

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

APR 15 2019

API 47-061-01742 County Monongalia District Clay
Quad Blacksville Pad Name Jenkins Field/Pool Name Jenkins 4H WV Department of
Farm name Lois A. Jenkins Irrevocable Trust Well Number Jenkins 4H Environmental Protection
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia Street 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 4395837.9 Easting 573741.1
Landing Point of Curve Northing 4395757.1 Easting 573704.8
Bottom Hole Northing 4393058.3 Easting 575341.6

Elevation (ft) 1,128' 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 - 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 05/18/2017 Date drilling commenced 07/09/2017 Date drilling ceased 02/13/2018
Date completion activities began 05/17/2018 Date completion activities ceased 06/01/2018
Verbal plugging (Y/N) NA 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 1034' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2182' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 710' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
ADK 7/16/2019

Reviewed

API 47-061 - 01742 Farm name Lois A. Jenkins Irrevocable Trust Well number Jenkins 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"	40'	N	94.71	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1,094'	N	54.5	N/A	Y, 60 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,255'	N	40	N/A	Y, 40 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	18,713'	N	20	N/A	N, est. 1,334'
Tubing	N/A	2-7/8"	N/A	N	6.5	N/A	
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	4,500 PSI Grout	-	-	-	-	-	-
Surface	Class A	941	15.2	1.27	1195	CTS	8
Coal							
Intermediate 1	Class A	700	15.2	1.27	889	CTS	8
Intermediate 2							
Intermediate 3							
Production	Class A	3,496	14.5	1.19	4,138	1,334	48
Tubing							

Drillers TD (ft) 18741'

Loggers TD (ft) 18441'

Deepest formation penetrated Marcellus

Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) 6,188'

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

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

API 47- 061 - 01742 Farm name Lois A. Jenkins Irrevocable Trust Well number Jenkins 4H

PERFORATION RECORD

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

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 (bbbls)	Amount of Nitrogen/other (units)
						Please	See	Attachment
								RECEIVED Office of Oil and Gas

Please insert additional pages as applicable.

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API 47- 061 - 01742 Farm name Lois A. Jenkins Irrevocable Trust Well number Jenkins 4H

PRODUCING FORMATION(S)

DEPTHS

Marcellus 7860' TVD 18,741 MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow Flow Pump
 SHUT-IN PRESSURE Surface 3233 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 2263 mcfpd _____ bpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT	BOTTOM DEPTH IN FT	TOP MD	BOTTOM MD	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	<u>0</u>		<u>0</u>					Please See Attachment <u>SEE ATTACHED</u>

Please insert additional pages as applicable.

Drilling Contractor Patterson-UTI Drilling Company
 Address 207 Carlton Drive City Eighty Four State PA Zip 15330

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

Cementing Company BJ Services
 Address 11211 FM 2920 Rd City Tomball State TX Zip 77375

Stimulating Company Producers Service Corporation
 Address 109 Graham St City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Hollie Medley Title Regulatory Manager Telephone 304-212-0422 Office of Oil and Gas
 Signature _____ Date 3-20-19 **RECEIVED**
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Stimulation Information Per Stage - Jenkins 4H

