

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

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Office of Oil and Gas

MAY - 1 2020

WV Department of
Environmental Protection

API 47 - 061 - 01836 County Monongalia District Clay
Quad Blacksville, WV Pad Name Cummins Field/Pool Name _____
Farm name Jerry L. Yost et al Well Number 4H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia St. E, Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4390556.9 Easting 570262.9
Landing Point of Curve Northing 4390627.8 Easting 570369.8
Bottom Hole Northing 4388029.2 Easting 572394.1

Elevation (ft) 1,358' 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

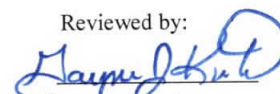
Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
SYNTHETIC BASED MUD FOR HORIZONTAL SECTION; BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-Seal Plus, HRP, Lime, M-I WATE (BARITE), M-I-X II MEDIUM,
MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUM

Date permit issued 5/10/2019 Date drilling commenced 7/24/2019 Date drilling ceased 10/9/2019
Date completion activities began 11/23/2019 Date completion activities ceased 1/7/2020
Verbal plugging (Y/N) N Date permission granted NA Granted by NA

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

Freshwater depth(s) ft 750', 906', 1,248' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2,123' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 530', 906', 1,248' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

6/5/2020

API 47-061 - 01836 Farm name Jerry L. Yost et al Well number 4H

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	30"	24"	50"	N	NA	NA	Y
Surface	17.5"	13-3/8"	1,336'	N	54.5	NA	Y, 31 BBL
Coal							
Intermediate 1	12.25"	9-5/8"	2,474'	N	40	NA	Y, 18 BBL
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	19,419'	N	20	NA	Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	4500 psi ready mix	36				CTS	48
Surface	Class A	1,034	15.6	1.23	1,275	CTS	8
Coal							
Intermediate 1	Class A	861	15.6	1.13	977	CTS	8
Intermediate 2							
Intermediate 3							
Production	Class A	3,565	14.5	1.16	4,137	1,847'	48
Tubing							

Drillers TD (ft) 19,463' Loggers TD (ft) 19,433'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure NA

Kick off depth (ft) 6,368'

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

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Surface: Bow spring centralizers every 3rd joint or approximately 120'

Intermediate: Bow spring centralizers every 3rd joint or approximately 120'

Production: Rigid body centralizers placed at a minimum of every other joint (~80') from TD to surface

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

API 47-061 - 01836

Farm name Jerry L. Yost et al

Well number 4H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	See Attached				

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
	See	Attached						

Please insert additional pages as applicable.

API 47- 061 - 01836 Farm name Jerry L. Yost et al Well number 4H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>8,084'</u> TVD	<u>19,463'</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2,242 psi Bottom Hole 3,120 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 1,265 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd
GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION TOP DEPTH IN FT BOTTOM DEPTH IN FT TOP DEPTH IN FT BOTTOM DEPTH IN FT DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H₂S, ETC)

LITHOLOGY/ FORMATION	TOP DEPTH IN FT	BOTTOM DEPTH IN FT	TOP DEPTH IN FT	BOTTOM DEPTH IN FT	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 Drilling Company
Address 400 Town Center Blvd, Suite 240 City Canonsburg State PA Zip 15317

Logging Company Baker Hughes
Address 837 Phillippi Pike City Clarksburg State WV Zip 26301

Cementing Company C&J Energy Services
Address 528 Industrial Park Rd City Jane Lew State WV Zip 26378

Stimulating Company ProFrac
Address 800 Mountain View Drive City Smithfield State PA Zip 15478

Please insert additional pages as applicable.

Completed by Hollie Medley Telephone 304.212.0422
Signature Hollie Medley Title Regulatory Manager Date 4-23-20

