

SOUTHWESTERN ENERGY

Location: Ohio County, WV
 Field: Ohio
 Facility: Thelma Hays OHI Pad
 Slot: Slot #01
 Well: Thelma Hays OHI 1H
 Wellbore: Thelma Hays OHI 1H.PWB

API: 47-069-00236-0000

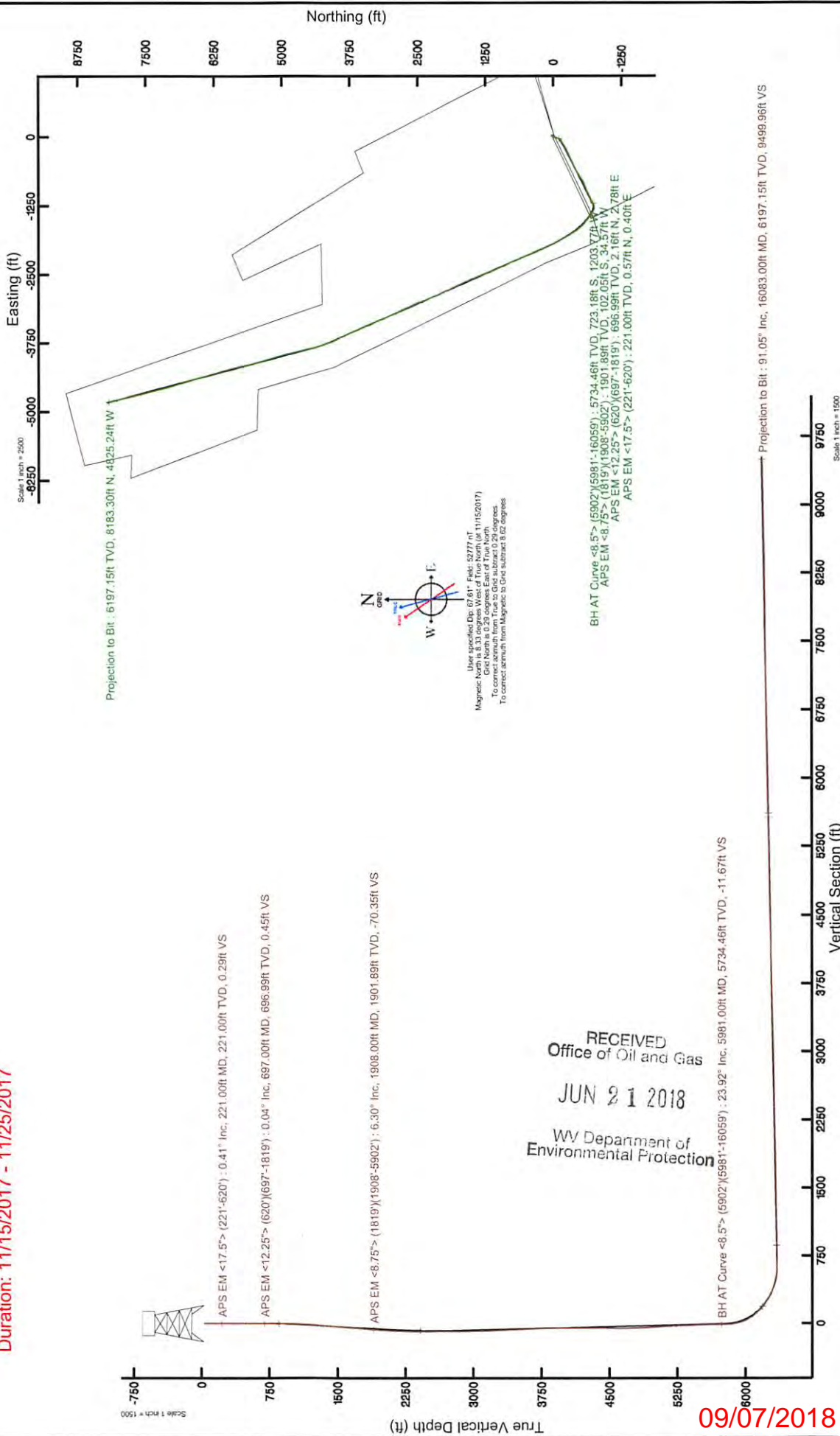
Job #: 8856819

Rig: SDC 46

Duration: 11/15/2017 - 11/25/2017



Plot reference with 8. Thomas Hays OHI 1H PWB from A-D	Grid System: NAD83 (117M Zone 17 North, US feet)
True vertical depths are referenced to SDC-46 (RWD)	Wellbore was transferred from a different producer status
Measured depths are referenced to SDC-46 (RWD)	North Reference: Grid north
SDC-46 (RWD) to Main State Local (1970) (feet)	Scale: True distance
Main State Local to General (feet)	Datum: sea in Mean
General to Grid (feet)	Coordinate system: NAD 83
Coordinate system: NAD 83	Coordinate system: NAD 83



APS EM <17.5°> (221°/620°) : 0.41° Inc, 221.00ft MD, 221.00ft TVD, 0.29ft VS

APS EM <12.25°> (620°/697°-1819°) : 0.04° Inc, 697.00ft MD, 696.99ft TVD, 0.45ft VS

APS EM <8.75°> (1819°/1908°-5902°) : 6.30° Inc, 1908.00ft MD, 1901.89ft TVD, -70.35ft VS

BH AT Curve <8.5°> (5902°/5981°-16059°) : 23.92° Inc, 5981.00ft MD, 5734.46ft TVD, -11.67ft VS

User specified Dip: 0.61° Field: 52777 nT
 Magnetic North is the direction of the Earth's magnetic field at the location of the well.
 Grid North is 0.20 degrees East of True North.
 To correct azimuth from True to Grid subtract 0.20 degrees
 To correct azimuth from Magnetic to Grid subtract 8.02 degrees

BH AT Curve <8.5°> (5902°/5981°-16059°) : 5734.46ft TVD, 723.18ft S, 1203.27ft W
 APS EM <8.75°> (1819°/1908°-5902°) : 1901.89ft TVD, 102.05ft S, 34.57ft W
 APS EM <12.25°> (620°/697°-1819°) : 696.99ft TVD, 2.16ft N, 2.78ft E
 APS EM <17.5°> (221°/620°) : 221.00ft TVD, 0.57ft N, 0.40ft E