Stage Number	Report Date	Avg Treating Rate (BPM)	Avg Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Proppant Amount (lbs)	Flush Volume (bbbls)	Clean Fluid (bbbls)	Amount of Water (bbbls)
1	5/16/2018	80	8,993	8,500	#N/A	301,320	218	7,083	7,301
2	5/17/2018	80	8,559	6,102	5,740	355,360	411	7,549	7,960
3	5/17/2018	80	9,171	6,081	5,521	350,840	410	7,621	8,031
4	5/17/2018	80	9,297	6,934	#N/A	321,180	401	7,186	7,587
5	5/17/2018	80	9,298	6,309	5,619	302,540	297	6,627	6,924
6	5/18/2018	80	9,463	6,616	5,899	302,520	405	6,379	6,784
7	5/18/2018	81	9,511	6,931	6,035	304,540	390	6,492	6,882
8	5/18/2018	78	9,203	6,570	5,603	301,020	382	6,394	6,776
9	5/19/2018	78	9,254	6,822	5,992	300,530	379	6,206	6,585
10	5/19/2018	81	9,478	7,157	5,998	300,300	375	6,398	6,773
11	5/19/2018	81	9,437	6,769	5,695	330,600	368	7,293	7,661
12	5/19/2018	80	9,147	6,596	6,380	332,240	362	7,051	7,413
13	5/20/2018	80	8,685	7,559	6,596	330,380	365	7,170	7,535
14	5/20/2018	80	8,697	6,933	5,991	329,340	353	7,205	7,558
15	5/20/2018	79	9,457	7,058	6,607	329,940	352	7,170	7,522
16	5/20/2018	79	9,558	6,847	6,063	319,130	348	7,068	7,416
17	5/21/2018	80	9,246	6,776	5,633	330,960	348	7,384	7,732
18	5/21/2018	80	9,150	6,608	5,769	328,420	341	7,320	7,661
19	5/21/2018	80	9,177	6,932	5,997	330,720	335	7,332	7,667
20	5/22/2018	80	9,140	6,930	5,861	333,760	331	7,601	7,932
21	5/22/2018	82	9,319	6,882	5,695	347,980	329	7,379	7,708
22	5/22/2018	82	9,197	7,122	5,835	348,840	323	7,379	7,702
23	5/23/2018	80	8,615	6,926	5,759	349,920	321	7,478	7,799
24	5/23/2018	80	9,094	7,121	6,022	351,820	313	7,572	7,885
25	5/23/2018	82	8,900	6,478	5,523	349,680	309	7,580	7,889
26	5/23/2018	81	9,084	6,520	5,787	351,340	308	7,589	7,897
27	5/24/2018	80	8,813	6,891	6,075	357,380	297	7,704	8,001
28	5/24/2018	81	8,963	7,280	5,782	357,060	296	7,450	7,746
29	5/25/2018	82	9,166	7,320	5,887	355,260	292	7,516	7,808
30	5/25/2018	80	9,027	7,572	5,649	349,300	286	7,588	7,874
31	5/25/2018	79	9,040	7,418	6,190	350,780	291	7,533	7,824
32	5/26/2018	81	8,854	7,043	5,893	349,220	282	7,318	7,600
33	5/26/2018	83	9,032	7,054	6,218	351,260	274	7,638	7,912
34	5/26/2018	81	9,127	7,418	6,226	353,680	269	7,646	7,915
35	5/26/2018	81	8,983	6,956	6,001	354,860	265	7,637	7,902
36	5/27/2018	81	8,921	7,095	5,998	350,240	262	7,104	7,366
37	5/27/2018	80	8,771	7,345	6,114	353,200	254	7,573	7,827
38	5/27/2018	79	8,874	7,208	6,069	302,160	251	7,675	7,926
39	5/28/2018	81	8,736	7,222	6,525	352,360	298	7,166	7,464
40	5/28/2018	81	8,949	7,213	6,009	350,400	245	7,507	7,752
41	5/28/2018	81	8,533	7,222	6,268	349,480	243	7,366	7,609
42	5/29/2018	80	8,499	7,116	6,052	352,300	242	7,065	7,307
43	5/29/2018	80	8,529	7,379	5,869	349,920	230	7,064	7,294
44	5/29/2018	81	8,294	7,349	#N/A	350,580	0	7,226	7,226
45	5/29/2018	81	8,471	6,852	6,069	350,080	222	7,690	7,912
46	5/30/2018	79	8,331	7,275	5,985	318,060	266	6,547	6,813
47	5/30/2018	80	8,582	6,994	6,102	352,040	211	7,412	7,623
48	5/30/2018	79	8,341	7,155	#N/A	333,160	208	7,317	7,525
49	5/30/2018	80	8,460	7,015	5,973	343,280	204	7,223	7,427
50	5/31/2018	81	8,312	7,742	6,092	321,980	200	6,993	7,193
51	5/31/2018	81	8,313	6,768	6,026	352,560	197	7,578	7,775
52	5/31/2018	81	8,230	7,390	6,115	350,200	200	7,216	7,416
53	5/31/2018	79	8,825	7,654	5,349	351,040	182	7,224	7,406

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Perforation Record - Jenkins 4H

Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	5/16/2018	18,553	18,649	0
2	5/17/2018	18,352	18,509	40
3	5/17/2018	18,154	18,310	40
4	5/17/2018	17,956	18,112	40
5	5/17/2018	17,758	17,914	40
6	5/18/2018	17,560	17,716	40
7	5/18/2018	17,361	17,518	40
8	5/18/2018	17,163	17,320	40
9	5/19/2018	16,965	17,122	40
10	5/19/2018	16,767	16,923	40
11	5/19/2018	16,569	16,725	40
12	5/19/2018	16,371	16,527	40
13	5/20/2018	16,173	16,329	40
14	5/20/2018	15,974	16,131	40
15	5/20/2018	15,776	15,933	40
16	5/20/2018	15,578	15,735	40
17	5/21/2018	15,380	15,537	40
18	5/21/2018	15,182	15,338	40
19	5/21/2018	14,984	15,140	40
20	5/22/2018	14,786	14,942	40
21	5/22/2018	14,587	14,744	40
22	5/22/2018	14,389	14,546	40
23	5/23/2018	14,191	14,348	40
24	5/23/2018	13,992	14,150	40
25	5/23/2018	13,795	13,951	40
26	5/23/2018	13,597	13,753	40
27	5/24/2018	13,399	13,555	40
28	5/24/2018	13,200	13,357	40
29	5/25/2018	13,002	13,159	40
30	5/25/2018	12,804	12,961	40
31	5/25/2018	12,606	12,763	40
32	5/26/2018	12,408	12,564	40
33	5/26/2018	12,210	12,366	40
34	5/26/2018	12,012	12,168	40
35	5/26/2018	11,814	11,970	40
36	5/27/2018	11,615	11,772	40
37	5/27/2018	11,417	11,574	40
38	5/27/2018	11,219	11,376	40
39	5/28/2018	11,021	11,177	40
40	5/28/2018	10,823	10,979	40
41	5/28/2018	10,625	10,781	40
42	5/29/2018	10,427	10,583	40
43	5/29/2018	10,268	10,385	40
44	5/29/2018	10,030	10,187	40
45	5/29/2018	9,832	9,989	40
46	5/30/2018	9,634	9,791	40
47	5/30/2018	9,436	9,592	40
48	5/30/2018	9,238	9,394	40
49	5/30/2018	9,040	9,196	40
50	5/31/2018	8,841	8,998	40
51	5/31/2018	8,643	8,800	40
52	5/31/2018	8,445	8,602	40
53	5/31/2018	8,247	8,404	40

Lithology/Formation	Top Depth in FT Name TVD	Bottom Depth in FT TVD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
sand/shale	0	310	sand/shale
Sand	310	350	gray sand
coal	350	355	coal - (Washington)
shale	355	374	gray shale
coal	374	377	coal
shale	377	475	red and gray shale
shale	475	590	gray sandstone and shale interbedded
coal	590	598	coal - (Waynesburg)
sand/shale	598	710	brown sand/shale
coal	710	718	coal - (Pittsburgh)
sand/shale	718	1100	brown sand/shale
sand/shale	1100	1200	sand/shale interbedded
red shale	1200	1650	red rock - clay rich
sand/shale	1650	1880	brown sand/shale
Big Lime	1880	1935	limestone
Siltstone	1935	2000	siltstone
Big Injun	2000	2030	sandstone
sandstone/siltstone	2030	2700	interbedded sandstone and siltstone
red rock	2700	2950	clay rich red shale
sandstone/siltstone	2950	3852	interbedded sandstone and siltstone
sandstone	3852	3925	sandstone
siltstone/shale	3925	6100	interbedded brown siltstone and shale
shale	6100	6225	gray shale
silt/shale	6225	7190	mixed brown siltstone and brown/gray shale
Middlesex	7202	7425	light gray shale
Burkett	7425	7629	gray shale
Genesco	7629	7686	black shale
Tully	7686	7744	limestone
Mahantango	7744	7860	gray shale

API Permit #: 47-061-01742

Customer: Northeast

Lease and Well Names: Jenkins 4-H

A.F.E # : 100359-603



Job Type: 13 3-3
Cement Operator: Brian Fullum

Date Cemented: 7/8/2017

Drilling Contractor: Highlands #14

Cement Slurry Information							
No. of Sacks	Cement Blend Composition	Yield (ft ³ /sck)	Mix Water (gal/sck)	Density (lb/gal)	(bbl) Mix Water Of Slurry	(ft ³) Of Slurry	(bbl) Of Slurry
941	Type 1 + 2% CaCl ₂	1.27	5.76	15.2	129	1195	213
				Totals	129	1195	213