Cummins 4H Perforation Information

Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	11/26/19	19,287	0	0
2	11/27/19	19,089	19,244	40
3	11/27/19	18,892	19,047	40
4	11/28/19	18,695	18,851	40
5	11/29/19	18,499	18,654	40
6	11/29/19	18,565	18,720	40
7	11/29/19	18,105	18,261	40
8	11/30/19	17,909	18,064	40
9	11/30/19	17,712	17,867	40
10	12/1/19	17,515	17,671	40
11	12/1/19	17,319	17,474	40
12	12/2/19	17,122	17,277	40
13	12/2/19	16,925	17,081	40
14	12/3/19	16,729	16,884	40
15	12/3/19	16,532	16,687	40
16	12/4/19	16,335	16,491	40
17	12/4/19	16,139	16,294	40
18	12/5/19	15,942	16,097	40
19	12/5/19	15,745	15,901	40
20	12/6/19	15,549	15,704	40
21	12/6/19	15,352	15,507	40
22	12/6/19	15,173	15,311	40
23	12/7/19	14,959	15,114	40
24	12/8/19	14,762	14,917	40
25	12/8/19	14,565	14,721	40
26	12/9/19	14,369	14,524	40
27	12/9/19	14,172	14,327	40
28	12/9/19	13,975	14,131	40
29	12/10/19	13,779	13,934	40
30	12/10/19	13,582	13,737	40
31	12/11/19	13,385	13,541	40
32	12/11/19	13,189	13,344	40
33	12/12/19	12,992	13,147	40
34	12/13/19	12,795	12,951	40
35	12/13/19	12,599	12,754	40
36	12/13/19	12,402	12,557	40
37	12/14/19	12,205	12,361	40
38	12/14/19	12,009	12,164	40
39	12/15/19	11,812	11,967	40
40	12/15/19	11,615	11,771	40
41	12/16/19	11,419	11,574	40
42	12/16/19	11,222	11,377	40
43	12/17/19	11,025	11,181	40
44	12/17/19	10,829	10,984	40
45	1/5/20	10,632	10,787	40
46	1/5/20	10,436	10,591	40
47	1/5/20	10,239	10,394	40
48	1/6/20	10,042	10,198	40
49	1/6/20	9,846	10,001	40
50	1/6/20	9,649	9,804	40
51	1/7/20	9,452	9,608	40
52	1/7/20	9,256	9,411	40
53	1/7/20	9,059	9,214	40
54	1/7/20	8,862	9,018	40

Cummins 4H Stimulation Information

Stage Number	Report Date	ISIP (psi)	Breakdown Pressure (psi)	Avg Treating Pressure (psi)	Avg Treating Rate (BPM)	Pad Volume (bbls)	Total Clean Fluid (Bbls)	Total Proppant Amount (lbs)	Flush Volume (bbls)
1	11/26/19	5,449	0	9,676	87	541	6,673	300,940	439
2	11/27/19	5,047	6,620	9,967	84	36	10,403	500,700	429
3	11/27/19	5,953	6,622	10,011	87	15	10,323	500,040	428
4	11/28/19	5,385	6,251	9,873	87	22	10,270	500,060	419
5	11/29/19	5,996	7,357	9,581	89	125	10,448	500,620	413
6	11/29/19	5,974	6,049	9,558	90	34	10,388	501,820	559
7	11/29/19	5,809	6,250	9,633	87	61	10,428	500,680	405
8	11/30/19	5,598	6,050	9,546	90	18	9,962	504,920	402
9	11/30/19	5,885	6,206	9,607	87	76	9,979	500,160	398
10	12/1/19	6,207	6,256	9,653	84	50	12,955	450,920	388
11	12/1/19	5,333	6,111	9,426	87	26	10,269	500,680	387
12	12/2/19	6,356	6,113	9,446	83	64	8,061	378,100	443
13	12/2/19	6,087	5,960	9,701	83	31	11,861	500,840	379
14	12/3/19	6,247	5,950	9,407	88	12	10,313	500,560	375
15	12/3/19	5,619	6,123	9,288	88	42	9,481	500,140	371
16	12/4/19	6,159	6,396	9,372	86	106	10,508	503,800	368
17	12/4/19	6,358	6,082	9,384	86	14	9,846	504,720	362
18	12/5/19	5,646	5,042	9,419	89	84	10,103	500,240	360
19	12/5/19	6,381	6,160	9,219	89	17	9,710	500,940	360
20	12/6/19	5,346	5,165	9,017	85	17	9,262	414,040	433
21	12/6/19	6,204	5,838	9,055	84	148	10,287	500,860	355
22	12/6/19	6,065	6,219	9,221	82	429	14,316	471,260	445
23	12/7/19	6,032	6,157	9,063	84	22	9,845	465,900	336
24	12/8/19	5,302	6,101	8,980	85	51	10,995	500,100	335
25	12/8/19	5,455	6,074	9,122	84	219	9,969	503,620	327
26	12/9/19	5,981	5,901	8,748	81	10	9,886	499,520	336
27	12/9/19	6,292	6,080	9,002	87	131	10,293	500,020	318
28	12/9/19	6,370	6,317	9,328	78	38	10,526	450,720	315
29	12/10/19	6,210	6,414	9,438	83	99	10,574	500,600	314
30	12/10/19	6,429	6,351	8,786	86	20	10,128	500,560	305
31	12/11/19	6,265	6,412	9,172	91	30	9,257	503,900	303
32	12/11/19	6,386	6,941	8,911	87	25	9,549	499,820	296
33	12/12/19	6,182	6,703	8,804	87	62	10,097	500,900	294
34	12/13/19	6,333	6,587	8,967	86	106	12,191	501,100	290
35	12/13/19	6,168	6,770	9,028	88	29	10,163	500,420	285
36	12/13/19	6,201	6,132	8,377	83	45	10,271	506,460	279
37	12/14/19	6,012	6,227	8,600	90	22	10,081	500,540	275
38	12/14/19	6,615	5,679	8,565	86	22	10,051	503,160	270
39	12/15/19	6,196	6,621	8,580	88	43	9,811	461,660	265
40	12/15/19	5,668	6,931	8,697	85	65	10,213	504,800	262
41	12/16/19	6,178	7,524	8,364	88	25	10,261	500,500	256
42	12/16/19	6,124	6,174	8,435	88	23	10,012	491,360	251
43	12/17/19	6,192	6,420	8,793	88	48	10,453	500,160	250
44	12/17/19	5,644	5,962	8,162	88	47	10,094	499,020	244
45	1/5/20	5,815	6,410	8,531	59	40	8,604	107,840	100
46	1/5/20	5,968	0	7,356	80	478	10,620	500,920	234
47	1/5/20	5,942	7,085	7,675	80	258	11,223	500,480	230
48	1/6/20	5,905	6,130	7,586	80	203	10,264	499,680	226
49	1/6/20	5,614	7,136	7,817	80	30	10,307	500,100	222
50	1/6/20	6,541	6,867	7,805	80	74	10,193	501,220	218
51	1/7/20	7,080	6,314	7,875	80	62	10,199	500,930	214
52	1/7/20	6,466	6,465	7,691	80	68	10,221	502,480	208
53	1/7/20	6,092	6,513	7,951	79	65	10,601	490,060	325
54	1/7/20	6,180	6,468	7,890	80	68	10,152	491,440	208

