

WR-35  
Rev. 8/23/13

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

API 47-061-01689 County Monongalia District Clay  
Quad Blacksville Pad Name Kassay Field/Pool Name \_\_\_\_\_  
Farm name Nehemiah Kassay Well Number 13H  
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 4390193.9 Easting 569112.4  
Landing Point of Curve Northing 4390556.7 Easting 569560.5  
Bottom Hole Northing 4392349.8 Easting 568072.7

Elevation (ft) 1,534.5' 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 12/08/16 Date drilling commenced 11/24/15 Date drilling ceased 01/17/17  
Date completion activities began 03/27/17 Date completion activities ceased 04/12/17  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

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

Freshwater depth(s) ft 1,300' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 2,570' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 300';2,310' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed

Reviewed by:  
*Raymond J. King*  
6/11/2018

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API 47-061 - 01689 Farm name Nehemiah Kassay 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"	42'	N	94.71	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1,244'	N	54.5	N/A	N, see below
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,764'	N	40	N/A	Y 20 bbl return
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	17,183'	N	20	N/A	Y 30 bbl return
Tubing	N/A	2-7/8"	N/A	N	6.5	N/A	N/A
Packer type and depth set							

Comment Details Top out job performed on 13 3/8". 1" tubing ran down the backside to tag up of 145'. Pumped 63 bbl of class A neat cement with 20 bbl returning to surface.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	4,500 PSI Grout	-	-	3 Yds	-	-	-
Surface	Class A + Additives	1,052	15.6	1.18	1,240.823	Surface	8
Coal							
Intermediate 1	Class A + Additives	990	15.6	1.19	1,179.063	Surface	8
Intermediate 2							
Intermediate 3							
Production	50:50 + Additives	3,505	14.5	1.15	4,126.719	Surface	48
Tubing							

Drillers TD (ft) 17,210' Loggers TD (ft) 17,180'  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) 6,428'

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

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 - 01689

Farm name Nehemiah Kassay

Well number 13H

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 (bbls)	Amount of Nitrogen/other (units)
						Please	See	Attachment

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Please insert additional pages as applicable.

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API 47- 061 - 01689 Farm name Nehemiah Kassay Well number 13H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	8,377'	TVD	17,210'	MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 4,339 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST 48 hrs

OPEN FLOW Gas 3,007 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 <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		Please see attachment

Please insert additional pages as applicable.

Drilling Contractor Nabors  
 Address 82 Old Elkins Rd. City Buckhannon State WV Zip 26201

Logging Company KLX Energy Services  
 Address 6072 W. Veterans Memorial Highway City Bridgeport State WV Zip 26330

Cementing Company C&J Energy Services  
 Address 380 Southpoint Blvd #210 City Canonsburg State PA Zip 15317

Stimulating Company BJ Services  
 Address 1036 E Main St City Bridgeport State WV Zip 26330



Please insert additional pages as applicable.

Completed by Hollie Medley Telephone 304-212-0422  
 Signature Hollie Medley Title Regulatory Manager Date 5-18-18

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



JOB LOG						JOB NUMBER	TICKET DATE		
COMPANY		COUNTRY		STATE		COUNTY			
Northeast Natural Energy		USA		WV		Monongalia			
LEASE NAME		EMPLOYEE NAME		CUSTOMER REP					
Kassay 13H		David Thorne		Matt Rockey					
FIELD		JOB TYPE							
		13 3/8 casing							
Materials Furnished by C&J Energy Services				Sacks of Cement	Slurry Wt PPG	Slurry Yield	Water GPS	Slurry Bbls	Mix Water Bbls
Spacer: CJ020 - Gel									
Lead:									
Tail: CJ910 Cemex + CJ110 - 2% + CJ600 - .25LB/SK				1052	15.60	1.18	5.20	221	130
Date	Time	Rate (BPM)	Volume (BBL)(GAL)	Press.(PSI)		Job Description / Remarks			
				CSG.	Tbg				
	2000					Arrived on Location			
	2100					Requested time on location			
	2120					Pre Rig meeting Safety meeting			
	2130					Spot turcks			
	2200					Safety Meeting with Rig			
	2230					PSI Test			
	2235	6.0	280.0			washed down pipe			
	0000					rigged up cement head			
	0020				1200	PSI Test			
	0035	6.0	50.0		5	water			
	0045	6.0	25.0			Gel			
	0055	6.0	10.0			Water			
	0100	6.0	220.0		200	Slurry			
	0150					SD DP			
	0200	6.0	186.0		200	Disp(9 bbls Gel Back)			
	0230	3.0	186.0			Plug Landed (floats held bleed back 1 bbl)			
	0300					Wash UP			
	0330					Rigged down			
						Clean Up to pit			
						Pre rig down safety meeting			
						Departure Time			

