

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

API 47-061-01741 County Monongalia District Clay
Quad Blacksville Pad Name Jenkins Field/Pool Name _____
Farm name Lois A. Jenkins Irrevocable Trust Well Number Jenkins 2H
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 4395840.5 Easting 573729.4
Landing Point of Curve Northing 4395621.4 Easting 579560.7
Bottom Hole Northing 4393143.3 Easting 575069.5

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 07/01/2017 Date drilling ceased 02/03/2018
Date completion activities began 5/15/2018 Date completion activities ceased 6/1/2018
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 1034' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 2182' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 710' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

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Reviewed by: MAX 5/28/2018

WR-35
Rev. 8/23/13

API 47-061 - 01741 Farm name Lois A. Jenkins Irrevocable Trust Well number Jenkins 2H

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	Y, Grouted In
Surface	17-1/2"	13-3/8"	1,090'	N	54.5	N/A	Y,
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,247'	N	40	N/A	Y, 36 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	17,990'	N	20	N/A	N, Est 1,800'
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	-	-	3 Yds	-	-	-
Surface	Class A	1033	15.6	1.20	1,239	CTS	8
Coal							
Intermediate 1	Class A	697	15.2	1.27	889	CTS	8
Intermediate 2							
Intermediate 3							
Production	Class A	3,274	14.5	1.18	3,882	1,800'	48
Tubing							

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Drillers TD (ft) 18,026 Loggers TD (ft) 17,996
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure NA

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Kick off depth (ft) 6,008'

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 _____

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API 47- 061 - 01741 Farm name Lois A. Jenkins Irrevocable Trust Well number Jenkins 2H

PERFORATION RECORD

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

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Please insert additional pages as applicable.

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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)
	Please	see	attachment					

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS		
<u>Marcellus</u>	<u>7860'</u>	<u>TVD</u>	<u>18026'</u> MD
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3574 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 1605 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd
GAS MEASURED BY Estimated Orifice Pilot

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

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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 Philippi 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 Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Hollie Medley Telephone 304-212-0422
Signature Hollie Medley Title Regulatory Manager Date 3-25-19

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
Geneseo	7629	7686	black shale
Tully	7686	7744	limestone
Mahantango	7744	7860	gray shale
Marcellus	7860	7976	Black shale

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Stimulation Information Per Stage - Jenkins 2H