Cummins Lithology

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Sand/silt	0	210	Sand/silt
silt/red shale	210	382	silt/red shale
coal/silt	382	400	coal/silt
limestone/siltstone/sandstone	400	530	limestone/siltstone/sandstone
coal	530	540	coal
siltstone/limestone/shale	540	710	siltstone/limestone/shale
limestone/siltstone	710	750	limestone/siltstone
siltstone/sandstone	750	802	siltstone/sandstone
coal	802	810	coal
sandstone/siltstone/limestone	810	862	sandstone/siltstone/limestone
coal	862	866	coal
sandstone/limestone	866	906	sandstone/limestone
coal - Pittsburgh	906	915	coal - Pittsburgh
Limestone/siltstone	915	1010	Limestone/siltstone
sandstone	1010	1030	sandstone
sandstone/siltstone/red shale	1030	1250	sandstone/siltstone/red shale
siltstone/sandstone	1250	1330	siltstone/sandstone
sandstone	1330	1340	sandstone
sandstone/siltstone/shale	1340	2010	sandstone/siltstone/shale
sandstone	2010	2040	sandstone
sandstone/siltstone/red shale	2040	2120	sandstone/siltstone/red shale
Little Lime	2123	2204	Little Lime
Big Lime	2204	2270	Big Lime
Big Injun Sandstone	2270	2365	Big Injun Sandstone
Siltstone	2365	2460	Siltstone
Berea Sandstone	2460	2470	Berea Sandstone
siltstone/shale	2470	2721	siltstone/shale
Gantz sandstone	2721	2730	Gantz sandstone
Gordon Sandstones	2730	3210	Gordon Sandstones
Upper Devonian Sands/silts	3210	5800	Upper Devonian Sands/silts
Elk siltstones and shales	5800	6500	Elk siltstones and shales
siltstone/gray shale	6500	7364	siltstone/gray shale
Middlesex shale/silt	7364	7667	Middlesex shale/silt
Burkett shale	7667	7846	Burkett shale
Geneseo shale	7846	7899	Geneseo shale
Tully Limestone	7899	7980	Tully Limestone
Hamilton shale	7980	8084	Hamilton shale
Marcellus shale	8084	TD	Marcellus shale



