

SWN PRODUCTION COMPANY, LLC

Location: Marshall County, WV
 Field: Marshall
 Facility: Shawn Harlan MSH Pad

Slot: Slot #410
 Well: Shawn Harlan MSH 410H
 Wellbore: Shawn Harlan MSH 410H PWB



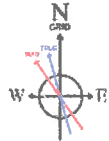
Final reference wellbath is Shawn Harlan MSH 410H PWB Rev-A-D	Grid System: NAD83 / UTM Zone 17 North, US feet
True vertical depths are referenced to SDC 48 (RKB)	North Reference: Grid north
Reference wellbath measured depths are referenced to SDC 48 (RKB)	Scale: True distance
SDC 48 (RKB) to Mean Sea Level: 1417.2 feet	Coordinates are in feet referenced to Slot
Mean Sea Level to Mud line (At Slot: Slot #410): -1391.2 feet	Depths are in feet
Offset wellbath MDs are referenced to each well's default MD datum	Created by: sterner on 2020-03-03; Database: WA_MPL_EASTERNUS_Datb

Location Information

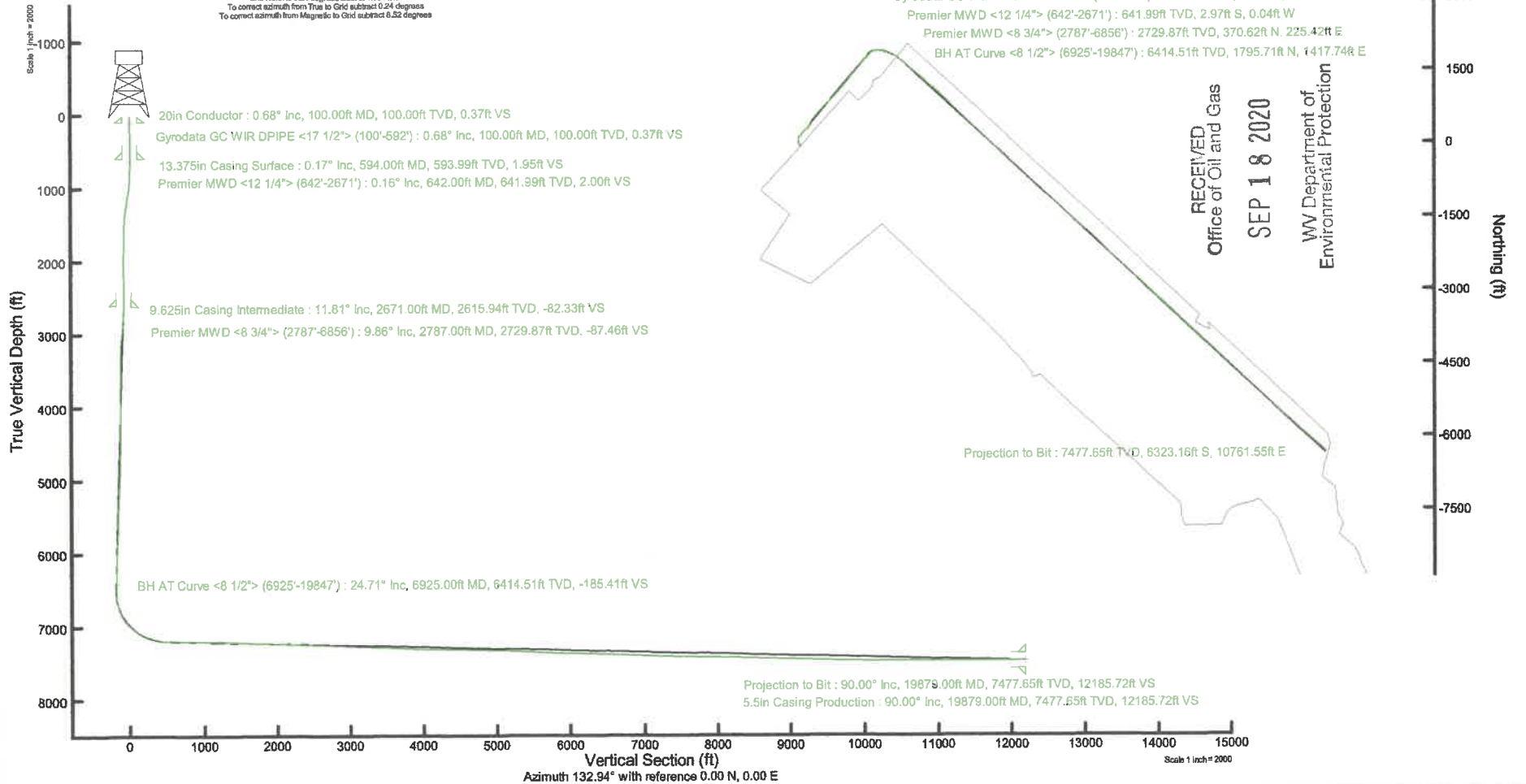
Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Shawn Harlan MSH Pad		1746333.890	14430025.540	39°44'1.6940"N	80°37'23.7088"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude
Slot #410	43.54	-34.36	1746299.540	14430069.060	39°44'2.1257"N
SDC 48 (RKB) to Mud line (At Slot: Slot #410)				26ft	
Mean Sea Level to Mud line (At Slot: Slot #410)				-1391.2ft	
SDC 48 (RKB) to Mean Sea Level				1417.2ft	

Comments

API: 47-051-02271-0000
 BH Job #: 110250349A
 Rig: SDC 46
 Duration: 02/23/2020 - 02/26/2020



User specified Dip: 66.70° Field: S2931 nT
 Magnetic North is 8.28 degrees West of True North (at 2/21/2020)
 Grid North is 0.24 degrees East of True North
 To correct azimuth from True to Grid subtract 0.24 degrees
 To correct azimuth from Magnetic to Grid subtract 8.52 degrees



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Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'
Page 1 of 11

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SWN PRODUCTION COMPANY, LLC	Well	Shawn Harlan MSH 410H
Field	Marshall	API/Legal	
Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

REPORT SETUP INFORMATION			
Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 6.0
North Reference	Grid	User	Atenjen
Scale	0.999613	Report Generated	3/3/2020 at 1:30:55 PM
Convergence at slot	0.24° East	Database	WA_MPL_EASTERNUS_Defn

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	43.54	-34.36	1746299.54	14430069.06	39°44'2.1257"N	80°37'24.1461"W
Facility Reference Pt			1746333.89	14430025.54	39°44'1.6940"N	80°37'23.7086"W
Field Reference Pt			0.00	0.00	0°00'0.0000"	85°29'19.4780"W

WELLPATH DATUM			
Calculation method	Minimum curvature	SDC 46 (RKB) to Facility Vertical Datum	1417.20ft
Horizontal Reference Pt	Slot	SDC 46 (RKB) to Mean Sea Level	1417.20ft
Vertical Reference Pt	SDC 46 (RKB)	SDC 46 (RKB) to Mud Line at Slot (Slot #410)	26.00ft
MD Reference Pt	SDC 46 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	132.94°