Stage Number	Report Date	Avg Treating Rate (BPM)	Avg Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Proppant Amount (lbs)	Flush Volume (bbls)	Clean Fluid (Bbls)	Amount Water (bbls)
1	5/15/2018	82	8,934	6,387	6,069	300,580	397	6,457	6,854
2	5/17/2018	77	9,180	7,239	6,777	352,020	478	7,537	8,015
3	5/17/2018	79	9,405	6,531	6,292	309,620	389	6,041	6,430
4	5/18/2018	81	9,517	6,966	5,923	300,700	384	6,362	6,746
5	5/13/2018	79	9,495	7,402	6,347	306,000	385	6,424	6,809
6	5/18/2018	78	9,278	6,231	6,374	300,820	376	6,297	6,673
7	5/19/2018	82	9,380	6,776	5,894	301,450	379	6,402	6,781
8	5/19/2018	81	9,523	7,127	6,067	300,300	367	6,286	6,653
9	5/19/2018	81	9,439	7,202	6,072	329,700	364	7,228	7,592
10	5/19/2018	79	9,282	6,697	6,047	331,030	364	6,849	7,213
11	5/20/2018	82	8,787	7,453	5,846	329,840	353	7,130	7,483
12	5/20/2018	81	9,049	6,944	5,846	334,240	350	7,417	7,767
13	5/20/2018	79	9,433	6,925	5,924	322,680	347	6,914	7,261
14	5/20/2018	80	9,121	6,578	5,758	331,530	343	7,008	7,351
15	5/21/2018	80	9,233	6,944	5,846	329,020	339	7,184	7,523
16	5/21/2018	84	9,306	6,787	5,894	330,600	330	7,332	7,662
17	5/22/2018	81	9,140	6,873	5,676	330,780	328	7,246	7,574
18	5/22/2018	81	9,122	6,272	6,079	329,400	321	7,165	7,486
19	5/22/2018	82	9,088	7,083	5,752	349,740	320	7,388	7,708
20	5/22/2018	81	8,964	7,016	5,922	354,000	314	7,667	7,981
21	5/23/2018	82	8,998	7,157	6,190	351,300	310	7,616	7,926
22	5/23/2018	79	8,793	7,645	6,069	355,500	306	7,352	7,658
23	5/23/2018	82	8,890	6,711	6,342	350,840	303	7,558	7,861
24	5/24/2018	80	8,780	7,137	5,969	351,340	296	7,615	7,911
25	5/24/2018	80	8,907	7,101	6,308	351,700	289	7,514	7,803
26	5/24/2018	68	9,615	7,167	6,020	294,560	284	7,998	8,282
27	5/25/2018	82	9,014	7,171	6,232	349,800	285	7,342	7,627
28	5/25/2018	80	8,858	7,231	#N/A	352,340	279	7,497	7,776
29	5/25/2018	80	8,706	6,957	6,474	350,960	276	7,298	7,574
30	5/26/2018	80	8,767	7,129	6,071	350,140	266	7,543	7,809
31	5/26/2018	80	8,938	7,400	5,653	286,220	263	6,826	7,089
32	5/26/2018	79	8,828	7,744	6,458	326,661	260	7,398	7,658
33	5/26/2018	81	8,792	6,952	6,098	349,300	258	7,059	7,317
34	5/27/2018	79	8,623	7,259	5,990	359,860	257	7,514	7,771
35	5/27/2018	83	8,655	7,176	6,054	349,980	250	7,206	7,456
36	5/27/2018	82	8,455	7,673	6,034	351,920	244	7,086	7,330
37	5/28/2018	82	8,247	7,679	5,869	347,860	240	7,137	7,377
38	5/28/2018	80	8,322	7,096	5,959	352,900	232	7,387	7,619
39	5/28/2018	80	8,305	7,140	5,863	351,320	227	7,112	7,339
40	5/29/2018	80	8,301	6,988	5,829	348,520	230	7,014	7,244
41	5/29/2018	78	8,610	7,186	#N/A	351,280	217	8,820	9,037
42	5/29/2018	82	8,502	7,623	6,141	330,860	204	7,127	7,331
43	5/29/2018	81	8,104	7,165	6,320	350,040	215	7,503	7,718
44	5/30/2018	80	8,357	7,191	6,189	353,980	204	8,196	8,400
45	5/30/2018	81	8,533	7,315	6,286	326,680	205	7,146	7,351
46	5/30/2018	80	8,177	7,407	6,075	289,340	193	6,687	6,880
47	5/31/2018	81	8,350	6,812	6,553	351,540	193	7,011	7,200
48	5/30/2018	79	8,341	7,155	#N/A	333,330	193	7,011	7,525

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Perforation Record - Jenkins 2H

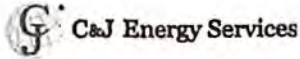
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	5/15/2018	17,836	17,931	0
2	5/17/2018	17,631	17,791	40
3	5/17/2018	17,430	17,589	40
4	5/18/2018	17,228	17,387	40
5	5/13/2018	17,026	17,185	40
6	5/18/2018	16,824	16,984	40
7	5/19/2018	16,623	16,782	40
8	5/19/2018	16,421	16,580	40
9	5/19/2018	16,219	16,379	40
10	5/19/2018	16,017	16,177	40
11	5/20/2018	15,816	15,975	40
12	5/20/2018	15,614	15,773	40
13	5/20/2018	15,412	15,572	40
14	5/20/2018	15,211	15,370	40
15	5/21/2018	15,009	15,168	40
16	5/21/2018	14,807	14,967	40
17	5/22/2018	14,605	14,765	40
18	5/22/2018	14,404	14,563	40
19	5/22/2018	14,202	14,361	40
20	5/22/2018	14,000	14,160	40
21	5/23/2018	13,799	13,958	40
22	5/23/2018	13,597	13,756	40
23	5/23/2018	13,435	13,554	40
24	5/24/2018	13,193	13,353	40
25	5/24/2018	12,992	13,151	40
26	5/24/2018	12,790	12,949	40
27	5/25/2018	12,588	12,748	40
28	5/25/2018	12,386	12,546	40
29	5/25/2018	12,185	12,344	40
30	5/26/2018	11,983	12,142	40
31	5/26/2018	11,781	11,941	40
32	5/26/2018	11,580	11,739	40
33	5/26/2018	11,378	11,537	40
34	5/27/2018	11,176	11,336	40
35	5/27/2018	10,974	11,134	40
36	5/27/2018	10,773	10,932	40
37	5/28/2018	10,571	10,730	40
38	5/28/2018	10,369	10,529	40
39	5/28/2018	10,168	10,327	40
40	5/29/2018	9,966	10,125	40
41	5/29/2018	9,764	9,923	40
42	5/29/2018	9,562	9,722	40
43	5/29/2018	9,363	9,520	40
44	5/30/2018	9,159	9,318	40
45	5/30/2018	8,957	9,117	40
46	5/30/2018	8,755	8,915	40
47	5/31/2018	8,554	8,713	40
48	5/30/2018	8,352	8,511	40

