

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

API 47-061-01921 County Monongalia District Clay
Quad Grant Town Pad Name Sullivan Field/Pool Name _____
Farm name Alan Sullivan Well Number 13H
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 4385285.5 Easting 566674.0
Landing Point of Curve Northing 4384953.8 Easting 566082.0
Bottom Hole Northing 4388058.4 Easting 563938.6

Elevation (ft) 1,476' 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 12/19/2022 Date drilling commenced 1/15/2023 Date drilling ceased 2/6/2023
Date completion activities began 9/1/2023 Date completion activities ceased 10/5/2023
Verbal plugging (Y/N) NA Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 914' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2,402' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 894' - 914' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

02/23/2024

API 47-061 - 01921 Farm name Alan Sullivan Well number 13H

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"	128'	N		NA	
Surface	22"	18-5/8"	991'	N	87.5	NA	Y, 37 bbl
Coal	17-1/2"	13-3/8"	1,470'	N	54.5	NA	Y, 20 bbl
Intermediate 1	12-1/4"	9-5/8"	2,459'	N	36	NA	Y, 36 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	21,720' <input checked="" type="checkbox"/>	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	4,500 PSI Grout						48
Surface	Class A	1,150	15.6	1.14	1,306	CTS	8
Coal	Class A	1,125	15.6	1.14	1,278	CTS	
Intermediate 1	Class A	990	15.6	1.13	1,116	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	4,180	14.5	1.13	4,709	1,917'	48
Tubing							

Drillers TD (ft) 21,740' Loggers TD (ft) 21,710'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure _____

Kick off depth (ft) 4,760'

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 - 01921 Farm name Alan Sullivan Well number 13H

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 - 01921 Farm name Alan Sullivan Well number 13H

PRODUCING FORMATION(S)	DEPTHS
Marcellus	8163' TVD 21,740' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2917 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 7067 mcfpd Oil _____ bpd NGL _____ bpd Water _____ 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)
See attached	0		0		

Please insert additional pages as applicable.

Drilling Contractor Patterson UTI
Address 4000 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 NextTier
Address 4000 Town Center Blvd City Canonsburg State PA Zip 15317

Stimulating Company Universal Pressure Pumping
Address 2198 University Dr. City Lemont Furnace State PA Zip 15456

Please insert additional pages as applicable.

Completed by Hollie Medley Telephone 304-212-0422
Signature Hollie Medley Title Regulatory Manager Date _____

