

pm

WR-35
Rev. 8/23/13

March 28, 2014

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

API 47-001-03238W County Barbour District Pleasant
Quad Philippi Pad Name PHL13HS Field/Pool Name Philippi
Farm name MCCAULEY, RANDALL Well Number PHL13EHS Rework
Operator (as registered with the OOG) CNX Gas Company, LLC
Address P.O. Box 1248 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,341,374.137m Easting 585,248.697m
Landing Point of Curve Northing 4,341,203.132m Easting 584,129.003m
Bottom Hole Northing 4,338,757.003m Easting 586,568.140m

Elevation (ft) 1520' 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)
Waterbased Mud, Bactericide, Polymers and Weighting Agents.

Date permit issued 02/12/2013 Date drilling commenced 7/31/2011 Date drilling ceased 5/25/2013
Date completion activities began 8/21/2013 Date completion activities ceased 9/19/2013
Verbal plugging (Y/N) N/A 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 None Reported Open mine(s) (Y/N) depths N
Salt water depth(s) ft None Reported Void(s) encountered (Y/N) depths 6803' - Fault
Coal depth(s) ft 190', 230', 310' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
Steve Spivey

04/25/2014

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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	26"	20"	103'	N	L.S. 81.3 / 103'	N/A	Y
Surface	17 1/2"	13 3/8"	653'	N	J-55 54.5 / 653'	84.38'	Y
Coal	-	-	-	-	-	-	-
Intermediate 1	12 3/8"	9 5/8"	2019'	N	J-55 36 / 2019'	94.8'/189.25'	Y
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	8 3/4"	5 1/2"	17965'	N	P-110 20 / 17965'	N/A	Y
Tubing	8 3/4"	2 3/8"	7595'	N	J-55 4.7 / 7595'	N/A	N
Packer type and depth set		None					

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	Grouted to Surface	15.6	1.18	277.36	Surface	8
Surface	Class A	520	14.6	1.39	707.4	Surface	8
Coal	-	-	-	-	-	-	-
Intermediate 1	Class A	635	15.2	1.26	797.27	Surface	8
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	Class A (Lead) / Class A (Tail)	190 (bbbls) / 581 (bbbls)	14.5 / 15.0	1.26	5548.64	2000'	24
Tubing	-	-	-	-	-	-	-

Drillers TD (ft) 7641.02' Loggers TD (ft) 7843'

Deepest formation penetrated Lower Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 4500'

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 Conductor - No centralizers used. Fresh water & Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface. Intermediate - Bow spring centralizers one on the first two joints and every fourth joint until inside surface casing. Production - Rigid bow spring centralizer on first joint then every 2 casing joints (free floating) through the lateral and the curve.
(Note: cementing the 5 1/2" casing completely in open hole lateral and curve.)

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS Plug and Perforation Shot Hole

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number Of Perforations	Formation(s)
1	8/21/2013	17841	17720	4	Marcellus
2	8/22/2013	17687	17565	5	Marcellus
3	8/23/2013	17537	17415	5	Marcellus
4	8/23/2013	17387	17265	5	Marcellus
5	8/24/2013	17237	17115	5	Marcellus
6	8/25/2013	17087	16965	5	Marcellus
7	8/26/2013	16937	16815	5	Marcellus
8	8/26/2013	16787	16665	5	Marcellus
9	8/26/2013	16637	16515	5	Marcellus
10	8/27/2013	16487	16365	5	Marcellus
11	8/28/2013	16337	16215	5	Marcellus
12	8/28/2013	16187	16065	5	Marcellus
13	8/29/2013	16037	15915	5	Marcellus
14	8/29/2013	15887	15765	5	Marcellus
15	8/29/2013	15737	15615	5	Marcellus
16	8/30/2013	15587	15465	5	Marcellus
17	8/31/2013	15440	15343	5	Marcellus
18	8/31/2013	15153	15032	4	Marcellus
19	8/31/2013	14999	14877	5	Marcellus
20	8/31/2013	14849	14727	5	Marcellus
21	9/1/2013	14699	14577	5	Marcellus
22	9/1/2013	14549	14427	5	Marcellus
23	9/1/2013	14399	14277	5	Marcellus
24	9/2/2013	14249	14127	5	Marcellus
25	9/2/2013	14099	13977	5	Marcellus
26	9/2/2013	13949	13827	5	Marcellus
27	9/2/2013	13799	13677	5	Marcellus
28	9/3/2013	13649	13527	5	Marcellus
29	9/3/2013	13499	13377	5	Marcellus
30	9/4/2013	13349	13227	5	Marcellus
31	9/4/2013	13199	13077	5	Marcellus
32	9/5/2013	13049	12927	5	Marcellus
33	9/5/2013	12899	12777	5	Marcellus
34	9/6/2013	12749	12627	5	Marcellus

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number Of Perforations	Formation(s)
35	9/7/2013	12599	12477	5	Marcellus
36	9/7/2013	12449	12327	5	Marcellus
37	9/8/2013	12299	12177	5	Marcellus
38	9/9/2013	12149	12027	5	Marcellus
39	9/10/2013	11999	11877	5	Marcellus
40	9/10/2013	11849	11727	5	Marcellus
41	9/11/2013	11699	11577	5	Marcellus
42	9/11/2013	11549	11427	5	Marcellus
43	9/11/2013	11399	11277	5	Marcellus
44	9/12/2013	11249	11127	5	Marcellus
45	9/12/2013	11099	10977	5	Marcellus
46	9/12/2013	10949	10827	5	Marcellus
47	9/13/2013	10799	10677	5	Marcellus
48	9/13/2013	10649	10527	5	Marcellus
49	9/13/2013	10499	10377	5	Marcellus
50	9/14/2013	10349	10227	5	Marcellus
51	9/14/2013	10199	10077	5	Marcellus
52	9/14/2013	10049	9927	5	Marcellus
53	9/14/2013	9899	9777	5	Marcellus
54	9/15/2013	9749	9627	5	Marcellus
55	9/16/2013	9599	9477	5	Marcellus
56	9/16/2013	9449	9327	5	Marcellus
57	9/17/2013	9299	9177	5	Marcellus
58	9/17/2013	9149	9027	5	Marcellus
59	9/18/2013	8999	8877	5	Marcellus
60	9/18/2013	8849	8727	5	Marcellus
61	9/18/2013	8699	8577	5	Marcellus
62	9/18/2013	8549	8427	5	Marcellus
63	9/19/2013	8399	8277	5	Marcellus
64	9/19/2013	8245	8091	5	Marcellus

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STIMULATION INFORMATION PER STAGE

Stage No.	Stimulations Date	Avg Pump Rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Perforations	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen / other (gals)
1	8/21/2013	73.6	8263	6114	4825	200000	7429	3886
2	8/22/2013	65.3	8171	6820	4893	199950	7507	3707
3	8/23/2013	64.5	8331	7069	5317	201500	6362	3557
4	8/23/2013	68.2	8350	6626	5177	181700	4569	3427
5	8/24/2013	75	8542	6575	5853	201250	4735	3369
6	8/25/2013	68.3	8059	7082	5125	206400	5305	3401
7	8/26/2013	66.1	8350	7321	5635	199100	4985	3460
8	8/26/2013	65.8	8073	6715	5840	202050	4810	6438
9	8/26/2013	57	7902	6816	5216	114100	5256	3496
10	8/27/2013	69.4	8574	6686	6386	201850	4708	3441
11	8/28/2013	60	7979	6904	6116	199950	5115	3510
12	8/28/2013	68.4	8650	6710	5867	200600	6321	3896
13	8/29/2013	89	8775	6488	6004	202350	4948	3527
14	8/29/2013	92	8840	6547	5630	200640	4959	3478
15	8/29/2013	77.8	8587	6547	5480	206531	6004	3868
16	8/30/2013	89	8853	6938	6349	202450	4959	3487
17	8/31/2013	85	8740	7136	6110	200800	4841	3516
18	8/31/2013	90	8590	6509	5599	203250	4931	3427
19	8/31/2013	85.3	8542	6097	6161	199800	5035	3589
20	8/31/2013	79.9	8549	6963	5990	200600	4964	3585
21	9/1/2013	87	8588	6870	6156	201050	4992	3474
22	9/1/2013	87	8602	6410	6082	200650	4870	3465
23	9/1/2013	86.3	8489	6430	6065	200600	4999	3487
24	9/2/2013	88	8401	6577	6058	202250	4991	3472
25	9/2/2013	88	8525	6585	6172	198000	4862	3396
26	9/2/2013	88	8628	6334	6112	200250	4879	3468
27	9/2/2013	75.2	8683	6373	6143	126050	5261	3704
28	9/3/2013	79	8668	6775	6121	200600	4941	3575
29	9/3/2013	85	8615	6610	6186	203162	4983	3473
30	9/4/2013	76.5	8578	6888	6279	154600	5280	3514
31	9/4/2013	72.5	8096	6641	5877	168050	4727	3428
32	9/5/2013	73.7	8086	6791	5686	199750	4898	3520
33	9/5/2013	76.1	8072	6985	6001	201400	5257	3488
34	9/6/2013	77.8	7978	6354	5812	199500	5252	3474
35	9/7/2013	79.7	8051	6704	5962	200700	5208	3339
36	9/7/2013	77.8	8012	6870	5759	197950	5304	3524
37	9/8/2013	79	7821	6947	6422	201600	5322	3509