Projection to Bit : 91.05° Inc, 16083.00ft MD, 6197.15ft TVD, 9499.96ft VS

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Ohio County, WV	Well	Theлма Hays OHI 1H
Field	Ohio	Wellbore	Theлма Hays OHI 1H AWB
Facility	Theлма Hays OHI 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	12/1/2017 at 2:09:20 PM
Convergence at slot	0.29° East	Database/Source file	WA_Pennsylvania/Theлма Hays_OHI_1H_AWP_Proj_16083_.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-0.51	0.10	1764972.50	14582171.90	40°09'04.985"N	80°33'15.313"W
Facility Reference Pt			1764972.40	14582172.42	40°09'04.990"N	80°33'15.314"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM

Calculation method	Minimum curvature	SDC-46 (RKB) to Facility Vertical Datum	1270.10ft
Horizontal Reference Pt	Slot	SDC-46 (RKB) to Mean Sea Level	1270.10ft
Vertical Reference Pt	SDC-46 (RKB)	SDC-46 (RKB) to Ground Level at Slot (Slot #01)	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	329.48°

RECEIVED
Office of Oil and Gas
JUN 21 2018
WV Department of
Environmental Protection

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Actual Wellpath Report

Thelma Hays OHI 1H AWP Proj: 16083'

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Area	Ohio County, WV	Well	Thelma Hays OHI 1H
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Facility	Thelma Hays OHI Pad		

WELLPATH DATA (180 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	34.810	0.00	0.00	0.00	0.00	1764972.50	14582171.90	40°09'04.985"N	80°33'15.313"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	34.810	26.00	0.00	0.00	0.00	1764972.50	14582171.90	40°09'04.985"N	80°33'15.313"W	0.00	0.000	0.00	0.00	0.00
221.00	0.410	34.810	221.00	0.29	0.57	0.40	1764972.90	14582172.47	40°09'04.991"N	80°33'15.308"W	0.70	34.810	0.21	17.85	17.85
309.00	0.420	61.980	309.00	0.41	0.98	0.86	1764973.36	14582172.88	40°09'04.995"N	80°33'15.302"W	1.31	41.276	0.22	30.87	30.87
406.00	0.410	57.900	405.99	0.40	1.33	1.47	1764973.97	14582173.23	40°09'04.998"N	80°33'15.294"W	1.99	47.782	0.03	-0.01	-4.21
499.00	0.400	52.050	498.99	0.45	1.71	2.01	1764974.51	14582173.61	40°09'05.002"N	80°33'15.287"W	2.64	49.576	0.05	-0.01	-6.29
591.00	0.210	65.620	590.99	0.48	1.98	2.42	1764974.91	14582173.88	40°09'05.004"N	80°33'15.281"W	3.12	50.686	0.22	-0.21	14.75
620.00	0.360	65.640	619.99	0.46	2.04	2.55	1764975.05	14582173.94	40°09'05.005"N	80°33'15.280"W	3.26	51.339	0.52	0.52	0.07
697.00	0.040	22.690	696.99	0.45	2.16	2.78	1764975.28	14582174.06	40°09'05.006"N	80°33'15.277"W	3.52	52.102	0.43	-0.42	-55.78
790.00	0.640	206.020	789.99	0.19	1.73	2.56	1764975.06	14582173.62	40°09'05.002"N	80°33'15.280"W	3.09	56.046	0.73	0.65	-189.97
883.00	2.410	204.620	882.95	-1.22	-0.52	1.52	1764974.02	14582171.38	40°09'04.980"N	80°33'15.293"W	1.61	108.870	1.90	1.90	-1.51
976.00	4.110	209.620	975.80	-4.00	-5.19	-0.94	1764971.56	14582166.71	40°09'04.934"N	80°33'15.325"W	5.28	190.283	1.85	1.83	5.38
1069.00	5.200	213.030	1068.49	-7.53	-11.63	-4.89	1764967.61	14582160.28	40°09'04.870"N	80°33'15.376"W	12.61	202.801	1.21	1.17	3.67
1161.00	6.530	210.990	1160.01	-11.89	-19.61	-9.85	1764962.65	14582152.30	40°09'04.792"N	80°33'15.441"W	21.94	206.683	1.46	1.45	-2.22
1254.00	7.230	206.560	1252.34	-17.59	-29.37	-15.19	1764957.31	14582142.54	40°09'04.695"N	80°33'15.510"W	33.07	207.349	0.94	0.75	-4.76
1347.00	8.090	204.240	1344.51	-24.54	-40.58	-20.50	1764952.01	14582131.34	40°09'04.585"N	80°33'15.579"W	45.46	206.800	0.98	0.92	-2.49
1440.00	6.740	199.490	1436.73	-31.83	-51.69	-25.00	1764947.51	14582120.23	40°09'04.475"N	80°33'15.638"W	57.42	205.816	1.59	-1.45	-5.11
1533.00	6.410	194.040	1529.12	-39.03	-61.87	-28.08	1764944.43	14582110.06	40°09'04.375"N	80°33'15.678"W	67.94	204.415	0.76	-0.35	-5.86
1625.00	5.900	181.730	1620.59	-46.69	-71.58	-29.47	1764943.04	14582100.35	40°09'04.279"N	80°33'15.697"W	77.41	202.380	1.53	-0.55	-13.38
1718.00	6.620	187.180	1713.03	-54.98	-81.67	-30.29	1764942.22	14582090.26	40°09'04.179"N	80°33'15.708"W	87.11	200.346	1.00	0.77	5.86
1819.00	6.130	193.210	1813.41	-63.48	-92.70	-32.25	1764940.27	14582079.24	40°09'04.070"N	80°33'15.734"W	98.15	199.181	0.82	-0.49	5.97
1908.00	6.300	194.710	1901.89	-70.35	-102.05	-34.57	1764937.94	14582069.89	40°09'03.978"N	80°33'15.765"W	107.75	198.716	0.26	0.19	1.69
2001.00	6.830	203.370	1994.28	-77.21	-112.06	-38.06	1764934.45	14582059.88	40°09'03.879"N	80°33'15.810"W	118.35	198.760	1.21	0.57	9.31
2094.00	7.200	215.570	2086.59	-82.83	-121.88	-43.65	1764928.87	14582050.07	40°09'03.783"N	80°33'15.883"W	129.46	199.703	1.65	0.40	13.12
2186.00	8.010	223.440	2177.78	-86.94	-131.22	-51.41	1764921.11	14582040.73	40°09'03.691"N	80°33'15.983"W	140.93	201.393	1.43	0.88	8.55
2279.00	8.340	231.010	2269.84	-89.72	-140.17	-61.11	1764911.42	14582031.78	40°09'03.603"N	80°33'16.109"W	152.91	203.554	1.21	0.35	8.14
2372.00	9.150	235.210	2361.76	-91.26	-148.63	-72.42	1764900.11	14582023.32	40°09'03.520"N	80°33'16.255"W	165.34	205.977	1.11	0.87	4.52
2465.00	10.690	239.670	2453.37	-91.79	-157.21	-85.94	1764886.59	14582014.75	40°09'03.436"N	80°33'16.430"W	179.17	208.663	1.85	1.66	4.80
2558.00	12.520	242.650	2544.46	-91.20	-166.20	-102.34	1764870.20	14582005.77	40°09'03.348"N	80°33'16.641"W	195.18	211.624	2.07	1.97	3.20
2650.00	16.060	242.340	2633.60	-90.01	-176.69	-122.47	1764850.07	14581995.28	40°09'03.245"N	80°33'16.901"W	214.99	214.728	3.85	3.85	-0.34