Ticket #: 0

Remit to:
 Lightning Energy Services
 104 Heliport Loop Road
 Bridgeport, WV 26330

Job Times				
Date:	On Loc:	Job Start:	Job End:	Off Loc:
	07/25/19			07/25/19
Time:	1:00pm	4:46pm	7:15 PM	9:00pm

Customer and Well Information					
Customer: NORTHEAST		Well Name: CUMMINS		Well #: 4H	Well Type: GAS
County:	State: WV	AFE #/API #: 47-061-01836		PO #/Permit #:	Well Class:
Field:		Lease: CUMMINS		Rig Name/# : DECKER RIG 8	
Wellbore Information					
Bit Size (Inches): 17.5	Well MD (ft):	Well TVD (ft): 1356	BHST (F°):	BHCT (F°):	Deviation (°):
Drilling Fluid Type:	Drilling Fluid Density (ppg):		Packer Depth (ft):	Treating Down:	
Previous Casing/Liner					
Size (Inches): 24	Weight (lb/ft):	Thread:	Grade:	Total Footage (ft): 50	
Casing/Liner/Tubing					
Size (Inches): 13.375	Weight (lb/ft): 54.5	Thread:	Grade:	Total Footage (ft): 1336	
Job					
Job Type:		Connection to Well: YES		Top Plug: YES	
Lift Pressure (PSI): 490	Max Annulus Pressure (PSI):		Mix Water Temp (F°):	Bottom Plug: No	
Casing/Tubing Secured : YES		Pipe Rotated: No	Cement Return to Surface (bbl): 32	Top Job (bbl): no	
Pipe Reciprocated : No	Circulation Lost: No	Job Completed: YES			



Ticket #: 0

Remit to:
 Lightning Energy Services
 104 Heliport Loop Road
 Bridgeport, WV 26330

Job Times				
On Loc:	Job Start:	Job End:	Off Loc:	
Date: 07/27/19			07/27/19	
Time: 1:00pm	2:38pm			

Customer and Well Information					
Customer: NORTHEAST		Well Name: CUMMINS	Well #: 4H	Well Type: GAS	
County:	State: WV	AFE #/API #: 100414-602	PO #/Permit #:	Well Class:	
Field:	Lease: CUMMINS	Rig Name/# : DECKER RIG 8			
Wellbore Information					
Bit Size (Inches): 12.25	Well MD (ft):	Well TVD (ft): 2515	BHST (F°):	BHCT (F°):	Deviation (°):
Drilling Fluid Type:	Drilling Fluid Density (ppg):	Packer Depth (ft):	Treating Down:		
Previous Casing/Liner					
Size (Inches): 13.375	Weight (lb/ft): 54.5	Thread:	Grade:	Total Footage (ft): 1336	
Casing/Liner/Tubing					
Size (Inches): 9.625	Weight (lb/ft): 40	Thread:	Grade:	Total Footage (ft): 2474	
Job					
Job Type:		Connection to Well: YES		Top Plug: YES	
Lift Pressure (PSI): 1415	Max Annulus Pressure (PSI):	Mix Water Temp (F°):		Bottom Plug: No	
Casing/Tubing Secured : YES	Pipe Rotated: No	Cement Return to Surface (bbl): 18 bbl	Top Job (bbl): no		
Pipe Reciprocated : No	Circulation Lost: No	Job Completed: YES			