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STIMULATION INFORMATION PER STAGE

Stage No.	Stimulations Date	Avg Pump Rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Perforations	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen / other (gals)
38	9/9/2013	77.7	8001	6622	5404	205150	5331	3500
39	9/10/2013	86.6	7977	6411	5918	201600	5095	3381
40	9/10/2013	87.2	8039	6449	6144	199950	5242	3506
41	9/11/2013	89.7	7787	6277	5843	200850	5682	3417
42	9/11/2013	89.8	7831	6124	5808	200100	6306	3407
43	9/11/2013	86.6	7895	6061	5827	203750	5968	3490
44	9/12/2013	89.4	7816	6486	5892	200250	5145	3433
45	9/12/2013	89	7904	6772	5712	199400	5234	3302
46	9/12/2013	98.7	8507	6345	5294	199400	5597	3457
47	9/13/2013	99.7	8391	6583	5632	201600	5211	3398
48	9/13/2013	88.4	8036	6751	5499	201000	5275	3332
49	9/13/2013	98.5	8488	6511	5464	198900	4964	3450
50	9/14/2013	99.8	8426	6432	5867	198900	5032	3387
51	9/14/2013	86.8	7913	6104	5091	200700	5360	3314
52	9/14/2013	88.1	7895	6608	5792	201000	5264	3401
53	9/14/2013	100	8724	6209	5931	201400	5062	3372
54	9/15/2013	89	7773	0	5987	200700	4996	3381
55	9/16/2013	89.4	7481	6092	5780	202050	4760	3348
56	9/16/2013	85.7	7607	6456	7145	202350	8183	3543
57	9/17/2013	88.7	7774	6150	5816	200950	4990	3532
58	9/17/2013	89.5	7953	6630	5908	203450	6210	3671
59	9/18/2013	88.4	7934	6209	6140	199700	6480	3702
60	9/18/2013	87.2	7929	7250	6237	198650	4629	3378
61	9/18/2013	99.8	8564	6833	6615	199500	4749	3381
62	9/18/2013	98.8	8502	6577	6776	201550	4941	3440
63	9/19/2013	89.4	7840	6613	6630	200200	4528	3360
64	9/19/2013	91.4	8009	7221	5364	199150	5152	3312

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Upper Marcellus	7588' TVD	8026' MD
Middle Marcellus	7602'	8058'

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1000 psi Bottom Hole 5117 psi DURATION OF TEST 211 hrs

OPEN FLOW Gas 12741 mcfpd Oil N/A bpd NGL N/A bpd Water 563 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	0		0		
					See Attached

Please insert additional pages as applicable.

Drilling Contractor Patterson UTI
Address 450 Gears Road Suite 500 City Houston State TX Zip 77067

Logging Company Diversified Mud Logging
Address 440 Route 519 City Eighty Four State PA Zip 15330

Cementing Company CalFrac
Address 2001 Summit View Rd City Smithfield State PA Zip 15478

Stimulating Company CalFrac
Address 2001 Summit View Rd City Smithfield State PA Zip 15478

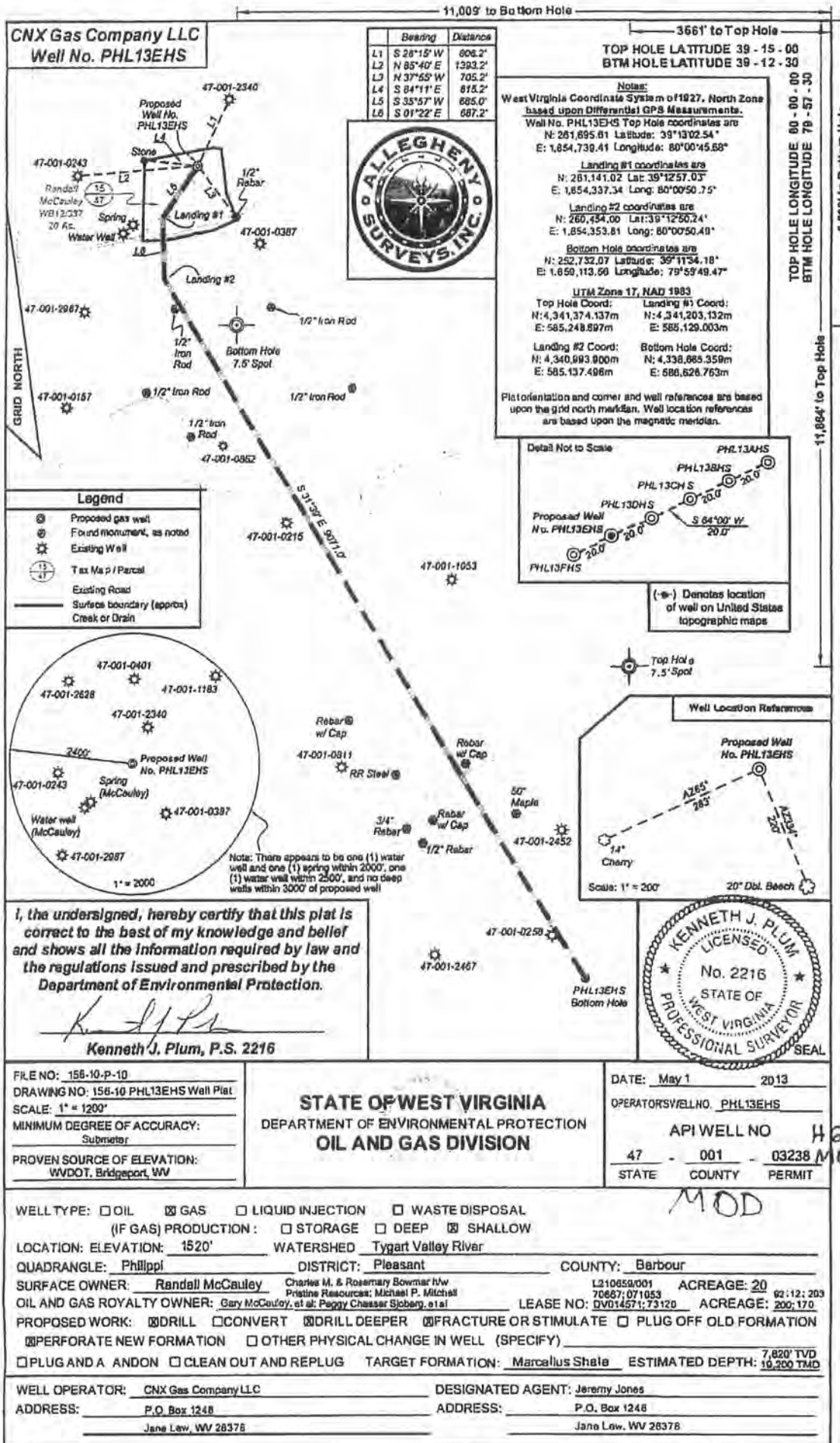
Please insert additional pages as applicable.

Completed by CNX Gas WV Operations Company, LLC - Drilling and Completions Telephone 304-884-2000
Signature Steve Spittler Title Steve Spittler - Completions Manager-Gas WV Date 3/26/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-001-03238W Farm name MCCAULEY, RANDALL Well number PHL13EHS Rework

LITHOLOGY / FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
	DEPTH IN FT TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
FILL	0	30			Brown
SAND/SHALE	30	190			Gray
COAL	190	195			Black
SAND/CLAY	195	230			Red
SAND/SHALE/COAL	230	310			Gray/Black
COAL	310	315			Black
SAND/SHALE	315	1045			Gray/Red/Brown/Black
SHALE/REDROCK	1045				Gray/Red
LITTLE LIME	1162	1170			
BIG LIME	1188	1240			
BIG INJUN	1240	1365			
GANTZ	1550	1574			
FOURTH SAND	2089	2118			
WARREN	2520	2550			
SPEECHLEY	2834	2873			
BALLTOWN	2996	3024			
RILEY	3720	3940			
BENSON SAND	4020	4085			
FIRST ELK	4250	4302			
SECOND ELK	4400	4480			
THIRD ELK	4660	4680			
FOURTH ELK	4934	4975			
SYCAMORE GRIT	6298	6405			
UN-NAMED SILTSTONE	6672	6760			
FAULT	6803				
UN-NAMED SILTSTONE REPEAT	6850	6927			
BURKET SHALE	7341	7363	7679	7706	
TULLY LIMESTONE	7363	7422	7706	7779	
HAMILTON SHALE	7422	7588	7779	8026	
UPPER MARCELLUS	7588	7600	8026	8051	
PURCELL	7600	7602	8051	8058	
MIDDLE MARCELLUS	7602	7637	8058	8156	
CHERRY VALLEY	7637	7646	8156	8196	
LOWER MARCELLUS	7646	7678	8196		
ONONDAGA LIMESTONE	7678	7692			
HUNTERSVILLE CHERT	7692				
LTD	7843				