8/27/2018

Actual Wellpath Report
Thelma Hays OHI 1H AWP Proj: 16083'
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Operator	Slot	Slot #01
SOUTHWESTERN ENERGY	Well	Thelma Hays OHI 1H
Area	Wellbore	Thelma Hays OHI 1H AWB
Field		
Facility		

WELLPATH DATA (180 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]
2743.00	19.010	239.930	2722.27	-89.25	-190.25	-146.98	1764825.57	14581981.72	40°09'03.112"N	80°33'17.218"W	240.42	217.688	3.27	3.17	-2.59
2839.00	20.100	238.930	2812.73	-89.29	-206.60	-174.64	1764797.92	14581965.38	40°09'02.952"N	80°33'17.575"W	270.53	220.208	1.19	1.14	-1.04
2932.00	20.440	241.130	2899.97	-88.97	-222.69	-202.55	1764740.03	14581949.30	40°09'02.794"N	80°33'17.936"W	301.03	222.289	0.90	0.37	2.37
3024.00	19.070	240.550	2986.56	-88.23	-237.84	-229.71	1764742.88	14581934.15	40°09'02.646"N	80°33'18.286"W	330.65	224.004	1.50	-1.49	-0.63
3117.00	19.200	242.810	3074.42	-87.06	-252.29	-256.54	1764716.06	14581919.70	40°09'02.504"N	80°33'18.633"W	359.81	225.478	0.81	0.14	2.43
3210.00	20.870	246.770	3161.79	-84.07	-265.82	-285.37	1764687.24	14581906.18	40°09'02.372"N	80°33'19.005"W	389.99	227.032	2.31	1.80	4.26
3302.00	22.060	247.160	3247.41	-79.68	-278.99	-316.35	1764656.27	14581893.02	40°09'02.244"N	80°33'19.405"W	421.80	228.591	1.30	1.29	0.42
3395.00	21.310	246.230	3333.83	-75.36	-292.58	-347.91	1764624.72	14581879.43	40°09'02.111"N	80°33'19.812"W	454.58	229.938	0.89	-0.81	-1.00
3488.00	22.280	245.530	3420.18	-71.51	-306.69	-379.42	1764593.22	14581865.33	40°09'01.973"N	80°33'20.219"W	487.88	231.051	1.08	1.04	-0.75
3581.00	22.040	245.130	3506.31	-67.94	-321.33	-411.30	1764561.36	14581850.69	40°09'01.830"N	80°33'20.630"W	521.94	232.001	0.30	-0.26	-0.43
3673.00	22.710	245.740	3591.38	-64.30	-335.89	-443.15	1764529.52	14581836.14	40°09'01.688"N	80°33'21.041"W	556.06	232.840	0.77	0.73	0.66
3766.00	22.290	245.330	3677.30	-60.55	-350.63	-475.55	1764497.13	14581821.41	40°09'01.544"N	80°33'21.459"W	590.83	233.598	0.48	-0.45	-0.44
3859.00	21.200	244.090	3763.69	-57.40	-365.34	-506.70	1764465.99	14581806.70	40°09'01.400"N	80°33'21.861"W	624.67	234.208	1.27	-1.17	-1.33
3952.00	21.980	243.390	3850.16	-54.86	-380.48	-537.39	1764435.32	14581791.57	40°09'01.252"N	80°33'22.258"W	658.45	234.701	0.88	0.84	-0.75
4045.00	21.420	242.720	3936.57	-52.71	-396.06	-568.04	1764404.68	14581775.99	40°09'01.099"N	80°33'22.653"W	692.49	235.114	0.66	-0.60	-0.72
4138.00	21.410	242.810	4023.15	-50.77	-411.60	-598.23	1764374.50	14581760.46	40°09'00.947"N	80°33'23.043"W	726.15	235.471	0.04	-0.01	0.10
4230.00	20.320	241.810	4109.12	-49.14	-426.82	-627.25	1764345.49	14581745.24	40°09'00.798"N	80°33'23.418"W	758.70	235.766	1.25	-1.18	-1.09
4323.00	20.520	239.460	4196.27	-48.49	-442.73	-655.52	1764317.23	14581729.34	40°09'00.642"N	80°33'23.783"W	791.02	235.965	0.91	0.22	-2.53
4416.00	19.840	239.020	4283.56	-48.62	-459.14	-683.09	1764289.67	14581712.94	40°09'00.482"N	80°33'24.139"W	823.06	236.093	0.75	-0.73	-0.47
4509.00	20.590	235.520	4370.84	-49.88	-476.52	-710.10	1764262.67	14581695.56	40°09'00.311"N	80°33'24.488"W	855.17	236.136	1.53	0.81	-3.76
4602.00	21.680	233.910	4457.58	-52.68	-495.90	-737.47	1764235.32	14581676.19	40°09'00.121"N	80°33'24.842"W	888.69	236.082	1.33	1.17	-1.73
4695.00	21.400	234.370	4544.09	-55.86	-515.90	-765.14	1764207.66	14581656.20	40°08'59.925"N	80°33'25.199"W	922.82	236.010	0.35	-0.30	0.49
4788.00	21.830	239.700	4630.55	-57.30	-534.51	-793.86	1764178.94	14581637.60	40°08'59.742"N	80°33'25.570"W	957.04	236.048	2.16	0.46	5.73
4881.00	22.800	244.730	4716.60	-55.58	-550.93	-825.09	1764147.73	14581621.18	40°08'59.581"N	80°33'25.974"W	992.12	236.268	2.30	1.04	5.41
4974.00	23.160	250.290	4802.23	-50.51	-564.79	-858.61	1764114.22	14581607.33	40°08'59.446"N	80°33'26.406"W	1027.71	236.663	2.37	0.39	5.98
5070.00	21.770	245.460	4890.95	-45.11	-578.55	-892.58	1764080.27	14581593.57	40°08'59.312"N	80°33'26.844"W	1063.68	237.049	2.41	-1.45	-5.03
5162.00	21.810	246.980	4976.37	-41.10	-592.32	-923.83	1764049.03	14581579.81	40°08'59.177"N	80°33'27.248"W	1097.41	237.334	0.61	0.04	1.65
5255.00	21.800	249.890	5062.72	-36.73	-605.01	-955.94	1764016.92	14581567.12	40°08'59.053"N	80°33'27.662"W	1131.31	237.670	1.16	-0.01	3.13
5348.00	20.680	247.130	5149.41	-30.42	-617.33	-987.29	1763985.59	14581554.80	40°08'58.933"N	80°33'28.067"W	1164.41	237.983	1.61	-1.20	-2.97
5441.00	21.120	244.790	5236.29	-26.68	-630.85	-1017.58	1763955.31	14581541.29	40°08'58.801"N	80°33'28.457"W	1197.27	238.203	1.01	0.47	-2.52