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JOB LOG					JOB NUMBER		TICKET DATE				
COMPANY <b>Northeast Natural Energy</b>					COUNTRY <b>USA</b>		STATE <b>WV</b>		COUNTY <b>Monongalia</b>		
LEASE NAME <b>Kassay 13H</b>			Well No.		EMPLOYEE NAME <b>Delmos Graham</b>			CUSTOMER REP <b>Matt Rockey</b>			
FIELD <b>Marcellus</b>				JOB TYPE <b>9 5/8 casing</b>							
Materials Furnished by C&J Energy Services					Sacks of Cement	Slurry Wt PPG	Slurry Yield	Water GPS	Slurry Bbls	Mix Water Bbls	
Spacer: CJ020 - Gel											
Lead:											
Tall: CJ910 Whitehall+ CJ110 - 1%					990	15.60	1.19	5.22	210	123	
Date	Time	Rate (BPM)	Volume (BBL/GAL)	Press.(PSI)		Job Description / Remarks					
				CSG.	Tbg						
12/17/15	2030					Arrived on Location running casing					
	2300					Requested time on location					
	2040					Pre Rig meeting Safety meeting					
	2100					Spot turcks					
12/18/15	0000					Casing down					
	0030					Safety Meeting					
	0045		2.0		2750	Load Lines Psi Test					
	0048	7.0	246.0		155	Treated H2O Supplied by rig					
	0130	7.0	25.0		140	Gel					
	0132	7.0	10.0		130	H2O Spacer					
	0140	6.0	210.0		240	Cement @ 15.6 scaled to weight					
	0157					broke circulation 376bbls					
	0220					SD DP					
	0222	7.0	195.0		100	1140	Displacement ***20bbls cement to surf				
	0254	2.7	206.0		1150	1650	Plug down bump plug				
	0259						floats held 1 bbl return				
	0305						wash up rig down				
	0400						Cj energy services released				
							Thanks For calling Cj Energy Services!!!!				

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<b>Customer:</b> NORTHEAST NATURAL ENERGY LLC		<b>Date:</b> 1/17/2017		<b>Serv. Supervisor:</b> Ryan Stout							
<b>Cust. Rep.:</b> Jamie		<b>Ticket #:</b> JVV1701-0014		<b>Serv. Center:</b> Jane Lew, WV							
<b>Lease:</b> Kassay 13H		<b>API Well #:</b>		<b>County:</b> Monongalia <b>State:</b> WV							
<b>Well Type:</b> Marcellus		<b>Rig:</b> Nabors Drilling X08		<b>Type of Job:</b> Production Casing							
<b>Materials Furnished by C&amp;J ENERGY SERVICES</b>											
<b>Plugs</b>		<b>Casing Hardware</b>		<b>Physical Slurry Properties</b>							
				<b>Sacks of Cement</b>	<b>Fluid Dens (lb/gal)</b>	<b>Yield (cuft/sk)</b>	<b>Mix Water (gal/sk)</b>	<b>Fluid Volume (bbls)</b>	<b>Mix Water (bbls)</b>		
Spacer 1	CJ810 PureScrub Spacer + 0.5 gpb CJ880			-	13.5			50			
Spacer 2:											
Scavenger											
Lead											
Tail:	50:50 CJ010:CJ910 + 0.25% CJ210 + 0.2% CJ500U + 0.2% CJX157011			3505	14.5	1.18	5.19	735	433		
<b>Displacement Chemicals:</b>											
<b>OPEN HOLE DATA</b>				<b>TUBULAR DATA</b>							
<b>SIZE (in)</b>	<b>EXCESS (%)</b>	<b>DEPTH (ft)</b>	<b>TYPE (CSG/TBQ/CP)</b>	<b>OD (in)</b>	<b>WEIGHT (lbs/ft)</b>	<b>THREAD</b>	<b>DEPTH (ft)</b>	<b>GRADE</b>	<b>ID (in)</b>	<b>BURST (psi)</b>	<b>COLLAPSE (psi)</b>
8 3/4		6400	Casing	5 1/2	20				4.79		
8 1/2		17221									
<b>PREVIOUS CASING DATA</b>				<b>PERFORATED INTERVAL DATA</b>				<b>CASING EQUIPMENT DEPTHS</b>			
<b>SIZE (in)</b>	<b>WEIGHT (lbs/ft)</b>	<b>ID (in)</b>	<b>DEPTH (ft)</b>	<b>TOP</b>	<b>BTM</b>	<b>SPF</b>	<b>SIZE</b>	<b>SHOE</b>	<b>FLOAT</b>	<b>STAGE</b>	<b>ACP</b>
9 5/8	40	8.84	2764					43			
<b>WELL FLUID</b>		<b>DISPLACEMENT FLUID</b>			<b>DIFF PRESS (psi)</b>	<b>CSG LIFT (psi)</b>	<b>MAX PRESS (psi)</b>	<b>WATER ON LOC (bbl)</b>			
<b>TYPE</b>	<b>DENSITY</b>	<b>VOLUME</b>	<b>TYPE</b>	<b>DENSITY</b>							
synthetic	12.7 ppg	381 bbl	h2o	8.3 ppg	2655	6966	6000	1500			
<b>Time</b>	<b>Rate (bbl/min)</b>	<b>Csg Press (psi)</b>	<b>Tbg Press (psi)</b>	<b>Ann Press (psi)</b>	<b>Stg. Vol (bbl)</b>	<b>Cum. Vol. (bbl)</b>	<b>Stage Details</b>				
2:00 PM						0	arrive on location				
2:20 PM						0	spot trucks				
2:45 PM						0	rig up				
4:00 PM						0	rig circulating				
5:00 PM						0	safety meeting				
5:20 PM						0	rig up floor				
5:35 PM		6000				0	test lines				
5:40 PM						0	drop bottom plug				
5:45 PM	4.5	800			50	50	spacer @13.5 ppg				
6:00 PM	7	1100			737	787	cement (scaled to weight) @ 14.5 ppg				
8:15 PM						787	drop plug				
8:20 PM	8	3800			381	1168	displacement (switch to back up pump)				
9:00 PM	7	4700				1168	slow pump rate				
9:10 PM	6	4400				1168	slow pump rate				
9:15 PM	3.5	3800				1168	slow pump rate				
9:20 PM	3.5	4300				1168	land plug				
9:25 PM						1168	bleed back (float held) 5 bbl return				
9:30 PM						1168	wash up (40-50 bbl through stack) rig confirmed to be clean				
10:00 PM						1168	rig down				
11:00 PM						1168	leave location				
						1168					
						1168					
						1168					
						1168					
<b>Left Yard</b>	12pm			<b>Left Loc</b>	11pm						
<b>Arrived Loc.</b>	2pm			<b>Left Loc.</b>							
<b>Bumped Plug (psi)</b>	<b>Final Differential (psi)</b>	<b>Floats Held (Y/N)</b>	<b>PSI Left on Casing</b>	<b>Cement to Surface (bbl)</b>	<b>Full Circ During Job (Y/N)</b>	<b>Max Pump Pressure (psi)</b>	<i>Ryan Stout</i>				
yes	3800	yes	0	30	yes	6000	Service Supervisor				