Actual Wellpath Report

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Page 2 of 11

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Slot	Slot #410		

WELLPATH DATA (238 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	166.710	0.00	0.00	0.00	0.00	1746299.54	14430069.06	39°44'2.1257"N	80°37'24.1461"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	166.710	26.00	0.00	0.00	0.00	1746299.54	14430069.06	39°44'2.1257"N	80°37'24.1461"W	0.00	0.000	0.00	0.00	0.00
100.00	0.680	166.710	100.00	0.37	-0.43	0.10	1746299.64	14430068.63	39°44'2.1214"N	80°37'24.1448"W	0.44	166.710	0.92	0.92	0.00
125.00	0.610	172.590	125.00	0.59	-0.70	0.15	1746299.69	14430068.36	39°44'2.1187"N	80°37'24.1442"W	0.72	167.795	0.39	-0.28	23.52
150.00	0.540	180.820	150.00	0.77	-0.95	0.17	1746299.71	14430068.11	39°44'2.1162"N	80°37'24.1440"W	0.97	170.025	0.43	-0.28	32.92
175.00	0.580	179.040	174.99	0.94	-1.20	0.17	1746299.71	14430067.86	39°44'2.1138"N	80°37'24.1440"W	1.21	172.010	0.17	0.16	-7.12
200.00	0.560	173.870	199.99	1.12	-1.45	0.18	1746299.72	14430067.61	39°44'2.1114"N	80°37'24.1438"W	1.46	172.775	0.22	-0.08	-20.68
225.00	0.470	178.740	224.99	1.28	-1.67	0.20	1746299.74	14430067.39	39°44'2.1092"N	80°37'24.1436"W	1.68	173.218	0.40	-0.36	19.48
250.00	0.410	181.380	249.99	1.41	-1.86	0.20	1746299.74	14430067.20	39°44'2.1073"N	80°37'24.1436"W	1.87	173.908	0.25	-0.24	10.56
275.00	0.400	179.460	274.99	1.53	-2.04	0.20	1746299.74	14430067.02	39°44'2.1055"N	80°37'24.1437"W	2.05	174.470	0.07	-0.04	-7.68
300.00	0.320	188.430	299.99	1.63	-2.19	0.19	1746299.73	14430066.87	39°44'2.1040"N	80°37'24.1438"W	2.20	175.105	0.39	-0.32	35.88
325.00	0.060	169.240	324.99	1.68	-2.28	0.18	1746299.72	14430066.78	39°44'2.1032"N	80°37'24.1439"W	2.28	175.475	1.06	-1.04	-76.76
350.00	0.180	187.180	349.99	1.72	-2.33	0.18	1746299.72	14430066.73	39°44'2.1026"N	80°37'24.1439"W	2.34	175.636	0.50	0.48	71.76
375.00	0.150	223.080	374.99	1.74	-2.39	0.15	1746299.69	14430066.67	39°44'2.1020"N	80°37'24.1443"W	2.40	176.400	0.42	-0.12	143.60
400.00	0.150	231.220	399.99	1.73	-2.44	0.10	1746299.64	14430066.63	39°44'2.1016"N	80°37'24.1449"W	2.44	177.589	0.09	0.00	32.56
425.00	0.180	238.130	424.99	1.72	-2.48	0.04	1746299.58	14430066.58	39°44'2.1012"N	80°37'24.1457"W	2.48	178.989	0.14	0.12	27.64
450.00	0.250	213.660	449.99	1.72	-2.54	-0.02	1746299.52	14430066.52	39°44'2.1005"N	80°37'24.1465"W	2.54	180.448	0.46	0.28	-97.88
475.00	0.120	185.390	474.99	1.74	-2.61	-0.05	1746299.49	14430066.45	39°44'2.0998"N	80°37'24.1469"W	2.62	181.152	0.62	-0.52	-113.08
500.00	0.130	182.660	499.99	1.78	-2.67	-0.06	1746299.48	14430066.39	39°44'2.0993"N	80°37'24.1469"W	2.67	181.209	0.05	0.04	-10.92
525.00	0.180	183.140	524.99	1.82	-2.74	-0.06	1746299.48	14430066.32	39°44'2.0986"N	80°37'24.1470"W	2.74	181.252	0.20	0.20	1.92
550.00	0.180	180.960	549.99	1.87	-2.81	-0.06	1746299.48	14430066.25	39°44'2.0978"N	80°37'24.1470"W	2.82	181.274	0.03	0.00	-8.72
575.00	0.170	191.400	574.99	1.92	-2.89	-0.07	1746299.47	14430066.17	39°44'2.0971"N	80°37'24.1471"W	2.89	181.399	0.13	-0.04	41.76
592.00	0.180	186.450	591.99	1.95	-2.94	-0.08	1746299.46	14430066.12	39°44'2.0966"N	80°37'24.1472"W	2.94	181.530	0.11	0.06	-29.12
642.00	0.160	46.070	641.99	2.00	-2.97	-0.04	1746299.50	14430066.09	39°44'2.0963"N	80°37'24.1467"W	2.97	180.716	0.64	-0.04	-280.76
680.00	0.490	37.620	679.99	1.98	-2.81	0.10	1746299.64	14430066.26	39°44'2.0979"N	80°37'24.1450"W	2.81	177.953	0.88	0.87	-22.24
773.00	2.290	18.090	772.96	1.17	-0.72	0.92	1746300.46	14430068.34	39°44'2.1185"N	80°37'24.1343"W	1.17	128.222	1.97	1.94	-21.00
879.00	5.830	6.690	878.68	-2.91	6.64	2.21	1746301.74	14430075.70	39°44'2.1912"N	80°37'24.1175"W	6.99	18.377	3.41	3.34	-10.75
969.00	8.770	4.090	967.94	-9.92	18.02	3.23	1746302.77	14430087.08	39°44'2.3037"N	80°37'24.1038"W	18.31	10.152	3.29	3.27	-2.89
1059.00	11.420	2.020	1056.54	-20.06	33.77	4.03	1746303.57	14430102.82	39°44'2.4593"N	80°37'24.0927"W	34.01	6.806	2.97	2.94	-2.30
1150.00	12.860	358.670	1145.50	-33.03	52.90	4.11	1746303.65	14430121.94	39°44'2.6483"N	80°37'24.0906"W	53.06	4.446	1.76	1.58	-3.68



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'
Page 3 of 11

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Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