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Area	Wellbore	Thelma Hays OHI 1H AWP
Field		
Facility		

WELLPATH DATA (180 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]
5534.00	21.280	244.830	5322.99	-23.56	-645.17	-1048.01	1763924.89	14581526.98	40°08'58.661"N	80°33'28.850"W	1230.68	238.383	0.17	0.17	0.04
5624.00	21.210	244.830	5406.88	-20.52	-659.04	-1077.53	1763895.38	14581513.12	40°08'58.526"N	80°33'29.231"W	1263.09	238.549	0.08	-0.08	0.00
5716.00	22.270	244.610	5492.33	-17.41	-673.59	-1108.34	1763864.58	14581498.57	40°08'58.383"N	80°33'29.629"W	1296.98	238.711	1.16	1.15	-0.24
5809.00	24.740	245.430	5577.61	-13.81	-689.24	-1141.97	1763830.97	14581482.92	40°08'58.230"N	80°33'30.063"W	1333.84	238.887	2.68	2.66	0.88
5902.00	24.110	240.840	5662.29	-11.34	-706.59	-1176.25	1763796.70	14581465.58	40°08'58.060"N	80°33'30.506"W	1372.17	239.006	2.15	-0.68	-4.94
5981.00	23.920	236.960	5734.46	-11.67	-723.18	-1203.77	1763769.19	14581448.99	40°08'57.898"N	80°33'30.861"W	1404.30	239.004	2.01	-0.24	-4.91
6073.00	23.660	248.680	5818.69	-9.53	-740.07	-1236.62	1763736.35	14581432.11	40°08'57.733"N	80°33'31.285"W	1441.16	239.101	5.14	-0.28	12.74
6166.00	24.460	271.230	5903.79	3.61	-746.46	-1273.33	1763699.65	14581425.73	40°08'57.671"N	80°33'31.758"W	1476.00	239.620	9.87	0.86	24.25
6259.00	28.670	286.900	5987.06	30.21	-739.55	-1314.00	1763659.01	14581432.63	40°08'57.742"N	80°33'32.282"W	1507.82	240.628	8.76	4.53	16.85
6351.00	36.520	299.910	6064.60	70.38	-719.43	-1358.97	1763614.05	14581452.75	40°08'57.943"N	80°33'32.859"W	1537.65	242.104	11.40	8.53	14.14
6444.00	45.930	304.670	6134.49	124.92	-686.54	-1410.56	1763562.48	14581485.62	40°08'58.270"N	80°33'33.522"W	1568.77	244.047	10.66	10.12	5.12
6537.00	52.170	307.880	6195.42	189.46	-644.94	-1467.09	1763505.97	14581527.21	40°08'58.684"N	80°33'34.247"W	1602.59	246.270	7.20	6.71	3.45
6629.00	59.510	309.860	6247.05	260.68	-597.16	-1526.28	1763446.80	14581574.97	40°08'59.159"N	80°33'35.006"W	1638.94	248.632	8.17	7.98	2.15
6722.00	67.370	313.770	6288.61	339.89	-541.68	-1588.15	1763384.96	14581630.43	40°08'59.710"N	80°33'35.799"W	1677.99	251.167	9.25	8.45	4.20
6769.00	72.210	318.580	6304.85	382.79	-509.86	-1618.65	1763354.47	14581662.24	40°09'00.026"N	80°33'36.190"W	1697.05	252.516	14.08	10.30	10.23
6815.00	75.380	322.560	6317.69	426.42	-475.75	-1646.69	1763326.45	14581696.34	40°09'00.365"N	80°33'36.549"W	1714.03	253.885	10.79	6.89	8.65
6861.00	78.310	324.440	6328.16	470.96	-439.74	-1673.32	1763299.82	14581732.33	40°09'00.722"N	80°33'36.890"W	1730.14	255.276	7.51	6.37	4.09
6908.00	78.480	326.910	6337.62	516.90	-401.72	-1699.28	1763273.87	14581770.33	40°09'01.099"N	80°33'37.222"W	1746.12	256.699	5.16	0.36	5.26
6954.00	83.150	328.000	6344.96	562.26	-363.45	-1723.70	1763249.46	14581808.59	40°09'01.478"N	80°33'37.534"W	1761.60	258.093	10.42	10.15	2.37
7000.00	87.140	328.420	6348.85	608.08	-324.50	-1747.84	1763225.33	14581847.52	40°09'01.864"N	80°33'37.842"W	1777.71	259.482	8.72	8.67	0.91
7047.00	89.140	329.400	6350.37	655.05	-284.28	-1772.10	1763201.08	14581887.73	40°09'02.263"N	80°33'38.152"W	1794.75	260.886	4.74	4.26	2.09
7093.00	88.890	328.990	6351.16	701.04	-244.77	-1795.65	1763177.54	14581927.22	40°09'02.654"N	80°33'38.453"W	1812.26	262.238	1.04	-0.54	-0.89
7186.00	91.230	330.530	6351.07	794.03	-164.44	-1842.48	1763130.73	14582007.53	40°09'03.451"N	80°33'39.051"W	1849.81	264.900	3.01	2.52	1.66
7278.00	91.200	331.290	6349.12	885.98	-84.06	-1887.20	1763086.02	14582087.87	40°09'04.247"N	80°33'39.621"W	1889.07	267.450	0.83	-0.03	0.83
7371.00	91.290	333.310	6347.10	978.84	-1.74	-1930.42	1763042.82	14582170.16	40°09'05.063"N	80°33'40.173"W	1930.42	269.948	2.17	0.10	2.17
7464.00	91.230	334.850	6345.05	1071.52	81.88	-1971.06	1763002.20	14582253.75	40°09'05.891"N	80°33'40.691"W	1972.76	272.379	1.66	-0.06	1.66
7557.00	91.320	336.670	6342.98	1163.93	166.66	-2009.23	1762964.04	14582338.49	40°09'06.731"N	80°33'41.177"W	2016.13	274.742	1.96	0.10	1.96
7650.00	90.860	335.530	6341.21	1256.29	251.66	-2046.90	1762926.39	14582423.47	40°09'07.572"N	80°33'41.657"W	2062.31	277.009	1.32	-0.49	-1.23
7742.00	90.740	336.690	6339.93	1347.67	335.77	-2084.16	1762889.15	14582507.54	40°09'08.405"N	80°33'42.131"W	2111.03	279.152	1.27	-0.13	1.26
7834.00	90.770	337.590	6338.70	1439.83	421.46	-2120.28	1762853.03	14582593.20	40°09'09.254"N	80°33'42.591"W	2161.76	281.242	0.97	0.03	0.97

