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	332.29°

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
0.00†	0.000	265.270	0.00	0.00	0.00	0.00	1764576.86	14605490.52	40°12'55.525"N	80°33'18.905"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	265.270	26.00	0.00	0.00	0.00	1764576.86	14605490.52	40°12'55.525"N	80°33'18.905"W	0.00	0.000	0.00	0.00	0.00
136.00	0.110	265.270	136.00	0.04	-0.01	-0.11	1764576.76	14605490.51	40°12'55.525"N	80°33'18.906"W	0.11	265.270	0.10	0.10	-86.12
227.00	0.410	335.480	227.00	0.40	0.28	-0.33	1764576.54	14605490.80	40°12'55.528"N	80°33'18.909"W	0.43	310.569	0.43	0.33	77.15
318.00	0.640	348.820	318.00	1.21	1.08	-0.56	1764576.30	14605491.59	40°12'55.536"N	80°33'18.912"W	1.21	332.441	0.28	0.25	14.66
360.00	0.680	348.750	359.99	1.68	1.55	-0.66	1764576.21	14605492.07	40°12'55.540"N	80°33'18.913"W	1.68	337.082	0.10	0.10	-0.17
499.00	0.660	346.090	498.98	3.25	3.14	-1.01	1764575.85	14605493.65	40°12'55.556"N	80°33'18.918"W	3.29	342.171	0.03	-0.01	-1.91
538.00	0.750	343.320	537.98	3.71	3.60	-1.14	1764575.73	14605494.12	40°12'55.561"N	80°33'18.919"W	3.77	342.482	0.25	0.23	-7.10
622.00	0.590	336.000	621.97	4.68	4.52	-1.47	1764575.39	14605495.04	40°12'55.570"N	80°33'18.924"W	4.75	341.990	0.22	-0.19	-8.71
713.00	0.790	312.660	712.97	5.74	5.37	-2.12	1764574.74	14605495.89	40°12'55.578"N	80°33'18.932"W	5.78	338.455	0.37	0.22	-25.65
803.00	0.880	311.220	802.96	6.97	6.25	-3.10	1764573.77	14605496.77	40°12'55.587"N	80°33'18.945"W	6.97	333.633	0.10	0.10	-1.60
894.00	1.320	314.750	893.94	8.62	7.45	-4.37	1764572.50	14605497.96	40°12'55.599"N	80°33'18.961"W	8.63	329.610	0.49	0.48	3.88
987.00	0.420	324.110	986.93	9.98	8.48	-5.33	1764571.54	14605498.99	40°12'55.609"N	80°33'18.973"W	10.01	327.851	0.98	-0.97	10.06
1079.00	0.610	102.910	1078.93	10.00	8.64	-5.05	1764571.82	14605499.16	40°12'55.611"N	80°33'18.970"W	10.01	329.706	1.05	0.21	150.87
1172.00	0.660	114.840	1171.92	9.25	8.31	-4.08	1764572.78	14605498.82	40°12'55.607"N	80°33'18.957"W	9.25	333.840	0.15	0.05	12.83
1265.00	0.790	113.350	1264.91	8.33	7.83	-3.01	1764573.86	14605498.34	40°12'55.602"N	80°33'18.943"W	8.38	338.995	0.14	0.14	-1.60
1358.00	0.910	98.950	1357.90	7.39	7.46	-1.69	1764575.18	14605497.97	40°12'55.599"N	80°33'18.926"W	7.65	347.254	0.26	0.13	-15.48
1450.00	0.170	148.500	1449.90	6.81	7.23	-0.89	1764575.97	14605497.74	40°12'55.596"N	80°33'18.916"W	7.28	352.949	0.88	-0.80	53.86
1543.00	0.190	254.830	1542.90	6.71	7.07	-0.97	1764575.89	14605497.59	40°12'55.595"N	80°33'18.917"W	7.14	352.181	0.31	0.02	114.33
1636.00	0.600	254.850	1635.90	6.85	6.90	-1.59	1764575.27	14605497.42	40°12'55.593"N	80°33'18.925"W	7.08	347.031	0.44	0.44	0.02
1685.00	0.560	251.360	1684.89	6.94	6.76	-2.06	1764574.80	14605497.28	40°12'55.592"N	80°33'18.931"W	7.07	343.017	0.11	-0.08	-7.12
1760.00	0.730	273.600	1759.89	7.25	6.67	-2.89	1764573.98	14605497.19	40°12'55.591"N	80°33'18.942"W	7.27	336.591	0.40	0.23	29.65
1823.00	0.910	271.240	1822.88	7.70	6.71	-3.79	1764573.08	14605497.22	40°12'55.591"N	80°33'18.953"W	7.70	330.538	0.29	0.29	-3.75
1913.00	0.920	272.080	1912.87	8.40	6.75	-5.23	1764571.64	14605497.27	40°12'55.592"N	80°33'18.972"W	8.54	322.251	0.02	0.01	0.93
2004.00	2.480	229.340	2003.83	8.33	5.49	-7.45	1764569.42	14605496.01	40°12'55.580"N	80°33'19.001"W	9.26	306.403	2.10	1.71	-46.97
2094.00	4.930	217.670	2093.64	6.28	1.16	-11.29	1764565.58	14605491.68	40°12'55.537"N	80°33'19.050"W	11.35	275.877	2.83	2.72	-12.97
2185.00	6.620	215.450	2184.17	2.28	-6.21	-16.72	1764560.15	14605484.32	40°12'55.464"N	80°33'19.121"W	17.84	249.638	1.87	1.86	-2.44
2278.00	8.120	211.380	2276.40	-3.51	-16.18	-23.25	1764553.62	14605474.34	40°12'55.366"N	80°33'19.206"W	28.33	235.166	1.71	1.61	-4.38
2371.00	9.230	211.270	2368.34	-10.73	-28.16	-30.54	1764546.33	14605462.37	40°12'55.248"N	80°33'19.301"W	41.55	227.321	1.19	1.19	-0.12
2463.00	10.090	215.500	2459.03	-18.17	-41.03	-39.05	1764537.82	14605449.50	40°12'55.121"N	80°33'19.411"W	56.65	223.585	1.21	0.93	4.60

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Actual Wellpath Report

Worthley BRK 1H AWP Proj: 12040'MD
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