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DEVELOPER
SANDY HILL
SANDY HILL
SANDY HILL



Cement Job Log

Customer: NORTHEAST NATURAL ENERGY LLC		Date:		Serv. Supervisor: Jason Beeson							
Cust. Rep.: greg		Ticket #: JWV1707-0001		Serv. Center Jane Lew, WV							
Lease: Jenkins 2H		API Well #:		County: Monongalia State: WV							
Well Type:		Rig: US Energy 9-1		Type of Job: Surface Casing							
Materials Furnished by C&J ENERGY SERVICES											
Plugs		Casing Hardware		Physical Slurry Properties							
				Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbbls)	Mix Water (bbbls)		
Spacer 1:	6% Gel			-	8.7			50			
Lead											
Tail:	CJ910 + 2% CJ110 + 0.25 LB/SK CJ600			1033	15.6	1.20	5.21	220	128		
Displacement Chemicals:											
OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/MG/OP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
17 1/2		1031	Casing	13 3/8	54.5		1096		12.61		
PREVIOUS CASING DATA			PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS				
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
24	94.5	23.27	65					44	1052		
WELL FLUID		DISPLACEMENT FLUID			DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)				WATER ON LOC (bbl)
TYPE	DENSITY	VOLUME	TYPE	DENSITY							
		162.5 bbl	fresh	8.3 ppg	386	425	2000				600
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
9:30 PM							0 arrived on location				
9:45 PM							0 spot trucks rig up				
11:00 PM							0 safety meeting				
11:15 PM							0 psi test to 2000psi				
11:20 PM	6	135			195	195	processed water ahead wash down casing				
12:10 AM						195	shut down rig up cement head				
12:15 AM						195	psi test to 2000psi				
12:23 AM	4.5	110			50	245	gel spacer				
12:35 AM	4.5	145			10	255	h2o spacer established circulation				
12:38 AM	4.5	205			221	476	cement slurry @ 15.6 ppg				
12:51 AM	6	310				476	cement slurry @ 15.6 ppg				
1:04 AM	4.7	180				476	cement slurry @ 15.6 ppg				
1:16 AM	5	215				476	cement slurry @ 15.6 ppg				
1:28 AM						476	shut down drop plug				
1:30 AM	4.8	45			162.5	638.5	start displacement				
1:45 AM	5	280				638.5	cement to surface 80 bbl return				
1:55 AM	6	370				638.5	displacement				
1:58 AM	3	360				638.5	slow rate				
2:00 AM		900				638.5	bump plug				
2:05 AM							float held 2 bbl return				
Left Yard	7/1/17 7:30 PM			Left Loc.	7/2/17 3:00 AM			Start Pump	7/1/17 11:30 PM		
Arrived Loc.	7/1/17 9:30 AM			Returned Yd				End Pump	7/2/17 2:00 AM		
Bumped Plug (psi)	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Jason Beeson				
Yes	380	Yes	0	60	Yes	900	Service Supervisor				

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API Permit #:

Customer:

Lease and Well Name:

A.F.E #:



Job Type:

Cement Operator:

Date Cemented:

Drilling Contractor:

Cement Slurry Information										
No. of Sacks	Cement Blend Composition			Yield (ft ³ /sk)	Mix Water (gal/sk)	Density (lb/gal)	(bbl) Mix Water	(ft ³) Of Slurry	(bbl) Of Slurry	
700	Type 1 + 2% CaCl ₂			1.27	5.76	15.2	96	889	158	
							Totals	96	889	158

Wellbore Information									
	New/Used	Diameter (in)	Weight (lb/ft)	Top (ft)	Bottom (ft)	Collapse/Burst Pressures (psi)		Requested TOC (ft)	Surface
Casing	New	9 5/8	40.0	2,240	0			TVD (ft)	2,270
Previous Casing								Displacement Depth (ft)	
Tubing or Drillpipe								Displacement (bbl)	167.4
Open Hole									
Open Hole									