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Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Ohio County, WV	Well	Thelma Hays OHI 1H
Field	Ohio	Wellbore	Thelma Hays OHI 1H AWB
Facility	Thelma Hays OHI Pad		

WELLPATH DATA (180 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]
7928.00	90.890	337.680	6337.351	1531.88	507.45	-2155.66	1762817.66	14582679.16	40°09'10.105"N	80°33'43.041"W	2214.59	283.247	0.16	0.13	0.10
8021.00	90.830	338.000	6335.96	1623.88	593.58	-2190.74	1762782.60	14582765.25	40°09'10.958"N	80°33'43.487"W	2269.73	285.160	0.35	-0.06	0.34
8113.00	91.050	337.750	6334.45	1714.88	678.79	-2225.38	1762747.97	14582850.83	40°09'11.802"N	80°33'43.928"W	2326.60	286.963	0.36	0.24	-0.27
8206.00	90.980	335.940	6332.80	1807.10	764.28	-2261.95	1762711.42	14582935.55	40°09'12.649"N	80°33'44.393"W	2387.58	288.669	1.95	-0.08	-1.95
8299.00	91.170	337.320	6331.06	1899.35	849.63	-2298.83	1762674.55	14583021.21	40°09'13.494"N	80°33'44.863"W	2450.81	290.284	1.50	0.20	1.48
8392.00	90.890	337.520	6329.39	1991.45	935.49	-2334.53	1762638.86	14583107.03	40°09'14.344"N	80°33'45.317"W	2514.99	291.837	0.37	-0.30	0.22
8485.00	90.920	336.570	6327.92	2083.63	1021.11	-2370.80	1762602.61	14583192.62	40°09'15.192"N	80°33'45.779"W	2581.35	293.302	1.02	0.03	-1.02
8577.00	90.800	335.470	6326.54	2175.01	1105.16	-2408.18	1762565.24	14583276.64	40°09'16.024"N	80°33'46.255"W	2649.67	294.651	1.20	-0.13	-1.20
8670.00	90.950	335.270	6325.12	2267.51	1189.69	-2446.94	1762526.50	14583361.13	40°09'16.861"N	80°33'46.749"W	2720.82	295.929	0.27	0.16	-0.22
8763.00	90.890	337.830	6323.62	2359.79	1274.99	-2483.94	1762489.52	14583446.40	40°09'17.706"N	80°33'47.220"W	2792.05	297.171	2.75	-0.06	2.75
8856.00	90.890	338.860	6322.18	2451.66	1361.42	-2518.25	1762452.21	14583532.79	40°09'18.562"N	80°33'47.656"W	2862.70	298.397	1.11	0.00	1.11
8948.00	90.890	337.310	6320.75	2542.61	1446.76	-2552.59	1762420.90	14583618.10	40°09'19.407"N	80°33'48.093"W	2934.07	299.544	1.68	0.00	-1.68
9041.00	90.920	337.420	6319.28	2634.72	1532.58	-2588.37	1762385.12	14583703.89	40°09'20.257"N	80°33'48.549"W	3008.07	300.630	0.12	0.03	0.12
9134.00	90.920	335.900	6317.79	2726.98	1617.96	-2625.21	1762348.30	14583789.24	40°09'21.102"N	80°33'49.018"W	3083.75	301.646	1.63	0.00	-1.63
9226.00	90.830	334.600	6316.38	2818.50	1701.50	-2663.72	1762309.80	14583872.74	40°09'21.930"N	80°33'49.508"W	3160.78	302.569	1.42	-0.10	-1.41
9319.00	91.050	333.700	6314.86	2911.18	1785.18	-2704.27	1762269.27	14583956.39	40°09'22.759"N	80°33'50.025"W	3240.36	303.430	1.00	0.24	-0.97
9412.00	91.170	334.060	6313.05	3003.89	1868.66	-2745.20	1762228.35	14584039.85	40°09'23.586"N	80°33'50.547"W	3320.85	304.243	0.41	0.13	0.39
9504.00	91.110	334.530	6311.22	3095.54	1951.54	-2785.10	1762188.47	14584122.69	40°09'24.406"N	80°33'51.056"W	3400.78	305.019	0.51	-0.07	0.51
9597.00	91.200	335.680	6309.35	3188.08	2035.88	-2824.24	1762149.35	14584207.00	40°09'25.242"N	80°33'51.555"W	3481.54	305.786	1.24	0.10	1.24
9690.00	91.420	336.520	6307.22	3280.43	2120.89	-2861.91	1762111.69	14584291.97	40°09'26.084"N	80°33'52.034"W	3562.12	306.541	0.93	0.24	0.90
9782.00	91.350	337.880	6305.00	3371.57	2205.67	-2897.55	1762076.07	14584376.72	40°09'26.923"N	80°33'52.488"W	3641.53	307.279	1.48	-0.08	1.48
9875.00	91.510	339.350	6302.68	3463.36	2292.24	-2931.45	1762042.18	14584463.26	40°09'27.780"N	80°33'52.919"W	3721.25	308.024	1.59	0.17	1.58
9967.00	91.320	339.080	6300.41	3554.00	2378.22	-2964.08	1762009.55	14584549.21	40°09'28.632"N	80°33'53.334"W	3800.23	308.742	0.36	-0.21	-0.29
10060.00	91.290	338.290	6298.29	3645.78	2464.84	-2997.88	1761975.77	14584635.79	40°09'29.489"N	80°33'53.764"W	3881.07	309.427	0.85	-0.03	-0.85
10153.00	91.380	336.880	6296.12	3737.83	2550.79	-3033.33	1761940.33	14584721.71	40°09'30.340"N	80°33'54.215"W	3963.28	310.061	1.52	0.10	-1.52
10245.00	91.540	334.280	6293.78	3829.27	2634.52	-3071.35	1761902.33	14584805.41	40°09'31.170"N	80°33'54.699"W	4046.47	310.622	2.83	0.17	-2.83
10338.00	91.380	334.270	6291.41	3921.91	2718.28	-3111.70	1761861.99	14584889.13	40°09'31.999"N	80°33'55.214"W	4131.80	311.139	0.17	-0.17	-0.01
10431.00	91.380	334.790	6289.17	4014.52	2802.22	-3151.69	1761822.02	14584973.04	40°09'32.831"N	80°33'55.724"W	4217.29	311.641	0.56	0.00	0.56
10523.00	91.420	334.300	6286.92	4106.14	2885.26	-3191.22	1761782.51	14585056.05	40°09'33.653"N	80°33'56.227"W	4302.16	312.118	0.53	0.04	-0.53
10616.00	91.480	335.150	6284.57	4198.72	2969.33	-3230.91	1761742.83	14585140.09	40°09'34.486"N	80°33'56.733"W	4388.13	312.584	0.92	0.06	0.91