Cement Job Log

C&J ENERGY SERVICES		Customer: NORTHEAST NATURAL ENERGY LLC		Date: 10/9/2019	Serv. Supervisor: Dave Thorne						
		Cust. Rep.:		Ticket #: JWV1910-0004	Serv. Center Jane Lew - 3044						
Lease: Cummins - 4H		API Well #: 47-061-01836		County: Monongalia State: WV							
Well Type: Production		Rig: Patterson 334		Type of Job: CM-PROD. CASING							
Materials Furnished by C&J ENERGY SERVICES											
Plugs		Casing Hardware			Physical Slurry Properties						
			Sacks of Cement	Fluid Dens (lb/gal)	Excess	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Mix Water (bbls)		
13.5 ppg PureScrub Spacer w/Surfactant		+7.0 PPB CJX157011+1.1 GPB CJ880				13.5			100.00		
14.5 ppg Cement		50 % CJ010-74+50 % CJ910 +0.2 % CJX157011+0.25 % CJFCP013+0.4 % CJ415+0.15 % CJ504+0.3 % CJ511			3565	14.5	1.16	4.88	736.23 414		
Displacement									430.65		
0											
Displacement Chemicals:											
OPEN HOLE DATA				TUBULAR DATA							
12.25 in. O.H. (2,474 to 2,494 ft)		5.5 in. 20#, (0 to 19,419 ft)			SIZE WEIGHT	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
8.75 in. O.H. (2,494 to 6,350 ft)					5.5 20 #	BTC	19396.6	P-110	4.778	12640	11080
Mix Cem. Temperature °F	Lead Temp.	Middle Temp.	Tail Temp.								
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
9.625 in. 40# (0 to 2,474 ft)				TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
WELL FLUID			DISPLACEMENT FLUID			DIFF PRESS (psi)	CBG LIFT (psi)	MAX PRESS (psi)	Total Number of Runs		WATER ON LOC (M)
TYPE	DENSITY	VOLUME	TYPE	DENSITY							
Mud	12.5 ppg	431 bbl	Water	8.3 ppg	2597	5898	6000			1600	

NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV

Field: Monongalia

Facility: Cummins Pad

Slot: Slot #04

Well: Cummins 4H

Wellbore: Cummins 4H PWB

Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (4701), US feet

North Reference: Grid north

Scale: True distance

Distances are in feet

Created by: athena on 2019-10-08

Database: WA_MPL_EASTERNUS_Dpth

True vertical depths are referenced to Patterson 334 (KB)

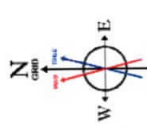
Measured depths are referenced to Patterson 334 (KB)

Patterson 334 (KB) to Mean Sea Level: 1363 feet

Mean Sea Level to Ground level (At Slot: Slot #04): -1358 feet

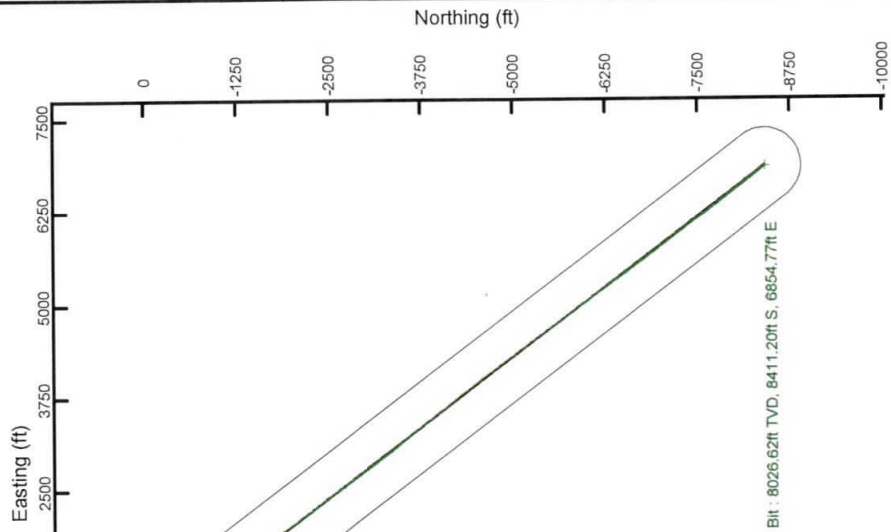
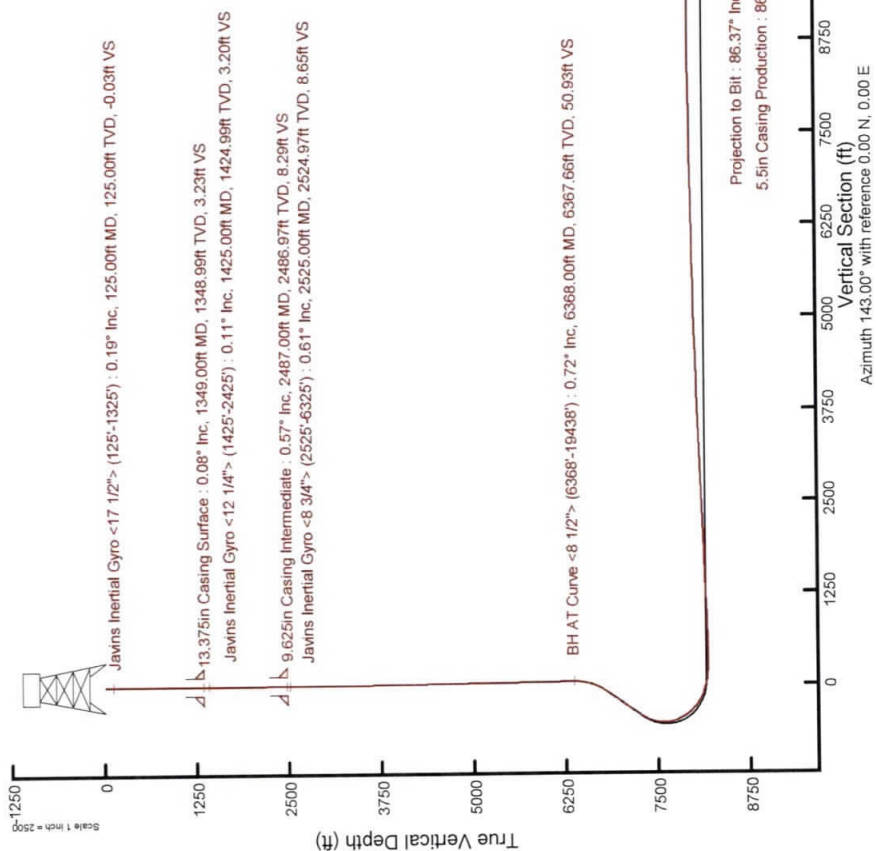
Coordinates are in feet referenced to Slot