Sullivan 13H Stimulation Report

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	9/1/2023	5,002	6,632	8,940	93	529	7,532	299,000	486
2	9/2/2023	5,218	6,690	9,239	94	23	9,559	457,300	474
3	9/2/2023	5,208	7,046	9,198	94	82	9,546	455,600	468
4	9/3/2023	5,440	6,214	9,154	94	41	9,515	455,500	458
5	9/4/2023	5,333	6,574	9,437	94	21	9,466	456,600	469
6	9/4/2023	5,122	6,955	9,550	94	27	9,473	455,800	463
7	9/5/2023	5,179	5,335	9,519	94	31	9,542	455,800	453
8	9/6/2023	5,245	7,177	9,539	94	9	9,466	455,700	453
9	9/6/2023	5,402	7,108	9,481	94	19	9,458	456,000	448
10	9/7/2023	5,229	7,340	9,521	94	58	9,366	456,700	442
11	9/8/2023	5,204	6,801	9,418	93	35	9,376	455,900	432
12	9/8/2023	5,098	4,932	9,390	93	6	9,182	455,000	436
13	9/9/2023	5,558	6,476	9,223	93	40	8,448	455,600	420
14	9/9/2023	5,615	6,973	9,332	94	14	8,599	454,600	489
15	9/10/2023	5,118	6,204	9,352	94	47	9,999	454,700	488
16	9/11/2023	5,053	6,682	9,456	93	23	8,519	455,700	409
17	9/11/2023	4,463	5,262	9,201	94	18	9,123	454,600	417
18	9/12/2023	5,217	6,259	9,219	94	23	8,674	455,600	399
19	9/13/2023	5,720	6,591	9,119	94	33	8,558	455,400	406
20	9/13/2023	5,242	6,531	9,370	94	24	7,828	456,000	395
21	9/14/2023	5,441	6,664	9,180	94	47	9,336	455,442	450
22	9/14/2023	5,593	4,336	9,191	94	15	8,640	455,100	450
23	9/15/2023	5,403	6,973	9,494	96	6	8,624	456,276	427
24	9/15/2023	6,426	4,977	9,389	94	19	8,448	455,200	383
25	9/16/2023	5,601	7,041	9,279	94	9	8,551	456,100	396
26	9/16/2023	6,293	6,713	9,273	94	39	8,666	455,200	444
27	9/17/2023	5,462	5,933	8,867	92	7	8,903	457,900	399
28	9/18/2023	5,814	6,911	9,146	94	18	8,373	454,500	366
29	9/18/2023	5,818	6,558	9,279	94	8	8,590	456,300	364
30	9/19/2023	5,884	6,143	9,208	94	3	8,488	455,500	35
31	9/19/2023	5,605	6,669	9,186	94	21	8,612	454,700	354
32	9/20/2023	5,752	6,180	9,081	94	11	8,254	455,600	357
33	9/20/2023	5,583	6,668	9,192	94	16	8,524	455,200	344
34	9/21/2023	5,690	7,137	8,935	93	11	8,294	455,400	340
35	9/22/2023	5,815	6,732	8,650	94	21	8,247	455,700	346
36	9/22/2023	5,315	6,313	8,754	94	33	8,328	457,100	320
37	9/23/2023	5,321	7,126	8,646	94	12	8,209	455,600	336
38	9/24/2023	5,653	6,402	8,521	94	33	8,334	456,700	312
39	9/24/2023	5,432	6,487	8,900	93	32	8,365	456,700	308
40	9/25/2023	5,251	7,079	8,794	94	11	8,158	455,771	311
41	9/25/2023	5,478	6,479	8,651	95	33	8,370	456,600	301
42	9/26/2023	5,308	5,198	8,623	93	17	8,129	455,700	292
43	9/27/2023	5,641	6,832	8,728	94	25	8,054	456,300	277
44	9/27/2023	5,330	6,869	8,910	95	1	7,626	455,500	312
45	9/28/2023	5,380	6,856	8,566	94	22	8,648	456,400	278

02/23/2024

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)
46	9/28/2023	5,334	7,426	8,622	95	40	8,226	456,700	276
47	9/29/2023	4,910	7,185	8,878	94	11	8,209	454,700	366
48	9/29/2023	5,159	7,598	8,555	94	30	8,357	456,400	269
49	9/30/2023	5,163	7,544	8,543	94	11	8,289	454,900	341
50	9/30/2023	6,032	7,415	8,296	94	31	8,168	456,600	262
51	10/1/2023	5,482	7,078	8,331	94	27	8,247	455,000	240
52	10/1/2023	5,446	7,553	8,198	94	19	8,115	456,400	241
53	10/2/2023	4,902	7,650	8,479	94	19	8,125	455,200	294
54	10/2/2023	5,233	7,801	7,989	94	24	8,129	456,800	242
55	10/3/2023	5,182	7,642	7,944	94	7	8,136	455,100	298
56	10/3/2023	5,446	7,579	7,919	94	33	8,161	456,500	229
57	10/4/2023	5,926	7,647	7,918	94	25	8,080	454,500	226
58	10/4/2023	5,239	6,996	7,883	94	23	8,125	455,200	214
59	10/5/2023	5,241	7,659	7,779	94	36	8,274	456,600	217
60	10/5/2023	5,258	6,621	7,599	94	49	8,255	455,200	267
61	10/5/2023	5,163	6,664	7,808	94	16	8,036	454,900	259
62	10/5/2023	5,303	6,999	7,695	94	18	8,027	455,300	246
63	10/5/2023	5,110	6,826	8,015	95	19	8,025	455,600	220
64	10/5/2023	5,311	7,841	8,153	94	7	8,039	455,600	285
65	10/6/2023	5,511	7,441	8,271	92	11	8,678	443,100	307