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PHL13EHS

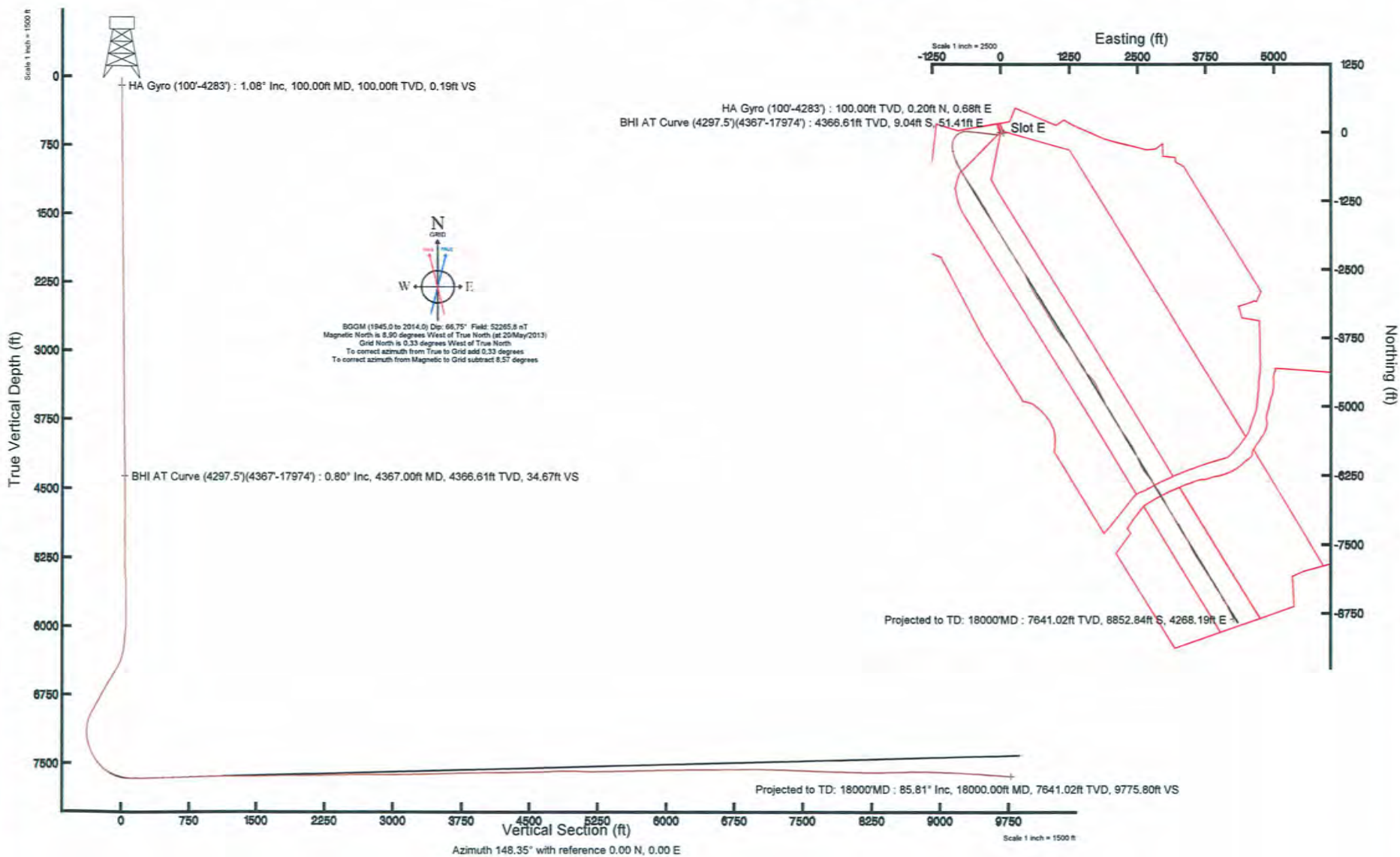
CNX GAS COMPANY, LLC

Location: Barbour County, WV
 Field: Barbour
 Facility: PHL13 Pad

Slot: Slot E
 Well: PHL13EHS
 Wellbore: PHL13EHS PWB



Plot reference wellpath is True (2013) PWB Rev. E.0	
True vertical depths are referenced to Patterson 201 (RT)	Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (KT01), US feet
Measured depths are referenced to Patterson 201 (RT)	North Reference: Grid north
Patterson 201 (RT) to Mean Sea Level: 1951.6 feet	Scale: True distance
Mean Sea Level to Mud line (M.S.L. Slot E): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: thomaz on 24/May/2013



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PHL13EHS



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD

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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

REPORT SETUP INFORMATION

Projection System	NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet	Software System	WellArchitect® 4.0.0
North Reference	Grid	User	Thomsuze
Scale	0.999966	Report Generated	24/May/2013 at 10:46
Convergence at slot	0.33° West	Database/Source file	WA_Eastern_US/PHL13EHS_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-35.40	-71.08	1854739.95	261695.67	39°13'02.536"N	80°00'45.670"W
Facility Reference Pt			1854811.03	261731.07	39°13'02.890"N	80°00'44.770"W
Field Reference Pt			1853088.00	260038.65	39°12'46.064"N	80°01'06.538"W

WELLPATH DATUM

Calculation method	Minimum curvature	Patterson 331 (RT) to Facility Vertical Datum	1551.60ft
Horizontal Reference Pt	Slot	Patterson 331 (RT) to Mean Sea Level	1551.60ft
Vertical Reference Pt	Patterson 331 (RT)	Patterson 331 (RT) to Mud Line at Slot (Slot E)	1551.60ft
MD Reference Pt	Patterson 331 (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	148.35°



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD

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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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	73.890	0.00	0.00	0.00	0.00	1854739.95	261695.67	39°13'02.536"N	80°00'45.670"W	0.00	0.000	0.00	0.00	0.00
24.50	0.000	73.890	24.50	0.00	0.00	0.00	1854739.95	261695.67	39°13'02.536"N	80°00'45.670"W	0.00	0.000	0.00	0.00	0.00
114.50	1.290	73.890	114.49	0.27	0.28	0.97	1854740.92	261695.95	39°13'02.539"N	80°00'45.658"W	1.01	73.890	1.43	1.43	0.00
214.50	1.450	77.170	214.46	0.98	0.87	3.29	1854743.24	261696.54	39°13'02.545"N	80°00'45.629"W	3.40	75.109	0.18	0.16	3.28
314.50	1.210	87.230	314.44	1.90	1.21	5.58	1854745.53	261696.88	39°13'02.548"N	80°00'45.600"W	5.71	77.793	0.33	-0.24	10.06
414.50	0.710	68.160	414.42	2.51	1.49	7.21	1854747.16	261697.16	39°13'02.551"N	80°00'45.579"W	7.36	78.334	0.59	-0.50	-19.07
514.50	1.080	70.300	514.41	2.82	2.04	8.67	1854748.62	261697.71	39°13'02.557"N	80°00'45.561"W	8.90	76.782	0.37	0.37	2.14
614.50	0.930	68.340	614.40	3.15	2.65	10.31	1854750.26	261698.32	39°13'02.563"N	80°00'45.540"W	10.65	75.568	0.15	-0.15	-1.96
714.50	1.270	74.600	714.38	3.60	3.25	12.13	1854752.08	261698.92	39°13'02.569"N	80°00'45.517"W	12.56	75.017	0.36	0.34	6.26
814.50	1.280	83.910	814.35	4.39	3.66	14.31	1854754.26	261699.33	39°13'02.573"N	80°00'45.489"W	14.77	75.655	0.21	0.01	9.31
914.50	0.700	87.090	914.34	5.17	3.81	16.03	1854755.98	261699.48	39°13'02.575"N	80°00'45.467"W	16.48	76.634	0.58	-0.58	3.18
1014.50	0.910	86.820	1014.33	5.84	3.88	17.44	1854757.38	261699.55	39°13'02.575"N	80°00'45.449"W	17.86	77.440	0.21	0.21	-0.27
1114.50	0.690	84.280	1114.32	6.48	3.99	18.83	1854758.78	261699.66	39°13'02.577"N	80°00'45.432"W	19.25	78.039	0.22	-0.22	-2.54
1214.50	0.650	77.780	1214.31	6.94	4.17	19.98	1854759.93	261699.84	39°13'02.578"N	80°00'45.417"W	20.41	78.215	0.09	-0.04	-6.50
1314.50	0.560	104.250	1314.30	7.48	4.17	21.01	1854760.96	261699.84	39°13'02.578"N	80°00'45.404"W	21.42	78.778	0.29	-0.09	26.47
1414.50	0.480	120.070	1414.30	8.20	3.84	21.85	1854761.79	261699.51	39°13'02.575"N	80°00'45.393"W	22.18	80.035	0.16	-0.08	15.82
1514.50	0.500	96.950	1514.30	8.84	3.58	22.64	1854762.59	261699.25	39°13'02.573"N	80°00'45.383"W	22.92	81.026	0.20	0.02	-23.12
1614.50	0.890	98.430	1614.29	9.61	3.41	23.84	1854763.79	261699.08	39°13'02.571"N	80°00'45.368"W	24.08	81.863	0.39	0.39	1.48
1714.50	0.610	85.150	1714.28	10.35	3.34	25.14	1854765.09	261699.01	39°13'02.571"N	80°00'45.351"W	25.36	82.432	0.33	-0.28	-13.28
1814.50	0.880	99.090	1814.27	11.09	3.26	26.43	1854766.38	261698.93	39°13'02.570"N	80°00'45.335"W	26.63	82.960	0.32	0.27	13.94
1914.50	0.750	125.280	1914.26	12.19	2.76	27.72	1854767.67	261698.43	39°13'02.565"N	80°00'45.318"W	27.86	84.305	0.39	-0.13	26.19
2014.50	0.640	113.140	2014.26	13.25	2.17	28.77	1854768.72	261697.84	39°13'02.559"N	80°00'45.305"W	28.85	85.693	0.18	-0.11	-12.14
2114.50	0.470	101.790	2114.25	13.99	1.86	29.69	1854769.63	261697.53	39°13'02.556"N	80°00'45.293"W	29.74	86.408	0.20	-0.17	-11.35
2214.50	0.410	115.660	2214.25	14.57	1.62	30.41	1854770.36	261697.29	39°13'02.554"N	80°00'45.284"W	30.45	86.941	0.12	-0.06	13.87
2314.50	0.710	131.980	2314.24	15.47	1.06	31.19	1854771.14	261696.73	39°13'02.548"N	80°00'45.274"W	31.21	88.062	0.34	0.30	16.32
2414.50	0.760	125.610	2414.23	16.67	0.25	32.19	1854772.14	261695.92	39°13'02.540"N	80°00'45.262"W	32.19	89.546	0.10	0.05	-6.37
2514.50	0.500	86.270	2514.23	17.49	-0.10	33.17	1854773.12	261695.57	39°13'02.537"N	80°00'45.249"W	33.17	90.178	0.49	-0.26	-39.34
2614.50	0.330	105.170	2614.23	17.91	-0.15	33.88	1854773.83	261695.52	39°13'02.537"N	80°00'45.240"W	33.88	90.253	0.22	-0.17	18.90
2714.50	0.790	97.670	2714.22	18.55	-0.32	34.84	1854774.79	261695.35	39°13'02.535"N	80°00'45.228"W	34.84	90.522	0.46	0.46	-7.50
2814.50	0.720	117.210	2814.21	19.53	-0.70	36.08	1854776.03	261694.97	39°13'02.531"N	80°00'45.212"W	36.09	91.106	0.27	-0.07	19.54