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Cummins Pad	1776796.000	423931.400	80°10'51.454"W
Local E (ft)	Local N (ft)	Local E (US ft)	Local N (US ft)
5.46	19.29	1776815.291	423936.861
Slot #04	Slot #04	Slot #04	Slot #04
25f	25f	25f	25f
Mean Sea Level to Ground level (At Slot: Slot #04)	-1358f		
Patterson 334 (KB) to Mean Sea Level	1363f		
Comments			
API: 47-061-01836-0000			
BH Job #: 110037575A			
Rig: Patterson 334			
Duration: 10/02/2019 - 10/08/2019			



User specified Dip: 66.66° Field: 52119 nT
 Magnetic North is 9.53 degrees West of True North (as of 10/08/2019)
 To correct azimuth from True to Grid add 0.45 degrees
 To correct azimuth from Magnetic to Grid subtract 8.70 degrees

Javins Inertial Gyro <17 1/2"> (125'-1325') : 125.00ft TVD, 0.07ft S, 0.15ft W
 Javins Inertial Gyro <12 1/4"> (1425'-2425') : 1424.99ft TVD, 3.52ft S, 0.64ft E
 Javins Inertial Gyro <8 3/4"> (2525'-6325') : 2524.97ft TVD, 6.59ft S, 5.63ft E
 BH AT Curve <8 1/2"> (6368'-19438') : 6367.66ft TVD, 34.43ft S, 38.94ft E



Projection to Bit : 86.37° Inc, 19463.00ft MD, 8026.62ft TVD, 10842.79ft VS
 5.5in Casing Production : 86.36° Inc, 19419.00ft MD, 8023.83ft TVD, 10806.74ft VS



Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/26/2019
Job End Date:	1/7/2020
State:	West Virginia
County:	Monongalia
API Number:	47-061-01836-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Cummins 4H
Latitude:	39.66193400
Longitude:	-80.18089100
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,186
Total Base Water Volume (gal):	24,008,442
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	Northeast Natural Energy	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	88.25205	None
Sand (100 Mesh Proppant)	ProFrac	Proppant					
			Silica Substrate	14808-60-7	100.00000	8.17876	None
Sand (40/70 White Proppant)	ProFrac	Proppant					
			Silica Substrate	14808-60-7	100.00000	3.28351	None
Hydrochloric Acid (7.5%)	PVS	Acidizing					
			Water	7732-18-5	85.00000	0.16687	None
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	36.00000	0.07067	None
StimSTREAM FR 9800	ChemStream	Friction Reducer					
			Butene, homopolymer	9003-29-6	25.00000	0.01284	None
			Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01284	None
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00154	None
Clearal 268	ChemStream	Biocide					
			Non-hazardous substances	Proprietary	90.00000	0.01663	None