02/23/2024

Sullivan 13H
Perforation Report

Stage Number	Report Date	Total Shots	Cluster 1 Top TD	Cluster 5 Bottom TD
1	9/1/2023	36		21,584
2	9/2/2023	40	21,540	21,382
3	9/2/2023	40	21,340	21,182
4	9/3/2023	40	21,140	20,983
5	9/4/2023	40	20,941	20,783
6	9/4/2023	40	20,541	20,383
7	9/5/2023	40	20,741	20,583
8	9/6/2023	40	20,341	20,183
9	9/6/2023	40	20,141	19,983
10	9/7/2023	40	19,941	19,783
11	9/8/2023	40	19,741	15,583
12	9/8/2023	40	19,541	19,384
13	9/9/2023	40	19,342	19,184
14	9/9/2023	40	19,142	18,984
15	9/10/2023	40	18,942	18,784
16	9/11/2023	40	18,742	18,584
17	9/11/2023	40	18,542	18,384
18	9/12/2023	40	18,342	18,184
19	9/13/2023	40	18,142	17,984
20	9/13/2023	40	17,942	17,784
21	9/14/2023	40	17,743	17,585
22	9/14/2023	40	17,543	17,385
23	9/15/2023	40	17,343	17,185
24	9/15/2023	40	17,143	16,985
25	9/16/2023	40	16,943	16,785
26	9/16/2023	40	16,743	16,585
27	9/17/2023	40	16,543	16,385
28	9/18/2023	40	16,343	16,185
29	9/18/2023	40	16,143	15,986
30	9/19/2023	40	15,944	15,786
31	9/19/2023	40	15,744	15,586
32	9/20/2023	40	15,544	15,386
33	9/20/2023	40	15,344	15,186
34	9/21/2023	40	15,144	14,986
35	9/22/2023	40	14,944	14,786
36	9/22/2023	40	14,744	14,586
37	9/23/2023	40	14,544	14,387
38	9/24/2023	40	14,345	14,187
39	9/24/2023	40	14,145	13,987
40	9/25/2023	40	13,945	13,787
41	9/25/2023	40	13,745	13,587
42	9/26/2023	40	13,545	13,387
43	9/27/2023	40	13,345	13,187
44	9/27/2023	40	13,145	12,987
45	9/28/2023	40	12,945	12,787
46	9/28/2023	40	12,746	12,588
47	9/29/2023	40	12,546	12,388

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Stage Number	Report Date	Total Shots	Cluster 1 Top TD	Cluster 5 Bottom TD
48	9/29/2023	40	12,346	12,188
49	9/30/2023	40	12,146	11,988
50	9/30/2023	40	11,946	11,788
51	10/1/2023	40	11,746	11,588
52	10/1/2023	40	11,546	11,388
53	10/2/2023	40	11,346	11,188
54	10/2/2023	40	11,146	10,989
55	10/3/2023	40	10,947	10,789
56	10/3/2023	40	10,747	10,589
57	10/4/2023	40	10,547	10,389
58	10/4/2023	40	10,347	10,189
59	10/5/2023	40	10,147	9,989
60	10/5/2023	40	9,947	9,789
61	10/5/2023	40	9,747	9,589
62	10/5/2023	40	9,547	9,390
63	10/5/2023	40	9,348	9,190
64	10/5/2023	40	9,148	8,990
65	10/6/2023	40	8,948	8,790