Actual Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION			
Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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]
2914.50	0.480	84.140	2914.21	20.25	-0.94	37.06	1854777.01	261694.73	39°13'02.529"N	80°00'45.200"W	37.07	91.455	0.41	-0.24	-33.07
3014.50	0.450	108.680	3014.20	20.73	-1.02	37.85	1854777.80	261694.65	39°13'02.528"N	80°00'45.190"W	37.86	91.550	0.20	-0.03	24.54
3114.50	0.360	124.490	3114.20	21.32	-1.33	38.48	1854778.43	261694.34	39°13'02.525"N	80°00'45.182"W	38.50	91.976	0.14	-0.09	15.81
3214.50	0.750	106.990	3214.20	22.10	-1.70	39.36	1854779.31	261693.97	39°13'02.522"N	80°00'45.170"W	39.40	92.468	0.42	0.39	-17.50
3314.50	0.750	114.740	3314.19	23.14	-2.16	40.58	1854780.53	261693.51	39°13'02.517"N	80°00'45.155"W	40.64	93.049	0.10	0.00	7.75
3414.50	0.470	97.440	3414.18	23.94	-2.49	41.58	1854781.53	261693.18	39°13'02.514"N	80°00'45.142"W	41.66	93.425	0.33	-0.28	-17.30
3514.50	0.680	138.700	3514.18	24.78	-2.99	42.38	1854782.33	261692.68	39°13'02.509"N	80°00'45.132"W	42.49	94.033	0.45	0.21	41.26
3614.50	0.460	113.560	3614.17	25.70	-3.59	43.14	1854783.09	261692.08	39°13'02.503"N	80°00'45.122"W	43.29	94.762	0.33	-0.22	-25.14
3714.50	0.800	110.210	3714.17	26.58	-4.00	44.17	1854784.11	261691.67	39°13'02.499"N	80°00'45.109"W	44.35	95.170	0.34	0.34	-3.35
3814.50	0.680	136.440	3814.16	27.71	-4.67	45.23	1854785.18	261691.00	39°13'02.493"N	80°00'45.096"W	45.47	95.891	0.36	-0.12	26.23
3914.50	0.900	115.800	3914.15	28.95	-5.44	46.35	1854786.29	261690.23	39°13'02.485"N	80°00'45.081"W	46.66	96.693	0.36	0.22	-20.64
4014.50	0.620	124.610	4014.14	30.11	-6.09	47.50	1854787.45	261689.58	39°13'02.479"N	80°00'45.067"W	47.89	97.304	0.30	-0.28	8.81
4114.50	0.980	120.480	4114.13	31.36	-6.83	48.68	1854788.63	261688.84	39°13'02.471"N	80°00'45.052"W	49.16	97.985	0.36	0.36	-4.13
4214.50	0.820	134.300	4214.12	32.81	-7.76	49.93	1854789.88	261687.91	39°13'02.462"N	80°00'45.036"W	50.53	98.837	0.27	-0.16	13.82
4297.50	0.660	130.520	4297.11	33.84	-8.49	50.72	1854790.67	261687.18	39°13'02.455"N	80°00'45.025"W	51.42	99.501	0.20	-0.19	-4.55
4367.00	0.800	126.630	4366.61	34.67	-9.04	51.41	1854791.36	261686.63	39°13'02.450"N	80°00'45.017"W	52.20	99.970	0.21	0.20	-5.60
4461.00	0.680	128.810	4460.60	35.81	-9.78	52.37	1854792.32	261685.89	39°13'02.442"N	80°00'45.004"W	53.28	100.576	0.13	-0.13	2.32
4556.00	0.650	136.080	4555.59	36.86	-10.52	53.19	1854793.13	261685.15	39°13'02.435"N	80°00'44.994"W	54.22	101.189	0.09	-0.03	7.65
4651.00	0.630	154.150	4650.59	37.91	-11.38	53.79	1854793.74	261684.29	39°13'02.427"N	80°00'44.986"W	54.98	101.944	0.21	-0.02	19.02
4745.00	0.790	72.890	4744.58	38.59	-11.65	54.63	1854794.58	261684.02	39°13'02.424"N	80°00'44.976"W	55.86	102.040	0.99	0.17	-86.45
4839.00	2.940	265.500	4838.55	37.65	-11.65	52.85	1854792.80	261684.02	39°13'02.424"N	80°00'44.998"W	54.12	102.433	3.95	2.29	-178.07
4934.00	0.030	179.690	4933.51	36.56	-11.87	50.42	1854790.37	261683.80	39°13'02.422"N	80°00'45.029"W	51.80	103.245	3.09	-3.06	-90.33
5028.00	0.880	128.450	5027.50	37.26	-12.34	50.98	1854790.93	261683.33	39°13'02.417"N	80°00'45.022"W	52.46	103.607	0.92	0.90	-54.51
5122.00	0.790	71.630	5121.49	38.09	-12.59	52.16	1854792.11	261683.09	39°13'02.415"N	80°00'45.007"W	53.66	103.564	0.85	-0.10	-60.45
5216.00	2.700	219.600	5215.46	38.95	-14.09	51.37	1854791.32	261681.58	39°13'02.400"N	80°00'45.017"W	53.26	105.336	3.61	2.03	157.41
5310.00	0.070	76.690	5309.43	39.68	-15.78	50.01	1854789.96	261679.89	39°13'02.383"N	80°00'45.034"W	52.44	107.512	2.93	-2.80	-152.03
5405.00	2.150	125.450	5404.41	41.34	-16.80	51.52	1854791.47	261678.87	39°13'02.373"N	80°00'45.015"W	54.19	108.061	2.22	2.19	51.33
5500.00	4.690	115.180	5499.23	46.23	-19.49	56.49	1854796.44	261676.18	39°13'02.347"N	80°00'44.951"W	59.75	109.034	2.74	2.67	-10.81
5594.00	0.380	94.670	5593.12	49.63	-21.15	60.28	1854800.23	261674.52	39°13'02.330"N	80°00'44.903"W	63.88	109.333	4.61	-4.59	-21.82
5689.00	0.100	81.360	5688.12	49.85	-21.16	60.67	1854800.62	261674.51	39°13'02.330"N	80°00'44.898"W	64.26	109.228	0.30	-0.29	-14.01