WELLPATH DATA (147 stations)															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
2556.00	11.570	215.380	2550.37	-26.06	-55.27	-49.19	1764527.70	14605435.27	40°12'54.981"N	80°33'19.543"W	73.99	221.667	1.59	1.59	-0.13
2649.00	13.270	216.340	2641.19	-34.95	-71.47	-60.91	1764515.98	14605419.07	40°12'54.822"N	80°33'19.695"W	93.91	220.439	1.84	1.83	1.03
2741.00	13.380	214.310	2730.72	-44.57	-88.77	-73.17	1764503.72	14605401.78	40°12'54.651"N	80°33'19.854"W	115.04	219.497	0.52	0.12	-2.21
2834.00	14.540	212.740	2820.97	-55.37	-107.48	-85.55	1764491.35	14605383.08	40°12'54.467"N	80°33'20.015"W	137.37	218.518	1.31	1.25	-1.69
2927.00	14.560	214.610	2910.99	-66.56	-126.92	-98.50	1764478.40	14605363.65	40°12'54.276"N	80°33'20.183"W	160.66	217.815	0.51	0.02	2.01
3020.00	13.820	221.040	3001.16	-76.02	-144.92	-112.43	1764464.47	14605345.66	40°12'54.098"N	80°33'20.364"W	183.42	217.806	1.87	-0.80	6.91
3113.00	13.440	220.130	3091.54	-84.12	-161.56	-126.69	1764450.22	14605329.02	40°12'53.935"N	80°33'20.549"W	205.31	218.103	0.47	-0.41	-0.98
3205.00	14.600	218.650	3180.79	-92.80	-178.79	-140.83	1764436.09	14605311.80	40°12'53.765"N	80°33'20.732"W	227.59	218.226	1.32	1.26	-1.61
3295.00	14.420	215.370	3267.93	-102.42	-196.79	-154.40	1764422.52	14605293.81	40°12'53.588"N	80°33'20.908"W	250.13	218.117	0.93	-0.20	-3.64
3384.00	13.970	211.490	3354.21	-112.94	-214.99	-166.43	1764410.50	14605275.62	40°12'53.409"N	80°33'21.064"W	271.88	217.744	1.18	-0.51	-4.36
3477.00	13.000	216.000	3444.65	-123.32	-233.02	-178.44	1764398.49	14605257.59	40°12'53.231"N	80°33'21.220"W	293.50	217.443	1.54	-1.04	4.85
3570.00	13.880	216.270	3535.10	-132.85	-250.48	-191.19	1764385.75	14605240.14	40°12'53.059"N	80°33'21.386"W	315.11	217.354	0.95	0.95	0.29
3662.00	14.430	221.550	3624.31	-141.75	-267.96	-205.32	1764371.62	14605222.67	40°12'52.887"N	80°33'21.569"W	337.57	217.461	1.52	0.60	5.74
3755.00	14.150	220.930	3714.43	-150.00	-285.22	-220.45	1764356.50	14605205.41	40°12'52.717"N	80°33'21.765"W	360.48	217.701	0.34	-0.30	-0.67
3848.00	14.140	219.380	3804.61	-158.56	-302.58	-235.11	1764341.85	14605188.05	40°12'52.547"N	80°33'21.955"W	383.19	217.847	0.41	-0.01	-1.67
3940.00	13.990	217.630	3893.86	-167.57	-320.08	-249.03	1764327.93	14605170.56	40°12'52.374"N	80°33'22.136"W	405.54	217.883	0.49	-0.16	-1.90
4033.00	14.480	215.040	3984.00	-177.59	-338.50	-262.56	1764314.40	14605152.15	40°12'52.193"N	80°33'22.311"W	428.40	217.800	0.86	0.53	-2.78
4126.00	15.680	216.820	4073.80	-188.32	-358.08	-276.77	1764300.20	14605132.58	40°12'52.000"N	80°33'22.496"W	452.58	217.702	1.38	1.29	1.91
4219.00	16.710	221.360	4163.11	-198.50	-378.18	-293.14	1764283.84	14605112.49	40°12'51.802"N	80°33'22.708"W	478.49	217.781	1.75	1.11	4.88
4311.00	16.190	218.380	4251.34	-208.42	-398.16	-309.84	1764267.14	14605092.51	40°12'51.606"N	80°33'22.925"W	504.51	217.890	1.08	-0.57	-3.24
4404.00	14.360	222.950	4341.06	-217.50	-416.77	-325.75	1764251.23	14605073.91	40°12'51.423"N	80°33'23.131"W	528.97	218.012	2.35	-1.97	4.91
4497.00	12.970	220.060	4431.42	-225.26	-433.20	-340.33	1764236.66	14605057.49	40°12'51.261"N	80°33'23.320"W	550.89	218.154	1.66	-1.49	-3.11
4590.00	13.130	218.500	4522.02	-233.47	-449.45	-353.62	1764223.38	14605041.24	40°12'51.101"N	80°33'23.492"W	571.89	218.195	0.42	0.17	-1.68
4682.00	14.270	220.190	4611.40	-241.95	-466.29	-367.44	1764209.56	14605024.41	40°12'50.935"N	80°33'23.671"W	593.67	218.239	1.31	1.24	1.84
4775.00	16.040	219.020	4701.17	-251.34	-485.03	-382.93	1764194.08	14605005.67	40°12'50.751"N	80°33'23.872"W	617.97	218.291	1.93	1.90	-1.26
4868.00	15.940	214.420	4790.57	-262.39	-505.55	-398.24	1764178.78	14604985.16	40°12'50.549"N	80°33'24.071"W	643.56	218.229	1.37	-0.11	-4.95
4961.00	15.580	216.360	4880.08	-273.82	-526.14	-412.86	1764164.16	14604964.58	40°12'50.346"N	80°33'24.261"W	668.79	218.121	0.69	-0.39	2.09
5054.00	15.190	221.600	4969.75	-283.59	-545.31	-428.36	1764148.67	14604945.42	40°12'50.158"N	80°33'24.462"W	693.44	218.151	1.55	-0.42	5.63
5147.00	14.090	218.880	5059.73	-292.79	-563.24	-443.55	1764133.48	14604927.50	40°12'49.981"N	80°33'24.659"W	716.92	218.221	1.39	-1.18	-2.92
5239.00	13.960	215.410	5148.99	-301.86	-581.00	-457.01	1764120.03	14604909.74	40°12'49.806"N	80°33'24.833"W	739.20	218.188	0.92	-0.14	-3.77

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Actual Wellpath Report

Worthley BRK 1H AWP Proj: 12040'MD
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