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<b>Perforation Record</b>					
<b>Stage No.</b>	<b>Report Date</b>	<b>Perforated from MD ft.</b>	<b>Perforated to MD ft.</b>	<b>Number of Perforations</b>	<b>Formation</b>
1	3/27/2017	17,106	16,938	40	Marceullus
2	3/27/2017	16,901	16,748	40	Marceullus
3	3/27/2017	16,703	16,531	40	Marceullus
4	3/30/2017	16,499	16,323	40	Marceullus
5	3/30/2017	16,275	16,113	40	Marceullus
6	3/31/2017	16,082	15,926	40	Marceullus
7	3/31/2017	15,880	15,704	40	Marceullus
8	3/31/2017	15,673	15,516	40	Marceullus
9	4/1/2017	15,478	15,311	40	Marceullus
10	4/2/2017	15,266	15,094	40	Marceullus
11	4/2/2017	15,061	14,889	40	Marceullus
12	4/2/2017	14,856	14,693	40	Marceullus
13	4/2/2017	14,654	14,506	40	Marceullus
14	4/3/2017	14,458	14,310	40	Marceullus
15	4/3/2017	14,260	14,088	40	Marceullus
16	4/4/2017	14,042	13,871	40	Marceullus
17	4/4/2017	13,836	13,677	40	Marceullus
18	4/4/2017	13,628	13,464	40	Marceullus
19	4/5/2017	13,427	13,262	40	Marceullus
20	4/5/2017	13,226	13,052	40	Marceullus
21	4/5/2017	13,003	12,833	40	Marceullus
22	4/6/2017	12,789	12,643	40	Marceullus
23	4/6/2017	12,609	12,452	40	Marceullus
24	4/6/2017	12,402	12,241	40	Marceullus
25	4/7/2017	12,200	12,036	40	Marceullus
26	4/7/2017	11,997	11,832	40	Marceullus
27	4/8/2017	11,797	11,628	40	Marceullus
28	4/8/2017	11,592	11,426	40	Marceullus
29	4/8/2017	11,392	11,230	40	Marceullus
30	4/9/2017	11,187	11,022	40	Marceullus
31	4/9/2017	10,982	10,820	40	Marceullus
32	4/9/2017	10,771	10,598	40	Marceullus
33	4/10/2017	10,564	10,410	40	Marceullus
34	4/10/2017	10,363	10,196	40	Marceullus
35	4/10/2017	10,147	9,992	40	Marceullus
36	4/10/2017	9,959	9,789	40	Marceullus
37	4/11/2017	9,749	9,590	40	Marceullus
38	4/11/2017	9,554	9,375	40	Marceullus