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD

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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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]
5782.00	0.040	126.130	5781.12	49.91	-21.17	60.78	1854800.73	261674.50	39°13'02.330"N	80°00'44.897"W	64.36	109.202	0.08	-0.06	48.14
5874.00	0.100	63.540	5873.12	49.95	-21.15	60.88	1854800.83	261674.52	39°13'02.330"N	80°00'44.895"W	64.45	109.159	0.10	0.07	-68.03
5969.00	4.120	244.160	5968.04	49.61	-22.60	57.88	1854797.83	261673.07	39°13'02.316"N	80°00'44.933"W	62.14	111.331	4.44	4.23	-188.82
6019.00	9.440	256.620	6017.67	48.14	-24.34	52.27	1854792.22	261671.34	39°13'02.299"N	80°00'45.005"W	57.66	114.966	10.98	10.64	24.92
6063.00	13.630	260.130	6060.77	45.09	-26.06	43.65	1854783.60	261669.61	39°13'02.281"N	80°00'45.114"W	50.84	120.840	9.65	9.52	7.98
6112.00	16.600	257.060	6108.07	40.70	-28.62	31.13	1854771.08	261667.05	39°13'02.255"N	80°00'45.273"W	42.29	132.588	6.28	6.06	-6.27
6158.00	16.370	257.900	6152.18	36.42	-31.45	18.39	1854758.34	261664.22	39°13'02.226"N	80°00'45.435"W	36.43	149.679	0.72	-0.50	1.83
6206.00	15.960	258.000	6198.29	31.94	-34.24	5.32	1854745.27	261661.43	39°13'02.198"N	80°00'45.600"W	34.65	171.162	0.86	-0.85	0.21
6253.00	18.630	263.670	6243.16	26.55	-36.41	-8.46	1854731.49	261659.26	39°13'02.176"N	80°00'45.775"W	37.38	193.083	6.71	5.68	12.06
6296.00	22.410	267.830	6283.43	19.58	-37.48	-23.49	1854716.47	261658.19	39°13'02.164"N	80°00'45.966"W	44.23	212.073	9.42	8.79	9.67
6347.00	28.370	269.040	6329.48	8.60	-38.05	-45.33	1854694.62	261657.62	39°13'02.157"N	80°00'46.244"W	59.19	229.993	11.73	11.69	2.37
6391.00	32.430	270.330	6367.42	-2.99	-38.16	-67.59	1854672.36	261657.51	39°13'02.155"N	80°00'46.527"W	77.62	240.555	9.35	9.23	2.93
6440.00	38.450	273.330	6407.33	-18.69	-37.20	-95.97	1854643.98	261658.48	39°13'02.163"N	80°00'46.887"W	102.93	248.815	12.79	12.29	6.12
6491.00	43.130	276.150	6445.93	-38.48	-34.40	-129.15	1854610.80	261661.27	39°13'02.189"N	80°00'47.309"W	133.66	255.084	9.86	9.18	5.53
6534.00	44.800	277.410	6476.88	-57.04	-30.88	-158.79	1854581.16	261664.80	39°13'02.222"N	80°00'47.686"W	161.77	258.997	4.38	3.88	2.93
6629.00	44.840	277.040	6544.27	-99.07	-22.45	-225.23	1854514.73	261673.22	39°13'02.301"N	80°00'48.530"W	226.34	264.307	0.28	0.04	-0.39
6724.00	44.830	275.920	6611.64	-140.42	-14.90	-291.78	1854448.18	261680.78	39°13'02.372"N	80°00'49.377"W	292.16	267.078	0.83	-0.01	-1.18
6818.00	43.290	276.030	6679.19	-180.33	-8.09	-356.79	1854383.17	261687.58	39°13'02.436"N	80°00'50.203"W	356.88	268.701	1.64	-1.64	0.12
6912.00	41.790	275.890	6748.44	-219.11	-1.49	-420.00	1854319.97	261694.18	39°13'02.498"N	80°00'51.007"W	420.00	269.797	1.60	-1.60	-0.15
7006.00	41.850	276.210	6818.50	-257.44	5.11	-482.33	1854257.64	261700.78	39°13'02.559"N	80°00'51.799"W	482.35	270.608	0.24	0.06	0.34
7100.00	41.870	275.740	6888.51	-295.74	11.64	-544.71	1854195.26	261707.31	39°13'02.620"N	80°00'52.592"W	544.84	271.225	0.33	0.02	-0.50
7194.00	41.990	276.250	6958.44	-334.10	18.20	-607.18	1854132.79	261713.87	39°13'02.682"N	80°00'53.386"W	607.45	271.717	0.38	0.13	0.54
7244.00	40.430	268.740	6996.08	-352.59	19.67	-640.04	1854099.93	261715.34	39°13'02.694"N	80°00'53.804"W	640.34	271.760	10.37	-3.12	-15.02
7289.00	39.220	258.830	7030.67	-364.96	16.59	-668.61	1854071.36	261712.26	39°13'02.662"N	80°00'54.167"W	668.82	271.421	14.35	-2.69	-22.02
7338.00	39.410	249.820	7068.61	-373.48	8.22	-698.44	1854041.54	261703.89	39°13'02.578"N	80°00'54.545"W	698.48	270.674	11.65	0.39	-18.39
7383.00	39.380	245.270	7103.39	-378.04	-2.69	-724.82	1854015.16	261692.98	39°13'02.469"N	80°00'54.879"W	724.82	269.788	6.42	-0.07	-10.11
7431.00	37.390	241.870	7141.02	-380.77	-15.93	-751.50	1853988.47	261679.74	39°13'02.336"N	80°00'55.217"W	751.67	268.786	6.04	-4.15	-7.08
7479.00	37.350	235.960	7179.18	-381.06	-30.96	-776.43	1853963.55	261664.71	39°13'02.186"N	80°00'55.533"W	777.05	267.717	7.47	-0.08	-12.31
7525.00	35.570	229.000	7216.19	-378.31	-47.55	-798.10	1853941.88	261648.12	39°13'02.021"N	80°00'55.807"W	799.52	266.590	9.78	-3.87	-15.13
7572.00	35.320	219.660	7254.51	-371.73	-67.00	-817.10	1853922.88	261628.68	39°13'01.828"N	80°00'56.047"W	819.84	265.313	11.53	-0.53	-19.87



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD
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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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]
7618.00	36.260	212.560	7291.84	-361.54	-88.71	-832.92	1853907.06	261606.97	39°13'01.612"N	80°00'56.246"W	837.63	263.921	9.25	2.04	-15.43
7665.00	36.210	208.530	7329.76	-348.59	-112.62	-847.03	1853892.95	261583.05	39°13'01.375"N	80°00'56.424"W	854.48	262.426	5.07	-0.11	-8.57
7713.00	35.590	202.920	7368.65	-333.44	-137.95	-859.25	1853880.74	261557.72	39°13'01.124"N	80°00'56.577"W	870.25	260.879	6.97	-1.29	-11.69
7760.00	37.680	194.220	7406.39	-315.49	-164.49	-868.11	1853871.87	261531.18	39°13'00.861"N	80°00'56.688"W	883.55	259.271	11.90	4.45	-18.51
7808.00	38.970	189.560	7444.05	-293.92	-193.60	-874.22	1853865.76	261502.07	39°13'00.573"N	80°00'56.764"W	895.40	257.513	6.59	2.69	-9.71
7854.00	41.490	183.240	7479.18	-270.52	-223.10	-877.48	1853862.50	261472.58	39°13'00.281"N	80°00'56.803"W	905.40	255.735	10.42	5.48	-13.74
7905.00	46.330	176.530	7515.93	-240.37	-258.42	-877.32	1853862.66	261437.26	39°12'59.932"N	80°00'56.798"W	914.59	253.588	13.16	9.49	-13.16
7949.00	51.440	172.760	7544.86	-210.66	-291.40	-874.19	1853865.79	261404.28	39°12'59.607"N	80°00'56.756"W	921.48	251.565	13.28	11.61	-8.57
7999.00	57.570	169.760	7573.88	-173.17	-331.60	-867.97	1853872.01	261364.08	39°12'59.210"N	80°00'56.674"W	929.15	249.091	13.20	12.26	-6.00
8044.00	62.950	167.770	7596.20	-136.56	-369.90	-860.34	1853879.64	261325.78	39°12'58.831"N	80°00'56.574"W	936.49	246.735	12.56	11.96	-4.42
8093.00	67.890	166.110	7616.58	-94.34	-413.29	-850.26	1853889.72	261282.39	39°12'58.403"N	80°00'56.443"W	945.39	244.077	10.54	10.08	-3.39
8138.00	73.330	163.890	7631.51	-53.68	-454.27	-839.27	1853900.71	261241.42	39°12'57.999"N	80°00'56.300"W	954.32	241.575	12.95	12.09	-4.93
8188.00	76.050	160.480	7644.72	-6.87	-500.17	-824.51	1853915.47	261195.52	39°12'57.546"N	80°00'56.110"W	964.36	238.758	8.54	5.44	-6.82
8233.00	79.700	156.600	7654.17	36.42	-541.09	-808.41	1853931.57	261154.59	39°12'57.142"N	80°00'55.902"W	972.78	236.204	11.70	8.11	-8.62
8282.00	84.110	151.750	7661.07	84.66	-584.73	-787.28	1853952.70	261110.96	39°12'56.712"N	80°00'55.630"W	980.67	233.398	13.30	9.00	-9.90
8327.00	88.060	150.260	7664.15	129.49	-623.99	-765.52	1853974.46	261071.70	39°12'56.325"N	80°00'55.351"W	987.62	230.816	9.38	8.78	-3.31
8375.00	91.970	150.180	7664.13	177.46	-665.64	-741.68	1853998.29	261030.05	39°12'55.915"N	80°00'55.045"W	996.58	228.093	8.15	8.15	-0.17
8421.00	91.200	149.840	7662.86	223.42	-705.47	-718.70	1854021.28	260990.23	39°12'55.523"N	80°00'54.750"W	1007.08	225.532	1.83	-1.67	-0.74
8514.00	91.780	145.240	7660.44	316.36	-783.89	-668.82	1854071.16	260911.81	39°12'54.751"N	80°00'54.111"W	1030.44	220.471	4.98	0.62	-4.95
8610.00	91.480	146.210	7657.71	412.22	-863.19	-614.77	1854125.20	260832.51	39°12'53.970"N	80°00'53.419"W	1059.74	215.459	1.06	-0.31	1.01
8705.00	91.420	143.370	7655.31	506.99	-940.77	-560.02	1854179.95	260754.93	39°12'53.206"N	80°00'52.717"W	1094.84	210.764	2.99	-0.06	-2.99
8799.00	90.680	144.480	7653.58	600.69	-1016.73	-504.68	1854235.29	260678.97	39°12'52.459"N	80°00'52.009"W	1135.10	206.399	1.42	-0.79	1.18
8892.00	91.570	148.100	7651.76	693.60	-1094.07	-453.09	1854286.88	260601.64	39°12'51.697"N	80°00'51.348"W	1184.18	202.496	4.01	0.96	3.89
8986.00	91.450	149.560	7649.28	787.56	-1174.47	-404.45	1854335.51	260521.24	39°12'50.905"N	80°00'50.724"W	1242.16	199.002	1.56	-0.13	1.55
9080.00	91.450	149.250	7646.90	881.51	-1255.36	-356.63	1854383.34	260440.36	39°12'50.108"N	80°00'50.110"W	1305.03	195.859	0.33	0.00	-0.33
9174.00	91.970	148.200	7644.10	975.47	-1335.66	-307.85	1854432.11	260360.06	39°12'49.317"N	80°00'49.485"W	1370.68	192.979	1.25	0.55	-1.12
9270.00	91.110	149.100	7641.52	1071.43	-1417.61	-257.92	1854482.04	260278.11	39°12'48.510"N	80°00'48.844"W	1440.89	190.312	1.30	-0.90	0.94
9364.00	90.340	150.790	7640.33	1165.38	-1498.96	-210.85	1854529.11	260196.76	39°12'47.709"N	80°00'48.241"W	1513.72	188.007	1.98	-0.82	1.80
9457.00	90.220	153.430	7639.87	1258.17	-1581.15	-167.35	1854572.60	260114.57	39°12'46.899"N	80°00'47.682"W	1589.99	186.042	2.84	-0.13	2.84
9552.00	89.690	149.630	7639.95	1353.01	-1664.65	-122.07	1854617.88	260031.08	39°12'46.076"N	80°00'47.101"W	1669.12	184.194	4.04	-0.56	-4.00