WELLPATH DATA (238 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]
1240.00	13.170	355.880	1233.19	-47.53	73.14	3.14	1746302.68	14430142.17	39°44'2.8484"N	80°37'24.1019"W	73.21	2.461	0.78	0.34	-3.10
1331.00	11.540	358.040	1322.08	-61.54	92.58	2.09	1746301.63	14430161.61	39°44'3.0405"N	80°37'24.1144"W	92.61	1.292	1.86	-1.79	2.37
1421.00	9.400	7.130	1410.58	-72.20	108.87	2.69	1746302.23	14430177.89	39°44'3.2015"N	80°37'24.1058"W	108.91	1.417	3.00	-2.38	10.10
1512.00	10.390	27.870	1500.25	-78.68	123.51	7.45	1746306.99	14430192.52	39°44'3.3459"N	80°37'24.0441"W	123.73	3.453	4.04	1.09	22.79
1602.00	13.440	40.830	1588.32	-81.18	138.60	18.09	1746317.62	14430207.61	39°44'3.4947"N	80°37'23.9071"W	139.78	7.436	4.49	3.39	14.40
1693.00	16.810	43.450	1676.16	-81.45	156.16	34.06	1746333.58	14430225.16	39°44'3.6675"N	80°37'23.7017"W	159.83	12.303	3.78	3.70	2.89
1783.00	19.910	42.270	1761.57	-81.51	176.95	53.32	1746352.84	14430245.95	39°44'3.8722"N	80°37'23.4541"W	184.81	16.769	3.47	3.44	-1.31
1874.00	19.890	38.470	1847.14	-82.90	200.54	73.37	1746372.88	14430269.52	39°44'4.1045"N	80°37'23.1961"W	213.54	20.096	1.42	-0.02	-4.18
1964.00	16.400	33.610	1932.65	-86.16	223.12	89.94	1746389.44	14430292.09	39°44'4.3269"N	80°37'22.9829"W	240.56	21.954	4.22	-3.88	-5.40
2055.00	13.110	37.240	2020.64	-89.26	242.04	103.30	1746402.80	14430311.00	39°44'4.5134"N	80°37'22.8109"W	263.16	23.112	3.75	-3.62	3.99
2145.00	12.190	49.700	2108.47	-89.16	256.31	116.72	1746416.22	14430325.27	39°44'4.6539"N	80°37'22.6382"W	281.64	24.484	3.19	-1.02	13.84
2236.00	13.480	53.380	2197.20	-86.11	268.85	132.56	1746432.05	14430337.81	39°44'4.7772"N	80°37'22.4348"W	299.76	26.247	1.68	1.42	4.04
2326.00	16.320	51.230	2284.16	-82.38	283.03	150.85	1746450.33	14430351.98	39°44'4.9165"N	80°37'22.2000"W	320.72	28.056	3.21	3.16	-2.39
2417.00	17.010	47.670	2371.34	-79.44	300.00	170.66	1746470.13	14430368.95	39°44'5.0834"N	80°37'21.9455"W	345.14	29.633	1.35	0.76	-3.91
2507.00	17.120	41.780	2457.39	-78.62	318.75	189.22	1746488.68	14430387.68	39°44'5.2679"N	80°37'21.7070"W	370.68	30.694	1.92	0.12	-6.54
2597.00	14.760	37.250	2543.92	-80.03	337.75	204.98	1746504.44	14430406.68	39°44'5.4551"N	80°37'21.5041"W	395.09	31.254	2.96	-2.62	-5.03
2671.00	11.810	32.560	2615.94	-82.33	351.64	214.77	1746514.22	14430420.57	39°44'5.5919"N	80°37'21.3781"W	412.04	31.415	4.24	-3.99	-6.34
2787.00	9.860	25.430	2729.87	-87.46	370.62	225.42	1746524.87	14430439.54	39°44'5.7790"N	80°37'21.2407"W	433.79	31.309	2.04	-1.68	-6.15
2878.00	12.170	27.530	2819.19	-92.35	386.17	233.20	1746532.65	14430455.08	39°44'5.9323"N	80°37'21.1403"W	451.12	31.127	2.58	2.54	2.31
2969.00	14.720	26.450	2907.69	-98.18	405.03	242.79	1746542.23	14430473.93	39°44'6.1183"N	80°37'21.0166"W	472.22	30.940	2.82	2.80	-1.19
3059.00	19.500	26.780	2993.68	-105.61	428.69	254.66	1746554.10	14430497.58	39°44'6.3517"N	80°37'20.8634"W	498.62	30.712	5.31	5.31	0.37
3149.00	22.680	29.430	3077.64	-113.85	457.22	269.95	1746569.39	14430526.10	39°44'6.6330"N	80°37'20.6660"W	530.96	30.559	3.69	3.53	2.94
3239.00	24.720	34.340	3160.05	-120.72	487.87	289.10	1746588.53	14430556.75	39°44'6.9352"N	80°37'20.4193"W	567.10	30.650	3.15	2.27	5.46
3329.00	26.330	39.760	3241.28	-124.64	518.76	312.48	1746611.90	14430587.62	39°44'7.2394"N	80°37'20.1183"W	605.61	31.063	3.15	1.79	6.02
3420.00	29.790	40.770	3321.57	-126.61	551.41	340.16	1746639.57	14430620.25	39°44'7.5609"N	80°37'19.7623"W	647.89	31.670	3.84	3.80	1.11
3510.00	30.580	40.350	3399.37	-128.50	585.79	369.58	1746668.98	14430654.62	39°44'7.8994"N	80°37'19.3838"W	692.63	32.249	0.91	0.88	-0.47
3601.00	29.310	41.690	3478.22	-130.03	620.06	399.39	1746698.77	14430688.88	39°44'8.2369"N	80°37'19.0005"W	737.55	32.786	1.58	-1.40	1.47
3691.00	29.340	41.850	3556.68	-130.93	652.94	428.75	1746728.12	14430721.74	39°44'8.5606"N	80°37'18.6228"W	781.12	33.291	0.09	0.03	0.18
3782.00	28.640	43.230	3636.28	-131.24	685.43	458.56	1746757.92	14430754.23	39°44'8.8805"N	80°37'18.2395"W	824.68	33.783	1.06	-0.77	1.52
3872.00	29.800	41.840	3714.83	-131.56	717.81	488.25	1746787.60	14430786.59	39°44'9.1993"N	80°37'17.8576"W	868.13	34.223	1.49	1.29	-1.54



Actual Wellpath Report

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Page 4 of 11

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3962.00	30.310	42.130	3792.73	-132.31	751.32	518.41	1746817.75	14430820.08	39°44'9.5291"N	80°37'17.4699"W	912.81	34.606	0.59	0.57	0.32
4053.00	29.660	43.570	3871.55	-132.39	784.66	549.33	1746848.66	14430853.42	39°44'9.8573"N	80°37'17.0722"W	957.84	34.995	1.07	-0.71	1.58
4143.00	29.190	44.600	3949.94	-131.51	816.42	580.09	1746879.40	14430885.16	39°44'10.1700"N	80°37'16.6768"W	1001.52	35.395	0.77	-0.52	1.14
4234.00	29.710	44.880	4029.18	-130.10	848.20	611.58	1746910.88	14430916.93	39°44'10.4827"N	80°37'16.2720"W	1045.70	35.793	0.59	0.57	0.31
4324.00	28.870	43.400	4107.67	-129.17	879.79	642.25	1746941.54	14430948.51	39°44'10.7936"N	80°37'15.8777"W	1089.27	36.129	1.23	-0.93	-1.64
4414.00	28.200	44.620	4186.74	-128.37	910.71	672.11	1746971.39	14430979.42	39°44'11.0980"N	80°37'15.4937"W	1131.87	36.428	0.99	-0.74	1.36
4505.00	28.140	43.320	4266.96	-127.60	941.63	701.94	1747001.21	14431010.32	39°44'11.4023"N	80°37'15.1103"W	1174.47	36.703	0.68	-0.07	-1.43
4596.00	27.680	42.140	4347.38	-127.75	972.92	730.84	1747030.10	14431041.60	39°44'11.7102"N	80°37'14.7386"W	1216.84	36.913	0.79	-0.51	-1.30
4686.00	27.410	41.340	4427.18	-128.63	1003.97	758.55	1747057.80	14431072.64	39°44'12.0160"N	80°37'14.3822"W	1258.32	37.073	0.51	-0.30	-0.89
4777.00	27.650	41.540	4507.87	-129.73	1035.50	786.39	1747085.62	14431104.16	39°44'12.3264"N	80°37'14.0242"W	1300.26	37.214	0.28	0.26	0.22
4867.00	26.850	41.250	4587.88	-130.84	1066.41	813.64	1747112.86	14431135.06	39°44'12.6308"N	80°37'13.6737"W	1341.36	37.343	0.90	-0.89	-0.32
4958.00	27.210	40.240	4668.95	-132.42	1097.75	840.63	1747139.84	14431166.38	39°44'12.9393"N	80°37'13.3265"W	1382.64	37.444	0.64	0.40	-1.11
5048.00	28.400	43.400	4748.56	-133.22	1129.01	868.63	1747167.83	14431197.63	39°44'13.2471"N	80°37'12.9664"W	1424.49	37.574	2.10	1.32	3.51
5139.00	28.350	40.620	4828.63	-133.92	1161.13	897.57	1747196.76	14431229.74	39°44'13.5633"N	80°37'12.5943"W	1467.60	37.704	1.45	-0.05	-3.05
5229.00	27.260	37.680	4908.24	-136.67	1193.67	924.08	1747223.26	14431262.26	39°44'13.8838"N	80°37'12.2531"W	1509.56	37.745	1.95	-1.21	-3.27
5320.00	28.070	37.490	4988.83	-140.62	1227.15	949.85	1747249.02	14431295.73	39°44'14.2136"N	80°37'11.9214"W	1551.81	37.741	0.90	0.89	-0.21
5410.00	28.030	38.870	5068.26	-144.13	1260.42	976.01	1747275.17	14431328.98	39°44'14.5412"N	80°37'11.5848"W	1594.13	37.753	0.72	-0.04	1.53
5500.00	28.370	38.730	5147.58	-147.20	1293.56	1002.66	1747301.81	14431362.12	39°44'14.8677"N	80°37'11.2419"W	1636.65	37.780	0.38	0.38	-0.16
5591.00	27.570	38.220	5227.95	-150.52	1326.97	1029.21	1747328.35	14431395.51	39°44'15.1968"N	80°37'10.9001"W	1679.33	37.798	0.92	-0.88	-0.56
5681.00	26.760	37.500	5308.02	-154.16	1359.41	1054.43	1747353.56	14431427.94	39°44'15.5163"N	80°37'10.5755"W	1720.41	37.799	0.97	-0.90	-0.80
5771.00	26.830	36.970	5388.36	-158.19	1391.71	1078.98	1747378.10	14431460.23	39°44'15.8345"N	80°37'10.2595"W	1760.98	37.786	0.28	0.08	-0.59
5862.00	28.390	40.990	5469.00	-161.06	1424.45	1105.53	1747404.64	14431492.96	39°44'16.1569"N	80°37'9.9179"W	1803.12	37.815	2.67	1.71	4.42
5952.00	28.700	42.600	5548.06	-161.92	1456.51	1134.19	1747433.29	14431525.00	39°44'16.4725"N	80°37'9.5493"W	1846.03	37.908	0.92	0.34	1.79
6043.00	28.480	41.500	5627.97	-162.59	1488.85	1163.36	1747462.44	14431557.33	39°44'16.7909"N	80°37'9.1742"W	1889.46	38.003	0.63	-0.24	-1.21
6133.00	27.490	39.030	5707.44	-164.55	1521.05	1190.66	1747489.73	14431589.52	39°44'17.1080"N	80°37'8.8230"W	1931.65	38.053	1.69	-1.10	-2.74
6223.00	27.860	37.900	5787.15	-167.81	1553.78	1216.66	1747515.72	14431622.24	39°44'17.4304"N	80°37'8.4884"W	1973.45	38.062	0.71	0.41	-1.26
6313.00	27.760	36.780	5866.75	-171.91	1587.17	1242.12	1747541.18	14431655.61	39°44'17.7592"N	80°37'8.1606"W	2015.43	38.047	0.59	-0.11	-1.24
6403.00	28.250	38.510	5946.22	-175.80	1620.62	1267.94	1747566.98	14431689.05	39°44'18.0888"N	80°37'7.8283"W	2057.69	38.039	1.05	0.54	1.92
6493.00	26.700	38.610	6026.06	-178.98	1653.09	1293.82	1747592.85	14431721.51	39°44'18.4086"N	80°37'7.4953"W	2099.21	38.049	1.72	-1.72	0.11
6584.00	25.860	39.540	6107.66	-181.70	1684.37	1319.21	1747618.24	14431752.77	39°44'18.7166"N	80°37'7.1685"W	2139.49	38.068	1.03	-0.92	1.02