Pumping Returns			Cement Slurry Temperature Record (°F)					Fluid Information	
Spacer or Gel Sweep Return Seen At Surface	Yes		Cement	Reading 1	Reading 2	Reading 3	Average	Mix Water Temp (°F)	73
Cement Returns Seen at Surface	Yes		Blend 1	85			85	Displacement Fluid Type	Water
Amount of Cement Returns (BBL)	36		Blend 2					Displacement Fluid Temp (°F)	73
			Blend 3					Displacement Fluid Density (lb/gal)	8.3

Time	Rate (bpm)	Volume (bbl)	Pressure (psi)	Event or Stage Description
2:00				ARRIVED ON LOCATION
2:02				TALK TO CO.MAN
2:25				SPOT TRUCKS AND START RACK IN
3:30				WAIT ON RIG TO FINISH RUNNING CASING
				FINISH RACK IN
				HOLD SAFETY MEETING
14:15	3	3	2900	WET LINES PRESSURE TEST
14:17	5	165	99	RUN WATER
14:55	0	0	0	SHUT DOWN RIG HAD A PROBLEM
15:05	5	10	112	RUN WATER
15:07	5	25	134	RUN GEL SPACER
15:13	5	5	122	RUN WATER
15:14	5	159	242	MIX AND PUMP CEMENT
15:46	0	0	0	SHU DOWN DROP PLUG
15:48	5/4/3	167	1000	DISPLACE PLUG
16:28	0	0	1500	PLUG LANED BUMP 500 OVER PER. CO.MAN
16:28				WAIT 5 MINUTES CHECK FLOATS
16:31				FLOAT HELD 1 BBL BACK
16:35				CLEAN PUMP TRUCK
17:00				RACK OUT
18:00				LEAVE LOCATION

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Comments:

PH 6.5 HARDNESS 230 TEMP 73

Thank You for your Business

UWS Cement Operator Signature: _____

Customer Representative Signature: Brad Chodura

Cementing Treatment



Start Date	2/1/2018	Well	Lois A Jenkins Irrevocable Trust 2H
End Date	2/2/2018	County	MONONGALIA
Client	NORTHEAST NATURAL ENERGY LLC	State/Province	WV
Client Field Rep	Josh Grim	API	47-061-01741
Service Supervisor	Paul Christ	Formation	
Field Ticket No.	FT-03341-D255F30202-00098	Rig	Patterson 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
Open Hole	8.50			18,206.00	7,939.00	0.00		
Casing	4.78	5.50	20.00	17,982.00	7,939.00		P-110	
Previous Casing	8.84	9.63	40.00	2,247.00	2,247.00	0.00	J-55	

Shoe Length (ft): 45

HARDWARE

Bottom Plug Used?	Yes	Tool Type	Float Collar
Bottom Plug Provided By	Non BJ	Tool Depth (ft)	17,958.00
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)	6,200.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	BTC
Landing Collar Depth (ft)	17,958	Top Connection Size	5.5

CIRCULATION PRIOR TO JOB

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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)		Gas Units	
Mud Density Out (ppg)			
PV Mud In			
PV Mud Out			
YP Mud In			
YP Mud Out			

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TEMPERATURE

Ambient Temperature (°F)	23.00	Slurry Cement Temperature (°F)	58.00
Mix Water Temperature (°F)	55.00	Flow Line Temperature (°F)	

BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H2O Req. (gals/sk)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	IntegraGuard RHEO 10 13.5 ppg	13.5000					100.0000
Tail Slurry	Single Slurry 14.5 ppg	14.5000	1.1859	5.18	3,274	3,882.0000	691.3000
Displacement 1	Inhibited Water	8.3400				0.0000	20.0000
Displacement Final	Treated Water	8.3400				0.0000	378.9000

Fluid Type	Fluid Name	Component	Concentration	UOM
Spacer / Pre Flush / Flush	IntegraGuard RHEO 10 13.5 ppg	SURFACTANT, S-5	3.5000	GPB

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/5/2018
Job End Date:	5/14/2018
State:	West Virginia
County:	Monongalia
API Number:	47-061-01720-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Jenkins 8H
Latitude:	39.70920000
Longitude:	-80.13970000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,881
Total Base Water Volume (gal):	14,252,962
Total Base Non Water Volume:	0