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Environmental Protection



REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #01
SOUTHWESTERN ENERGY	Well	Thelma Hays OHI 1H
Area	Wellbore	Thelma Hays OHI 1H AWP
Field		
Facility		

WELLPATH DATA (180 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]
10709.00	91.420	336.740	6282.21	4291.09	3054.22	-3268.81	1761704.95	14585224.95	40°09'35.326"N	80°33'57.216"W	4473.63	313.056	1.71	-0.06	1.71
10802.00	91.420	337.810	6279.91	4383.20	3139.97	-3304.72	1761669.05	14585310.67	40°09'36.176"N	80°33'57.673"W	4558.58	313.536	1.15	0.00	1.15
10895.00	91.600	337.340	6277.46	4475.24	3225.91	-3340.19	1761633.60	14585396.57	40°09'37.027"N	80°33'58.125"W	4643.63	314.003	0.54	0.19	-0.51
10987.00	91.050	336.790	6275.33	4566.41	3310.62	-3376.03	1761597.77	14585481.24	40°09'37.865"N	80°33'58.581"W	4728.40	314.440	0.85	-0.60	-0.60
11080.00	90.980	336.840	6273.68	4658.64	3396.09	-3412.63	1761561.18	14585566.69	40°09'38.712"N	80°33'59.047"W	4814.51	314.861	0.09	-0.08	0.05
11173.00	90.980	336.190	6272.09	4750.93	3481.38	-3449.69	1761524.14	14585651.94	40°09'39.556"N	80°33'59.519"W	4901.05	315.262	0.70	0.00	-0.70
11265.00	91.050	335.460	6270.46	4842.35	3565.29	-3487.36	1761486.48	14585735.82	40°09'40.387"N	80°33'59.999"W	4987.28	315.633	0.80	0.08	-0.79
11358.00	90.990	335.330	6268.81	4934.84	3649.84	-3526.08	1761447.78	14585820.33	40°09'41.225"N	80°34'00.492"W	5074.89	315.988	0.15	-0.06	-0.14
11451.00	91.020	334.550	6267.18	5027.40	3734.07	-3565.46	1761408.41	14585904.53	40°09'42.059"N	80°34'00.994"W	5162.92	316.323	0.84	0.03	-0.84
11544.00	91.020	334.830	6265.52	5120.00	3818.13	-3605.21	1761368.67	14585988.56	40°09'42.892"N	80°34'01.501"W	5251.25	316.643	0.30	0.00	0.30
11637.00	91.080	334.390	6263.82	5212.61	3902.13	-3645.08	1761328.82	14586072.53	40°09'43.724"N	80°34'02.009"W	5339.78	316.951	0.48	0.06	-0.47
11729.00	91.420	335.800	6261.81	5304.15	3985.55	-3683.82	1761290.10	14586155.92	40°09'44.550"N	80°34'02.503"W	5427.26	317.253	1.58	0.37	1.53
11822.00	90.950	337.350	6259.88	5396.41	4070.87	-3720.78	1761253.15	14586241.20	40°09'45.395"N	80°34'02.974"W	5515.08	317.573	1.74	-0.51	1.67
11915.00	91.020	339.230	6258.29	5488.30	4157.25	-3755.17	1761218.77	14586327.55	40°09'46.250"N	80°34'03.411"W	5602.15	317.909	2.02	0.08	2.02
12008.00	90.920	341.920	6256.71	5579.54	4244.94	-3786.10	1761187.86	14586415.21	40°09'47.118"N	80°34'03.804"W	5688.06	318.270	2.89	-0.11	2.89
12101.00	91.170	344.300	6255.01	5669.90	4333.90	-3813.11	1761160.86	14586504.14	40°09'47.998"N	80°34'04.146"W	5772.57	318.658	2.57	0.27	2.56
12194.00	90.920	345.880	6253.32	5759.45	4423.76	-3837.03	1761136.94	14586593.96	40°09'48.888"N	80°34'04.449"W	5855.97	319.063	1.72	-0.27	1.70
12287.00	90.860	346.320	6251.87	5848.55	4514.02	-3859.37	1761114.61	14586684.19	40°09'49.781"N	80°34'04.731"W	5938.95	319.470	0.48	-0.06	0.47
12379.00	91.050	345.610	6250.34	5936.76	4603.26	-3881.68	1761092.31	14586773.39	40°09'50.664"N	80°34'05.013"W	6021.42	319.861	0.80	0.21	-0.77
12472.00	90.990	346.350	6248.69	6025.91	4693.48	-3904.21	1761069.79	14586863.57	40°09'51.556"N	80°34'05.297"W	6105.04	320.245	0.80	-0.06	0.80
12565.00	90.830	346.370	6247.21	6114.89	4783.84	-3926.13	1761047.87	14586953.90	40°09'52.450"N	80°34'05.574"W	6188.67	320.624	0.17	-0.17	0.02
12657.00	90.980	346.030	6245.76	6202.99	4873.18	-3948.08	1761025.94	14587043.20	40°09'53.334"N	80°34'05.851"W	6271.77	320.987	0.40	0.16	-0.37
12750.00	91.050	345.620	6244.11	6292.22	4963.33	-3970.85	1761003.18	14587133.32	40°09'54.226"N	80°34'06.139"W	6356.28	321.339	0.45	0.08	-0.44
12843.00	90.890	344.850	6242.53	6381.71	5053.24	-3994.55	1760979.49	14587223.20	40°09'55.116"N	80°34'06.438"W	6441.40	321.674	0.85	-0.17	-0.83
12936.00	90.920	344.020	6241.06	6471.55	5142.82	-4019.50	1760954.55	14587312.75	40°09'56.002"N	80°34'06.754"W	6527.25	321.990	0.89	0.03	-0.89
13029.00	90.770	343.730	6239.69	6561.62	5232.15	-4045.32	1760928.73	14587402.04	40°09'56.886"N	80°34'07.081"W	6613.63	322.290	0.35	-0.16	-0.31
13122.00	90.710	343.210	6238.49	6651.86	5321.30	-4071.78	1760902.28	14587491.16	40°09'57.768"N	80°34'07.416"W	6700.42	322.577	0.56	-0.06	-0.56
13214.00	90.650	344.130	6237.40	6741.04	5409.58	-4097.65	1760876.43	14587579.41	40°09'58.642"N	80°34'07.744"W	6786.33	322.857	1.00	-0.07	1.00
13307.00	90.740	345.140	6236.27	6830.80	5499.25	-4122.29	1760851.80	14587669.04	40°09'59.529"N	80°34'08.056"W	6872.77	323.144	1.09	0.10	1.09
13400.00	90.680	347.030	6235.12	6919.91	5589.51	-4144.65	1760829.44	14587759.26	40°10'00.422"N	80°34'08.338"W	6958.50	323.443	2.03	-0.06	2.03

