

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

API 47 - 061 - 01759 County Monongalia District Clay  
Quad Blacksville Pad Name MEPCO Field/Pool Name \_\_\_\_\_  
Farm name MEPCO, LLC Well Number MEPCO 8H  
Operator (as registered with the OOG) Northeast Natural Energy LLC  
Address 707 Virginia Street E., Suite 1200 City Charleston State WV Zip 25301

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As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4390667.0 Easting 572722.3  
Landing Point of Curve Northing 4390302.7 Easting 572436.7  
Bottom Hole Northing 4388306.7 Easting 573746.4

NOV - 7 2019

WV Department of Environmental Protection

Elevation (ft) 1420' 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 11/02/17 Date drilling commenced 11/17/17 Date drilling ceased 4/21/2018  
Date completion activities began 9/27/2018 Date completion activities ceased 10/8/2018  
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 906' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 2027', 2250', 2460' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 848', 930' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
*MJIC 11/26/2018*

Reviewed

API 47-061 - 01759

Farm name MEPCO, LLC

Env. permit # MEPCO, 8H  
Well number

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	52.78	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1,400'	N	54.6	N/A	Y, 80 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,650'	N	40	N/A	Y, 45 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	16,680'	N	20	N/A	Y, 20 bbl
Tubing	N/A	2-7/8"	N/A	N	4.7	N/A	
Packer type and depth set							

Comment Details \_\_\_\_\_

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	-	CTS	-
Surface	Class A + 2%	1290	15.6	1.19	1535	CTS	8
Coal							
Intermediate 1	Class A + 1%	950	15.6	1.19	1131	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	3193	14.5	1.17	3742	CTS	48
Tubing							

Drillers TD (ft) 16,860' Loggers TD (ft) 16,830'  
 Deepest formation penetrated Marcellus Plug back to (ft) NA  
 Plug back procedure NA

Kick off depth (ft) 6,654'

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

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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 \_\_\_\_\_





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)
Shale/Sand	0	384	Shale/Sand
Shale	384	400	Shale
sand/shale	400	466	sand/shale
shale	466	470	shale
Sandstone/shale/coal	470	570	Sandstone/shale/coal
sand/shale	570	848	sand/shale
coal	848	853	coal
sand/shale	853	930	sand/shale
coal	930	933	sandstone/shale/coal - water @ 906'
sand/shale	933	1214	sand/shale
shale/red rock	1214	1651	shale/red rock
sand/shale	1651	2010	sand/shale
red rock	2010	2110	red rock
Big Lime	2110	2248	Big Lime
Big Injun	2248	2370	Big Injun
siltstone	2370	2430	siltstone
Berea	2430	2450	Berea
siltstone	2450	2610	siltstone
Gantz	2610	2630	Gantz
Upper Devonian undifferentiated	2630	2920	Upper Devonian undifferentiated
red rock/siltstone	2920	3080	red rock/siltstone
Devonian silt/sand/shale	3080	7290	Devonian silt/sand/shale
Middlesex	7290	7530	Middlesex
Burkett	7530	7710	Burkett
Geneseo	7710	7770	Geneseo
Tully	7710	7830	Tully
Hamilton	7830	7890	Hamilton
Marcellus	7890	8082	Marcellus
Onondaga	8082	8114	Onondaga
Huntersville chert	8114		Huntersville chert

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**MEPCO 8H STIMULATION INFORMATION**