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APR 15 2019

05/31/2019

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.41667	None
Sand (Proppant)	Producers Service Corp	Proppant					
IC Acid (7.5%)	Producers Service Corp	Acidizing	Crystalline Silica (quartz)	14808-60-7	100.00000	11.75471	None
STIMLUBE HBVB	Producers Service Corp	Friction Reducer	Hydrochloric Acid	7647-01-0	15.00000	0.11271	None
SCAL16486A	Naico-Champion	Scale Inhibitor	Petroleum Distillates	64742-47-8	30.00000	0.02033	None
			Ammonium Acetate	631-61-8	10.00000	0.00678	None
BIOC11219A	Naico-Champion	Biocide	Ethylene Glycol	107-21-1	30.00000	0.00163	None
			Amine Triphosphate	Proprietary	30.00000	0.00163	None
			Methanol	67-56-1	60.00000	0.00156	None
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00078	None
			Glutaraldehyde	111-30-8	10.00000	0.00026	None

PROHIB II	Producers Service Corp	Inhibitor					
		Acetic Acid	64-19-7		90.00000		0.00126 None
		2-Ethylhexanol	104-76-7		10.00000		0.00014 None
		Methanol	67-56-1		10.00000		0.00014 None
		Cocamide Diethanolamine	68603-42-9		5.00000		0.00007 None
		Diethanolamine	111-42-2		1.00000		0.00001 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					
		Ammonium Acetate	531-61-8		10.00000		0.00678
		Ethylene Glycol	107-21-1		30.00000		0.00163
		Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1		30.00000		0.00078
		Glutaraldehyde	111-30-8		10.00000		0.00026
		2-Ethylhexanol	104-76-7		10.00000		0.00014
		Methanol	67-56-1		10.00000		0.00014
		Cocamide Diethanolamine	68603-42-9		5.00000		0.00007
		Diethanolamine	111-42-2		1.00000		0.00001

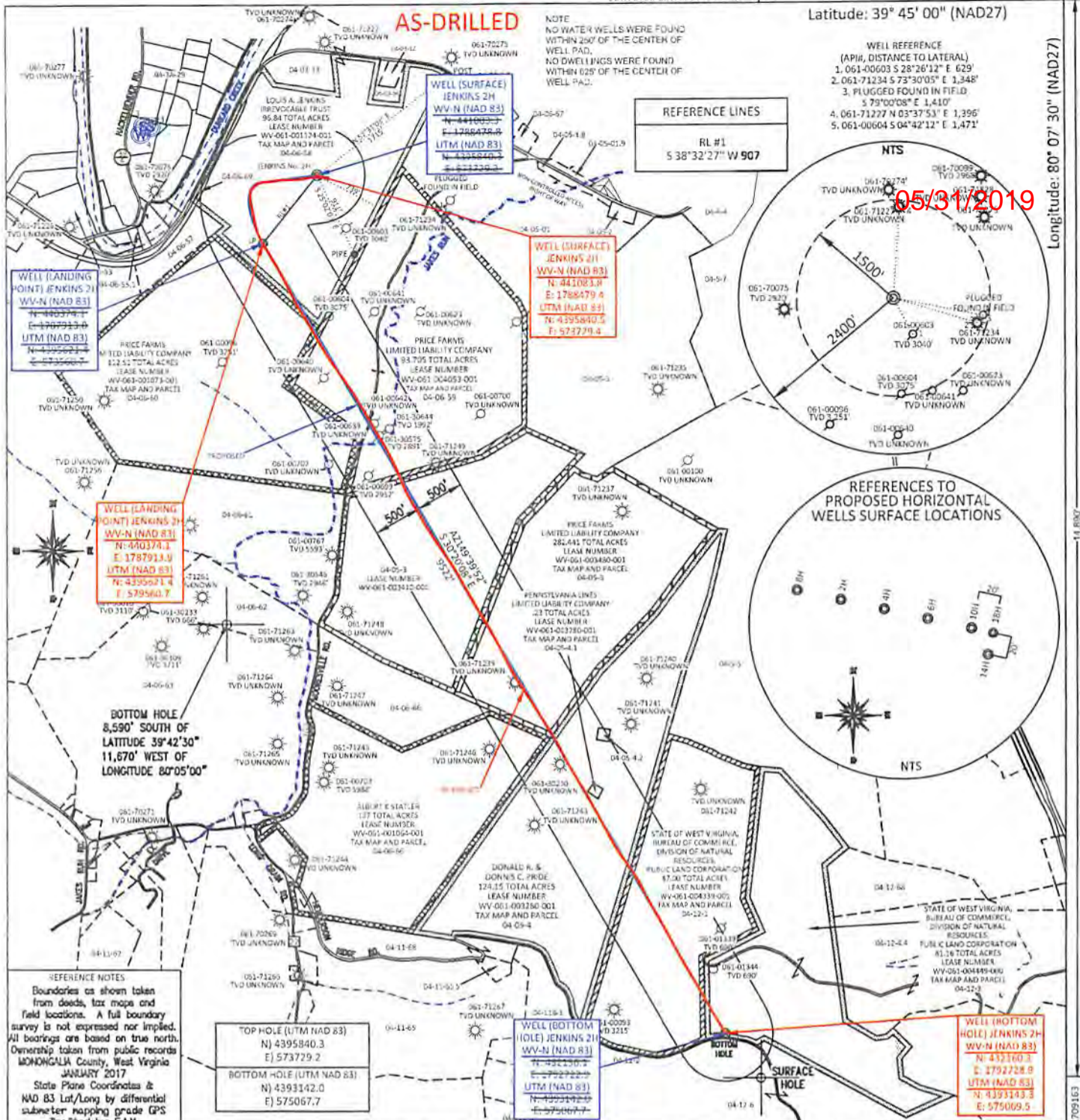
* Total Water Volume sources may include fresh water, produced water, and/or recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%