			Glutaraldehyde	111-30-8	20.00000	0.00370	None
			Didecyl dimethyl ammonium chloride	7173-51-5	3.00000	0.00055	None
			Alkyl dimethyl benzyl ammonium chloride	68391-01-5	3.00000	0.00055	None
StimSTREAM SC-398	ChemStream	Scale Inhibitor	Non-hazardous substances	Proprietary	100.00000	0.01836	None
			Bis(Hexamethylene Triamine Penta(Methylene Phosphonic Acid) (BHMT)	34690-00-1	10.00000	0.00184	None
ProFE 105	ProFrac	Iron Control	Citric Acid	77-92-9	50.50000	0.00035	None
			Water	7732-18-5	49.50000	0.00034	None
ProHib 100	ProFrac	Acid Inhibitor	Methyl alcohol	67-56-1	45.00000	0.00022	None
			Ethylene glycol	107-21-1	20.00000	0.00010	None
			Isoquinoline	119-65-3	15.00000	0.00007	None
			Water	7732-18-5	10.00000	0.00005	None
			N,N-Dimethylformamide	68-12-2	10.00000	0.00005	None
			2-Butoxyethanol	111-76-2	5.00000	0.00002	None
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.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	85.00000	0.16687	
			Non-hazardous substances	Proprietary	100.00000	0.01836	
			Non-hazardous substances	Proprietary	90.00000	0.01663	
			Butene, homopolymer	9003-29-6	25.00000	0.01284	
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00154	
			Didecyl dimethyl ammonium chloride	7173-51-5	3.00000	0.00055	
			Alkyl dimethyl benzyl ammonium chloride	68391-01-5	3.00000	0.00055	
			Water	7732-18-5	49.50000	0.00034	
			Ethylene glycol	107-21-1	20.00000	0.00010	
			Isoquinoline	119-65-3	15.00000	0.00007	
			Water	7732-18-5	10.00000	0.00005	
			N,N-Dimethylformamide	68-12-2	10.00000	0.00005	
			2-Butoxyethanol	111-76-2	5.00000	0.00002	
			Alcohols, C11-14-iso-, C13-rich, ethoxylated	78330-21-9	5.00000		

* 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)



northeast

NATURAL ENERGY

April 28, 2020

WV Department of Environmental Protection
Office of Oil and Gas Management
601 57th Street, SE
Charleston, WV 25304-2345

RECEIVED
Office of Oil and Gas

MAY - 1 2020

WV Department of
Environmental Protection

RE: WR-35 Forms:
Cummins 4H, 8H, 10H
Lemley 2H, 6H, 12H, 14H
Clay District, Monongalia County, West Virginia

To Whom It May Concern:

Please find enclosed Northeast Natural Energy LLC's Well Operator's Report of Well Work Forms (WR-35) for our Cummins 4H, 8H, and 10H wells, as well as our Lemley 2H, 6H, 12H and 14H wells.

Should you have any questions please feel free to contact me at 304-212-0445 or by email at kbrooks@nne-llc.com.