WELLPATH DATA (147 stations)															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
5286.00	13.340	225.610	5194.67	-305.98	-589.41	-464.17	1764112.87	14604901.33	40°12'49.723"N	80°33'24.926"W	750.24	218.221	5.28	-1.32	21.70
5332.00	12.580	241.410	5239.51	-307.58	-595.52	-472.37	1764104.68	14604895.22	40°12'49.663"N	80°33'25.032"W	760.12	218.421	7.85	-1.65	34.35
5378.00	12.190	257.570	5284.45	-306.37	-598.97	-481.51	1764095.54	14604891.78	40°12'49.630"N	80°33'25.150"W	768.51	218.796	7.56	-0.85	35.13
5425.00	13.650	268.530	5330.27	-302.61	-600.18	-491.90	1764085.15	14604890.57	40°12'49.618"N	80°33'25.284"W	776.00	219.338	6.06	3.11	23.32
5471.00	15.720	272.460	5374.76	-297.08	-600.05	-503.55	1764073.50	14604890.70	40°12'49.620"N	80°33'25.434"W	783.34	220.003	4.99	4.50	8.54
5517.00	17.730	277.400	5418.82	-289.92	-598.88	-516.73	1764060.33	14604891.87	40°12'49.633"N	80°33'25.604"W	790.99	220.788	5.35	4.37	10.74
5564.00	20.090	284.900	5463.28	-280.34	-595.88	-531.63	1764045.44	14604894.87	40°12'49.663"N	80°33'25.796"W	798.57	221.738	7.20	5.02	15.96
5610.00	21.270	293.570	5506.33	-268.47	-590.51	-546.92	1764030.16	14604900.23	40°12'49.717"N	80°33'25.993"W	804.87	222.805	7.13	2.57	18.85
5657.00	23.570	301.040	5549.78	-253.78	-582.26	-562.79	1764014.29	14604908.49	40°12'49.799"N	80°33'26.197"W	809.78	224.026	7.78	4.89	15.89
5703.00	26.530	305.180	5591.45	-236.77	-571.59	-579.07	1763998.02	14604919.15	40°12'49.905"N	80°33'26.406"W	813.66	225.372	7.47	6.43	9.00
5749.00	29.250	309.630	5632.11	-217.25	-558.50	-596.13	1763980.97	14604932.23	40°12'50.035"N	80°33'26.625"W	816.88	226.866	7.44	5.91	9.67
5796.00	32.440	312.120	5672.46	-194.82	-542.72	-614.33	1763962.77	14604948.01	40°12'50.192"N	80°33'26.859"W	819.72	228.541	7.31	6.79	5.30
5842.00	35.530	314.940	5710.60	-170.47	-525.00	-632.94	1763944.16	14604965.73	40°12'50.368"N	80°33'27.097"W	822.34	230.326	7.54	6.72	6.13
5889.00	37.390	318.840	5748.41	-143.55	-504.60	-652.01	1763925.11	14604986.11	40°12'50.571"N	80°33'27.342"W	824.46	232.263	6.32	3.96	8.30
5973.00	43.480	325.550	5812.34	-89.97	-461.51	-685.19	1763891.94	14605029.19	40°12'50.998"N	80°33'27.767"W	826.12	236.038	8.90	7.25	7.99
6020.00	47.040	328.400	5845.42	-56.74	-433.51	-703.35	1763873.78	14605057.17	40°12'51.276"N	80°33'27.999"W	826.22	238.352	8.71	7.57	6.06
6066.00	50.510	330.740	5875.74	-22.19	-403.68	-720.86	1763856.28	14605086.99	40°12'51.572"N	80°33'28.223"W	826.19	240.751	8.46	7.54	5.09
6112.00	55.180	332.890	5903.51	14.46	-371.37	-738.15	1763839.00	14605119.30	40°12'51.892"N	80°33'28.444"W	826.30	243.293	10.81	10.15	4.67
6158.00	60.390	334.220	5928.03	53.35	-336.53	-755.46	1763821.69	14605154.12	40°12'52.237"N	80°33'28.665"W	827.03	245.989	11.59	11.33	2.89
6205.00	65.920	335.760	5949.24	95.22	-298.54	-773.17	1763803.99	14605192.10	40°12'52.613"N	80°33'28.890"W	828.80	248.887	12.12	11.77	3.28
6251.00	70.320	337.120	5966.38	137.79	-259.42	-790.22	1763786.95	14605231.20	40°12'53.001"N	80°33'29.108"W	831.71	251.826	9.95	9.57	2.96
6297.00	74.040	338.770	5980.46	181.36	-218.83	-806.66	1763770.52	14605271.77	40°12'53.402"N	80°33'29.317"W	835.81	254.822	8.78	8.09	3.59
6344.00	76.270	340.550	5992.50	226.41	-176.24	-822.44	1763754.74	14605314.35	40°12'53.824"N	80°33'29.518"W	841.11	257.905	5.99	4.74	3.79
6390.00	79.130	341.370	6002.30	270.83	-133.76	-837.10	1763740.08	14605356.81	40°12'54.245"N	80°33'29.704"W	847.72	260.922	6.46	6.22	1.78
6436.00	82.530	342.220	6009.63	315.61	-90.62	-851.28	1763725.91	14605399.93	40°12'54.671"N	80°33'29.884"W	856.09	263.923	7.61	7.39	1.85
6483.00	86.860	343.290	6013.97	361.62	-45.94	-865.15	1763712.04	14605444.60	40°12'55.114"N	80°33'30.060"W	866.37	266.960	9.49	9.21	2.28
6529.00	90.460	343.910	6015.05	406.71	-1.83	-878.13	1763699.07	14605488.69	40°12'55.550"N	80°33'30.224"W	878.14	269.881	7.94	7.83	1.35
6622.00	90.710	342.670	6014.10	497.99	87.23	-904.87	1763672.34	14605577.72	40°12'56.432"N	80°33'30.563"W	909.07	275.507	1.36	0.27	-1.33
6714.00	90.460	342.150	6013.16	588.56	174.93	-932.67	1763644.55	14605665.38	40°12'57.300"N	80°33'30.916"W	948.94	280.623	0.63	-0.27	-0.57
6807.00	90.430	343.380	6012.44	680.00	263.75	-960.23	1763617.00	14605754.17	40°12'58.179"N	80°33'31.266"W	995.79	285.359	1.32	-0.03	1.32