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)

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 OFFICE OF OIL AND GAS
 APR 15 2019

SURFACE HOLE DEC. LONG: 80.140105
SURVEYED LONG: 80° 08' 24.4"

Latitude: 39° 45' 00" (NAD27)



05/31/2019

FILE #: NNE16
DRAWING #: 2729
SCALE: 1" = 1500'
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: Ernest J. Benchek III
L.L.S. #2124 : Ernest J. Benchek III

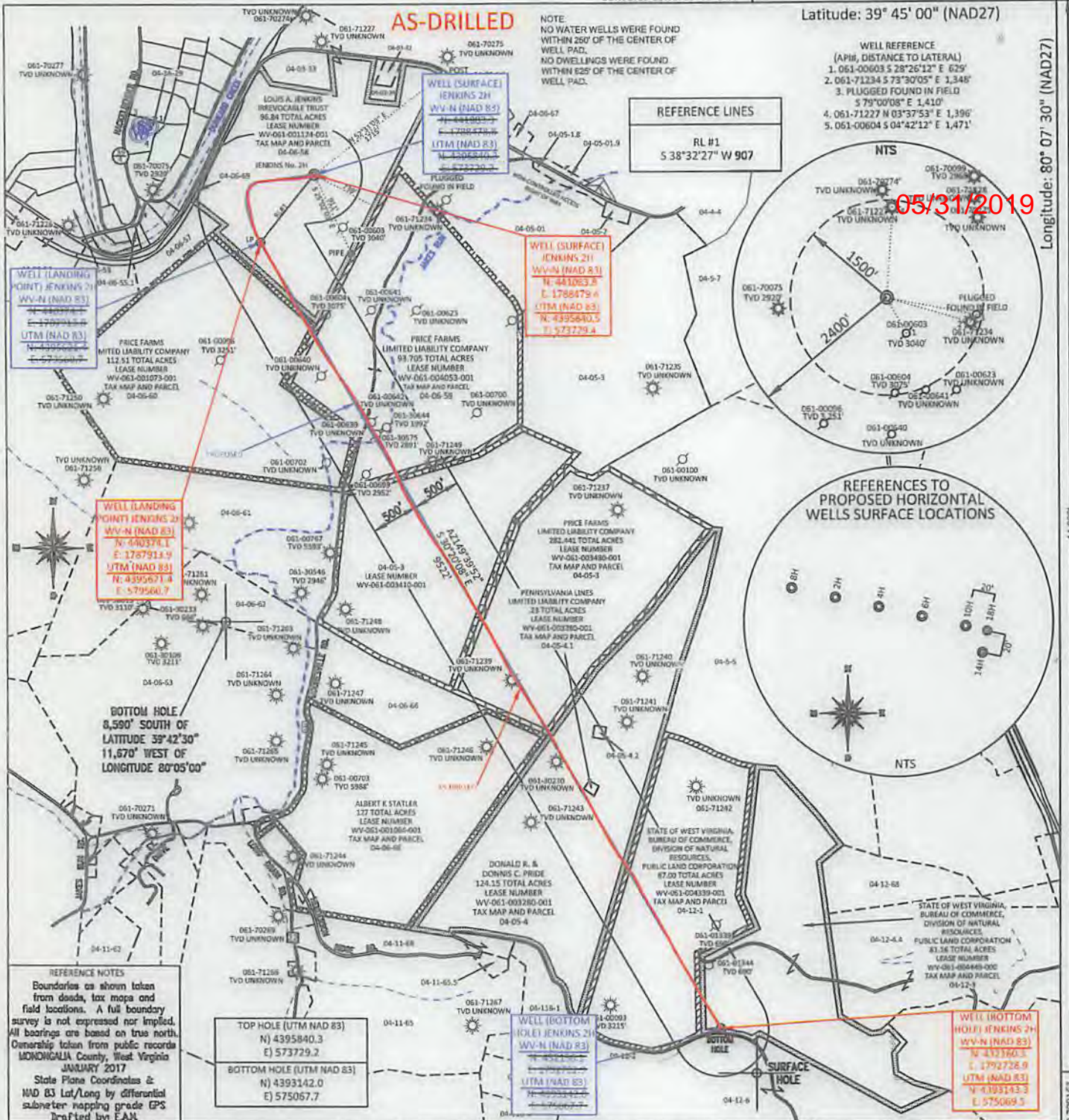


(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304
Well Type: Oil Waste Diposal Production Deep
 Gas Liquid Injection Storage Shallow
WATERSHED: DUNKARD CREEK
COUNTY/DISTRICT: MONONGALIA / CLAY
SURFACE OWNER: LOIS A. JENKINS IRREVOCABLE TRUST
OIL & GAS ROYALTY OWNER: LOIS A. JENKINS IRREVOCABLE TRUST, ET AL
LEASE NUMBERS:
TARGET FORMATION: MARCELLUS
WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301

DATE: FEBRUARY 13, 2019
OPERATOR'S WELL #: JENKINS NO.
API WELL #: 47 61