Wellbore Information			
	Top (ft)	Bottom (ft)	Collapse/Burst Pressures (psi)
Casing	0	1,090	
Previous Casing Tubing or Drillpipe	0	60	
Open Hole	60	1,110	
Open Hole			

Pumping Returns				Cement Slurry Temperature Record (°F)				Fluid Information				
Spacer or Gel Sweep Return Seen At Surface	Yes	Cement Blend 1	Reading 1	Reading 2	Reading 3	Average	Mix Water Temp (°F)	Displacement Fluid Type	Temp (°F)	Displacement Fluid Density (lb/gal)	Displacement Depth (ft)	Displacement (bbl)
Cement Returns Seen at Surface	Yes	Blend 1	95	95	95	95	85	Water	76		1,110	76
Amount of Cement Returns (BBL)	60	Blend 2						Water	76		1,950	8.3
		Blend 3										

Time	Rate (bpm)	Volume (bbl)	Pressure (psi)	Event or Stage Description
10:30				Arrive on Location
14:11	5	218	65	Hold Safety Meeting
14:50				Spot Trucks, Rig In
15:10	2	2	500	Pump recycled water to pump casing down
15:11				Shut down rack in cement head
15:14	5	50	1500	Test CPDS
15:24	4	10	110	Pressure Test Lines
15:26	5	212	90	Mix and pump gel with flake
16:06				Pump Fresh Water
16:07	5-3-3	162	180	Mix and Pump Lead Cement
16:41				Shut Down, Drop Plug
18:45				Displace Plug
18:00				Plug Lands, Shut Down
				Hold 5 Minutes, Release Pressure
				Floats Hold, Shut in Manifold
				Wash Up, Rack Out
				Leave Location

Comments:

PH-6
Hardness-200
SG-1.001

Thank You for your Business

UWS Cement Operator Signature:

Brian Fullum

Customer Representative Signature:

Brian Chalkin

API Permit #: 47-061-01742-00

Job Types: 9.625

Customer: NORTHEAST
 Lease and Well Names: JENKINS #4-H

Cement Operator: CURTIS NCKLOW
 Date Cemented: 7/11/2017



A.P.E.#: 100368-603

Drilling Contractor: HIGHLANDS #14

Cement Slurry Information						
No. of Sacks	Cement Blend Composition	Yield (ft³/sk)	Mix Water (gal/sk)	Density (lb/gal)	(bbl) Mix Water	(ft³) Of Slurry
700	Type 1 + 2% CaCl2	1.27	5.78	15.2	96	889
				Totals		
				96 889 158		

Wellbore Information				
	Diameter (in)	Weight (lb/ft)	Top (ft)	Bottom (ft)
Casing	9 5/8	40.0	2,240	0
Previous Casing				
Tubing or Drillpipe				
Open Hole				
Open Hole				

Pumping Returns				Cement Slurry Temperature Record (°F)			
Spacers or Gel Sweep	Return Seen At Surface	Yes	Blend 1	Blend 2	Blend 3	Average	Fluid Information
Cement Returns	Seen at Surface	Yes	87			87	Mix Water Temp (°F)
Amount of Cement Returns (BBL)		40					Displacement Fluid Type
							Displacement Fluid Temp (°F)
							Displacement Fluid Density (lb/gal)

Time	Rate (bpm)	Volume (bbl)	Pressure (psf)	Event or Stage Description
12:30				ARRIVED ON LOCATION
12:33				TALK TO CO.MAN
12:35				SPOT TRUCKS AND RACK IN
13:30				WAIT ON RIG TO RUN CASING
16:45				FINISH RACK IN
17:10				HOLD SAFETY MEETING
17:26	2	3	1000	WET LINES PRESSURE TEST
17:31	5	180	165	RUN WATER
18:05	5	25	185	RUN BENOTMITE 500 LBS
18:11	5	5	200	RUN WATER
18:12	5	169	285	MIX AND PUMP CEMENT
18:48	0	0	0	SHUT DOWN DROP PLUG
18:50	5/4/3	166	989	DISPLACE WATER
19:25		0	1100	PLUG BUMPED PUT 500LBS OVER
19:25		0	1455	WAIT 5 MINUTES TO CHECK FLOATS
19:30				FLOAT HELD .5 BBL'S BACK
19:40				CLEAN PUMP TRUCK
20:00				RACK OUT
20:30				LEAVE LOCATION