47-001-03238

PHL13EHS



Actual Wellpath Report
 PHL13EHS AWP Proj: 18000'MD
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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [ft]	Grid North [ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
9647.00	90.620	147.860	7639.69	1448.00	-1745.86	-72.79	1854667.17	259949.88	39°12'45.27"N	80°00'46.46"W	1747.37	182.387	2.10	0.98	-1.86
9741.00	90.650	149.370	7638.65	1541.99	-1826.10	-23.84	1854716.11	259869.64	39°12'44.48"N	80°00'45.84"W	1826.25	180.748	1.61	0.03	1.61
9836.00	91.510	146.820	7636.86	1636.97	-1906.72	26.36	1854766.31	259789.02	39°12'43.62"N	80°00'45.19"W	1906.91	179.208	2.83	0.91	-2.68
9931.00	91.020	147.220	7634.76	1731.92	-1986.40	78.06	1854818.01	259709.35	39°12'42.90"N	80°00'44.53"W	1987.93	177.750	0.67	-0.52	0.42
10023.00	90.680	148.200	7633.40	1823.90	-2064.16	127.20	1854867.14	259631.59	39°12'42.14"N	80°00'43.90"W	2068.07	176.474	1.13	-0.37	1.07
10118.00	90.340	148.440	7632.55	1918.88	-2145.76	175.82	1854915.76	259549.98	39°12'41.33"N	80°00'43.28"W	2152.96	175.316	2.17	-0.36	2.14
10213.00	89.940	148.440	7632.32	2013.86	-2227.48	224.27	1854964.21	259468.27	39°12'40.53"N	80°00'42.66"W	2238.74	174.251	1.93	-0.42	-1.88
10304.00	90.980	146.710	7631.59	2104.85	-2304.28	273.06	1855013.00	259391.47	39°12'39.77"N	80°00'42.03"W	2320.40	173.242	2.22	1.14	-1.90
10400.00	90.830	148.830	7630.07	2200.82	-2385.48	324.25	1855064.18	259310.28	39°12'38.97"N	80°00'41.37"W	2407.41	172.260	2.21	-0.16	2.21
10495.00	90.860	150.450	7628.67	2295.79	-2467.44	372.26	1855112.19	259228.32	39°12'38.17"N	80°00'40.76"W	2495.36	171.421	1.71	0.03	1.71
10590.00	90.990	150.740	7627.14	2390.70	-2550.19	418.89	1855158.83	259145.58	39°12'37.35"N	80°00'40.16"W	2584.36	170.672	0.33	0.14	0.31
10682.00	91.540	154.770	7625.10	2482.39	-2631.94	460.99	1855200.92	259063.82	39°12'36.54"N	80°00'39.62"W	2672.01	170.065	4.42	0.60	4.38
10776.00	89.820	155.730	7623.99	2575.70	-2717.30	500.34	1855240.27	258978.47	39°12'35.70"N	80°00'39.11"W	2762.98	169.567	2.10	-1.83	1.02
10870.00	90.090	152.390	7624.06	2669.22	-2801.82	541.45	1855281.38	258893.96	39°12'34.87"N	80°00'38.58"W	2853.65	169.062	3.56	0.29	-3.55
10965.00	89.910	151.350	7624.06	2764.03	-2885.59	586.24	1855326.17	258810.18	39°12'34.04"N	80°00'38.01"W	2944.54	168.516	1.11	-0.19	-1.09
11059.00	90.220	148.050	7623.96	2858.00	-2966.74	633.66	1855373.59	258729.04	39°12'33.24"N	80°00'37.40"W	3033.66	167.943	3.53	0.33	-3.51
11154.00	90.740	146.030	7623.16	2952.96	-3046.44	685.34	1855425.27	258649.34	39°12'32.46"N	80°00'36.74"W	3122.58	167.322	2.20	0.55	-2.13
11248.00	90.800	149.740	7621.90	3046.87	-3124.29	738.01	1855477.93	258571.49	39°12'31.69"N	80°00'36.06"W	3210.27	166.709	0.24	0.10	-0.23
11341.00	90.890	149.740	7620.52	3139.84	-3202.94	787.59	1855527.51	258492.84	39°12'30.92"N	80°00'35.43"W	3298.35	166.185	4.23	0.10	4.23
11435.00	91.110	150.060	7618.88	3233.79	-3284.25	834.72	1855574.64	258411.53	39°12'30.12"N	80°00'34.82"W	3388.67	165.740	0.41	0.23	0.34
11529.00	91.510	148.810	7616.74	3327.74	-3365.17	882.51	1855622.43	258330.62	39°12'29.32"N	80°00'34.21"W	3478.96	165.305	1.40	0.43	-1.33
11623.00	91.570	148.900	7614.21	3421.71	-3445.59	931.11	1855671.02	258250.20	39°12'28.53"N	80°00'33.59"W	3569.18	164.878	0.12	0.06	0.10
11718.00	91.480	149.220	7611.68	3516.66	-3527.05	979.93	1855719.85	258168.75	39°12'27.71"N	80°00'32.96"W	3660.64	164.473	0.35	-0.09	0.34
11814.00	91.630	147.140	7609.08	3612.62	-3608.58	1030.53	1855770.44	258087.22	39°12'26.92"N	80°00'32.31"W	3752.85	164.062	2.17	0.16	-2.17
11909.00	91.420	144.300	7606.55	3707.48	-3687.05	1084.01	1855823.92	258008.76	39°12'26.15"N	80°00'31.63"W	3843.10	163.616	3.00	-0.22	-2.99
12004.00	90.920	139.270	7604.61	3801.81	-3761.65	1142.75	1855882.66	257934.16	39°12'25.42"N	80°00'30.88"W	3931.39	163.102	5.32	-0.53	-5.29
12097.00	91.020	144.360	7603.03	3894.16	-3834.71	1200.21	1855940.12	257861.10	39°12'24.70"N	80°00'30.14"W	4018.15	162.621	5.47	0.11	5.47
12192.00	90.890	147.580	7601.45	3989.05	-3913.42	1253.36	1855993.27	257782.39	39°12'23.92"N	80°00'29.46"W	4109.23	162.241	3.39	-0.14	3.39
12286.00	90.890	148.810	7599.99	4083.04	-3993.30	1302.90	1856042.80	257702.52	39°12'23.14"N	80°00'28.83"W	4200.47	161.930	1.31	0.00	1.31
12380.00	90.950	148.140	7598.48	4177.03	-4073.41	1352.04	1856091.94	257622.41	39°12'22.35"N	80°00'28.20"W	4291.93	161.638	0.72	0.06	-0.71