Stage Number	Report Date	Avg Treating Rate (BPM)	Avg Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Proppant Amount (lbs)	Flush Volume (bbls)	Total Clean Fluid (Bbls)	Pad Volume (bbls)
1	9/26/2018	77	7,977	9,840	5,420	300,290	378	7,249	378
2	9/27/2018	79	8,348	6,466	5,435	350,260	369	7,606	457
3	9/27/2018	80	8,813	6,800	5,276	350,350	367	8,281	378
4	9/27/2018	79	8,884	6,694	5,591	350,050	360	7,556	415
5	9/27/2018	80	8,930	7,028	5,874	350,280	359	7,753	515
6	9/28/2018	80	8,793	6,430	5,393	355,060	350	7,568	429
7	9/28/2018	80	8,859	6,710	5,255	353,480	347	7,562	400
8	9/28/2018	75	8,602	7,719	5,474	350,300	349	7,557	428
9	9/29/2018	81	8,747	6,200	5,539	351,350	337	7,816	350
10	9/29/2018	79	8,832	7,519	5,290	349,840	335	7,398	429
11	9/30/2018	79	8,824	7,245	5,008	350,720	330	7,384	430
12	9/30/2018	80	9,076	8,016	5,323	354,510	330	7,586	380
13	9/30/2018	80	9,067	7,363	5,234	350,090	322	7,551	375
14	9/30/2018	80	8,901	7,042	5,539	355,120	315	7,407	429
15	10/1/2018	84	8,967	7,155	6,007	353,460	314	7,427	429
16	10/1/2018	80	8,729	7,403	5,655	342,389	309	7,365	429
17	10/1/2018	80	8,757	7,940	5,854	350,850	299	7,532	429
18	10/1/2018	82	8,579	7,617	5,604	349,820	300	7,344	429
19	10/2/2018	84	9,022	8,093	5,472	326,940	297	7,004	428
20	10/2/2018	80	8,488	7,150	5,128	351,919	290	7,511	430
21	10/2/2018	80	8,540	7,195	5,409	349,210	284	6,806	238
22	10/3/2018	80	8,642	7,526	5,918	349,860	281	7,014	280
23	10/3/2018	80	8,447	7,608	5,832	350,270	271	7,396	435
24	10/3/2018	80	8,402	7,048	5,888	355,260	271	7,309	429
25	10/3/2018	80	8,257	6,936	5,912	349,840	267	7,249	429
26	10/3/2018	81	8,612	7,423	5,598	350,040	264	6,690	225
27	10/4/2018	85	8,689	7,559	5,586	342,480	283	7,107	225
28	10/4/2018	80	8,444	7,414	5,826	350,700	254	7,190	429
29	10/4/2018	81	8,495	8,153	5,510	354,080	275	7,257	190
30	10/5/2018	81	8,294	7,548	5,433	349,920	247	7,686	160
31	10/5/2018	80	8,194	7,440	5,792	349,360	244	7,291	429
32	10/5/2018	81	8,123	7,641	5,874	350,220	239	7,459	429
33	10/5/2018	80	8,074	7,708	5,306	352,570	233	6,858	177
34	10/6/2018	81	8,148	7,160	6,075	351,340	224	6,937	170
35	10/6/2018	80	8,001	7,189	5,941	350,640	229	7,429	429
36	10/6/2018	79	7,975	6,843	5,293	291,560	215	6,596	479
37	10/6/2018	81	7,758	7,392	5,923	350,190	216	6,787	181
38	10/6/2018	83	8,041	7,438	6,106	354,340	204	6,794	140
39	10/7/2018	83	7,919	7,588	5,794	351,200	204	6,839	109
40	10/7/2018	80	8,092	7,457	5,782	352,360	197	7,437	429