02/23/2024

Sullivan Completion 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	175	Sand/silt
Sand/red shale	175	280	sand with reddish shale
sandstone/shale	280	620	sandstone/shale
Washington coal	530	534	coal
siltstone/sandstone	534	607	
Waynesburg coal	607	614	Waynesburg coal
sandstone/limestone	614	680	sandstone/limestone
siltstone/sandstone	680	715	siltstone/sandstone
sandstone/siltstone	715	750	sandstone/siltstone
Limestone/sandstone/shale	750	767	Limestone/sandstone/shale
Sewickley coal	767	774	Sewickley coal
Limestone	774	893	Limestone
Pittsburgh coal	894	914	Pittsburgh coal
Limestone/siltstone	915	1220	Limestone/siltstone
sandstone/siltstone	1450	1960	sandstone/siltstone
Red Rock/siltstone/limestone	1960	2100	Red Rock/siltstone/limestone
Little Lime	2100	2156	Little Lime
Big Lime	2156	2280	Big Lime
Big Injun	2280	2410	Big Injun
Sand/silt	2410	2790	Sand/silt
Gantz	2790	2800	Gantz
Sand/shale	2800	3040	Sand/shale
Red Rock/siltstone	3040	3135	Red Rock/siltstone
siltstone/sandstone	3135	7393	siltstone/sandstone
Middlesex	7393	7610	Middlesex
Burkett	7610	7793	Burkett
Geneseo	7793	7846	Geneseo
Tully	7846	7905	Tully
Hamilton	7905	8035	Hamilton
Marcellus	8035		Marcellus
		TD	

Cement Job Log



NextTier Completion Solutions
3990 Rogerdale Rd., Houston, TX 77042
(713)325-6000

Customer: NORTHEAST NATURAL ENERGY LLC	Date: 22-Jan-23	Serv. Supervisor: Robert Given
Cust. Rep.: NEAL /SHORTY	Ticket #: BPA-2301-0021	Serv. Center: Black Lick - 1571
Well Name: Sullivan 13H	API Well #: 47-061-01921	County: Monongalia State: WV
Well Type: NATURAL GAS	Rig: PATTERSON 277	Type of Job: CM-SURFACE CASING

Materials Furnished by NextTier

Plugs	Casing Hardware	Physical Slurry Properties							
		Sacks of Cement	Fluid Density (lb/gal)	Excess	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Fluid Volume (cuft)	Mix Water (bbls)
6% Gel Spacer	+20.0 PPB NEX-020		8.7		4.62	33.66	25.00	-	
15.6 lb/gal Cement	100 % NCM-956 +1.5 % NAC-110+0.25 PPS NLM-600	1125	15.6	30%	1.14	4.79	227.62	1,278.07	128
Fresh Water Displacement			8.33			-	221.07	-	
0						-		-	
						-		-	
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Displacement Chemicals:

OPEN HOLE DATA						TUBULAR DATA						
22 in. O.H. 990 to 1,045 ft		13.375 in. 54.5#, (0 to 1,470 ft)				SIZE WEIGHT	THRD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)

Ambient Temp.	Bulk Temp.	Slurry 1 Temp.	Slurry 2 Temp.	Slurry 3 Temp.	Slurry 4 Temp.							
25.0 °F		53.0 °F				13.375/ 54.5#	BTC	1470	J-55	12.615	2730	1130

PREVIOUS CASING DATA		PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
18.625 in. 87.5# (0 to 990 ft)		TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
						14678.7	1423.8	1	

WELL FLUID			DISPLACEMENT FLUID			DIFF PRESS	CSG LIFT	MAX PRESS	Mix H2O Chlorides (ppm)	Mix H2O pH	Mix H2O Temp	WATER ON LOC (bbl)
TYPE	DENSITY	VOLUME	TYPE	DENSITY		(psi)	(psi)	(psi)				
H2O	8.3 ppg	220.12 bbl	H2O	8.3 ppg		538	570	2184	<500	7.3	42.0 °F	1600

Bumped Plug	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Top of Cement (ft)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Casing Rotation	Additional Hrs Charged (hrs)	Casing Reciprocation	Rathole Length (ft)
Yes	580.00	Y	-	20.00	-	Yes	1,099.00	No		No	50

Comments/Additional Details:

<i>Robert Given</i>		22-Jan-23
Service Supervisor		Date

Cement Job Log



NexTier Completion Solutions
3990 Rogerdale Rd., Houston, TX 77042
(713)925-8000

Customer:	NORTHEAST NATURAL ENERGY LLC	Date:	24-Jan-23	Serv. Supervisor:	Tim Monoskey
Cust. Rep.:	NEIL	Ticket #:	BPA-2301-0022	Serv. Center:	Black Lick - 1571
Well Name:	Sullivan 13H	API Well #:	47-061-01921	County:	Monongalia State: WV
Well Type:		Rig:	PATTERSON 277	Type of Job:	CM-INTER. CASING

Plugs		Casing Hardware	Physical Slurry Properties							
CUSTOMER SUPPLIED	NEXTIER 9 5/8 PLUG CONTAINER		Sacks of Cement	Fluid Density (lb/gal)	Excess	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbbls)	Fluid Volume (cuft)	Mix Water (bbbls)
TOP PLUG										
6% Gel Spacer	20.0 PPB NEX-020			8.7		4.62	33.66	25.00	-	
15.6 lb/gal Cement	100 % NCM-956 +0.5 % NAC-110		990	15.6	30%	1.13	4.82	198.86	1,116.58	114
Fresh Water Displacement				8.33			-	201.78	-	
0							-		-	
							-		-	
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Displacement Chemicals: N/A

OPEN HOLE DATA				TUBULAR DATA										
17.5 in. O.H. 1,470 to 1,520 ft 12.375 in. O.H. 1,520 to 2,650 ft				9.525 in. 36#, (0 to 2,650 ft)				SIZE WEIGHT	THRD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
Ambient Temp.	Bulk Temp.	Slurry 1 Temp.	Slurry 2 Temp.	Slurry 3 Temp.	Slurry 4 Temp.	9.625" 36#	BTC	2459	J-55	8.832	3590	2020		
39.0 °F	39.0 °F	55.0 °F	63.0 °F											

PREVIOUS CASING DATA		PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
13.375 in. 64.5# (0 to 1,470 ft)		TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
						2459	2413.2		

WELL FLUID			DISPLACEMENT FLUID			DIFF PRESS (psi)	Csg LFT (psi)	MAX PRESS (psi)	Mix H2O Chlorides (ppm)	Mix H2O pH	Mix H2O Temp	WATER ON LOC (bbl)
TYPE	DENSITY	VOLUME	TYPE	DENSITY								
REC.	8.4 ppg	186.7 bbl	REC.	8.4 ppg	903	926	3500	<2000	7	53.0 °F	1600	
Bumped Plug	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Top of Cement (ft)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Casing Rotation	Additional Hrs Charged (hrs)	Casing Reciprocation	Rathole Length (ft)	
Yes	1,115.00	Y	-	36.00	-	No	3,500.00	No	2.00	No	20	

Comments/Additional Details:

Tim Monoskey 24-Jan-23
Service Supervisor Date

02/23/2024

Cement Job Log



NextTier Completion Solutions
3990 Rogerdale Rd., Houston, TX 77042
(713)325-6000

Customer:	NORTHEAST NATURAL ENERGY LLC	Date:	6-Feb-23	Serv. Supervisor:	Ron Stephenson
Cust. Rep.:	JOSH	Ticket #:	BPA-2302-0010	Serv. Center:	Black Lick - 1571
Well Name:	Sullivan 13H	API Well #:	47-061-01921	County:	Monongalia
Well Type:		Rig:	PATTERSON 277	State:	WV
				Type of Job:	CM-PROD. CASING