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

WELLPATH DATA (147 stations)															
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
6900.00	90.400	342.950	6011.76	771.33	352.76	-987.16	1763590.08	14605843.14	40°12'59.060"N	80°33'31.607"W	1048.30	289.664	0.46	-0.03	-0.46
6992.00	90.250	340.530	6011.24	862.07	440.12	-1015.99	1763561.27	14605930.47	40°12'59.924"N	80°33'31.973"W	1107.22	293.422	2.64	-0.16	-2.63
7085.00	90.250	336.380	6010.84	954.51	526.60	-1050.13	1763527.14	14606016.92	40°13'00.781"N	80°33'32.408"W	1174.77	296.632	4.46	0.00	-4.46
7177.00	90.680	337.050	6010.09	1046.24	611.10	-1086.50	1763490.78	14606101.39	40°13'01.617"N	80°33'32.871"W	1246.56	299.356	0.87	0.47	0.73
7270.00	90.800	338.550	6008.89	1138.80	697.20	-1121.63	1763455.66	14606187.45	40°13'02.470"N	80°33'33.318"W	1320.66	301.865	1.62	0.13	1.61
7363.00	90.680	339.350	6007.69	1231.16	783.99	-1155.03	1763422.27	14606274.20	40°13'03.329"N	80°33'33.743"W	1395.97	304.167	0.87	-0.13	0.86
7455.00	90.830	340.540	6006.48	1322.33	870.40	-1186.58	1763390.74	14606360.58	40°13'04.185"N	80°33'34.144"W	1471.59	306.261	1.30	0.16	1.29
7548.00	90.830	340.770	6005.13	1414.33	958.14	-1217.38	1763359.95	14606448.29	40°13'05.053"N	80°33'34.536"W	1549.21	308.204	0.25	0.00	0.25
7641.00	90.740	342.370	6003.85	1506.10	1046.36	-1246.78	1763330.56	14606536.48	40°13'05.926"N	80°33'34.909"W	1627.67	310.005	1.72	-0.10	1.72
7734.00	90.800	340.360	6002.60	1597.93	1134.47	-1276.49	1763300.86	14606624.55	40°13'06.799"N	80°33'35.287"W	1707.76	311.629	2.16	0.06	-2.16
7826.00	90.770	339.470	6001.34	1689.10	1220.87	-1308.08	1763269.28	14606710.92	40°13'07.654"N	80°33'35.688"W	1789.30	313.025	0.97	-0.03	-0.97
7919.00	90.920	339.000	5999.97	1781.41	1307.82	-1341.05	1763236.33	14606797.83	40°13'08.515"N	80°33'36.108"W	1873.18	314.281	0.53	0.16	-0.51
8012.00	90.920	338.380	5998.48	1873.82	1394.44	-1374.84	1763202.55	14606884.43	40°13'09.372"N	80°33'36.538"W	1958.23	315.406	0.67	0.00	-0.67
8105.00	90.990	338.550	5996.93	1966.27	1480.94	-1408.98	1763168.43	14606970.89	40°13'10.229"N	80°33'36.972"W	2044.11	316.426	0.20	0.08	0.18
8197.00	91.450	339.090	5994.97	2057.65	1566.71	-1442.21	1763135.21	14607056.62	40°13'11.078"N	80°33'37.395"W	2129.44	317.369	0.77	0.50	0.59
8290.00	91.390	338.530	5992.67	2150.02	1653.39	-1475.81	1763101.62	14607143.28	40°13'11.936"N	80°33'37.823"W	2216.24	318.248	0.61	-0.06	-0.60
8383.00	91.230	334.620	5990.54	2242.71	1738.69	-1512.77	1763064.67	14607228.54	40°13'12.781"N	80°33'38.294"W	2304.67	318.975	4.21	-0.17	-4.20
8476.00	91.350	335.430	5988.44	2335.58	1822.97	-1552.03	1763025.43	14607312.79	40°13'13.616"N	80°33'38.794"W	2394.16	319.590	0.88	0.13	0.87
8568.00	90.920	338.270	5986.62	2427.27	1907.54	-1588.18	1762989.29	14607397.32	40°13'14.453"N	80°33'39.255"W	2482.14	320.220	3.12	-0.47	3.09
8661.00	90.770	340.710	5985.25	2519.51	1994.62	-1620.76	1762956.72	14607484.38	40°13'15.315"N	80°33'39.670"W	2570.10	320.904	2.63	-0.16	2.62
8754.00	90.920	341.330	5983.88	2611.43	2082.56	-1651.01	1762926.49	14607572.28	40°13'16.186"N	80°33'40.054"W	2657.61	321.593	0.69	0.16	0.67
8847.00	90.890	339.780	5982.41	2703.45	2170.24	-1681.96	1762895.55	14607659.93	40°13'17.054"N	80°33'40.447"W	2745.71	322.224	1.67	-0.03	-1.67
8939.00	90.920	338.940	5980.96	2794.74	2256.32	-1714.39	1762863.14	14607745.98	40°13'17.906"N	80°33'40.860"W	2833.75	322.772	0.91	0.03	-0.91
9032.00	90.680	340.930	5979.66	2886.89	2343.67	-1746.29	1762831.25	14607833.28	40°13'18.771"N	80°33'41.265"W	2922.72	323.310	2.16	-0.26	2.14
9125.00	90.830	343.890	5978.43	2978.43	2432.30	-1774.39	1762803.16	14607921.88	40°13'19.648"N	80°33'41.622"W	3010.74	323.889	3.19	0.16	3.18
9218.00	90.860	346.500	5977.06	3069.06	2522.19	-1798.15	1762779.41	14608011.74	40°13'20.537"N	80°33'41.923"W	3097.55	324.514	2.81	0.03	2.81
9311.00	90.890	348.490	5975.64	3158.79	2612.97	-1818.28	1762759.28	14608102.49	40°13'21.435"N	80°33'42.176"W	3183.36	325.167	2.14	0.03	2.14
9404.00	91.230	347.500	5973.92	3248.30	2703.92	-1837.62	1762739.95	14608193.40	40°13'22.335"N	80°33'42.420"W	3269.26	325.799	1.13	0.37	-1.06
9496.00	91.420	343.330	5971.79	3337.86	2792.91	-1860.78	1762716.80	14608282.36	40°13'23.216"N	80°33'42.713"W	3356.02	326.326	4.54	0.21	-4.53
9589.00	90.920	342.270	5969.89	3429.28	2881.74	-1888.27	1762689.32	14608371.15	40°13'24.095"N	80°33'43.062"W	3445.28	326.765	1.26	-0.54	-1.14

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Actual Wellpath Report

Worthley BRK 1H AWP Proj: 12040'MD
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

WELLPATH DATA (147 stations)																
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	
9681.00	91.020	342.700	5968.34	3519.81	2969.46	-1915.96	1762661.64	14608458.84	40°13'24.963"N	80°33'43.413"W	3533.92	327.169	0.48	0.11	0.47	
9774.00	90.920	340.730	5966.76	3611.54	3057.74	-1945.13	1762632.48	14608547.09	40°13'25.837"N	80°33'43.783"W	3623.99	327.538	2.12	-0.11	-2.12	
9867.00	90.150	338.640	5965.89	3703.75	3144.95	-1977.41	1762600.21	14608634.26	40°13'26.700"N	80°33'44.194"W	3714.95	327.840	2.39	-0.83	-2.25	
9959.00	90.250	339.010	5965.57	3795.16	3230.74	-2010.64	1762566.99	14608720.02	40°13'27.549"N	80°33'44.617"W	3805.31	328.104	0.42	0.11	0.40	
10052.00	90.220	338.140	5965.19	3887.59	3317.31	-2044.61	1762533.03	14608806.55	40°13'28.407"N	80°33'45.049"W	3896.79	328.353	0.94	-0.03	-0.94	
10145.00	90.180	337.720	5964.86	3980.14	3403.49	-2079.56	1762498.10	14608892.71	40°13'29.260"N	80°33'45.494"W	3988.53	328.575	0.45	-0.04	-0.45	
10238.00	90.180	340.110	5964.57	4072.52	3490.26	-2113.01	1762464.66	14608979.44	40°13'30.119"N	80°33'45.920"W	4080.04	328.809	2.57	0.00	2.57	
10330.00	90.030	340.620	5964.40	4163.60	3576.91	-2143.93	1762433.76	14609066.06	40°13'30.977"N	80°33'46.313"W	4170.22	329.062	0.58	-0.16	0.55	
10423.00	90.310	342.870	5964.13	4255.33	3665.22	-2173.06	1762404.64	14609154.33	40°13'31.851"N	80°33'46.683"W	4260.99	329.337	2.44	0.30	2.42	
10516.00	90.340	343.490	5963.60	4346.66	3754.24	-2199.97	1762377.74	14609243.32	40°13'32.732"N	80°33'47.024"W	4351.35	329.630	0.67	0.03	0.67	
10609.00	90.120	343.950	5963.23	4437.81	3843.51	-2226.04	1762351.68	14609332.56	40°13'33.615"N	80°33'47.355"W	4441.60	329.922	0.55	-0.24	0.49	
10702.00	90.550	342.200	5962.68	4529.16	3932.48	-2253.11	1762324.62	14609421.49	40°13'34.496"N	80°33'47.698"W	4532.21	330.189	1.94	0.46	-1.88	
10794.00	90.400	340.670	5961.92	4619.99	4019.69	-2282.40	1762295.34	14609508.66	40°13'35.359"N	80°33'48.070"W	4622.47	330.412	1.67	-0.16	-1.66	
10887.00	90.580	335.480	5961.12	4712.48	4105.93	-2317.11	1762260.64	14609594.87	40°13'36.213"N	80°33'48.512"W	4714.62	330.563	5.58	0.19	-5.58	
10980.00	90.340	331.490	5960.38	4805.44	4189.13	-2358.62	1762219.15	14609678.04	40°13'37.037"N	80°33'49.042"W	4807.48	330.619	4.30	-0.26	-4.29	
11073.00	90.310	332.310	5959.85	4898.43	4271.16	-2402.42	1762175.36	14609760.04	40°13'37.850"N	80°33'49.602"W	4900.46	330.643	0.88	-0.03	0.88	
11165.00	90.430	335.630	5959.26	4990.38	4353.82	-2442.79	1762135.01	14609842.66	40°13'38.668"N	80°33'50.117"W	4992.29	330.705	3.61	0.13	3.61	
11258.00	90.280	342.170	5958.68	5082.71	4440.53	-2476.25	1762101.56	14609929.35	40°13'39.527"N	80°33'50.543"W	5084.30	330.854	7.03	-0.16	7.03	
11351.00	90.340	347.240	5958.18	5173.50	4530.21	-2500.78	1762077.05	14610018.99	40°13'40.414"N	80°33'50.853"W	5174.62	331.100	5.45	0.06	5.45	
11444.00	90.370	345.360	5957.60	5263.73	4620.56	-2522.80	1762055.03	14610109.30	40°13'41.308"N	80°33'51.132"W	5264.41	331.366	2.02	0.03	-2.02	
11536.00	90.400	341.370	5956.98	5354.00	4708.69	-2549.13	1762028.71	14610197.40	40°13'42.180"N	80°33'51.465"W	5354.42	331.570	4.34	0.03	-4.34	
11629.00	90.310	338.460	5956.40	5446.16	4796.02	-2581.06	1761996.79	14610284.70	40°13'43.045"N	80°33'51.872"W	5446.44	331.712	3.13	-0.10	-3.13	
11722.00	90.490	340.150	5955.76	5538.46	4883.01	-2613.93	1761963.94	14610371.66	40°13'43.906"N	80°33'52.290"W	5538.63	331.839	1.83	0.19	1.82	
11815.00	90.460	344.460	5954.98	5630.02	4971.59	-2642.19	1761935.69	14610460.20	40°13'44.783"N	80°33'52.649"W	5630.09	332.011	4.63	-0.03	4.63	
11907.00	90.250	348.290	5954.41	5719.23	5060.98	-2663.86	1761914.03	14610549.56	40°13'45.667"N	80°33'52.922"W	5719.24	332.240	4.17	-0.23	4.16	
12000.00	90.280	343.670	5953.98	5809.57	5151.19	-2686.38	1761891.52	14610639.73	40°13'46.560"N	80°33'53.207"W	5809.59	332.458	4.97	0.03	-4.97	
12040.00	90.280	343.670	5953.79	5848.78	5189.57	-2697.63	1761880.27	14610678.10	40°13'46.940"N	80°33'53.350"W	5848.83	332.534	0.00	0.00	0.00	