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<b>MEPCO 8H PERFORATION RECORD</b>				
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	9/26/2018	16,704	-	40
2	9/27/2018	16,499	16,658	40
3	9/27/2018	16,298	16,457	40
4	9/27/2018	16,097	16,256	40
5	9/27/2018	15,896	16,055	40
6	9/28/2018	15,695	15,854	40
7	9/28/2018	15,494	15,653	40
8	9/28/2018	15,293	15,452	40
9	9/29/2018	15,092	15,250	40
10	9/29/2018	14,890	15,049	40
11	9/30/2018	14,689	14,848	40
12	9/30/2018	14,488	14,647	40
13	9/30/2018	14,287	14,446	40
14	9/30/2018	14,086	14,245	40
15	10/1/2018	13,885	14,044	40
16	10/1/2018	13,684	13,843	40
17	10/1/2018	13,483	13,542	40
18	10/1/2018	13,282	13,440	40
19	10/2/2018	13,080	13,239	40
20	10/2/2018	12,879	13,038	40
21	10/2/2018	12,678	12,837	40
22	10/3/2018	12,477	12,636	40
23	10/3/2018	12,276	12,435	40
24	10/3/2018	12,075	12,234	40
25	10/3/2018	11,874	12,033	40
26	10/3/2018	11,673	11,832	40
27	10/4/2018	11,472	11,630	40
28	10/4/2018	11,270	11,429	40
29	10/4/2018	11,069	11,228	40
30	10/5/2018	10,868	11,027	40
31	10/5/2018	10,667	10,826	40
32	10/5/2018	10,466	10,625	40
33	10/5/2018	10,265	10,424	40
34	10/6/2018	10,064	10,223	40
35	10/6/2018	9,863	10,021	40
36	10/6/2018	9,661	9,820	40
37	10/6/2018	9,460	9,619	40
38	10/6/2018	9,259	9,418	40
39	10/7/2018	9,058	9,217	40
40	10/7/2018	8,857	9,016	40

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API Permit #: 47-061-01759

Customer: Northeast Natural Energy LLC

Lease and Well Name: Mepco #8-H

A.F.E #: 100379-602



Job Type: 13 3/8

Cement Operator: Brian Fullem

Date Cemented: 11/18/2017

Drilling Contractor: Highlands #8

Cement Slurry Information										
No. of Sacks	Cement Blend Composition			Yield (ft <sup>3</sup> /sk)	MixWater (gal/sk)	Density (lb/gal)	(bbl) Mix Water	(ft <sup>3</sup> ) Of Slurry	(bbl) Of Slurry	
1290	Class A 2%CaCl2			1.19	5.20	15.6	160	1535	273	
							Totals	160	1535	273

Wellbore Information									
	New/Used	Diameter (in)	Weight (lb/ft)	Top (ft)	Bottom (ft)	Collapse/Burst Pressures (psi)		Requested TOC (ft)	Surface
Casing	New	13 3/8	54.5	0	1,400			TVD (ft)	1,410
Previous Casing		24			40			Displacement Depth (ft)	1,358
Tubing or Drillpipe								Displacement (bbl)	209.9
Open Hole		17 1/2		40	1,410				
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)	50	
Cement Returns Seen at Surface	Yes	Blend 1	60	60	60	60	Displacement Fluid Type	Water	
Amount of Cement Returns (BBL)	80	Blend 2					Displacement Fluid Temp (°F)	50	
		Blend 3					Displacement Fluid Density (lb/gal)	8.3	

Time	Rate (bpm)	Volume (bbl)	Pressure (psi)	Event or Stage Description
23:00				Arrive on Location
				Hold Safety Meeting
				Spot Trucks, Rig in
4:35	2.0	2	500	Test OPDS
4:37			4000	Pressure Test Lines
4:39	5.5	200	110	Pump Recycled Water
5:12	5.5	25	115	Pump Gel
5:18	5.5	10	110	Pump Fresh Water
5:20	5.5	273	265	Mix and Pump Lead Cement
6:10				Shut Down, Drop Plug
6:12	5.5, 4, 3	211	600	Displace Plug
6:58			900	Plug Lands, Shut Down
				Hold 5 Minutes, Release Pressure
7:03				Floats Held
				Wash Up, Rack Out
8:00				Leave Location

Water Test		Pressurized Mud Scale			Comments: Ph-6 SG-1.001 Hardness-250
Temp	°F	Blend 1			
Iron	mg/L	Sample 1		ppg	
Hardness	mg/L	Sample 2		ppg	
S.G.		Sample 3		ppg	
pH		Blend 2			
Sulfates	mg/L	Sample 1		ppg	
Chlorides		Sample 2		ppg	
		Sample 3		ppg	