Materials Furnished by NextTier

Plugs	Casing Hardware	Physical Slurry Properties							
		Sacks of Cement	Fluid Density (lb/gal)	Excess	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbls)	Fluid Volume (cuft)	Mix Water (bbls)
13.5 lb/gal PureScrub Spacer w/ Surfactant	+7.0 PPB NFP-703+5.0 PPB NSU-888+2.0 PPB NRT-221		13.5		5.65	26.44	80.00	-	
14.5 lb/gal Cement	50% NCM-956+50% NPZ-010 +0.2% NFP-703+0.1% NAS-504+0.55% NRT-213+0.2% NFL-549+0.2% NTC-405	4180	14.5		1.13	4.64	838.70	4,709.28	461
Sugar Water Displacement	+5.0 PPB NRT-215					-	20.00	-	
Fresh Water Displacement						-	469.16	-	
						-		-	
						-		-	
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Displacement Chemicals:

OPEN HOLE DATA					TUBULAR DATA							
8.75 in. O.H. 2,650 to 8,000 ft 8.5 in. O.H. 8,000 to 22,060 ft			5.5 in. 20#, (0 to 22,060 ft)		SIZE WEIGHT	THRD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)	
Ambient Tmp.	Bulk Tmp.	Slurry 1 Tmp.	Slurry 2 Tmp.	Slurry 3 Tmp.	Slurry 4 Tmp.							
37.0 °F		65.0 °F	55.0 °F			5.5/20#	BTC	21720	HP-P110	4.778	12640 11080	
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS				
9.625 in. 36# (0 to 2,650 ft)				TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP	
								21716.8	21674.4			
WELL FLUID			DISPLACEMENT FLUID			DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)	Mix H2O Chlorides (ppm)	Mix H2O pH	Mix H2O Temp	WATER ON LOC (bbl)
TYPE	DENSITY	VOLUME	TYPE	DENSITY								
O.B.M.	13.4 ppg	482 bbl	PROCESSED	8.4 ppg	3866	6060	<200	8	52.0 °F	2000		
Bumped Plug	Final Differential (psi)	Floata Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Top of Cement (ft)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Casing Rotation	Additional Hrs Charged (hrs)	Casing Reciprocation	Rathole Length (ft)	
Yes	3,100.00	Y			1,917	Yes	4,400.00	No	7.00	No	20	

Comments/Additional Details:

<i>Ron Stephenson</i> Service Supervisor	6-Feb-23 Date
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Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	09/01/2023
Job End Date:	10/06/2023
State:	West Virginia
County:	Monongalia
API Number:	47-061-01921-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Sullivan 13H
Latitude:	39.614729
Longitude:	-80.223258
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8193.20045801527
Total Base Water Volume (gal)*:	24323712
Total Base Non Water Volume:	0

Water Source	Percent
Groundwater, < 1000TDS	100.00%

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
CIA-12	Universal Pressure Pumping	Acid corrosion inhibitor					
Clearal 268	Chemstream	Biocide					
Hydrochloric Acid (7.5%)	Universal Pressure Pumping	Acidizing					
Sand (100 Mesh Proppant)	Universal Pressure Pumping	Proppant					
Sand (40/70 White Proppant)	Universal Pressure Pumping	Proppant					
StimStream FR 9800	Chemstream	Friction Reducer					
StimStream SC 405	Chemstream	Scale Control					
Water	Operator	Carrier Fluid					

Items above are Trade Names. Items below are the individual ingredients.

02/23/2024

			Water	7732-18-5	100.00000	87.11332	None
			Crystalline silica, quartz	14808-60-7	100.00000	11.39281	None
			Crystalline silica, quartz	14808-60-7	100.00000	1.24788	None
			Hydrochloric acid	7647-01-0	15.00000	0.02361	None
			Water	7732-18-5	80.00000	0.01697	
			Water	7732-18-5	70.00000	0.01449	
			Butene Homopolymer	9003-29-6	25.00000	0.01163	
			Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01163	None
			Glutaraldehyde	111-30-8	20.00000	0.00424	None
			Diethylenetriamine penta (methylene phosphonic acid) (DTPMP)	15827-60-8	10.00000	0.00207	
			2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1	10.00000	0.00207	None
			Citric Acid	77-92-9	10.00000	0.00207	
			alcohols, C12-18, ethoxylated	68213-23-0	3.00000	0.00140	
			Quaternary Ammonium Compounds	68424-85-1	3.00000	0.00064	
			Didecyl dimethyl ammonium chloride	7173-51-5	3.00000	0.00064	
			Ethanol	64-17-5	1.50000	0.00032	
			Ethylene glycol	107-21-1	45.00000	0.00007	None
			Glycol Ether EB	111-76-2	45.00000	0.00007	
			N,N-Dimethylformamide	68-12-2	20.00000	0.00003	
			Tar bases,quinoline derivs.,benzyl chloride-quaternized	72480-70-7	20.00000	0.00003	
			Water	7732-18-5	15.00000	0.00002	
			Cinnamaldehyde	104-55-2	10.00000	0.00002	
			Nonylphenol ethoxylated	127087-87-0	10.00000	0.00002	
			Alcohols, C6-12	68603-15-6	10.00000	0.00002	