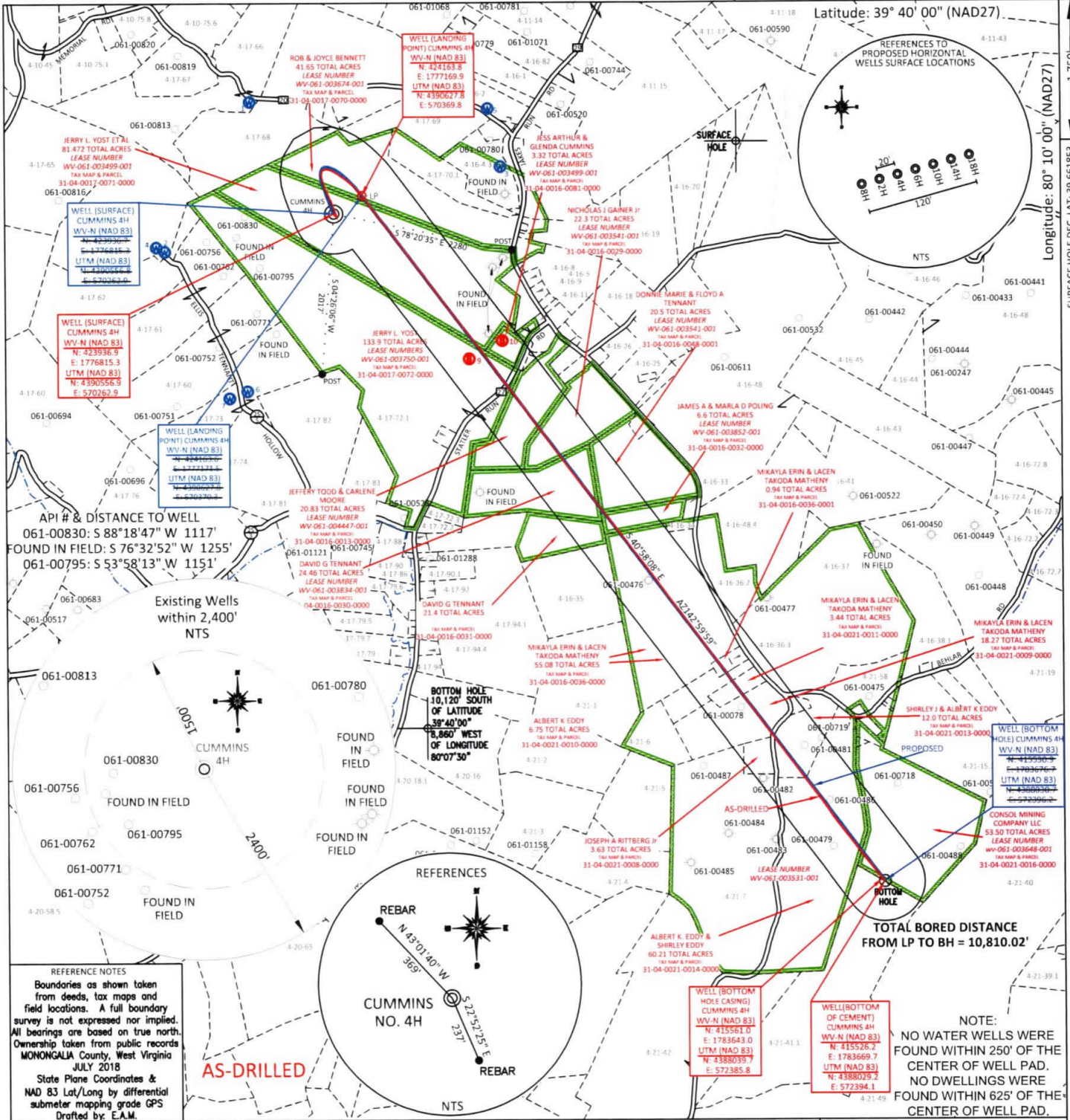
Sincerely,

Kristen Brooks

SURFACE HOLE DEC. LONG: 80.181096 SURVEYED LONG: 80°10'51.9"

Latitude: 39° 40' 00" (NAD27)

Longitude: 80° 10' 00" (NAD27)



REFERENCE NOTES
 Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records MONONGALIA County, West Virginia JULY 2018
 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
 Drafted by: E.A.M.

AS-DRILLED

NOTE:
 NO WATER WELLS WERE FOUND WITHIN 250' OF THE CENTER OF WELL PAD.
 NO DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF WELL PAD.

FILE #: NNE15
 DRAWING #: 2883
 SCALE: PLAT: 1" = 1800'
TICK: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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

Signed: [Signature]
 L.L.S. #2124 : Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
WVDEP
OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304
 Well Type: Oil Waste Diposal Production Deep
 Gas Liquid Injection Storage Shallow
 WATERSHED: DUNKARD CREEK
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: JERRY L. YOST ET AL
 OIL & GAS ROYALTY OWNER: NNE LLC, et al
 LEASE NUMBERS: _____

DATE: APRIL 21, 2020
 OPERATOR'S WELL #: CUMMINS 4H
 API WELL #: 47 61 01836
 STATE COUNTY PERMIT
 AS-BUILT ELEVATION: 1,358.80'
 QUADRANGLE: BLACKSVILLE
 ACREAGE: 81.472 +/-
 ACREAGE: 580.252 +/-
 DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____
 TARGET FORMATION: MARCELLUS
 ESTIMATED DEPTH: TVD: 8,070.5' TMD: 19,449.48'
TMD BH CASING: 19,419'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 DESIGNATED AGENT: JOHN ADAMS
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

SURFACE HOLE DEC. LAT: 39.661853 SURVEYED LAT: 39°39'42.7"