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Environmental Protection

UWS Cement Operator Signature:

Brian Fullem

Customer Representative Signature:





Cement Job Log

Customer: NORTHEAST NATURAL ENERGY LLC	Date: 4/20/2018	Serv. Supervisor: Nicholas Kile
Cust. Rep.: Jamie	Ticket #: JWV1804-0024	Serv. Center: Jane Lew, WV
Lease: Mepco 8H	API Well #: 100379-603	County: Monongalia State: West Virginia
Well Type:	Rig: Patterson 334	Type of Job: Production 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 (bbls)	Mix Water (bbls)
Spacer 1:	CJ810 PureScrub Spacer + 1 gal/bbl CPC35	-	13.5			100	
Lead							
Tail:	50:50 CJ010:CJ910 + 3% CJ111 (BWOW) + 0.25% CJ210F + 0.2% CJ500U + 0.2% CJX157011	3193	14.5	1.17	4.95	666	376

Displacement Chemicals:

OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
8 3/4		6600	Casing	5 1/2	20		16680		4.79		
8 1/2		16680									

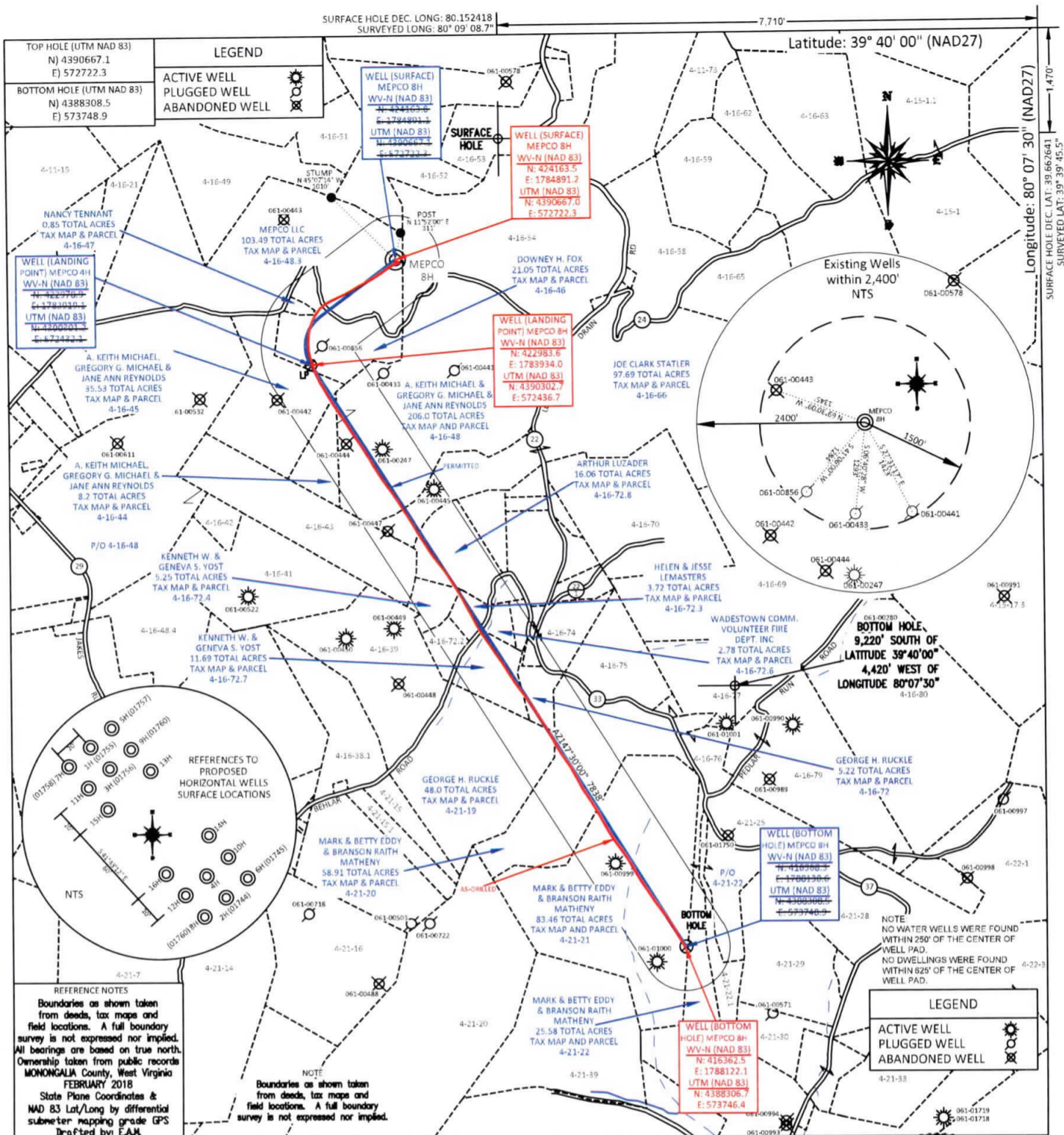
PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
9 5/8	40	8.84	2653					16680	16600		