Comments:

PH 6 HARDNESS 220

Thank You for your Business

UWS Cement Operator Signature:

Customer Representative Signature:

CURTIS NCKLOW



Cementing Treatment

Start Date	2/12/2018	Well	Lois A Jenkins Irrevocable Trust 4H
End Date	2/12/2018	County	MONONGALIA
Client	NORTHEAST NATURAL ENERGY LLC	State/Province	WV
Client Field Rep	Jamie Czerneski	API	47-061-01742
Service Supervisor	Paul Christ	Formation	
Field Ticket No.	FT-03669-C9J5Z60202-39477	Rig	Paterson 334
District	Bridgeport, WV	Type of Job	Long String

WELL GEOMETRY

Type	ID (in)	OD (in)	Wt. (lb/ft)	MD (ft)	TVD (ft)	Excess(%)	Grade	Thread
Previous Casing	8.84	9.63	40.00	2,255.00	2,255.00	0.00	J-55	
Open Hole	8.50			18,749.00	7,921.00	0.00		
Casing	4.78	5.50	20.00	18,713.00	7,887.00		P-110	
Open Hole	8.75			6,200.00	6,200.00			

Shoe Length (ft): 37

HARDWARE

Bottom Plug Used?	Yes	Tool Type	Float Collar
Bottom Plug Provided By	Non BJ	Tool Depth (ft)	18,676.00
Bottom Plug Size	5.500	Max Tubing Pressure - Rated (psi)	
Top Plug Used?	Yes	Max Tubing Pressure - Operated (psi)	
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	8,800.00
Top Plug Size	5.500	Max Casing Pressure - Operated (psi)	6,000.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	BTC
Landing Collar Depth (ft)	18,676	Top Connection Size	5.5

CIRCULATION PRIOR TO JOB



Cementing Treatment

Well Circulated By	Rig	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	10 sec SGS	
Circulation Time (min)	120.00	10 min SGS	
Circulation Rate (bpm)	10.00	30 min SGS	
Circulation Volume (bbls)		Flare Prior to/during the Cement Job	No
Lost Circulation Prior to Cement Job	No	Gas Present	No
Mud Density In (ppg)	12.20	Gas Units	
Mud Density Out (ppg)			
PV Mud In			
PV Mud Out			
YP Mud In			
YP Mud Out			

TEMPERATURE

Ambient Temperature (°F)	32.00	Slurry Cement Temperature (°F)	68.00
Mix Water Temperature (°F)	66.00	Flow Line Temperature (°F)	

BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H ₂ O Req. (gals/sk)	Planned Top of Fluid (Ft)	Length (Ft)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	Integraguard RHEO 10 13.5 ppg	13.5000			0.00				100.0000
Tail Slurry	Single Slurry 14.5 ppg	14.5000	1.1859	5.18	1,255.00		3,496	4,138.0000	736.9000
Displacement	Inhibited Water	8.3400			17,803.00				20.0000
Displacement	Treated Water	8.3400			0.00				394.9000

Fluid Type	Fluid Name	Component	Concentration UOM
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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	6/2/2018
Job End Date	6/19/2018
State	West Virginia
County	Monongalia
API Number	47-061-01743-00-00
Operator Name	Northeast Natural Energy LLC
Well Name and Number	Jenkins 6H
Latitude	39.70920000
Longitude	-80.13960000
Datum	NAD83
Federal Well	NO
Indian Well	NO
True Vertical Depth	7,886
Total Base Water Volume (gal)	14,820,748
Total Base Non Water Volume	0

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.41930	None
Sand (Proppant)	Producers Service Corp	Proppant					
HC Acid (7.5%)	Producers Service Corp	Acidizing	Crystalline Silica (quartz)	14808-60-7	100.00000	11.97650	None
STIMLUBE HBVB	Producers Service Corp	Friction Reducer	Hydrochloric Acid	7647-01-0	15.00000	0.07996	None
SCAL16486A	Naico-Champion	Scale Inhibitor	Petroleum Distillates	64742-47-8	30.00000	0.01877	None
BIOC11219A	Naico-Champion	Bioicide	Ammonium Acetate	631-61-8	10.00000	0.00626	None
			Ethylene Glycol	107-21-1	30.00000	0.00163	None
			Amine Triphosphate	Proprietary	30.00000	0.00163	None
			Methanol	67-56-1	60.00000	0.00153	None
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00077	None
			Glutaraldehyde	111-30-8	10.00000	0.00026	None