47-001-0323B

PHL13EHS



**BAKER
HUGHES**

Actual Wellpath Report

PHL13EHS AWP Proj: 180007MD

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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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]
12475.00	90.890	149.640	7596.95	4272.01	-4154.74	1401.12	1856141.02	257541.08	39°12'21.551"N	80°00'27.571"W	4384.63	161.364	1.58	-0.06	1.58
12569.00	90.860	149.220	7595.52	4365.98	-4235.66	1448.92	1856188.82	257460.16	39°12'20.753"N	80°00'26.958"W	4476.63	161.115	0.45	-0.03	-0.45
12635.00	90.770	146.670	7594.18	4459.96	-4315.31	1498.80	1856238.70	257380.51	39°12'19.969"N	80°00'26.318"W	4568.19	160.847	2.71	-0.10	-2.71
12757.00	90.280	137.310	7593.32	4553.27	-4389.29	1556.62	1856296.51	257306.54	39°12'19.241"N	80°00'25.578"W	4657.14	160.473	9.97	-0.52	-9.96
12852.00	90.800	133.250	7592.42	4645.79	-4456.78	1623.45	1856363.34	257239.05	39°12'18.578"N	80°00'24.725"W	4743.25	159.985	4.31	0.55	-4.27
12945.00	94.160	143.960	7588.38	4737.21	-4526.36	1684.80	1856424.68	257169.47	39°12'17.893"N	80°00'23.940"W	4829.75	159.584	12.06	3.61	11.52
13040.00	91.880	152.960	7583.37	4831.97	-4607.13	1734.36	1856474.25	257088.71	39°12'17.098"N	80°00'23.305"W	4922.77	159.371	9.76	-2.40	9.47
13135.00	89.850	153.800	7581.94	4926.59	-4692.04	1776.92	1856516.80	257003.80	39°12'16.261"N	80°00'22.758"W	5017.24	159.258	2.31	-2.14	0.88
13229.00	87.380	153.490	7584.21	5020.16	-4776.24	1818.63	1856558.52	256919.60	39°12'15.431"N	80°00'22.222"W	5110.76	159.155	2.65	-2.63	-0.33
13324.00	88.000	151.440	7588.04	5114.83	-4860.41	1862.51	1856602.39	256835.44	39°12'14.602"N	80°00'21.659"W	5205.05	159.033	2.25	0.65	-2.16
13417.00	90.280	156.120	7589.43	5207.37	-4943.80	1903.58	1856643.46	256752.05	39°12'13.780"N	80°00'21.131"W	5297.62	158.941	5.60	2.45	5.03
13513.00	90.800	154.240	7588.53	5302.68	-5030.92	1943.87	1856683.76	256664.93	39°12'12.921"N	80°00'20.613"W	5393.41	158.874	2.03	0.54	-1.96
13608.00	90.770	147.470	7587.23	5397.52	-5113.84	1990.11	1856729.99	256582.01	39°12'12.104"N	80°00'20.020"W	5487.43	158.736	7.13	-0.03	-7.13
13702.00	91.350	149.120	7585.49	5491.50	-5193.79	2039.50	1856779.38	256502.06	39°12'11.316"N	80°00'19.387"W	5579.88	158.561	1.86	0.62	1.76
13796.00	91.260	147.420	7583.35	5585.48	-5273.72	2088.92	1856828.80	256422.14	39°12'10.529"N	80°00'18.753"W	5672.37	158.391	1.81	-0.10	-1.81
13890.00	91.350	147.270	7581.20	5679.44	-5352.84	2139.63	1856879.50	256343.02	39°12'09.750"N	80°00'18.104"W	5764.63	158.212	0.19	0.10	-0.16
13985.00	91.320	140.720	7578.99	5774.09	-5429.63	2195.43	1856935.30	256266.23	39°12'08.994"N	80°00'17.389"W	5856.69	157.984	6.89	-0.03	-6.89
14079.00	91.290	143.170	7576.83	5867.47	-5503.62	2253.36	1856993.22	256192.24	39°12'08.266"N	80°00'16.648"W	5947.06	157.734	2.61	-0.03	2.61
14173.00	91.450	145.120	7574.60	5961.28	-5580.76	2305.90	1857046.87	256115.12	39°12'07.507"N	80°00'15.961"W	6038.80	157.541	4.28	0.17	4.28
14268.00	90.550	147.120	7572.94	6056.19	-5659.94	2359.90	1857099.77	256036.23	39°12'06.730"N	80°00'15.284"W	6131.94	157.365	2.38	-0.95	-2.18
14362.00	90.550	149.770	7572.04	6150.15	-5738.85	2410.47	1857150.33	255957.03	39°12'05.950"N	80°00'14.636"W	6224.52	157.216	4.95	0.00	4.95
14456.00	90.580	156.110	7571.11	6243.79	-5822.51	2453.21	1857193.07	255873.37	39°12'05.125"N	80°00'14.087"W	6318.21	157.153	6.74	0.03	6.74
14551.00	90.620	158.160	7570.12	6337.67	-5910.03	2490.12	1857229.98	255785.85	39°12'04.262"N	80°00'13.612"W	6413.20	157.153	2.16	0.04	2.16
14645.00	90.800	156.390	7568.95	6430.52	-5996.73	2526.42	1857266.28	255699.16	39°12'03.408"N	80°00'13.144"W	6507.19	157.154	1.89	0.19	-1.88
14738.00	90.680	152.130	7567.75	6522.99	-6080.47	2566.80	1857306.66	255615.42	39°12'02.582"N	80°00'12.626"W	6600.05	157.114	4.58	-0.13	-4.58
14832.00	90.550	147.190	7566.74	6616.94	-6161.57	2614.27	1857354.12	255534.32	39°12'01.783"N	80°00'12.017"W	6693.23	157.009	5.26	-0.14	-5.26
14926.00	90.800	139.870	7565.63	6710.53	-6237.10	2670.10	1857409.95	255458.79	39°12'01.040"N	80°00'11.302"W	6784.61	156.824	7.79	0.27	-7.79
15020.00	90.740	141.840	7564.37	6803.72	-6310.00	2729.43	1857469.28	255385.90	39°12'00.323"N	80°00'10.544"W	6875.01	156.609	2.10	-0.06	2.10
15113.00	90.520	144.210	7563.34	6896.30	-6384.28	2785.36	1857525.21	255311.62	39°11'59.591"N	80°00'09.828"W	6965.44	156.429	2.56	-0.24	2.55
15207.00	89.450	143.870	7563.37	6990.04	-6460.37	2840.56	1857580.40	255235.53	39°11'58.842"N	80°00'09.121"W	7057.27	156.265	1.19	-1.14	-0.36