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### Stimulation Report

<u>Stage No.</u>	<u>Report Date</u>	<u>Avg Treating Rate (BPM)</u>	<u>Avg Treating Pressure (psi)</u>	<u>Breakdown Pressure (psi)</u>	<u>ISIP (psi)</u>	<u>Total Amount of Proppant (lbs)</u>	<u>Total Clean Fluid (Bbls)</u>
1	3/27/2017	83	9,260	7,875	5,372	400,174	5,372
2	3/27/2017	83	9,260	7,775	4,943	399,833	4,943
3	3/27/2017	81	9,234	7,735	5,491	400,565	5,491
4	3/30/2017	78	9,011	7,660	6,226	403,644	6,226
5	3/30/2017	84	9,092	7,542	5,907	400,081	5,907
6	3/31/2017	83	9,034	7,226	6,034	400,755	6,034
7	3/31/2017	86	9,229	7,286	6,366	397,347	6,366
8	3/31/2017	85	9,045	7,638	6,941	399,796	6,941
9	4/1/2017	89	9,297	7,337	6,203	402,374	6,203
10	4/2/2017	85	9,100	7,140	6,586	403,219	6,586
11	4/2/2017	82	9,158	7,305	6,268	402,234	6,268
12	4/2/2017	81	8,964	7,150	5,924	403,755	5,924
13	4/2/2017	79	9,373	7,267	6,325	401,165	6,325
14	4/3/2017	82	8,990	7,604	6,410	401,825	8,477
15	4/3/2017	84	8,786	8,029	6,214	402,561	7,468
16	4/4/2017	89	9,190	8,425	6,582	401,468	7,693
17	4/4/2017	85	9,296	7,149	6,727	397,481	7,969
18	4/4/2017	89	9,490	7,680	6,515	403,576	7,872
19	4/5/2017	84	8,958	7,412	6,351	403,820	7,353
20	4/5/2017	83	9,085	7,219	5,771	398,281	7,424
21	4/5/2017	89	9,277	7,704	6,182	401,229	7,569
22	4/6/2017	82	8,983	7,704	6,071	404,947	7,435
23	4/6/2017	86	8,998	7,482	5,990	400,529	7,616
24	4/6/2017	87	9,307	8,139	6,220	401,949	7,537
25	4/7/2017	84	8,766	7,648	5,954	401,398	7,591
26	4/7/2017	89	8,768	7,453	5,809	400,661	7,741
27	4/8/2017	89	8,665	8,107	5,981	400,884	7,956
28	4/8/2017	89	8,624	7,422	6,116	402,241	7,713
29	4/8/2017	89	8,658	7,845	6,034	400,623	7,585
30	4/9/2017	89	8,628	8,298	6,236	400,272	7,482
31	4/9/2017	86	8,453	7,953	6,051	400,638	7,486
32	4/9/2017	89	8,916	8,304	5,885	400,071	7,524
33	4/10/2017	84	8,825	7,957	6,014	398,278	7,770
34	4/10/2017	84	8,734	8,082	6,175	400,309	7,470
35	4/10/2017	87	8,952	8,645	6,322	404,469	7,453
36	4/10/2017	88	9,022	8,123	5,612	398,631	7,466
37	4/11/2017	88	9,023	8,722	5,809	399,837	7,278
38	4/11/2017	82	8,664	7,670	5,542	400,113	7,560

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**Formation and Depths**

<u>Lithology/Formation</u>	<u>Top Depth in FT Name</u> <u>TVD</u>	<u>Bottom Depth in</u> <u>FT TVD</u>	<u>Top Depth in</u> <u>FT MD</u>	<u>Bottom Depth</u> <u>in FT MD</u>	<u>Describe rock type and record quantity and type of</u> <u>fluid (freshwater, brine, oil, gas, H2S, etc)</u>
Shale/Sandstone	0	300			shale/sandstone
Coal	300	330			coal
Grey Sandstone/Shale	330	1050			sandstone/shale
Shale/sandstone/coal	1050	1200			shale/sandstone/coal
Sandstone/shale	1200	1800			sandstone/shale/coal
Grey Shale	1800	1950			shale
Sandstone/shale	1950	2220			sandstone/shale
Shale/coal	2220	2310			shale/coal
Sandstone/limestone	2310	2430			sandstone/limestone
Big Injun	2430	2580			sandstone
Sandstone	2580	3090			sandstone
Grey Shale/sandstone	3090	3450			shale/sandstone
Sandstone/shale	3450	4590			sandstone/shale
Shale	4590	5490			shale
Sandstone/shale	5490	6400			sandstone/shale

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/27/2017
Job End Date:	4/11/2017
State:	West Virginia
County:	Monongalia
API Number:	47-061-01689-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Kassay 13H
Latitude:	39.65875600
Longitude:	-80.19434100
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,378
Total Base Water Volume (gal):	12,676,692
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	Operator	Carrier					
			Water	7732-18-5	100.00000	87.26269	
Sand, White	BJ Services	Proppant					
				Listed Below			

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Other Chemical (s)	BJ Services	See Trade Name (s) List					
			Water	7732-18-5	72.00000	0.08177	
MaxPerm 30	BJ Services	Friction Reducer					
				Listed Below			
HCl, 20.1 - 28%	BJ Services	Acidizing					
				Listed Below			
Ferrotrol 300L	BJ Services	Iron Control					
				Listed Below			
CI-14	BJ Services	Corrosion Inhibitor					
				Listed Below			
K-219	Nalco-Champion	Microbial Control					
				Listed Below			
EC6486A	Nalco-Champion	Scale Inhibitor					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline Silica (Quartz)	14808-60-7	100.00000	12.58165	
			Acrylamide Modified Acrylic Polymer	38193-60-1	60.00000	0.02772	
			Hydrochloric Acid	7647-01-0	28.00000	0.02064	
			Petroleum distillates	64742-47-8	30.00000	0.01386	
			Methanol	67-56-1	60.00000	0.00600	