PROHIB II	Producers Service Corp				
	Inhibitor				
			64-19-7	90.00000	0.00090None
			67-56-1	10.00000	0.00010None
			104-76-7	10.00000	0.00010None
			68603-42-9	5.00000	0.00005None
			111-42-2	1.00000	0.00010None
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		
			Ammonium Acetate	10.00000	0.00626
			Ethylene Glycol	30.00000	0.00163
			Benzyl-(C12-C16 Alkyl)- Dimethyl-Ammonium Chloride	30.00000	0.00077
			Glutaraldehyde	10.00000	0.00026
			67-56-1	10.00000	0.00010
			2-Ethylhexanol	10.00000	0.00010
			68603-42-9	5.00000	0.00005
			111-42-2	1.00000	0.00001

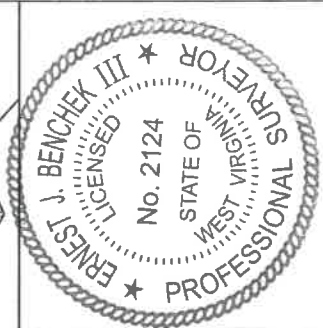
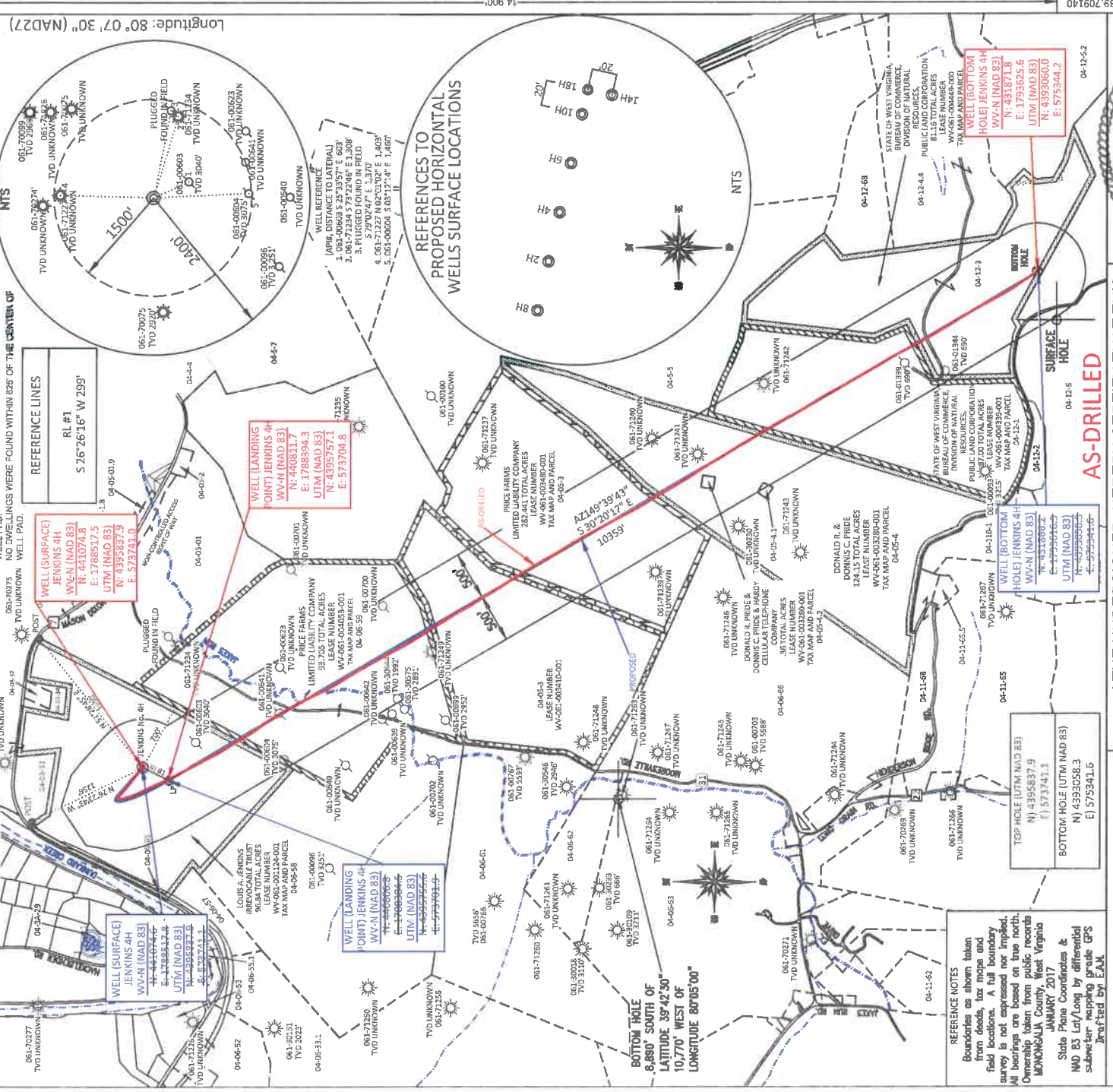
* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