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'
Page 5 of 11

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 Office of Oil and Gas
 SEP 18 2020
 WV Department of
 Environmental Protection



REFERENCE WELLPATH IDENTIFICATION			
Operator	SWN PRODUCTION COMPANY, LLC	Well	Shawn Harlan MSH 410H
Field	Marshall	API/Legal	
Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

WELLPATH DATA (238 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)
6674.00	26.350	39.750	6188.48	-183.97	1714.86	1344.48	1747643.49	14431783.26	39°44'19.0169"N	80°37'6.8434"W	2179.08	38.097	0.55	0.54	0.23
6765.00	26.140	42.940	6270.10	-185.10	1745.07	1371.05	1747670.05	14431813.45	39°44'19.3143"N	80°37'6.5016"W	2219.24	38.156	1.57	-0.23	3.51
6856.00	25.480	42.810	6352.02	-185.14	1774.10	1398.00	1747697.00	14431842.47	39°44'19.6001"N	80°37'6.1550"W	2258.73	38.238	0.73	-0.73	-0.14
6925.00	24.710	41.990	6414.51	-185.41	1795.71	1417.74	1747716.73	14431864.07	39°44'19.8128"N	80°37'5.9012"W	2287.91	38.292	1.22	-1.12	-1.19
7015.00	29.220	41.490	6494.70	-186.28	1826.16	1444.89	1747743.87	14431894.51	39°44'20.1126"N	80°37'5.5519"W	2328.64	38.352	5.02	5.01	-0.56
7106.00	29.980	49.450	6573.86	-184.26	1857.59	1476.90	1747775.86	14431925.93	39°44'20.4219"N	80°37'5.1405"W	2373.16	38.487	4.40	0.84	8.75
7196.00	30.090	59.150	6651.82	-175.41	1883.80	1513.37	1747812.32	14431952.12	39°44'20.6793"N	80°37'4.6722"W	2416.40	38.777	5.39	0.12	10.78
7286.00	29.120	73.300	6730.16	-158.02	1901.68	1553.77	1747852.70	14431970.00	39°44'20.8544"N	80°37'4.1541"W	2455.72	39.251	7.83	-1.08	15.72
7376.00	33.640	83.590	6807.04	-130.68	1910.77	1599.57	1747898.49	14431979.08	39°44'20.9422"N	80°37'3.5673"W	2491.92	39.934	7.77	5.02	11.43
7467.00	39.890	91.780	6879.94	-92.23	1912.68	1653.87	1747952.77	14431980.99	39°44'20.9588"N	80°37'2.8721"W	2528.56	40.850	8.72	6.87	9.00
7557.00	45.210	101.020	6946.29	-43.31	1905.67	1714.17	1748013.04	14431973.98	39°44'20.8870"N	80°37'2.1006"W	2563.19	41.972	9.11	5.91	10.27
7647.00	50.940	107.830	7006.44	15.52	1888.84	1778.88	1748077.72	14431957.16	39°44'20.7179"N	80°37'1.2732"W	2594.63	43.283	8.49	6.37	7.57
7737.00	57.290	113.460	7059.19	82.96	1863.02	1846.98	1748145.80	14431931.36	39°44'20.4600"N	80°37'0.4028"W	2623.39	44.752	8.68	7.06	6.26
7828.00	64.940	119.770	7103.15	159.36	1827.24	1918.04	1748216.83	14431895.59	39°44'20.1033"N	80°36'59.4952"W	2649.09	46.389	10.36	8.41	6.93
7918.00	69.970	123.050	7137.65	240.77	1783.90	1988.92	1748287.69	14431852.27	39°44'19.6720"N	80°36'58.5902"W	2671.72	48.110	6.52	5.59	3.64
8009.00	74.360	126.920	7165.53	326.53	1734.23	2059.84	1748358.58	14431802.61	39°44'19.1781"N	80°36'57.6851"W	2692.67	49.905	6.30	4.82	4.25
8099.00	80.820	130.190	7184.86	414.11	1679.46	2128.51	1748427.22	14431747.86	39°44'18.6339"N	80°36'56.8091"W	2711.30	51.726	8.01	7.18	3.63
8190.00	89.260	130.730	7192.73	504.60	1620.68	2197.42	1748496.11	14431689.11	39°44'18.0501"N	80°36'55.9301"W	2730.43	53.590	9.29	9.27	0.59
8280.00	89.020	131.870	7194.08	594.56	1561.29	2265.03	1748563.69	14431629.74	39°44'17.4603"N	80°36'55.0680"W	2750.99	55.421	1.29	-0.27	1.27
8370.00	88.920	130.660	7195.69	684.50	1501.94	2332.67	1748631.30	14431570.41	39°44'16.8709"N	80°36'54.2054"W	2774.37	57.224	1.35	-0.11	-1.34
8461.00	87.480	127.560	7198.55	775.24	1444.57	2403.23	1748701.84	14431513.07	39°44'16.3009"N	80°36'53.3053"W	2803.98	58.990	3.75	-1.58	-3.41
8551.00	88.890	132.990	7201.41	865.06	1386.44	2471.83	1748770.41	14431454.96	39°44'15.7236"N	80°36'52.4304"W	2834.11	60.712	6.23	1.57	6.03
8642.00	88.830	132.270	7203.22	956.04	1324.82	2538.77	1748837.32	14431393.37	39°44'15.1118"N	80°36'51.5769"W	2863.65	62.443	0.79	-0.07	-0.79
8732.00	89.200	133.870	7204.76	1046.03	1263.37	2604.51	1748903.03	14431331.94	39°44'14.5017"N	80°36'50.7388"W	2894.75	64.123	1.82	0.41	1.78
8823.00	89.380	130.210	7205.89	1136.99	1202.45	2672.07	1748970.57	14431271.04	39°44'13.8967"N	80°36'49.8773"W	2930.16	65.772	4.03	0.20	-4.02
8913.00	88.740	129.610	7207.37	1226.85	1144.72	2741.10	1749039.57	14431213.33	39°44'13.3232"N	80°36'48.9969"W	2970.52	67.334	0.97	-0.71	-0.67
9003.00	87.690	132.220	7210.17	1316.74	1085.81	2809.07	1749107.52	14431154.44	39°44'12.7381"N	80°36'48.1301"W	3011.62	68.867	3.12	-1.17	2.90
9094.00	88.000	133.190	7213.59	1407.68	1024.13	2875.89	1749174.32	14431092.79	39°44'12.1258"N	80°36'47.2781"W	3052.80	70.399	1.12	0.34	1.07
9184.00	88.060	134.420	7216.69	1497.61	961.87	2940.81	1749239.20	14431030.56	39°44'11.5077"N	80°36'46.4507"W	3094.11	71.888	1.37	0.07	1.37
9274.00	87.660	132.210	7220.05	1587.54	900.18	3006.24	1749304.61	14430968.89	39°44'10.8952"N	80°36'45.6165"W	3138.12	73.330	2.49	-0.44	-2.46