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD

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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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]
15300.00	89.350	146.400	7564.34	7082.88	-6536.66	2893.71	1857633.56	255159.24	39°11'58.091"N	80°00'08.441"W	7148.53	156.122	2.72	-0.11	2.72
15394.00	87.970	149.360	7566.54	7176.83	-6616.24	2943.67	1857683.52	255079.66	39°11'57.308"N	80°00'07.801"W	7241.54	156.015	3.47	-1.47	3.15
15487.00	88.180	151.020	7569.67	7269.73	-6696.89	2989.88	1857729.72	254999.02	39°11'56.513"N	80°00'07.208"W	7334.01	155.941	1.80	0.23	1.78
15581.00	88.150	153.040	7572.68	7363.48	-6779.86	3033.94	1857773.78	254916.05	39°11'55.695"N	80°00'06.642"W	7427.74	155.892	2.15	-0.03	2.15
15675.00	88.150	151.850	7575.71	7457.19	-6863.15	3077.40	1857817.24	254832.76	39°11'54.875"N	80°00'06.084"W	7521.52	155.849	1.27	0.00	-1.27
15768.00	86.890	146.730	7579.74	7550.06	-6943.01	3124.83	1857864.67	254752.91	39°11'54.088"N	80°00'05.476"W	7613.80	155.769	5.66	-1.35	-5.51
15861.00	88.370	144.380	7583.58	7642.86	-7019.63	3177.38	1857917.22	254676.29	39°11'53.333"N	80°00'04.803"W	7705.26	155.646	2.98	1.59	-2.53
15930.00	88.310	144.660	7585.58	7711.68	-7075.80	3217.42	1857957.25	254620.13	39°11'52.781"N	80°00'04.291"W	7772.94	155.548	0.41	-0.09	0.41
15955.00	88.180	144.870	7586.35	7736.62	-7096.21	3231.83	1857971.67	254599.72	39°11'52.580"N	80°00'04.106"W	7797.49	155.514	0.99	-0.52	0.84
16050.00	88.610	147.100	7589.01	7831.49	-7174.91	3284.95	1858024.78	254521.01	39°11'51.805"N	80°00'03.426"W	7891.15	155.400	2.39	0.45	2.35
16143.00	88.650	150.890	7591.23	7924.44	-7254.59	3332.83	1858072.67	254441.34	39°11'51.020"N	80°00'02.812"W	7983.54	155.325	4.07	0.04	4.08
16237.00	88.430	150.770	7593.63	8018.33	-7336.64	3378.64	1858118.46	254359.29	39°11'50.211"N	80°00'02.225"W	8077.22	155.273	0.27	-0.23	-0.13
16330.00	88.650	153.260	7596.00	8111.10	-7418.73	3422.26	1858162.08	254277.20	39°11'49.402"N	80°00'01.665"W	8170.03	155.236	2.69	0.24	2.68
16422.00	89.630	155.380	7597.38	8202.58	-7501.63	3462.12	1858201.94	254194.31	39°11'48.585"N	80°00'01.153"W	8262.01	155.226	2.54	1.07	2.30
16517.00	90.370	152.250	7597.38	8297.14	-7586.87	3504.03	1858243.86	254109.07	39°11'47.745"N	80°00'00.614"W	8356.96	155.210	3.39	0.78	-3.29
16610.00	90.280	149.240	7596.85	8390.04	-7668.00	3549.48	1858289.30	254027.95	39°11'46.946"N	80°00'00.031"W	8449.67	155.161	3.24	-0.10	-3.24
16704.00	91.390	145.870	7595.48	8484.01	-7747.30	3599.89	1858339.71	253948.64	39°11'46.165"N	79°59'59.385"W	8542.83	155.077	3.77	1.18	-3.59
16798.00	91.320	146.010	7593.26	8577.90	-7825.16	3652.52	1858392.34	253870.79	39°11'45.398"N	79°59'58.711"W	8635.62	154.978	0.17	-0.07	0.15
16891.00	91.260	148.210	7591.17	8670.85	-7903.23	3703.01	1858442.83	253792.73	39°11'44.629"N	79°59'58.065"W	8727.73	154.895	2.37	-0.06	2.37
16985.00	89.880	147.060	7590.23	8764.83	-7982.62	3753.32	1858493.14	253713.34	39°11'43.847"N	79°59'57.420"W	8820.98	154.818	1.91	-1.47	-1.22
17078.00	88.890	143.910	7591.23	8857.70	-8059.23	3806.01	1858545.82	253636.73	39°11'43.093"N	79°59'56.745"W	8912.74	154.721	3.55	-1.06	-3.39
17172.00	88.060	149.360	7593.73	8951.59	-8137.68	3857.67	1858597.48	253558.28	39°11'42.320"N	79°59'56.084"W	9005.75	154.637	5.86	-0.88	5.80
17266.00	87.600	150.050	7597.29	9045.49	-8218.78	3905.05	1858644.86	253477.18	39°11'41.521"N	79°59'55.476"W	9099.33	154.586	0.88	-0.49	0.73
17359.00	87.600	146.090	7601.19	9138.39	-8297.63	3954.19	1858693.99	253398.34	39°11'40.745"N	79°59'54.846"W	9191.64	154.520	4.25	0.00	-4.26
17452.00	86.800	144.060	7605.73	9231.12	-8373.78	4007.36	1858747.17	253322.19	39°11'39.995"N	79°59'54.166"W	9283.28	154.426	2.34	-0.86	-2.18
17548.00	86.830	144.980	7611.06	9326.76	-8451.84	4063.00	1858802.80	253244.14	39°11'39.227"N	79°59'53.454"W	9377.71	154.325	0.96	0.03	0.96
17641.00	86.460	151.180	7616.51	9419.55	-8530.60	4112.06	1858851.86	253165.38	39°11'38.451"N	79°59'52.825"W	9469.96	154.264	6.67	-0.40	6.67
17735.00	86.150	155.810	7622.57	9512.96	-8614.52	4153.91	1858893.71	253081.46	39°11'37.624"N	79°59'52.287"W	9563.73	154.257	4.93	-0.33	4.93
17829.00	86.090	155.390	7628.93	9605.99	-8699.93	4192.65	1858932.45	252996.05	39°11'36.782"N	79°59'51.789"W	9657.49	154.270	0.45	-0.06	-0.45
17921.00	85.960	153.320	7635.31	9697.26	-8782.66	4232.37	1858972.17	252913.32	39°11'35.966"N	79°59'51.279"W	9749.26	154.271	2.25	-0.14	-2.25



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD

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REFERENCE WELLPATH IDENTIFICATION

Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

WELLPATH DATA (212 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]
17974.00	85.810	152.780	7639.12	9749.95	-8829.79	4256.33	1858996.13	252866.20	39°11'35.502"N	79°59'50.971"W	9802.12	154.264	1.05	-0.28	-1.02
18000.00	85.810	152.780	7641.02	9775.80	-8852.84	4268.19	1859007.99	252843.14	39°11'35.274"N	79°59'50.819"W	9828.04	154.260	0.00	0.00	0.00

HOLE & CASING SECTIONS - Ref Wellbore: PHL13EHS AWB Ref Wellpath: PHL13EHS AWP Proj: 18000'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]
9.625in Casing	24.50	2033.50	2009.00	24.50	2033.25	0.00	0.00	2.09	28.96



Actual Wellpath Report

PHL13EHS AWP Proj: 18000'MD

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REFERENCE WELLPATH IDENTIFICATION			
Operator	CNX GAS COMPANY, LLC	Slot	Slot E
Area	Barbour County, WV	Well	PHL13EHS
Field	Barbour	Wellbore	PHL13EHS AWB
Facility	PHL13 Pad		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
PHL13EHS PBHL Rev-3		7410.81	-8915.35	4343.81	1859083.60	252780.64	39°11'34.661"N	79°59'49.854"W	point
PHL13EHS PBHL Rev-4		7418.66	-8660.00	4186.43	1858926.23	253035.98	39°11'37.176"N	79°59'51.871"W	point
PHL13EHS PBHL Rev-2		7512.46	-8915.35	4343.81	1859083.60	252780.64	39°11'34.661"N	79°59'49.854"W	point
PHL13EHS PBHL Rev-1		7517.70	-8660.00	4186.43	1858926.23	253035.98	39°11'37.176"N	79°59'51.871"W	point
PHL13EHS LP Rev-4		7662.00	-749.26	-689.25	1854050.72	260946.44	39°12'55.092"N	80°00'54.373"W	point
PHL13EHS LP Rev-3		7679.91	-749.26	-689.25	1854050.72	260946.44	39°12'55.092"N	80°00'54.373"W	point

WELLPATH COMPOSITION - Ref Wellbore: PHL13EHS AWB Ref Wellpath: PHL13EHS AWP Proj: 18000'MD				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
24.50	4297.50	Generic gyro - northseeking (Standard)	HA Gyro (100'-4283')	PHL13EHS AWB
4297.50	17974.00	NaviTrak (MagCorr)	BHI AT Curve (4297.5)(4367'-17974')	PHL13EHS AWB
17974.00	18000.00	Blind Drilling (std)	Projection to bit	PHL13EHS AWB

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/21/2013
Job End Date:	9/19/2013
State:	West Virginia
County:	Barbour
API Number:	47-001-03238-00-00
Operator Name:	CONSOL Energy Inc.
Well Name and Number:	PHL13EHS
Longitude:	-80.01358800
Latitude:	39.21555300
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,645
Total Base Water Volume (gal):	10,934,114
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	Customer & CWS	Base Fluid & Mix Water	Water	7732-18-5	100.00000	87.88751	
Sand (Proppant), DAP-903, DWP-111, DWP-614, DWP-901, BioClear 2000, DWP-NE1	CWS	Propping Agent, Scale Inhibitor, Gel Slurry, Viscosifier, Breaker, Biocide, Non-Emulsifier	Crystalline silica (Quartz)	14808-60-7	100.00000	11.31904	
			Hydrochloric acid	7647-01-0	35.00000	0.52177	
			2-Propenoic acid, polymer with 2-propenamamide, sodium salt	225987-30-8	40.00000	0.05133	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.04651	
			Dimethylcocoamine, bis (chloroethyl) ether, diquaternary ammonium salt	68607-28-3	40.00000	0.02379	
			Isopropanol	67-63-0	40.00000	0.02379	
			Calcite	471-34-1	1.00000	0.01902	
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	40.00000	0.01552	
			Polyethylene glycol mixture	25322-68-3	70.00000	0.01552	
			Methanol	67-56-1	15.00000	0.01339	
			Guar gum	9000-30-0	60.00000	0.00801	

		2-Propenoic acid, polymer with sodium phosphonate	71050-62-9	60.00000	0.00789
		Poly(oxyethylene)nonylphenol ether	9016-45-9	5.00000	0.00642
		Sorbitan monooleate	1338-43-8	5.00000	0.00642
		Illite	12173-60-3	1.00000	0.00623
		Goethite	1310-14-1	0.10000	0.00502
		Apatite	84476-38-6	0.10000	0.00321
		Biotite	1302-27-8	0.10000	0.00321
		Diallyldimethylammonium chloride	7398-69-8	5.00000	0.00297
		Ilmenite	98072-94-7	0.10000	0.00231
		Modified thiourea polymer	68527-49-1	0.10000	0.00224
		Fatty acids, tall-oil	61790-12-3	0.10000	0.00224
		Alcohols, C14-15, ethoxylated	68951-67-7	0.10000	0.00224
		Alkenes, C>10 a-	64743-02-8	0.10000	0.00224
		Propargyl Alcohol	107-19-7	0.10000	0.00075
		Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00067
		Ammonium Persulfate	7727-54-0	100.00000	0.00035
		Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00020
		Formaldehyde	50-00-0	0.10000	0.00015
		Sodium chloride	7647-14-5	0.10000	0.00007

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)