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

HOLE & CASING SECTIONS - Ref Wellbore: Worthley BRK 1H AWB Ref Wellpath: Worthley BRK 1H AWP Proj: 12040'MD									
String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
24in Conductor	26.00	126.00	100.00	26.00	126.00	0.00	0.00	-0.01	-0.09
20in Casing	26.00	418.00	392.00	26.00	417.99	0.00	0.00	2.22	-0.79
17.5in Open Hole	418.00	595.00	177.00	417.99	594.98	2.22	-0.79	4.25	-1.36
13.375in Casing	26.00	595.00	569.00	26.00	594.98	0.00	0.00	4.25	-1.36
12.25in Open Hole	595.00	1738.00	1143.00	594.98	1737.89	4.25	-1.36	6.67	-2.62
9.625in Casing	26.00	1738.00	1712.00	26.00	1737.89	0.00	0.00	6.67	-2.62
8.75in Open Hole	1738.00	5960.00	4222.00	1737.89	5802.83	6.67	-2.62	-468.78	-680.11
8.5in Open Hole	5960.00	12040.00	6080.00	5802.83	5953.79	-468.78	-680.11	5189.57	-2697.63

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Worthley BRK 1H BHL 1H Rev-3	5958.00	5193.11	-2727.00	1761850.91	14610681.63	40°13'46.976"N	80°33'53.728"W	point
Worthley BRK 1H BHL 1H Rev-2	5963.00	5193.11	-2727.00	1761850.91	14610681.63	40°13'46.976"N	80°33'53.728"W	point
Worthley BRK 1H LP Rev-2	6024.00	-33.90	-873.50	1763703.70	14605456.63	40°12'55.233"N	80°33'30.167"W	point
Worthley BRK 1H LP Rev-1	6024.30	-147.79	-827.98	1763749.20	14605342.78	40°12'54.105"N	80°33'29.587"W	point

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

WELLPATH COMPOSITION - Ref Wellbore: Worthley BRK 1H AWB Ref Wellpath: Worthley BRK 1H AWP Proj: 12040'MD				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	5889.00	OWSG MWD rev2 + HRGM	01_Premier MWD <8.75">(136'-5889')	Worthley BRK 1H AWB
5889.00	12000.00	BHI AutoTrak Curve (Short)	02_BH AT Curve <8-1/2"> (5889')(5973'-12000')	Worthley BRK 1H AWB
12000.00	12040.00	Blind Drilling (std)	Projection to bit	Worthley BRK 1H AWB

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01H
Area	Brooke County, WV	Well	Worthley BRK 1H
Field	Brooke	Wellbore	Worthley BRK 1H AWB
Facility	Worthley BRK Pad		

COMMENTS
<p>Wellpath general comments API: 47-009-00224-0000 BH Job #: 9173350 Rig: SDC 41 Duration: 06/09/2018 - 06/10/2018</p>

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Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	8/27/2018
Job End Date:	9/18/2018
State:	West Virginia
County:	Brooke
API Number:	47-009-00224-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	WORTHLEY BRK 1H
Latitude:	40.21542353
Longitude:	-80.55525129
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,984
Total Base Water Volume (gal):	8,115,392
Total Base Non Water Volume:	0

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Southwestern Energy	Carrier/Base Fluid	Water	7732-18-5	100.00000	84.97495	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	13.55784	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	1.10897	
			Hydrogen Chloride	7647-01-0	17.50000	0.25783	
WFRA-2000	U.S. Well Services, LLC	Friction Reducer	Water	7732-18-5	60.00000	0.04165	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.02083	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01708	
BIOC11139A	Nalco Champion	Anti-Bacterial Agent	Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00712	
			Glutaraldehyde	111-30-8	10.00000	0.00237	
			Ethanol	64-17-5	5.00000	0.00093	

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FSTI-IC-001	FSTI	Iron Control Additive					
			Acetic acid	64-19-7	60.00000	0.00310	
			Citric Acid	77-92-9	40.00000	0.00236	
SCAL16486A	Nalco Champion	Scale Inhibitor					
			Ethylene Glycol	107-21-1	30.00000	0.00178	
			Amine Triphosphate	Proprietary	30.00000	0.00160	
Econo-CI200	Economy Polymers & Chemicals	Acid Corrosion Inhibitors					
			Methanol	67-56-1	80.00000	0.00126	
			Fatty acid	Proprietary	10.00000	0.00021	
LT FLUSH SYSTEM I	J.S. Well Services, LLC	Other					
			Mineral oil, petroleum distillates, hrdotreated light naphthenic	64742-53-6	100.00000	0.00014	