STATE COUNTY PERMIT
PROPOSED ELEVATION: 1,113.77'
CURRENT ELEVATION: 1,128'
QUADRANGLE: BLACKSVILLE
ACREAGE: 96.84 +/-
ACREAGE: 1,005.476 +/-
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY):
ESTIMATED DEPTH: TVD: 7,891' TMD: 18,026'
DESIGNATED AGENT: JOHN ADAMS
ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301

SURFACE HOLE DEC. LAT: 39.709163
SURVEYED LAT: 39° 42' 33.0"

RECEIVED
OIL AND GAS
6107



05/31/2019

FILE #: NNE16
DRAWING #: 2729
SCALE: PLAT: 1" = 1500'
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: 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. 2H
API WELL #: 47 61
STATE COUNTY PERMIT
PROPOSED ELEVATION: 1,113.77'
CURRENT ELEVATION: 1,128'
QUADRANGLE: BLACKSVILLE
ACREAGE: 96.84 +/-
ACREAGE: 1,005.476 +/-

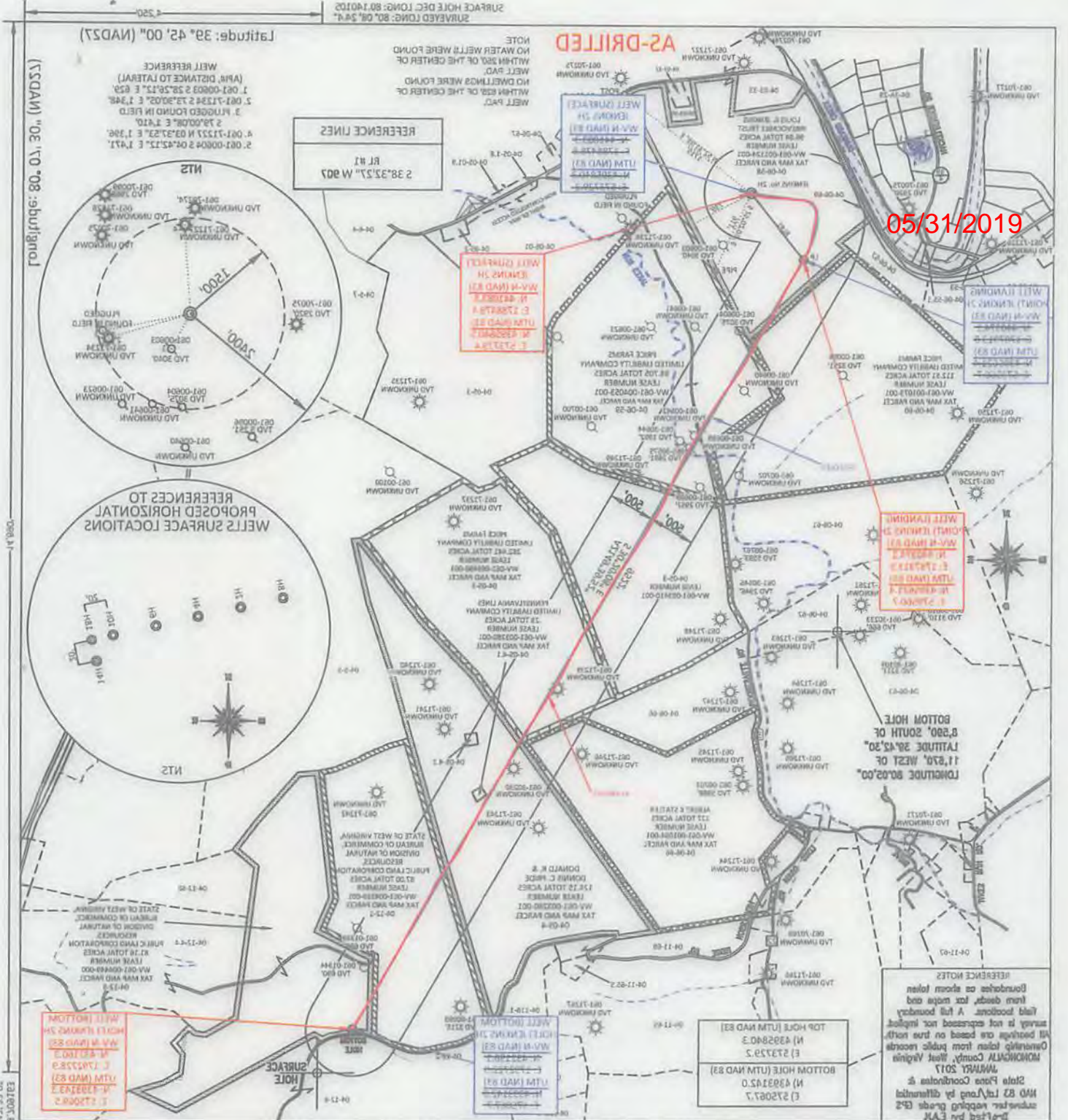
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 7,891' TMD: 18,026'
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: 39.759163 SURVEYED LAT: 39° 47' 33.0"