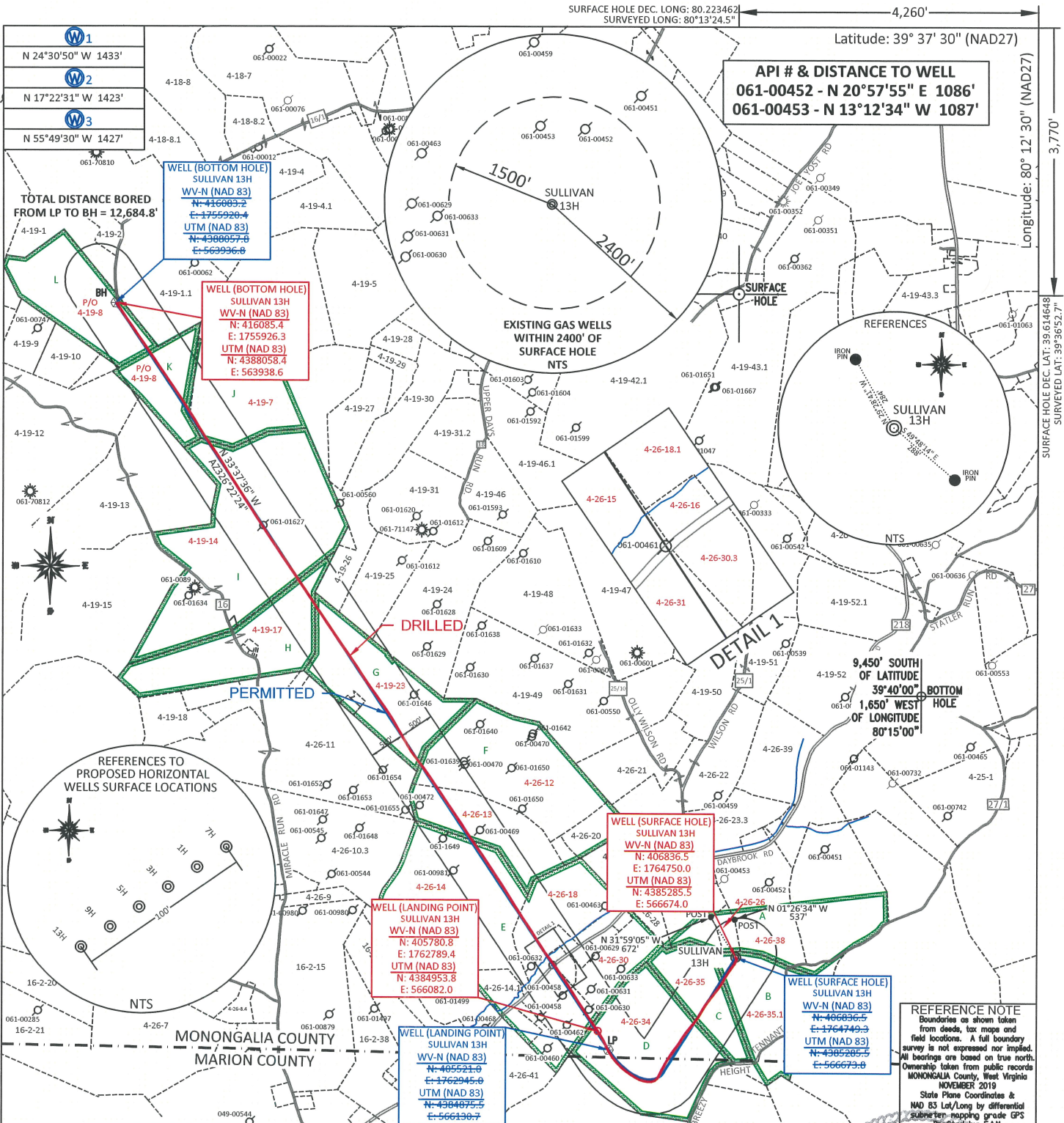
* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