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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**WORTHLEY BRK 1H
ATTACHMENT 1
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	8/26/2018	11,952	11,851	36
2	8/27/2018	11,816	11,709	42
3	8/28/2018	11,676	11,569	42
4	8/28/2018	11,536	11,429	42
5	8/29/2018	11,396	11,289	42
6	8/31/2018	11,256	11,149	42
7	8/31/2018	11,116	11,009	42
8	9/1/2018	10,976	10,869	42
9	9/2/2018	10,836	10,729	42
10	9/2/2018	10,696	10,589	42
11	9/2/2018	10,556	10,449	42
12	9/3/2018	10,416	10,309	42
13	9/3/2018	10,276	10,169	42
14	9/4/2018	10,136	10,029	42
15	9/4/2018	9,996	9,889	42
16	9/5/2018	9,856	9,749	42
17	9/6/2018	9,716	9,609	42
18	9/7/2018	9,576	9,469	42
19	9/8/2018	9,436	9,329	42
20	9/8/2018	9,296	9,189	42
21	9/9/2018	9,156	9,049	42
22	9/9/2018	9,016	8,909	42
23	9/10/2018	8,876	8,769	42
24	9/10/2018	8,736	8,629	42
25	9/11/2018	8,596	8,489	42
26	9/11/2018	8,456	8,349	42
27	9/12/2018	8,316	8,209	42
28	9/12/2018	8,176	8,069	42
29	9/12/2018	8,036	7,929	42
30	9/13/2018	7,896	7,789	42
31	9/13/2018	7,761	7,649	42
32	9/14/2018	7,616	7,509	42
33	9/14/2018	7,476	7,369	42
34	9/15/2018	7,336	7,229	42
35	9/16/2018	7,196	7,089	42
36	9/16/2018	7,056	6,949	42
37	9/17/2018	6,916	6,809	42
38	9/17/2018	6,776	6,669	42
39	9/17/2018	6,636	6,529	42
40	9/18/2018	6,496	6,389	42

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**WORTHLEY BRK 1H
ATTACHMENT 2
STIM REPORT**

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/othe
1	8/27/2018	89	6,897	8,404	3,839	258,440	5,891	0
2	8/28/2018	90	7,184	6,764	4,286	280,430	5,309	0
3	8/28/2018	89	6,829	5,586	4,271	274,560	6,385	0
4	8/28/2018	90	6,897	6,331	4,085	279,730	5,073	0
5	8/31/2018	90	6,952	6,625	9,683	286,770	6,448	0
6	8/31/2018	90	7,327	5,503	4,438	281,400	5,262	0
7	9/1/2018	90	7,100	5,922	4,698	281,380	5,018	0
8	9/1/2018	90	7,396	5,251	4,241	278,480	5,162	0
9	9/2/2018	91	6,744	6,130	4,371	277,220	4,786	0
10	9/2/2018	90	7,057	4,452	4,222	278,760	5,577	0
11	9/2/2018	90	7,526	5,900	4,507	279,340	4,867	0
12	9/3/2018	90	6,886	5,786	4,321	276,020	5,179	0
13	9/4/2018	86	7,215	5,130	4,329	280,710	5,172	0
14	9/4/2018	90	7,206	5,654	4,202	278,360	4,819	0
15	9/5/2018	51	8,194	5,400	4,051	281,640	8,944	0
16	9/6/2018	90	7,329	5,404	4,080	275,530	4,477	0
17	9/7/2018	90	7,168	5,207	4,229	283,940	4,471	0
18	9/8/2018	91	6,925	6,062	4,359	280,920	4,464	0
19	9/8/2018	90	7,435	5,891	4,549	291,180	4,525	0
20	9/9/2018	89	7,196	5,993	4,663	277,980	4,699	0
21	9/9/2018	90	7,488	6,019	4,306	277,800	4,444	0
22	9/10/2018	87	7,609	5,840	4,743	273,680	4,131	0
23	9/10/2018	88	6,932	5,839	4,539	283,800	6,393	0
24	9/11/2018	84	7,260	5,959	4,344	270,880	4,510	0
25	9/11/2018	85	6,925	5,940	4,332	286,300	4,441	0
26	9/11/2018	85	7,519	4,678	4,353	282,200	4,969	0
27	9/12/2018	85	7,301	5,909	4,684	276,080	4,451	0
28	9/12/2018	64	7,260	5,697	4,090	203,480	5,712	0
29	9/13/2018	89	6,751	5,886	4,480	278,100	4,441	0
30	9/13/2018	90	7,095	5,886	4,733	268,080	4,484	0
31	9/14/2018	88	6,959	5,770	4,121	280,240	4,144	0
32	9/14/2018	91	6,707	4,762	4,056	278,560	4,284	0
33	9/14/2018	88	6,676	5,597	4,556	279,420	4,239	0
34	9/15/2018	89	6,676	5,272	4,773	277,180	4,028	0
35	9/16/2018	89	6,482	5,633	4,846	255,240	4,220	0
36	9/17/2018	87	6,621	5,559	4,233	287,500	4,195	0
37	9/17/2018	89	6,580	5,850	4,502	281,300	4,140	0
38	9/17/2018	89	6,768	5,779	4,160	276,200	4,038	0
39	9/17/2018	89	6,795	5,854	4,148	276,320	4,227	0
40	9/18/2018	49	7,573	4,802	4,215	23,640	3,288	0

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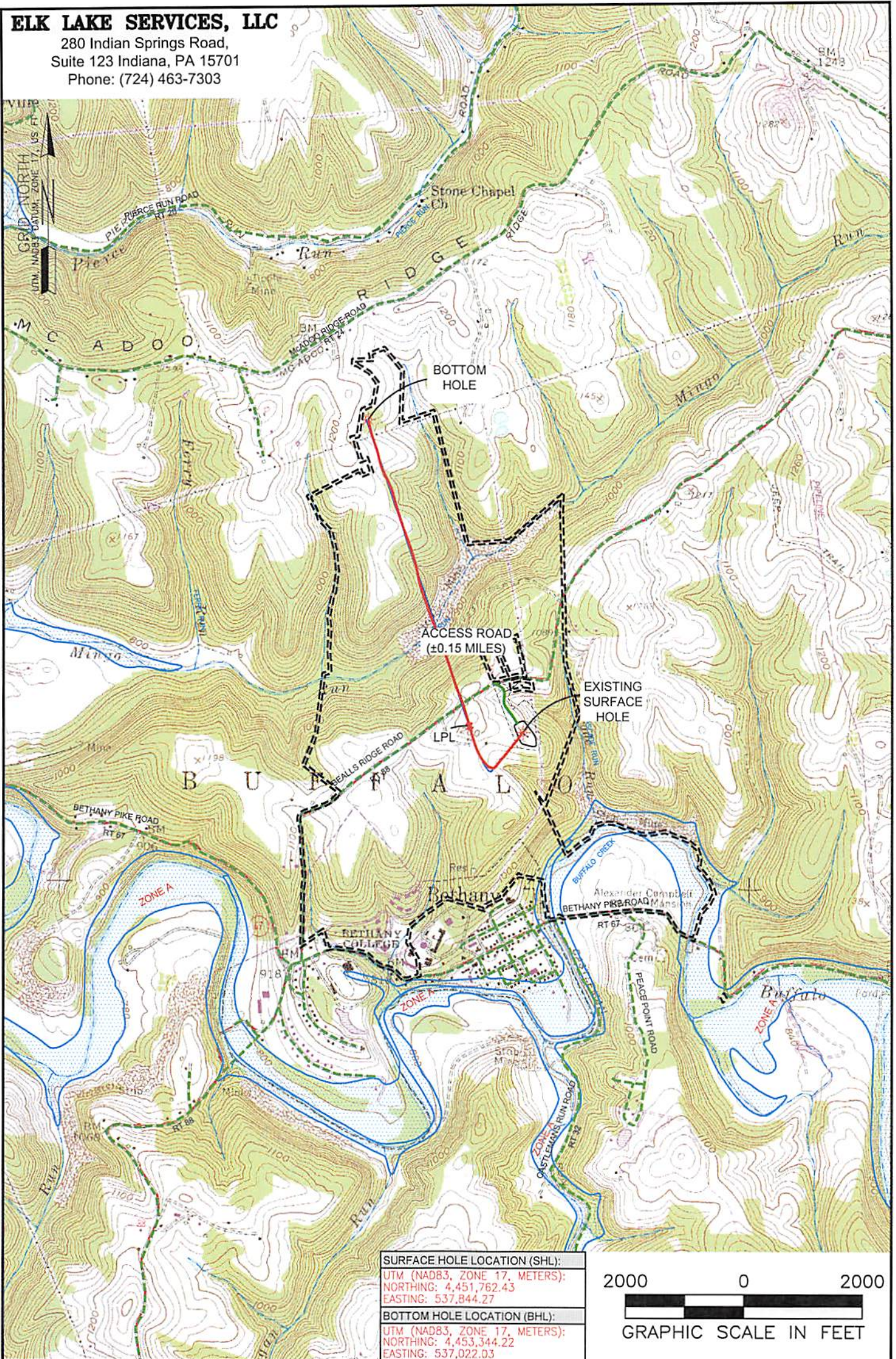
Well Name: Worthley BRK 1H