05/31/2019

A2-DRILLED



REFERENCE NOTES
 Boundaries as shown herein from deeds, tax maps and other sources. A full boundary survey is not expressed or implied. Ownership shown from public records. MONONGALIA County, West Virginia, January 2017. State Plane Coordinates & NAD 83 datum by differential adjustment, mapping grade (2'±) plotted by EAM.

FILE #:	INE16
DRAWING #:	2729
SCALE:	PLT: 1" = 150' TRK: 1" = 200'
MINIMUM DEGREE OF ACCURACY:	1/200
PROVEN SOURCE OF ELEVATION:	GRADE GPS
PROVEN SOURCE 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: _____
 L.J.S. #2124 : Ernest J. Benckek III



CITY: CHARLESTON STATE: WV ZIP CODE: 25301
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 TARGET FORMATION: MARCELLUS
 DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY):
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 LEASE NUMBERS: OIL & GAS ROYALTY OWNER: LOIS A JENKINS IRREVOCABLE TRST, ET AL
 SURFACE OWNER: LOIS A JENKINS IRREVOCABLE TRST
 COUNTY/DISTRICT: MONONGALIA / CLAY
 WATERSHED: DUNKARD CREEK
 Well Type: Oil Waste Disposal Production Deep Gas Liquid Injection Storage Shallow

DATE: FEBRUARY 13, 2019
 OPERATOR'S WELL #: JENKINS NO. 2H
 API WELL #: 47
 STATE COUNTY PERMIT
 PROPOSED ELEVATION: 1,113.77'
 CURRENT ELEVATION: 1,128'
 QUADRANGLE: BLACKSVILLE
 ACREAGE: 1.05476 +/-
 ACREAGE: 98.84 +/-
 ESTIMATED DEPTH: VTD: 7,891' TMD: 18,026'
 DESIGNATED AGENT: JOHN ADAMS
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

SURVEYED LONG: 80.08.24.4 SURFACE HOLE DEC LONG: 80.140125

Latitude: 39.42.00' (NAD83)
 Longitude: 80.03.30' (NAD83)

REFERENCE LINES
Rt #1
2 38.3727' W 90.5



WELL LANDING
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W

WELL LANDING
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
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 E 27.2727' N 90.5273' W
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 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W

WELL LANDING
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W

TOP HOLE (TUM HAD B3)
 E 27.2727' N 90.5273' W
 BOTTOM HOLE (TUM HAD B3)
 E 27.2727' N 90.5273' W

WELL BOTTOM
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W
 W-1 (HEAD & MOUTH)
 E 27.2727' N 90.5273' W