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 Environmental Protection



			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	30.00000	0.00600	
			Sodium Chloride	7647-14-5	5.00000	0.00231	
			Sorbitan monooleate ethoxylate	9005-65-6	5.00000	0.00231	
			Sorbic, mono-(9Z)-9octadecenoate	1338-43-8	5.00000	0.00231	
			Oxyalkylated Alcohol	78330-21-9	5.00000	0.00231	
			Glutaraldehyde	111-30-8	10.00000	0.00200	
			Citric Acid	77-92-9	60.00000	0.00117	
			Amine Triphosphate	Proprietary	30.00000	0.00100	
			Ethylene Glycol	107-21-1	30.00000	0.00100	
			Acetic acid	127-08-2	1.00000	0.00046	
			Methanol	67-56-1	100.00000	0.00045	
			Polyoxyalkylenes	68951-67-7	30.00000	0.00013	
			Tetrasodium EDTA	64-02-8	0.10000	0.00005	
			Acetic acid, Potassium Salt	64-19-7	0.10000	0.00005	
			Fatty Acids	61790-12-3	10.00000	0.00004	
			Modified Thiourea Polymer	68527-49-1	7.00000	0.00003	
			Propargyl Alcohol	107-19-7	5.00000	0.00002	
			Olefin	64743-02-8	5.00000	0.00002	
			Formaldehyde	50-00-0	1.00000	0.00000	

\* 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%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

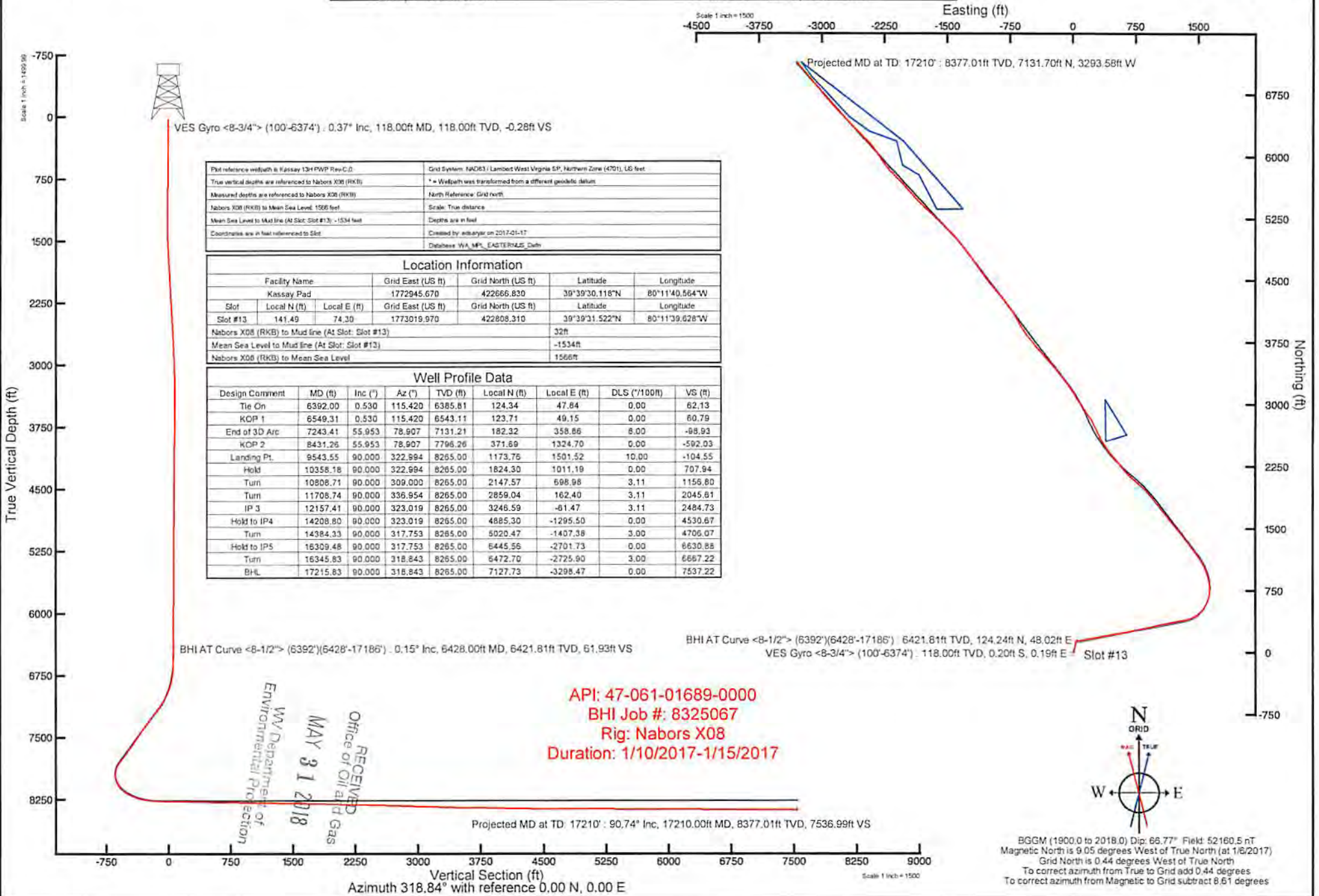
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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MAY 31 2018  
WV Department of  
Environmental Protection

# NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV  
 Field: Monongalia  
 Facility: Kassay Pad

Slot: Slot #13  
 Well: Kassay 13H  
 Wellbore: Kassay 13H PWB



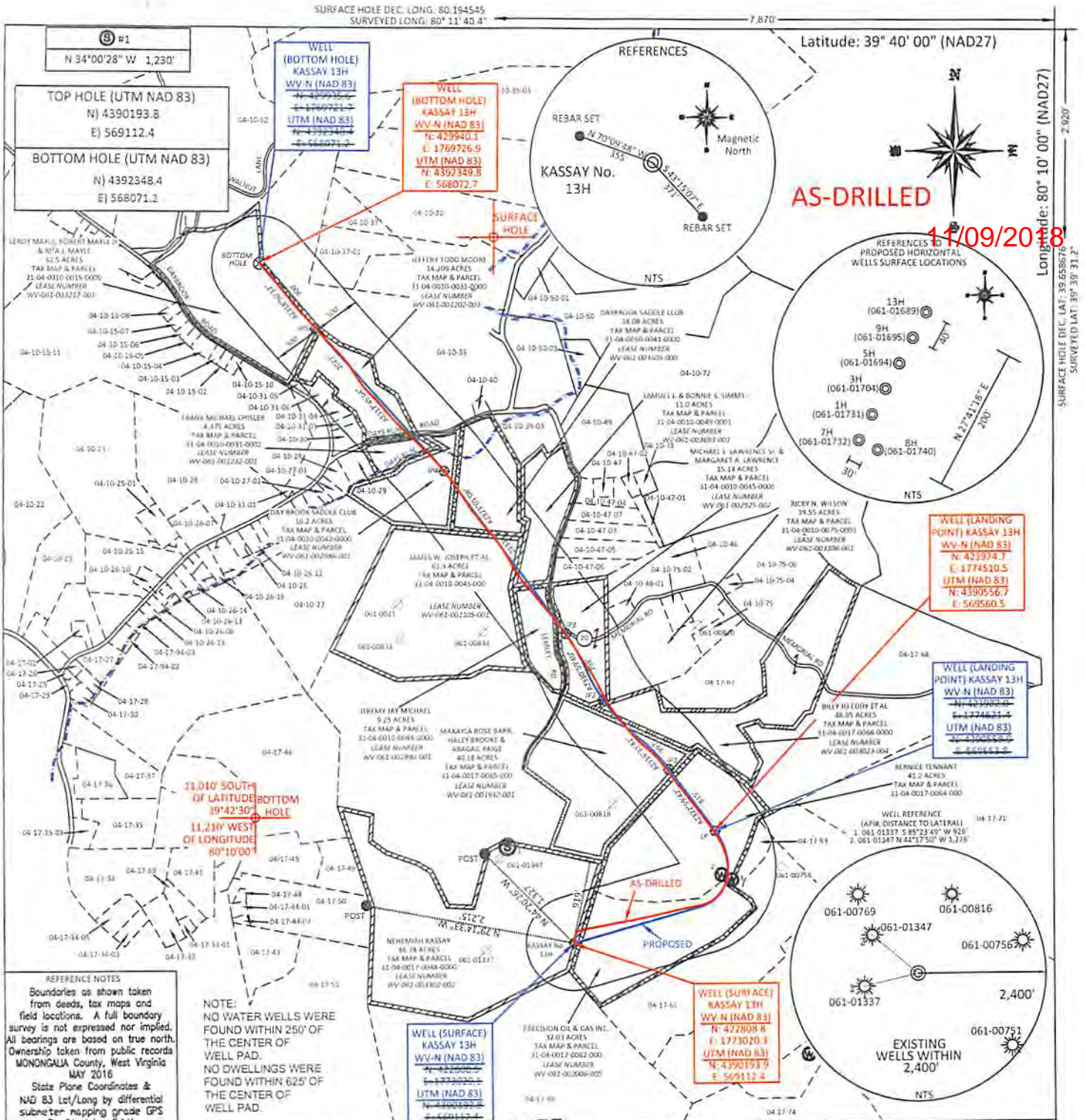
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 Office of Oil and Gas  
 MAY 31 2018  
 WV Department of  
 Environmental Protection

API: 47-061-01689-0000  
 BHI Job #: 8325067  
 Rig: Nabors X08  
 Duration: 1/10/2017-1/15/2017



BGGM (1900.0 to 2018.0) Dip: 66.77° Field: 52160.5 nT  
 Magnetic North is 9.05 degrees West of True North (at 1/6/2017)  
 Grid North is 0.44 degrees West of True North  
 To correct azimuth from True to Grid add 0.44 degrees  
 To correct azimuth from Magnetic to Grid subtract 8.61 degrees





FILE #: NNE15  
 DRAWING #: 2538  
 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