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'

Page 6 of 11

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 Office of Oil and Gas
 SEP 18 2020
 WV Department of
 Environmental Protection



REFERENCE WELLPATH IDENTIFICATION			
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Field	Marshall	API/Legal	
Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWP
Slot	Slot #410		

WELLPATH DATA (238 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]
9364.00	88.400	134.000	7223.14	1677.48	838.72	3071.91	1749370.25	14430907.45	39°44'10.2850"N	80°36'44.7793"W	3184.35	74.729	2.15	0.82	1.99
9454.00	87.660	135.320	7226.24	1767.39	775.49	3135.88	1749434.20	14430844.25	39°44'9.6575"N	80°36'43.9639"W	3230.35	76.110	1.68	-0.82	1.47
9545.00	90.370	135.020	7227.80	1858.30	710.97	3200.02	1749498.32	14430779.76	39°44'9.0171"N	80°36'43.1465"W	3278.05	77.474	3.00	2.98	-0.33
9635.00	88.250	132.930	7228.89	1948.27	648.49	3264.78	1749563.05	14430717.30	39°44'8.3968"N	80°36'42.3210"W	3328.56	78.765	3.31	-2.36	-2.32
9726.00	87.780	134.870	7232.04	2039.19	585.43	3330.31	1749628.55	14430654.27	39°44'7.7709"N	80°36'41.4858"W	3381.37	80.030	2.19	-0.52	2.13
9817.00	87.780	134.820	7235.56	2130.07	521.31	3394.78	1749693.00	14430590.17	39°44'7.1344"N	80°36'40.6641"W	3434.57	81.270	0.05	0.00	-0.05
9907.00	88.770	134.480	7238.27	2219.99	458.09	3458.78	1749756.97	14430526.97	39°44'6.5068"N	80°36'39.8484"W	3488.98	82.455	1.16	1.10	-0.38
9997.00	87.110	133.840	7241.51	2309.91	395.43	3523.30	1749821.47	14430464.34	39°44'5.8849"N	80°36'39.0260"W	3545.42	83.596	1.98	-1.84	-0.71
10087.00	87.820	134.470	7245.49	2399.80	332.80	3587.81	1749885.95	14430401.73	39°44'5.2631"N	80°36'38.2038"W	3603.21	84.700	1.05	0.79	0.70
10178.00	87.810	131.530	7248.96	2490.73	270.79	3654.30	1749952.42	14430339.75	39°44'4.6474"N	80°36'37.3561"W	3664.32	85.762	3.23	-0.01	-3.23
10268.00	86.740	133.490	7253.24	2580.62	210.05	3720.57	1750018.66	14430279.03	39°44'4.0443"N	80°36'36.5112"W	3726.49	86.769	2.48	-1.19	2.18
10359.00	87.660	134.340	7257.68	2671.49	147.01	3786.04	1750084.11	14430216.01	39°44'3.4185"N	80°36'35.6767"W	3788.90	87.776	1.38	1.01	0.93
10449.00	87.350	134.780	7261.60	2761.37	83.92	3850.11	1750148.15	14430152.95	39°44'2.7922"N	80°36'34.8602"W	3851.02	88.751	0.60	-0.34	0.49
10540.00	87.540	134.700	7265.66	2852.23	19.93	3914.68	1750212.70	14430088.98	39°44'2.1571"N	80°36'34.0372"W	3914.73	89.708	0.23	0.21	-0.09
10630.00	87.380	133.500	7269.65	2942.13	-42.64	3979.25	1750277.24	14430026.44	39°44'1.5359"N	80°36'33.2142"W	3979.48	90.614	1.34	-0.18	-1.33
10720.00	87.630	135.530	7273.56	3032.00	-105.67	4043.36	1750341.33	14429963.43	39°44'0.9102"N	80°36'32.3971"W	4044.74	91.497	2.27	0.28	2.26
10810.00	88.030	132.740	7276.97	3121.91	-168.30	4107.90	1750405.84	14429900.83	39°44'0.2886"N	80°36'31.5745"W	4111.35	92.346	3.13	0.44	-3.10
10901.00	88.460	135.750	7279.76	3212.83	-231.75	4173.05	1750470.97	14429837.40	39°43'59.6586"N	80°36'30.7441"W	4179.48	93.179	3.34	0.47	3.31
10991.00	88.430	133.260	7282.20	3302.76	-294.81	4237.21	1750535.10	14429774.36	39°43'59.0327"N	80°36'29.9264"W	4247.45	93.980	2.77	-0.03	-2.77
11082.00	89.450	133.560	7283.89	3393.74	-357.34	4303.30	1750601.17	14429711.86	39°43'58.4119"N	80°36'29.0839"W	4318.12	94.747	1.17	1.12	0.33
11172.00	87.970	131.650	7285.91	3483.71	-418.24	4369.53	1750667.37	14429650.98	39°43'57.8071"N	80°36'28.2397"W	4389.50	95.468	2.68	-1.64	-2.12
11262.00	87.840	133.350	7289.20	3573.64	-479.00	4435.83	1750733.65	14429590.25	39°43'57.2038"N	80°36'27.3944"W	4461.62	96.163	1.89	-0.14	1.89
11353.00	87.320	131.550	7293.05	3664.55	-540.36	4502.92	1750800.70	14429528.91	39°43'56.5945"N	80°36'26.5392"W	4535.22	96.843	2.06	-0.57	-1.98
11443.00	86.980	133.060	7297.52	3754.43	-600.86	4569.39	1750867.16	14429468.43	39°43'55.9937"N	80°36'25.6917"W	4608.73	97.491	1.72	-0.38	1.68
11533.00	88.250	135.130	7301.27	3844.33	-663.43	4633.97	1750931.71	14429405.89	39°43'55.3725"N	80°36'24.8687"W	4681.22	98.147	2.70	1.41	2.30
11623.00	87.690	132.200	7304.45	3934.26	-725.53	4699.03	1750996.74	14429343.82	39°43'54.7561"N	80°36'24.0395"W	4754.71	98.777	3.31	-0.62	-3.26
11713.00	86.950	132.770	7308.66	4024.15	-786.24	4765.32	1751063.01	14429283.12	39°43'54.1531"N	80°36'23.1943"W	4829.75	99.369	1.04	-0.82	0.63
11804.00	89.200	134.570	7311.72	4115.09	-849.04	4831.10	1751128.76	14429220.35	39°43'53.5297"N	80°36'22.3559"W	4905.14	99.968	3.17	2.47	1.98
11894.00	88.650	133.680	7313.41	4205.05	-911.69	4895.69	1751193.33	14429157.73	39°43'52.9078"N	80°36'21.5327"W	4979.86	100.549	1.16	-0.61	-0.99
11983.00	88.680	131.480	7315.48	4294.02	-971.89	4961.21	1751258.82	14429097.55	39°43'52.3100"N	80°36'20.6976"W	5055.50	101.084	2.47	0.03	-2.47



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'