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Field		
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13493.00	90.680	347.620	6234.02	7008.43	5680.24	-4165.05	1760809.05	14587849.96	40°10'01.320"N	80°34'08.595"W	7043.63	323.749	0.63	0.00	0.63
13586.00	90.650	347.060	6232.94	7096.94	5770.97	-4185.43	1760788.67	14587940.65	40°10'02.217"N	80°34'08.852"W	7128.95	324.048	0.60	-0.03	-0.60
13678.00	90.310	346.620	6232.17	7184.75	5860.55	-4206.38	1760767.74	14588030.20	40°10'03.104"N	80°34'09.116"W	7213.85	324.331	0.60	-0.37	-0.48
13771.00	90.310	345.470	6231.66	7273.88	5950.80	-4228.81	1760745.32	14588120.42	40°10'03.996"N	80°34'09.400"W	7300.33	324.601	1.24	0.00	-1.24
13864.00	90.340	343.920	6231.13	7363.62	6040.50	-4253.35	1760720.78	14588210.08	40°10'04.884"N	80°34'09.710"W	7387.74	324.849	1.67	0.03	-1.67
13957.00	90.180	343.450	6230.71	7453.78	6129.76	-4279.48	1760694.67	14588299.30	40°10'05.767"N	80°34'10.041"W	7475.82	325.079	0.53	-0.17	-0.51
14050.00	90.280	344.090	6230.34	7543.90	6219.05	-4305.47	1760668.68	14588388.56	40°10'06.651"N	80°34'10.370"W	7563.97	325.305	0.70	0.11	0.69
14143.00	90.250	344.320	6229.91	7633.84	6308.53	-4330.78	1760643.38	14588478.01	40°10'07.536"N	80°34'10.691"W	7652.01	325.531	0.25	-0.03	0.25
14235.00	90.680	344.510	6229.16	7722.73	6397.15	-4355.50	1760618.67	14588566.59	40°10'08.413"N	80°34'11.004"W	7739.12	325.751	0.51	0.47	0.21
14328.00	90.680	343.310	6228.06	7812.79	6486.50	-4381.27	1760592.91	14588655.91	40°10'09.297"N	80°34'11.330"W	7827.53	325.963	1.29	0.00	-1.29
14421.00	90.710	343.470	6226.93	7903.05	6575.61	-4407.86	1760566.34	14588744.98	40°10'10.179"N	80°34'11.667"W	7916.30	326.165	0.18	0.03	0.17
14514.00	90.580	343.550	6225.88	7993.27	6664.78	-4434.25	1760539.95	14588834.12	40°10'11.062"N	80°34'12.001"W	8005.12	326.363	0.16	-0.14	0.09
14607.00	90.580	342.960	6224.94	8083.59	6753.83	-4461.05	1760513.17	14588923.14	40°10'11.943"N	80°34'12.341"W	8094.14	326.554	0.63	0.00	-0.63
14700.00	90.920	342.830	6223.72	8174.05	6842.71	-4488.40	1760485.83	14589011.98	40°10'12.823"N	80°34'12.688"W	8183.42	326.738	0.39	0.37	-0.14
14792.00	90.920	343.350	6222.25	8263.45	6930.72	-4515.15	1760459.08	14589099.96	40°10'13.694"N	80°34'13.027"W	8271.73	326.917	0.57	0.00	0.57
14885.00	91.140	343.730	6220.58	8353.65	7019.89	-4541.50	1760432.75	14589189.10	40°10'14.576"N	80°34'13.361"W	8360.87	327.099	0.47	0.24	0.41
14978.00	91.080	343.950	6218.77	8443.73	7109.20	-4567.38	1760406.88	14589278.37	40°10'15.460"N	80°34'13.689"W	8449.95	327.281	0.25	-0.06	0.24
15070.00	91.230	344.860	6216.92	8532.61	7197.80	-4592.11	1760382.16	14589366.93	40°10'16.337"N	80°34'14.002"W	8537.90	327.463	1.00	0.16	0.99
15163.00	91.110	347.240	6215.02	8621.72	7288.03	-4614.52	1760359.75	14589457.13	40°10'17.229"N	80°34'14.285"W	8626.07	327.659	2.56	-0.13	2.56
15256.00	91.110	346.360	6213.22	8710.49	7378.55	-4635.75	1760338.53	14589547.62	40°10'18.125"N	80°34'14.553"W	8713.97	327.860	0.95	0.00	-0.95
15349.00	91.170	346.440	6211.37	8799.44	7468.93	-4657.62	1760316.67	14589637.96	40°10'19.019"N	80°34'14.829"W	8802.18	328.052	0.11	0.06	0.09