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	0.00	0.00	183.00	183.00	
Top of Salt Water	800.00	800.00	NA	NA	
Pittsburgh Coal	329.00	329.00	482.00	482.00	
Pottsville (ss)	482.00	482.00	784.00	784.00	
Raven Cliff (ss)	784.00	784.00	1182.00	1182.00	
Maxton (ss)	1182.00	1182.00	1510.00	1510.00	
Big Injun (ss)	1510.00	1510.00	5431.00	5430.00	
Rhinestreet (shale)	5431.00	5430.00	5698.00	5682.00	
Cashaqua (shale)	5698.00	5682.00	5762.00	5737.00	
Middlesex (shale)	5762.00	5737.00	5967.00	5808.00	
Burket (shale)	5967.00	5808.00	5986.00	5822.00	
Tully (ls)	5986.00	5822.00	6063.00	5874.00	
Mahantango (shale)	6063.00	5874.00	6354.00	5995.00	
Marcellus (shale)	6354.00	5995.00	NA	NA	Gas

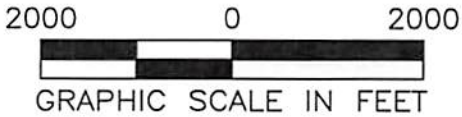
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ELK LAKE SERVICES, LLC

280 Indian Springs Road,
Suite 123 Indiana, PA 15701
Phone: (724) 463-7303



SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,451,762.43
EASTING: 537,844.27
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,453,344.22
EASTING: 537,022.03



NOTES ON SURVEY

1. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:	PROPOSED SURFACE HOLE / BOTTOM HOLE	ACCESS ROAD
EXISTING / PRODUCING WELLHEAD	PUBLIC ROAD	ACCESS ROAD TO PREV. SITE
LPL	LEASE BOUNDARY	EXISTING PATH
FLOOD PLAIN	PROPOSED PATH	

WELL OPERATOR:
SWN PRODUCTION COMPANY, LLC

ADDRESS:
1300 FORT PIERPONT DR STE 201, MORGANTOWN, WV 26508

SURFACE OWNER:
KIMBERLY CARMAN WORTHLEY

WELL (FARM) NAME:	WELL #	SERIAL #
WORTHLEY BRK	1H	XXXX
COUNTY	DISTRICT:	
BROOKE COUNTY - 9	BUFFALO	
USGS 7 1/2 QUADRANGLE MAP NAME		
BETHANY, WV		

ELK LAKE SERVICES, LLC

280 Indian Springs Road,
Suite 123 Indiana, PA 15701
Phone: (724) 463-7303

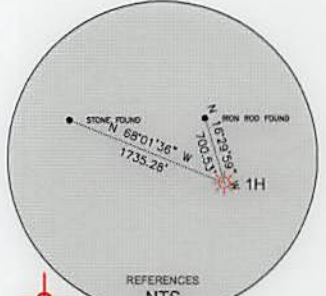
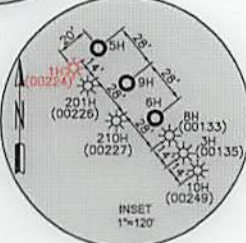
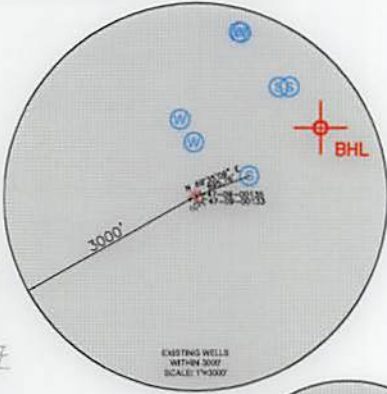
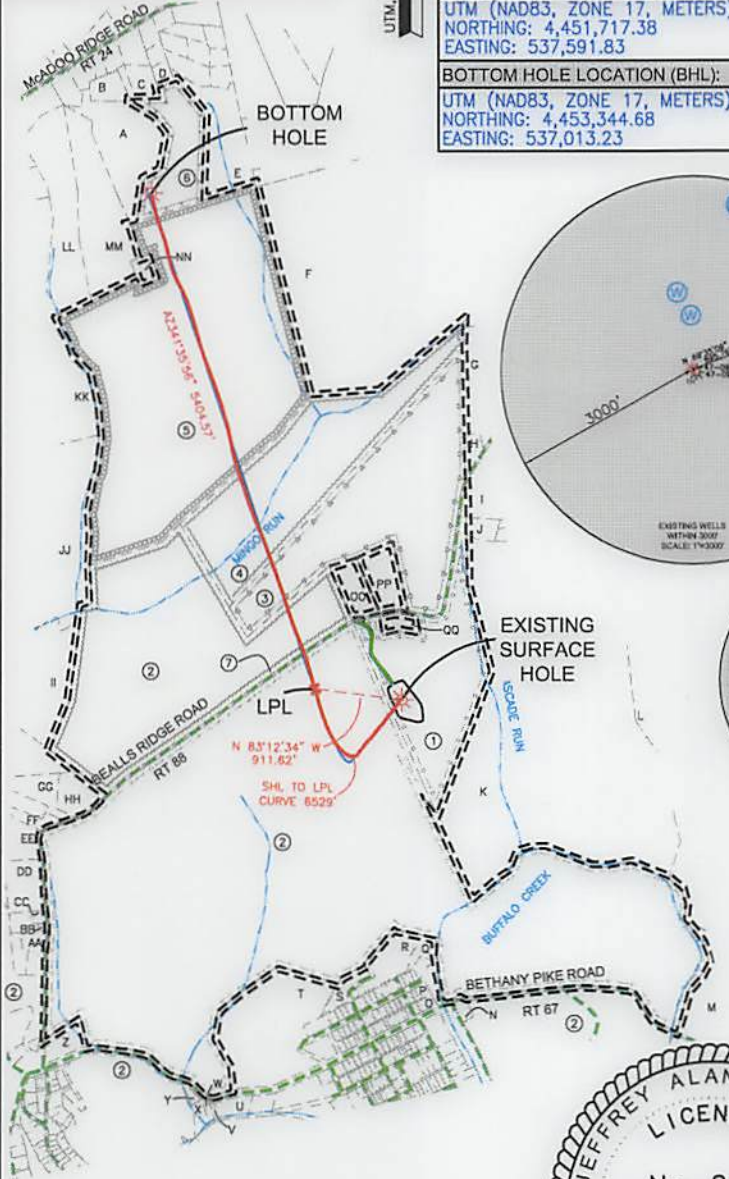
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,762.43 EASTING: 537,844.27
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,789.02 EASTING: 537,568.47
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,453,344.22 EASTING: 537,022.03