Page 7 of 11

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Slot	Slot #410		

WELLPATH DATA (238 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)
12074.00	88.490	132.090	7317.73	4384.97	-1032.50	5029.04	1751326.62	14429036.96	39°43'51.7080"N	80°36'19.8327"W	5133.94	101.602	0.70	-0.21	0.67
12164.00	89.080	132.250	7319.64	4474.94	-1092.91	5095.73	1751393.28	14428976.58	39°43'51.1081"N	80°36'18.9826"W	5211.61	102.105	0.68	0.66	0.18
12254.00	88.650	130.140	7321.42	4564.88	-1152.17	5163.43	1751460.96	14428917.34	39°43'50.5195"N	80°36'18.1193"W	5290.42	102.579	2.39	-0.48	-2.34
12345.00	88.210	132.070	7323.91	4655.79	-1211.97	5231.97	1751529.48	14428857.56	39°43'49.9255"N	80°36'17.2454"W	5370.51	103.042	2.17	-0.48	2.12
12435.00	88.710	132.520	7326.33	4745.75	-1272.52	5298.52	1751596.00	14428797.04	39°43'49.3243"N	80°36'16.3971"W	5449.19	103.505	0.75	0.56	0.50
12526.00	88.580	131.540	7328.48	4836.72	-1333.42	5366.10	1751663.55	14428736.15	39°43'48.7194"N	80°36'15.5356"W	5529.29	103.955	1.09	-0.14	-1.08
12616.00	88.340	130.970	7330.90	4926.64	-1392.75	5433.73	1751731.16	14428676.85	39°43'48.1302"N	80°36'14.6733"W	5609.38	104.376	0.69	-0.27	-0.63
12707.00	89.020	134.020	7333.00	5017.61	-1454.20	5500.80	1751798.20	14428615.43	39°43'47.5199"N	80°36'13.8183"W	5689.77	104.808	3.43	0.75	3.35
12797.00	89.230	131.600	7334.37	5107.59	-1515.35	5566.81	1751864.19	14428554.30	39°43'46.9127"N	80°36'12.9769"W	5769.38	105.228	2.70	0.23	-2.69
12887.00	88.150	132.650	7336.43	5197.55	-1575.70	5633.55	1751930.89	14428493.98	39°43'46.3134"N	80°36'12.1262"W	5849.76	105.626	1.67	-1.20	1.17
12978.00	88.430	131.780	7339.15	5288.50	-1636.81	5700.91	1751998.23	14428432.88	39°43'45.7065"N	80°36'11.2674"W	5931.24	106.020	1.00	0.31	-0.96
13068.00	87.320	130.040	7342.49	5378.38	-1695.71	5768.88	1752066.17	14428374.01	39°43'45.1214"N	80°36'10.4008"W	6012.94	106.380	2.29	-1.23	-1.93
13158.00	86.680	128.680	7347.20	5468.08	-1752.71	5838.37	1752135.64	14428317.04	39°43'44.5551"N	80°36'9.5147"W	6095.78	106.710	1.67	-0.71	-1.51
13249.00	86.460	128.930	7352.64	5558.68	-1809.63	5909.15	1752206.40	14428260.13	39°43'43.9894"N	80°36'8.6119"W	6180.04	107.027	0.37	-0.24	0.27
13339.00	87.480	132.670	7357.40	5648.47	-1868.35	5977.18	1752274.39	14428201.44	39°43'43.4062"N	80°36'7.7446"W	6262.38	107.358	4.30	1.13	4.16
13430.00	86.980	135.020	7361.80	5739.35	-1931.31	6042.72	1752339.91	14428138.51	39°43'42.7811"N	80°36'6.9092"W	6343.85	107.724	2.64	-0.55	2.58
13520.00	87.810	135.440	7365.89	5829.18	-1995.13	6106.04	1752403.21	14428074.70	39°43'42.1476"N	80°36'6.1025"W	6423.73	108.095	1.03	0.92	0.47
13610.00	88.090	134.010	7369.11	5919.08	-2058.42	6169.94	1752467.08	14428011.44	39°43'41.5193"N	80°36'5.2882"W	6504.25	108.450	1.62	0.31	-1.59
13701.00	87.570	137.020	7372.55	6009.91	-2123.29	6233.66	1752530.77	14427946.59	39°43'40.8754"N	80°36'4.4765"W	6585.35	108.810	3.35	-0.57	3.31
13791.00	89.630	135.810	7374.75	6099.71	-2188.46	6295.68	1752592.77	14427881.45	39°43'40.2286"N	80°36'3.6863"W	6665.21	109.168	2.65	2.29	-1.34
13882.00	88.180	133.020	7376.49	6190.66	-2252.13	6360.66	1752657.73	14427817.81	39°43'39.5966"N	80°36'2.8583"W	6747.60	109.498	3.45	-1.59	-3.07
13972.00	88.340	133.970	7379.23	6280.61	-2314.04	6425.92	1752722.96	14427755.92	39°43'38.9818"N	80°36'2.0266"W	6829.88	109.804	1.07	0.18	1.06
14062.00	87.880	131.000	7382.19	6370.55	-2374.79	6492.25	1752789.26	14427695.19	39°43'38.3785"N	80°36'1.1811"W	6912.95	110.092	3.34	-0.51	-3.30
14153.00	88.430	134.160	7385.12	6461.49	-2436.32	6559.21	1752856.20	14427633.69	39°43'37.7675"N	80°36'0.3276"W	6997.06	110.377	3.52	0.60	3.47
14243.00	88.120	130.870	7387.83	6551.43	-2497.11	6625.51	1752922.47	14427572.92	39°43'37.1638"N	80°35'59.4825"W	7080.46	110.651	3.67	-0.34	-3.66
14333.00	87.600	133.160	7391.20	6641.35	-2557.30	6692.33	1752989.26	14427512.76	39°43'36.5660"N	80°35'58.6308"W	7164.29	110.913	2.61	-0.58	2.54
14423.00	88.180	132.460	7394.51	6731.29	-2618.42	6758.31	1753055.22	14427451.66	39°43'35.9591"N	80°35'57.7899"W	7247.81	111.178	1.01	0.64	-0.78
14513.00	88.460	134.380	7397.15	6821.24	-2680.25	6823.64	1753120.53	14427389.85	39°43'35.3452"N	80°35'56.9572"W	7331.16	111.444	2.15	0.31	2.13
14603.00	87.810	131.620	7400.08	6911.18	-2741.59	6889.42	1753186.28	14427328.54	39°43'34.7360"N	80°35'56.1188"W	7414.88	111.700	3.15	-0.72	-3.07
14694.00	88.490	134.140	7403.02	7002.13	-2803.48	6956.07	1753252.90	14427266.67	39°43'34.1215"N	80°35'55.2694"W	7499.76	111.951	2.87	0.75	2.77



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'
Page 8 of 11

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SWN PRODUCTION COMPANY, LLC	Well	Shawn Harlan MSH 410H
Field	Marshall	API/Legal	
Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