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)

SURFACE HOLE DEC. LONG: 80.139966 SURVEYED LONG: 80° 08' 23.9" SURFACE HOLE DEC. LAT: 39.709140 SURVEYED LAT: 39° 42' 32.9"

Latitude: 39° 45' 00" (NAD27) Longitude: 80° 07' 30" (NAD27)

NOTE:
NO WATER WELLS WERE FOUND WITHIN 250' OF THE CENTER OF SURFACE HOLE.
NO DRILLINGS WERE FOUND WITHIN 625' OF THE CENTER OF SURFACE HOLE.



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

FILE #: NNE16
DRAWING #: 2733
SCALE: 1" = 1500'
1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WYDEP

OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

Well Type: Oil Waste Dipsal Production Deep Gas Liquid Injection Storage Shallow

WATERSHED: DUNKARD CREEK
COUNTY/DISTRICT: MONONGALIA / CLAY
SURFACE OWNER: LOIS A. JENKINS IRREVOCABLE TRUST
OIL & GAS ROYALTY OWNER: LOIS A. JENKINS IRREVOCABLE TRUST, ET AL
LEASE NUMBERS: _____

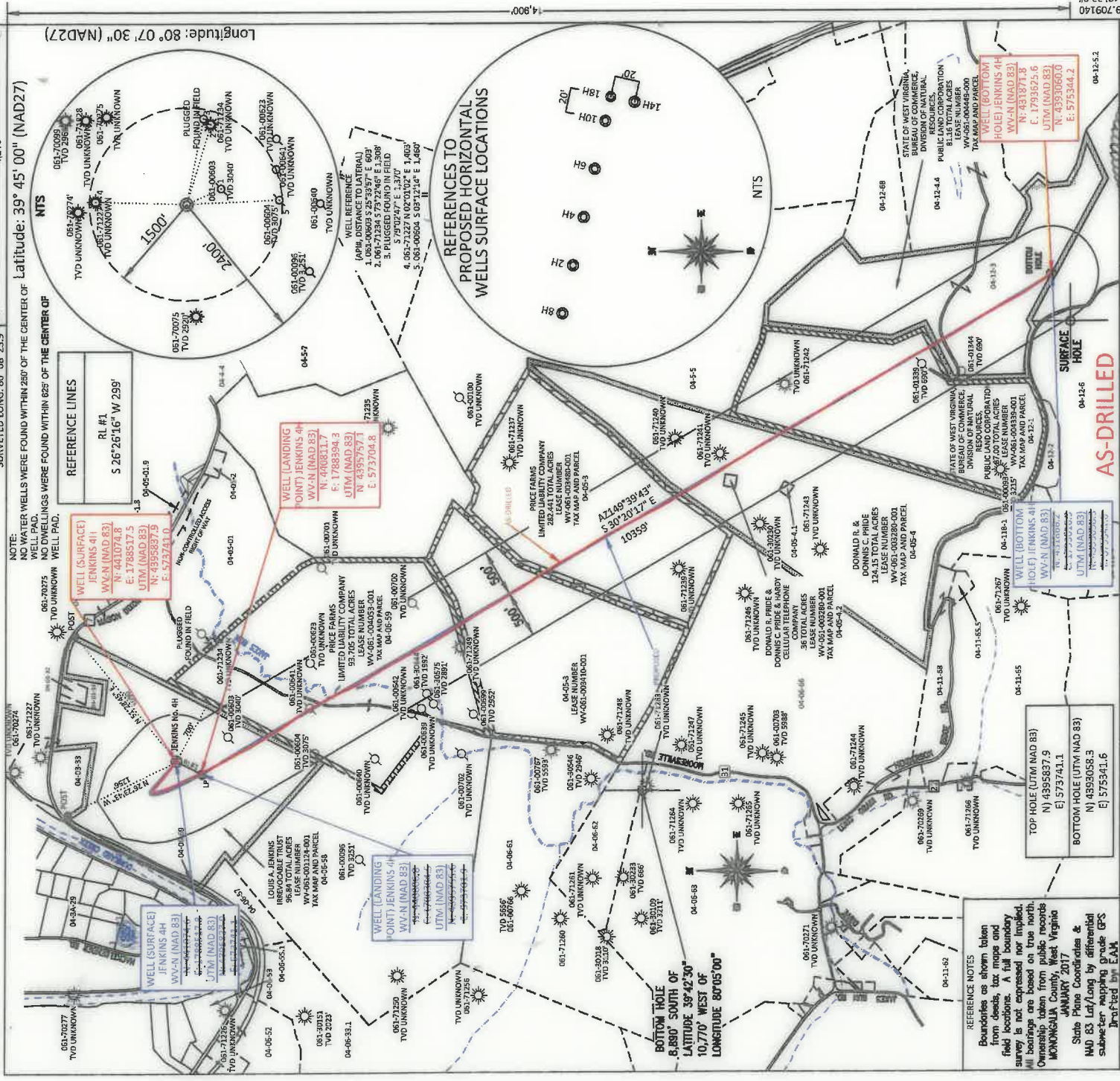
DATE: FEBRUARY 13, 2019
OPERATOR'S WELL #: JENKINS NO. 4H
API WELL #: 47 STATE COUNTY PERMIT
61 61
PROPOSED ELEVATION: 1,113.77'
CURRENT ELEVATION: 1,128'
QUADRANGLE: BLACKSVILLE
ACREAGE: 96.84 +/-
ACREAGE: 765.656 +/-

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: 7,886' TMD: 18,741'