GRID NORTH
UTM, NAD83 DATUM, ZONE 17, US FT

TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL	ACRES
1	KIMBERLY CARMAN WORTHLEY (S) COLONIAL CORP, A NEVADA CORP, & KIMBERLY J. CARMAN AKA KIMBERLY J. WORTHLEY, A MARRIED WOMAN DEALING IN HER SASP (R)	3-838-27	40.00
2	BETHANY COLLEGE	3-838-31	872.26
3	JEFFREY W. HENSHER	3-838-27.1	62.44
4	JEFFREY W. HENSHER	3-838-28	53.10
5	MARK A. & GEORGIA M. FEDAK	3-838-14	142.67
6	MARK A. & GEORGIA M. FEDAK	3-833-77.2	14.16
7	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS	BEALLS RIDGE ROAD	3.39

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,762.41 EASTING: 537,844.11
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,717.38 EASTING: 537,591.83
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,453,344.68 EASTING: 537,013.23

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	MARK A. & GEORGIA M. FEDAK	3-833-77	12.7300
B	GEORGIA M. & MARK A. FEDAK	3-833-77.1	2.3400
C	WILLIAM B. & CECILIA A. DUMAS	3-833-89	2.0000
D	PHILIP B. MAZZELLA	3-833-88	1.1300
E	DALE G. JR. & DELVIRA HUKILL	3-833-85	12.8100
F	SPORTSMAN FARMERS ASSN	3-838-17	101.0000
G	MARK OWEN WEAVER & VIRGINIA BEALL KREUTZ	3-838-19	249.0000
H	KEVIN SCOTT & LISA KAY STEWART	3-838-20	1.0600
I	MARK WEAVER OWEN & VIRGINIA BEALL KREUTZ	3-838-19	249.0000
J	LANCE M. ELSON	3-838-21	1.8180
K	KIMBERLY CARMAN WORTHLEY	3-838-25	136.0000
L	MARK WEAVER OWEN & VIRGINIA BEALL KREUTZ	3-838-24	188.0000
M	TRUST OF GENE CHARLES VALENTINE	3-843-28	478.4400
N	RICHARD FRANCIS GORRY	3-843-27	0.8600
O	JAMES & KATHLEEN KEEGAN	2-843C-37	0.5000
P	BARBARA L. CHAMBERS	2-843C-36	0.3700
Q	BETHANY COLLEGE	2-843C-3	0.7300
R	BETHANY COLLEGE	2-843C-2	4.5000
S	BETHANY COLLEGE	2-843C-1	2.1000
T	BETHANY COLLEGE	1-843B-26	29.4590
U	TRAVIS C. & GREGORY B. STRAUB	2-843F-84	1.8600
V	GEORGE JR. SONNEWALD	2-843F-82	0.2300
W	GEORGE JR. SONNEWALD	2-843F-81	0.2200
X	WILLIAM MITCHELL HEIRS	2-843B-22	1.1250
Y	MITCHELL DONALD STEVEN	2-843F-83	0.1900
Z	JOHN HUFF HEIRS	2-843B-4	3.0000
AA	DANNY M. & SANDRA L. HOLLADAY	3-843-3	2.8410
BB	DENNIS A. DERRELLE RUSCHELL	3-843-2	0.1740
CC	DENNIS & DERRELLE RUSCHELL	3-843-1	0.6170
DD	RUTH GERMON & JEFFREY WOY & SUE MOORE & PATRICIA WEST & SARA WOY	3-838-37	5.2780
EE	ALLEN JOHNSON & CHARLES WARREN ETAL	3-838-36	84.0000
FF	DAVID G. OWENS & LINDA WALTERS	3-838-35	1.9600
GG	DAVID G. OWENS & LINDA WALTERS	3-838-33	7.5200
HH	DAVID G. OWENS & LINDA WALTERS	3-838-32	3.8700
II	MELVIN E. PELLUCHETTE	3-837-63	109.3920
JJ	STARVAGGI INDUSTRIES INC	3-837-53	215.8000
KK	JOHN H. JR. & STEPHANIE PROELLOCHS & KEVIN RAY	3-838-7	103.9830
LL	JOHN H. JR. & STEPHANIE PROELLOCHS & KEVIN & JODY RAY	3-838-12	20.2800
MM	MARK A. & GEORGIA M. FEDAK	3-838-13	18.7400
NN	MARK ALBERT & ASHLEY L. FEDAK	3-838-14.1	1.7400
OO	CHARLES F. & DONNA BROWN	3-838-30	4.1800
PP	JEFFREY WILLIAM HENSHER	3-838-29	5.3300
QQ	CARRINGTON MORTGAGE SERVICES, LLC	3-838-28	1.9500



WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ. FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ. FT. WITHIN 625 FEET OF CENTER OF PAD.
3. WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 896 FEET OF PROPOSED WELL.
4. PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS ARE WITHIN THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

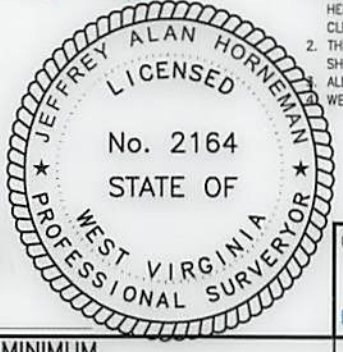
NOTES ON SURVEY

1. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
 2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.
WELLBORE PARCELS ARE DESIGNATED WITH UNIQUE LINE TYPES.



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2164



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)

COMPANY: **SWN** Production Company, LLC **SWN** Production Company™

WORTHLEY BRK
OPERATOR'S WELL #: 1H
API WELL #: 47 STATE 009 COUNTY 00224 PERMIT

WELL TYPE: OIL WASTE DISPOSAL PRODUCTION DEEP GAS LIQUID INJECTION STORAGE SHALLOW

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1156.51'

DISTRICT: BUFFALO COUNTY: BROOKE COUNTY QUADRANGLE: BETHANY

SURFACE OWNER: KIMBERLY CARMAN WORTHLEY ACREAGE: ±40.00

OIL & GAS ROYALTY OWNER: COLONIAL CORP, A NEVADA CORP, & KIMBERLY J. CARMAN AKA KIMBERLY J. WORTHLEY, A MARRIED WOMAN DEALING IN HER SASP ACREAGE: ±40.00

DRILL DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION

CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY) AS-DRILLED

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,015' TVD 12,040' TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: BRITTANY WOODY
ADDRESS: 1300 FORT PIERPONT DR STE 201 ADDRESS: 1300 FORT PIERPONT DR STE 201
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508 CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

LEGEND:	— SURVEYED BOUNDARY	— DRILLING UNIT	— DATE: 01-09-2019
○ PROPOSED SURFACE HOLE / BOTTOM HOLE	— LEASE BOUNDARY	— EXISTING PATH	— FILE NO: 17-02
⊙ EXISTING / PRODUCING WELLHEAD	— EXISTING PATH	— PROPOSED PATH	— DRAWN BY: JMB
LPL* LANDING POINT LOCATION			— SCALE: 1" = 2000'
⊙ EXISTING WATER WELL			— DRAWING NO: 1
⊙ EXISTING SPRING			— WELL LOCATION PLAT 1