WELLPATH DATA (238 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]
14784.00	88.220	131.100	7405.60	7092.08	-2864.39	7022.26	1753319.07	14427205.79	39°43'33.5166"N	80°35'54.4257"W	7583.98	112.191	3.39	-0.30	-3.38
14874.00	87.350	131.710	7409.08	7181.98	-2923.86	7089.71	1753386.49	14427146.33	39°43'32.9258"N	80°35'53.5658"W	7668.96	112.412	1.18	-0.97	0.68
14965.00	88.370	134.540	7412.48	7272.90	-2986.02	7156.08	1753452.83	14427084.20	39°43'32.3086"N	80°35'52.7201"W	7754.08	112.649	3.30	1.12	3.11
15055.00	88.710	134.090	7414.77	7362.85	-3048.88	7220.45	1753517.18	14427021.37	39°43'31.6846"N	80°35'51.8998"W	7837.76	112.892	0.63	0.38	-0.50
15146.00	88.370	131.950	7417.09	7453.81	-3110.94	7286.96	1753583.66	14426959.33	39°43'31.0683"N	80°35'51.0522"W	7923.24	113.119	2.38	-0.37	-2.35
15236.00	89.230	132.340	7418.97	7543.78	-3171.31	7353.67	1753650.35	14426898.98	39°43'30.4687"N	80°35'50.2018"W	8008.35	113.328	1.05	0.96	0.43
15326.00	88.650	131.130	7420.64	7633.75	-3231.21	7420.82	1753717.47	14426839.10	39°43'29.8737"N	80°35'49.3459"W	8093.78	113.530	1.49	-0.64	-1.34
15417.00	89.290	133.550	7422.28	7724.72	-3292.49	7488.07	1753784.69	14426777.85	39°43'29.2651"N	80°35'48.4888"W	8179.95	113.735	2.75	0.70	2.66
15507.00	89.110	132.270	7423.53	7814.71	-3353.76	7553.98	1753850.58	14426716.61	39°43'28.6567"N	80°35'47.6487"W	8265.00	113.940	1.44	-0.20	-1.42
15598.00	88.890	133.150	7425.12	7905.69	-3415.47	7620.83	1753917.41	14426654.92	39°43'28.0438"N	80°35'46.7967"W	8351.20	114.141	1.00	-0.24	0.97
15688.00	88.620	133.410	7427.08	7995.67	-3477.16	7686.34	1753982.89	14426593.25	39°43'27.4313"N	80°35'45.9619"W	8436.26	114.341	0.42	-0.30	0.29
15778.00	88.370	133.510	7429.44	8085.64	-3539.04	7751.64	1754048.17	14426531.39	39°43'26.8168"N	80°35'45.1297"W	8521.31	114.539	0.30	-0.28	0.11
15869.00	88.310	134.430	7432.08	8176.58	-3602.20	7817.11	1754113.60	14426468.27	39°43'26.1898"N	80°35'44.2955"W	8607.15	114.741	1.01	-0.07	1.01
15959.00	88.550	131.860	7434.54	8266.54	-3663.71	7882.75	1754179.22	14426406.78	39°43'25.5789"N	80°35'43.4590"W	8692.55	114.928	2.88	0.27	-2.87
16049.00	88.180	132.840	7437.11	8356.50	-3724.31	7949.24	1754245.69	14426346.20	39°43'24.9771"N	80°35'42.6115"W	8778.43	115.104	1.17	-0.41	1.10
16139.00	88.890	132.220	7439.41	8446.46	-3785.12	8015.54	1754311.96	14426285.41	39°43'24.3731"N	80°35'41.7665"W	8864.31	115.278	1.05	0.79	-0.69
16229.00	88.340	132.550	7441.59	8536.43	-3845.78	8082.00	1754378.39	14426224.78	39°43'23.7707"N	80°35'40.9195"W	8950.34	115.447	0.71	-0.61	0.37
16320.00	88.770	132.640	7443.88	8627.40	-3907.35	8148.97	1754445.33	14426163.23	39°43'23.1593"N	80°35'40.0660"W	9037.31	115.617	0.48	0.47	0.10
16410.00	88.740	133.450	7445.84	8717.38	-3968.76	8214.72	1754511.07	14426101.84	39°43'22.5494"N	80°35'39.2280"W	9123.20	115.786	0.90	-0.03	0.90
16500.00	88.250	132.960	7448.20	8807.35	-4030.36	8280.30	1754576.62	14426040.27	39°43'21.9377"N	80°35'38.3923"W	9209.08	115.954	0.77	-0.54	-0.54
16591.00	88.280	133.070	7450.96	8898.31	-4092.41	8346.81	1754643.10	14425978.25	39°43'21.3215"N	80°35'37.5447"W	9296.07	116.119	0.13	0.03	0.12
16681.00	88.710	133.330	7453.32	8988.27	-4153.99	8412.39	1754708.66	14425916.68	39°43'20.7099"N	80°35'36.7090"W	9382.11	116.280	0.56	0.48	0.29
16771.00	88.340	131.500	7455.64	9078.24	-4214.68	8478.81	1754775.05	14425856.02	39°43'20.1073"N	80°35'35.8625"W	9468.57	116.431	2.07	-0.41	-2.03
16862.00	87.970	132.730	7458.57	9169.18	-4275.67	8546.28	1754842.49	14425795.05	39°43'19.5014"N	80°35'35.0026"W	9556.16	116.579	1.41	-0.41	1.35
16952.00	88.680	132.260	7461.20	9259.14	-4336.44	8612.61	1754908.80	14425734.31	39°43'18.8979"N	80°35'34.1572"W	9642.71	116.725	0.95	0.79	-0.52
17043.00	88.220	134.130	7463.66	9350.10	-4398.70	8678.93	1754975.09	14425672.07	39°43'18.2796"N	80°35'33.3122"W	9729.97	116.877	2.12	-0.51	2.05
17133.00	89.050	131.470	7465.80	9440.06	-4459.83	8744.94	1755041.07	14425610.97	39°43'17.6725"N	80°35'32.4709"W	9816.52	117.021	3.10	0.92	-2.96
17223.00	88.180	134.000	7467.98	9530.03	-4520.88	8811.02	1755107.13	14425549.94	39°43'17.0662"N	80°35'31.6288"W	9903.15	117.162	2.97	-0.97	2.81
17314.00	88.710	132.610	7470.45	9620.99	-4583.27	8877.21	1755173.30	14425487.57	39°43'16.4467"N	80°35'30.7853"W	9990.56	117.307	1.63	0.58	-1.53
17404.00	88.740	132.800	7472.45	9710.97	-4644.29	8943.33	1755239.39	14425426.57	39°43'15.8406"N	80°35'29.9427"W	10077.34	117.443	0.21	0.03	0.21



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879*
Page 9 of 11

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Field	Marshall	API/Legal	
Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