15442.00	91.170	345.530	6209.47	8888.59	7559.14	-4680.13	1760294.16	14589728.14	40°10'19.912"N	80°34'15.113"W	8890.68	328.237	0.98	0.00	-0.98
15534.00	91.080	345.730	6207.66	8976.94	7648.25	-4702.96	1760271.34	14589817.21	40°10'20.793"N	80°34'15.402"W	8978.50	328.412	0.24	-0.10	0.22
15627.00	91.050	347.190	6205.93	9065.87	7738.64	-4724.73	1760249.58	14589907.57	40°10'21.688"N	80°34'15.676"W	9066.95	328.594	1.57	-0.03	1.57
15720.00	91.140	347.960	6204.16	9154.26	7829.45	-4744.74	1760229.59	14589998.34	40°10'22.586"N	80°34'15.929"W	9154.93	328.784	0.83	0.10	0.83
15813.00	91.170	348.040	6202.28	9242.42	7920.42	-4764.07	1760210.26	14590089.25	40°10'23.485"N	80°34'16.172"W	9242.78	328.973	0.09	0.03	0.09
15906.00	91.080	347.420	6200.46	9330.73	8011.25	-4783.83	1760190.51	14590180.08	40°10'24.384"N	80°34'16.421"W	9330.87	329.157	0.67	-0.10	-0.67
15999.00	91.080	346.480	6198.70	9419.42	8101.83	-4804.83	1760169.52	14590270.62	40°10'25.280"N	80°34'16.686"W	9419.45	329.330	1.01	0.00	-1.01
16092.00	91.050	345.630	6197.59	9476.92	8160.06	-4819.28	1760155.07	14590328.82	40°10'25.856"N	80°34'16.868"W	9476.92	329.434	1.42	-0.05	-1.42
16083.00	91.050	345.630	6197.15	9499.96	8183.30	-4825.24	1760149.12	14590352.06	40°10'26.086"N	80°34'16.944"W	9499.96	329.475	0.00	0.00	0.00

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape

06/27/2018

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Theлма Hays 1H BHL Rev-5	6189.51	8205.31	-4836.58	1760137.78	14590374.06	40°10'26.304"N	80°34'17.088"W	point
Theлма Hays 1H Bend Point	6264.28	4074.27	-3713.84	1761260.09	14586244.61	40°09'45.428"N	80°34'02.884"W	point
Theлма Hays 1H Way Point	6334.10	-691.04	-1474.95	1763498.11	14581481.13	40°08'58.229"N	80°33'34.351"W	point
HL A	6348.00	-73.17	-1749.37	1763223.80	14582098.76	40°09'04.348"N	80°33'37.846"W	point
HL B	6348.00	-284.59	-1679.54	1763293.61	14581887.41	40°09'02.255"N	80°33'36.960"W	point
Theлма Hays 1H LP Rev-7	6348.00	-301.87	-1757.44	1763215.74	14581870.15	40°09'02.088"N	80°33'37.964"W	point

WELLPATH COMPOSITION - Ref Wellbore: Theлма Hays OHI 1H AWB Ref Wellpath: Theлма Hays OHI 1H AWP Proj: 16083'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	620.00	BHI NaviTrak (Axial)	01_APS EM <17.5> (221'-620')	Theлма Hays OHI 1H AWB
620.00	1819.00	BHI NaviTrak (Axial)	02_APS EM <12.25"> (620')(697'-1819')	Theлма Hays OHI 1H AWB
1819.00	5902.00	BHI NaviTrak (Axial)	03_APS EM <8.75"> (1819')(1908'-5902')	Theлма Hays OHI 1H AWB
5902.00	16059.00	BHI AutoTrak Curve (Short)	04_BH AT Curve <8.5"> (5902')(5981'-16059')	Theлма Hays OHI 1H AWB
16059.00	16083.00	Blind Drilling (std)	Projection to bit	Theлма Hays OHI 1H AWB

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Office of Oil and Gas
JUN 21 2018
NY Department of
Environmental Protection

09/07/2018

REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #01
SOUTHWESTERN ENERGY	Well	Thelma Hays OHI 1H
Ohio County, WV	Wellbore	Thelma Hays OHI 1H AWB
Ohio		
Thelma Hays OHI Pad		

COMMENTS

Wellpath general comments
API: 47-069-00236-0000
Job #: 8856819
Rig: SDC 46
Duration: 11/15/2017 - 11/25/2017

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Environmental Protection