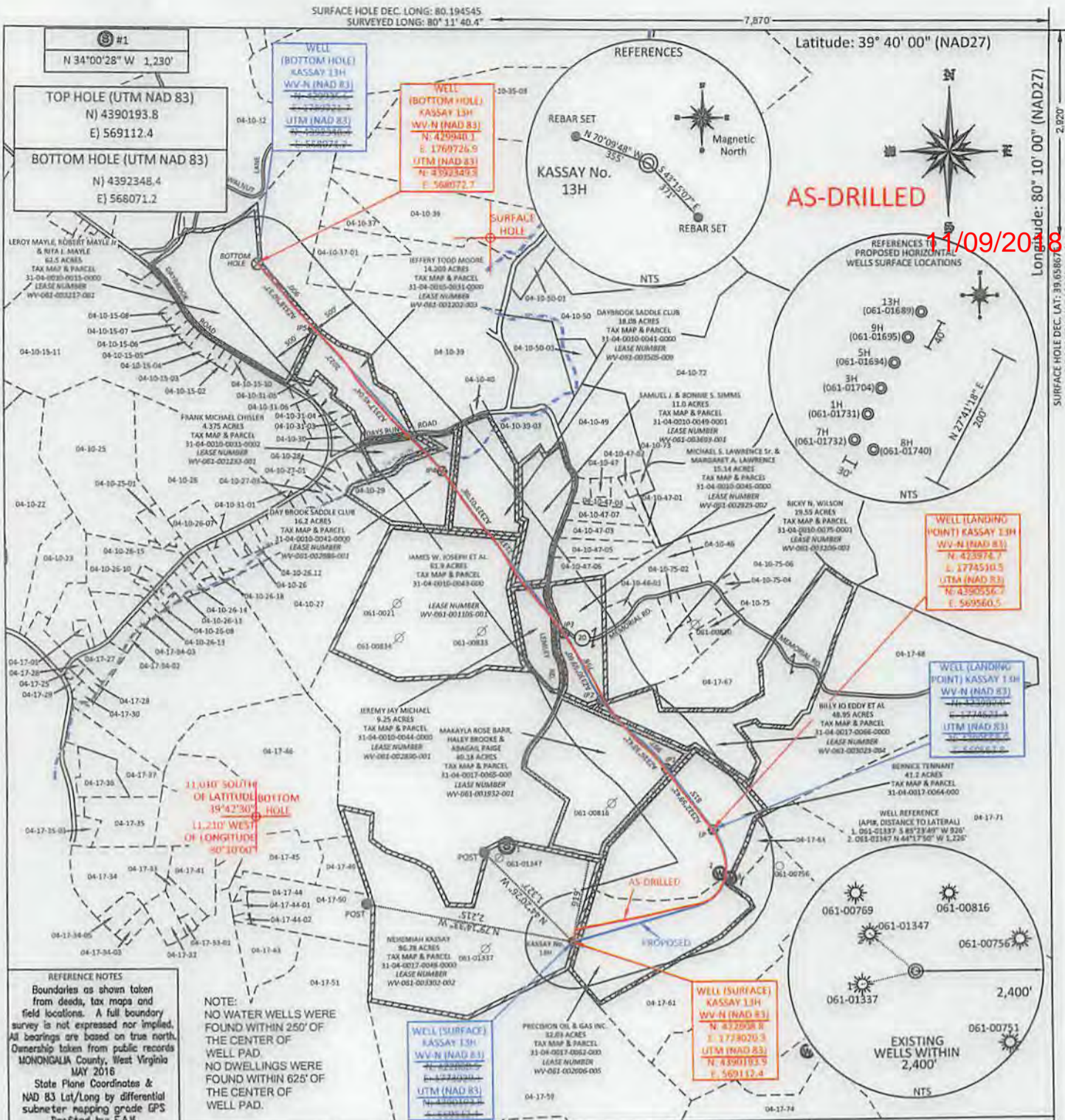
Well Type:  Oil  Waste Diposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

WATERSHED: DUNKARD CREEK AS-BUILT ELEVATION: 1,534.5'  
 COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE  
 SURFACE OWNER: NEHEMIAH KASSAY ACREAGE: 86.78 +/-  
 OIL & GAS ROYALTY OWNER: \_\_\_\_\_ ACREAGE: 457.419 +/-  
 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 ESTIMATED DEPTH: TVD: 8,377.01' TMD: 17,210'  
 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