WELLPATH DATA (238 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)
17494.00	89.290	134.070	7474.00	9800.95	-4706.16	9008.68	1755304.71	14425364.73	39°43'15.2262"N	80°35'29.1101"W	10163.87	117.583	1.54	0.61	1.41
17584.00	89.630	134.290	7474.85	9890.92	-4768.88	9073.22	1755369.23	14425302.03	39°43'14.6035"N	80°35'28.2878"W	10250.15	117.726	0.45	0.38	0.24
17675.00	89.690	132.140	7475.39	9981.91	-4831.19	9139.53	1755435.51	14425239.75	39°43'13.9848"N	80°35'27.4427"W	10337.86	117.861	2.36	0.07	-2.36
17764.00	89.630	133.100	7475.91	10070.91	-4891.45	9205.02	1755500.98	14425179.51	39°43'13.3862"N	80°35'26.6082"W	10423.95	117.986	1.08	-0.07	1.08
17855.00	89.690	132.310	7476.45	10161.91	-4953.17	9271.89	1755567.82	14425117.82	39°43'12.7733"N	80°35'25.7560"W	10511.99	118.112	0.87	0.07	-0.87
17945.00	90.090	133.240	7476.63	10251.91	-5014.29	9337.95	1755633.86	14425056.72	39°43'12.1663"N	80°35'24.9142"W	10599.08	118.235	1.12	0.44	1.03
18035.00	90.060	133.710	7476.51	10341.90	-5076.21	9403.26	1755699.14	14424994.82	39°43'11.5514"N	80°35'24.0820"W	10685.94	118.362	0.52	-0.03	0.52
18126.00	89.630	133.300	7476.76	10432.90	-5138.86	9469.27	1755765.12	14424932.20	39°43'10.9293"N	80°35'23.2410"W	10773.80	118.488	0.65	-0.47	-0.45
18216.00	91.050	133.380	7476.22	10522.89	-5200.62	9534.72	1755830.55	14424870.46	39°43'10.3159"N	80°35'22.4070"W	10860.82	118.610	1.58	1.58	0.09
18307.00	89.630	132.760	7475.68	10613.89	-5262.76	9601.19	1755897.00	14424808.34	39°43'9.6988"N	80°35'21.5599"W	10948.95	118.729	1.70	-1.56	-0.68
18397.00	89.690	133.500	7476.22	10703.88	-5324.29	9666.87	1755962.65	14424746.84	39°43'9.0878"N	80°35'20.7230"W	11036.15	118.845	0.82	0.07	0.82
18488.00	89.780	133.430	7476.64	10794.88	-5386.89	9732.92	1756028.67	14424684.27	39°43'8.4661"N	80°35'19.8815"W	11124.22	118.963	0.13	0.10	-0.08
18578.00	89.970	132.600	7476.83	10884.88	-5448.29	9798.73	1756094.45	14424622.89	39°43'7.8564"N	80°35'19.0430"W	11211.55	119.075	0.95	0.21	-0.92
18669.00	89.750	131.600	7477.05	10975.87	-5509.29	9866.25	1756161.95	14424561.91	39°43'7.2504"N	80°35'18.1825"W	11300.23	119.179	1.13	-0.24	-1.10
18760.00	90.710	132.510	7476.69	11066.85	-5570.25	9933.81	1756229.48	14424500.98	39°43'6.6449"N	80°35'17.3214"W	11388.95	119.281	1.45	1.05	1.00
18850.00	89.750	130.570	7476.33	11156.82	-5629.93	10001.17	1756296.82	14424441.32	39°43'6.0521"N	80°35'16.4629"W	11476.91	119.376	2.40	-1.07	-2.16
18941.00	90.340	132.800	7476.26	11247.79	-5690.44	10069.13	1756364.75	14424380.83	39°43'5.4510"N	80°35'15.5969"W	11565.83	119.472	2.53	0.65	2.45
19031.00	89.850	133.640	7476.11	11337.79	-5752.07	10134.71	1756430.31	14424319.23	39°43'4.8389"N	80°35'14.7612"W	11653.27	119.578	1.08	-0.54	0.93
19122.00	89.720	132.000	7476.45	11428.78	-5813.92	10201.46	1756497.03	14424257.40	39°43'4.2246"N	80°35'13.9107"W	11741.86	119.679	1.81	-0.14	-1.80
19213.00	90.250	133.080	7476.47	11519.78	-5875.45	10268.50	1756564.05	14424195.90	39°43'3.6135"N	80°35'13.0563"W	11830.60	119.777	1.32	0.58	1.19
19303.00	90.060	132.120	7476.23	11609.78	-5936.36	10334.75	1756630.27	14424135.01	39°43'3.0085"N	80°35'12.2122"W	11918.37	119.873	1.09	-0.21	-1.07
19394.00	90.030	132.390	7476.16	11700.77	-5997.56	10402.11	1756697.60	14424073.84	39°43'2.4007"N	80°35'11.3538"W	12007.27	119.967	0.30	-0.03	0.30
19485.00	89.570	132.460	7476.48	11791.77	-6058.95	10469.28	1756764.74	14424012.47	39°43'1.7909"N	80°35'10.4979"W	12096.14	120.060	0.51	-0.51	0.08
19575.00	90.060	131.270	7476.77	11881.75	-6119.01	10536.30	1756831.74	14423952.43	39°43'1.1943"N	80°35'9.6437"W	12184.25	120.146	1.43	0.54	-1.32
19666.00	89.750	132.560	7476.92	11972.73	-6179.80	10604.02	1756899.43	14423891.67	39°43'0.5904"N	80°35'8.7808"W	12273.35	120.233	1.46	-0.34	1.42
19756.00	89.660	132.100	7477.38	12062.73	-6240.40	10670.55	1756965.94	14423831.09	39°42'59.9885"N	80°35'7.9330"W	12361.36	120.320	0.52	-0.10	-0.51
19847.00	90.000	132.390	7477.65	12153.72	-6301.58	10737.91	1757033.28	14423769.93	39°42'59.3808"N	80°35'7.0745"W	12450.41	120.407	0.49	0.37	0.32
19879.00‡	90.000	132.390	7477.65	12185.72	-6323.16	10761.55	1757056.90	14423748.37	39°42'59.1665"N	80°35'6.7734"W	12481.72	120.437	0.00	0.00	0.00



Actual Wellpath Report

Shawn Harlan MSH 410H AWP Proj: 19879'

Page 10 of 11

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SWN PRODUCTION COMPANY, LLC	Well	Shawn Harlan MSH 410H
Field	Marshall	API/Legal	
Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

HOLE & CASING SECTIONS - Ref Wellbore: Shawn Harlan MSH 410H AWB Ref Wellpath: Shawn Harlan MSH 410H AWP Proj: 19879'									
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]
20in Conductor	26.00	100.00	74.00	26.00	100.00	0.00	0.00	-0.43	0.10
17.5in Open Hole	100.00	594.00	494.00	100.00	593.99	-0.43	0.10	-2.95	-0.08
13.375in Casing Surface	26.00	594.00	568.00	26.00	593.99	0.00	0.00	-2.95	-0.08
12.25in Open Hole	594.00	2671.00	2077.00	593.99	2615.94	-2.95	-0.08	351.64	214.77
9.625in Casing Intermediate	26.00	2671.00	2645.00	26.00	2615.94	0.00	0.00	351.64	214.77
8.75in Open Hole	2671.00	6927.00	4256.00	2615.94	6416.32	351.64	214.77	1796.33	1418.30
8.5in Open Hole	6927.00	19879.00	12952.00	6416.32	7477.65	1796.33	1418.30	-6323.16	10761.55
5.5in Casing Production	26.00	19879.00	19853.00	26.00	7477.65	0.00	0.00	-6323.16	10761.55

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Shawn Harlan MSH 410H LP Rev-2	7194.00	1636.16	2177.44	1748476.14	14431704.58	39°44'18.2039"N	80°36'56.1851"W	point
Shawn Harlan MSH 410H BHL Rev-4	7480.46	-6339.23	10748.50	1757043.86	14423732.30	39°42'59.0083"N	80°35'6.9413"W	point

WELLPATH COMPOSITION - Ref Wellbore: Shawn Harlan MSH 410H AWB Ref Wellpath: Shawn Harlan MSH 410H AWP Proj: 19879'					
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore	Survey Date
26.00	592.00	Gyrodatta 2015 - GC+WIR+DPIPE	01 Gyrodatta GC WIR DPIPE <17 1/2"> (100'-592')	Shawn Harlan MSH 410H AWB	2/19/2020
592.00	2671.00	OWSG MWD rev2 + HRGM	02 Premier MWD <12 1/4"> (642'-2671')	Shawn Harlan MSH 410H AWB	2/19/2020
2671.00	6856.00	OWSG MWD rev2 + HRGM	03 Premier MWD <8 3/4"> (2787'-6856')	Shawn Harlan MSH 410H AWB	2/20/2020
6856.00	19879.00	BH AutoTrak Curve (2019) (Short spacing)	04 BH AT Curve <8 1/2"> (6925'-19847')	Shawn Harlan MSH 410H AWB	2/20/2020



Actual Wellpath Report
Shawn Harlan MSH 410H AWP Proj: 19879'
Page 11 of 11

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Facility	Shawn Harlan MSH Pad	Wellbore	Shawn Harlan MSH 410H AWB
Slot	Slot #410		

COMMENTS
Wellpath general comments API: 47-051-02271-0000 BH Job #: 110250349A Rig: SDC 46 Duration: 02/23/2020 - 02/26/2020



Well Name: Shawn Harlan MSH 410H 47051022710000

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	489.00	489.00	489.00	489.00	
Top of Salt Water	750.00	750.00	NA	NA	
Pittsburgh Coal	1116.00	1116.00	1118.00	1118.00	
Pottsville (ss)	1211.00	1211.00	1550.00	1549.00	
Raven Cliff (ss)	1567.00	1554.00	1847.00	1822.00	
Maxton (ss)	2024.00	1991.00	2267.00	2227.00	
Big Injun (ss)	2313.00	2272.00	2563.00	2511.00	
Berea (siltstone)	2924.00	2864.00	2954.00	2893.00	
Rhinestreet (shale)	7000.00	6481.00	7345.00	6781.00	
Cashaqua (shale)	7345.00	6781.00	7514.00	6915.00	
Middlesex (shale)	7514.00	6915.00	7581.00	6962.00	
Burket (shale)	7625.00	6992.00	7676.00	7024.00	
Tully (ls)	7676.00	7024.00	7721.00	7050.00	
Mahantango (shale)	7721.00	7050.00	7962.00	7152.00	
Marcellus (shale)	7962.00	7152.00	NA	NA	GAS

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