** 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.

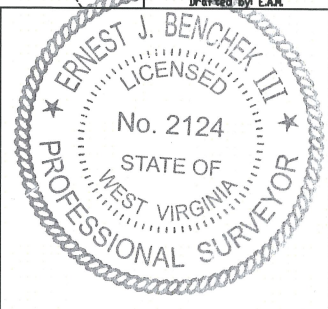
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

02/23/2024



FILE #: NNE20
 DRAWING #: 3046
 SCALE: PLAT: 1" = 2000'
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

DATE: FEBRUARY 29, 2024

OPERATOR'S WELL #: SULLIVAN 13H AS-DRILLED

API WELL #: 47 61 01921
 STATE COUNTY PERMIT

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

WATERSHED: UPPER MONONGAHELA RIVER AS-BUILT ELEVATION: 1,476'

COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: GRANT TOWN

SURFACE OWNER: ALAN SULLIVAN ACREAGE: 779.53 +/-

OIL & GAS ROYALTY OWNER: ALAN SULLIVAN ACREAGE: 25.870 **02/23/2024**

LEASE NUMBERS: _____

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 DRILLED DEPTH: TVD: 8,163' TMD: 21,740'

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

4-19-8	CHARLES W MOORE; JASON T & KIRSTON KARSON (LIFE)
4-19-7	STEPHEN R WILSON ET AL
4-19-14	PENNY S QUICKLE
4-19-17	LEWIS M MAXWELL II & SHERRY E MAXWELL
4-19-23	BOYD & MARY STARKEY ESTATE
4-26-12	KENNETH W & RUTH E ALBERT
4-26-35.1	ALAN SULLIVAN
4-26-35	RANDY LEE & TRINA TENNANT
4-26-34	SHIRLEY J NEELY, DEANNA M FRAZIER, DONNA J WALDEN & DARRIN NEELY
4-26-18	ROSE MARIE FLUHARTY
4-26-31	ERNEST E & HILERI GORBEBY
4-26-14	ELLEN M CURFMAN
4-26-13	ROSE MARIE FLUHARTY
4-26-18.1	JEFFERY A & BETH FLUHARTY
4-26-30	THOMAS R & LISA A LUZADER
4-26-30.3	LARRY L WHIPKEY
4-26-16	KEVIN MOORE
4-26-15	KEVIN MOORE
4-26-26	NNE MIDTREAM LLC
4-26-38	ADAM CLAY DARRAH

LEASE INDEX			
A	WV-061-000160-001-ACT	G	WV-061-004797-039
B	WV-061-005448-002	H	WV-061-001422-003
C	WV-061-000160-001-ACT	I	WV-061-000160-001-ACT
D	WV-061-000165-001 - LA	J	WV-061-004792-004
E	WV-061-000160-001-ACT	K	WV-061-004357-005
F	WV-061-005998-001	L	WV-061-002965-004

02/23/2024

FILE #: NEE20

DRAWING #: 3046

SCALE: N/A

DATE: FEBRUARY 29, 2024

OPERATOR'S WELL #: SULLIVAN 13H AS-DRILLED

API WELL #: 47 61 01921
STATE COUNTY PERMIT