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

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

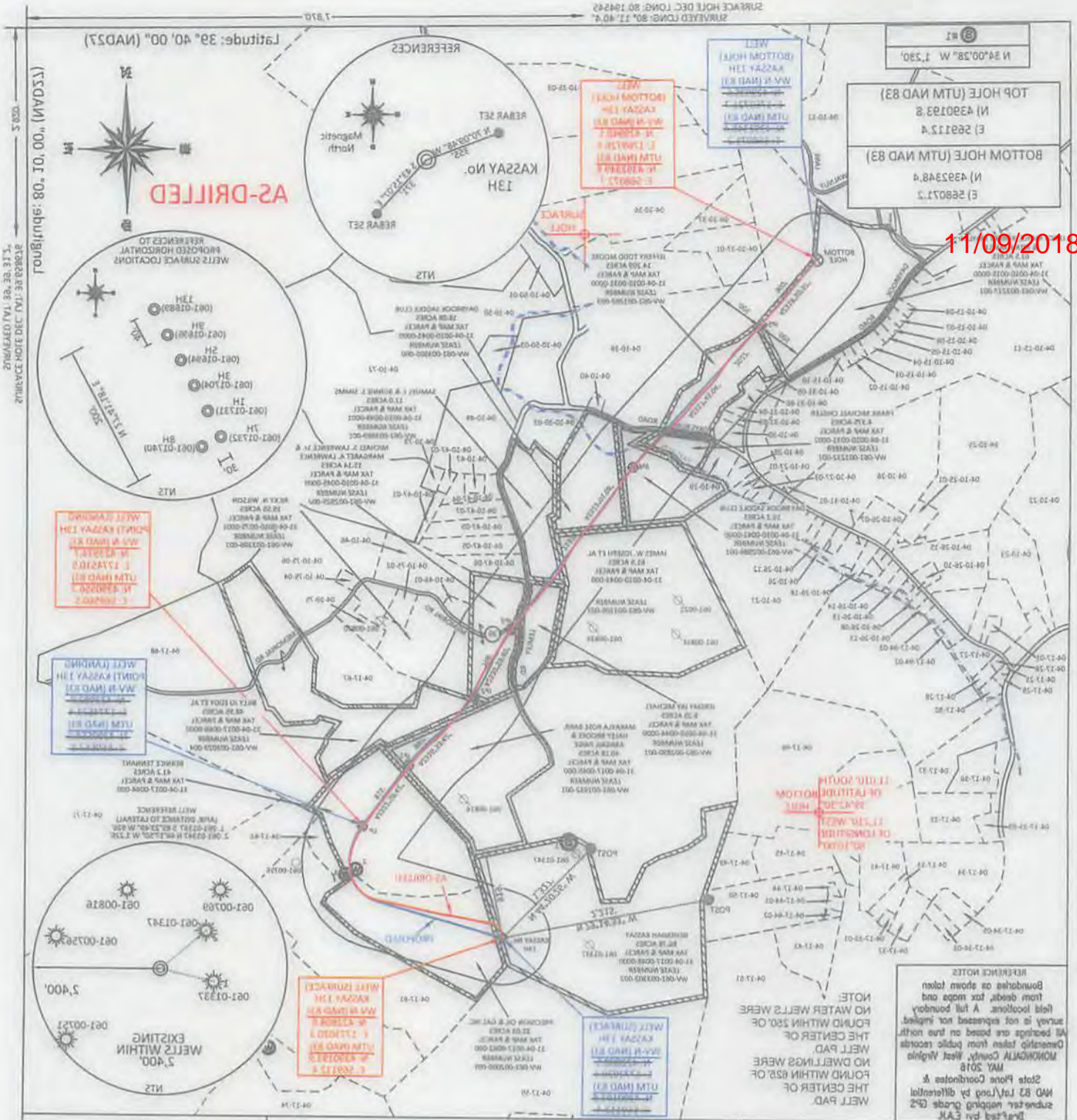
WATERSHED: DUNKARD CREEK AS-BUILT ELEVATION: 1,534.5'  
 COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE  
 SURFACE OWNER: NEHEMIAH KASSAY ACREAGE: 86.78 +/-  
 OIL & GAS ROYALTY OWNER: \_\_\_\_\_ ACREAGE: 457.419 +/-  
 LEASE NUMBERS: \_\_\_\_\_

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
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 CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY): \_\_\_\_\_

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11/09/2018



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Signed: \_\_\_\_\_  
 L.S. #2124 - Ernest J. Benchek III

FILE #:	INE15
DRAWING #:	2538
SCALE:	PLAT: 1" = 1500' TICK: 1" = 500'
MINIMUM DEGREE	
OF ACCURACY:	1/200
PROVEN SOURCE	SUBMETER MAPPING
OF ELEVATION:	GRADE GPS

CITY: CHARLESTON STATE: WV ZIP CODE: 25301  
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC  
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200

TARGET FORMATION: MARCELLUS  
 ESTIMATED DEPTH: TVD: 8,377.01' TMD: 17,210'  
 CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY):  
 PLUG OFF FORMATION  PERFORATE NEW FORMATION  PLUG & ABANDON   
 DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE

OIL & GAS ROYALTY OWNER:  
 SURFACE OWNER: NEHEMIAH KASSAY  
 COUNTY/DISTRICT: MONONGALIA / CLAY  
 WATERSHED: DUNKARD CREEK

AS-BUILT ELEVATION: 1,534.5'  
 QUADRANGLE: BLACKSVILLE  
 ACREAGE: 457.419 +/-  
 ACREAGE: 86.78 +/-

WELL TYPE:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

CHARLESTON, WV 25304  
 601 57TH STREET  
 OFFICE OF OIL & GAS  
 WADP  
 UNITED STATES TOPOGRAPHIC MAPS  
 (+) DENOTES LOCATION OF WELL ON

DATE: MARCH 29, 2018  
 OPERATOR'S WELL #: KASSAY NO. 13H  
 STATE COUNTY PERMIT  
 API WELL #: 47 61

REPERIENCE NOTES  
 State Plane Coordinates &  
 WAD 83 (used by differential  
 surveying mapping grade GPS  
 Modified by E.A.N.

NO DWELLINGS WERE  
 FOUND WITHIN 625' OF  
 THE CENTER OF  
 WELL PAD.  
 MONONGALIA County, West Virginia  
 Ownership taken from public records  
 All bearings are based on true north.  
 A full boundary survey is not expressed nor implied.  
 Boundaries on shown taken  
 from deed, tax maps and  
 other records.

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

EXISTING WELLS WITHIN 500'  
 500'  
 500'

WELLS (SURFACE)  
 KASSAY 13H  
 WAD 83 (used by differential  
 surveying mapping grade GPS  
 Modified by E.A.N.

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 POINT (KASSAY 13H)  
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