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. LONGS: 80.139966 SURVEYED LONG: 80° 08' 23.9" SURFACE HOLE DEC. LAT: 39° 42' 32.9" SURVEYED LAT: 39° 42' 32.9"

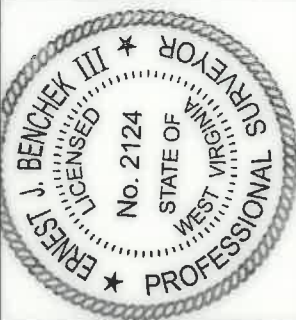
Latitude: 39° 45' 00" (NAD27) Longitude: 80° 07' 30" (NAD27)



FILE #: NNE16
 DRAWING #: 2733
 SCALE: PLAT: 1" = 1900' TIX: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMITTER 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 5TH STREET
 CHARLESTON, WV 25304

Well Type: Oil Waste Disposal Production Deep Shallow
 Gas Liquid Injection Storage DUNKARD CREEK
 WATERSHED: DUNKARD CREEK
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: LOIS A. JENKINS IRREVOCABLE TRUST
 OIL & GAS ROYALTY OWNER: LOIS A. JENKINS IRREVOCABLE TRUST, ET AL
 LEASE NUMBERS: OPERATOR'S WELL #: JENKINS NO. 4H
 API WELL #: 47 61 COUNTY PERMIT NO. 01742
 PROPOSED ELEVATION: 1,113.77'
 CURRENT ELEVATION: 1,128'
 QUADRANGLE: BLACKSVILLE
 ACREAGE: 96.84 +/-
 ACREAGE: 765.656 +/-

DATE: FEBRUARY 13, 2019

TARGET FORMATION: MARCELLUS
 ESTIMATED DEPTH: TVD: 7,886' TMD: 18,741'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 DESIGNATED AGENT: JOHN ADAMS
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

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 JANUARY 2017
 State Plane Coordinates & NAD 83 Lat/Long by differential sub-meter mapping grade GPS drafted by EAM