WELL FLUID		DISPLACEMENT FLUID (STG 1)			DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE	DENSITY				
					370 bbl	H2O	8.3 ppg	2000	2257	6819	6000

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
2:00AM						0	Arrived On Location
3:00AM						0	Spotted Trucks/Rigged Up
6:30AM						0	Safety Meeting
7:00AM						0	PSI Test 6000 Launch Bottom Plug
7:30AM						0	Load Top Plug
7:50AM	5	711			100	100	Spacer@13.5
8:15AM	5	411				100	Spacer@13.5
8:22AM	6	819			665	765	Started Tail Cement
8:36AM	8	1455				765	Scaled @ 15 ppg Sampled @ 14.7 ppg
8:55 AM	6.5	627				765	Scaled @ 14.5 ppg Sample taking @ 14.2
9:10 AM						765	Bottom Plug Landed
9:38AM	6.5	675				765	Scaled @ 14.5 Sample taking @ 14.2
10:18 AM	6.4	1680				765	Scaled @ 14.5 Sample taking @ 14.2
10:24 AM						765	Shut Down Wash Line Drop Plug
10:30AM	5	1300			371.5	1136.5	Start Displacement
10:46AM	8.3	2700				1136.5	Displacement
11:02AM	7.5	3807				1136.5	Displacement
11:13 AM	6.8	3300				1136.5	Displacement
11:22AM	6.8	4270				1136.5	Spacer to Surface
11:50AM						1136.5	Cement To Surface @ 350 bbls into Displacement
11:56AM		4750				1136.5	Plug Down
12:01PM						1136.5	Float Holds (5 bbl back)
						1136.5	
						1136.5	

Left Yard	4/20/18 8:00 PM			Left Loc.	4/21/2018 13:00PM			Start Pump	4-21-18 7:50AM		
Arrived Loc.	4/20/18 10:00 PM			Returned Yd	4-21-18 15:00PM			End Pump	4/21/18 11:56 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)	Standby Charged (hrs)	<i>Nicholas Kile</i> Service Supervisor			
Yes	4000	Yes	0	20	Yes	4750	7	SEP 9 2019			

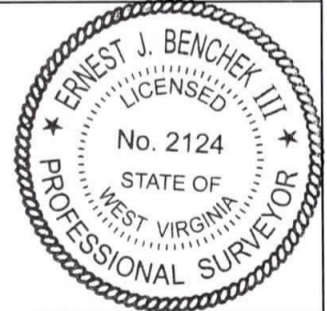
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FILE #: NNE16  
 DRAWING #: 2929  
 SCALE: PLAT: 1" = 1800'  
TICK: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1/200  
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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

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



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

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

WATERSHED: DUNKARD CREEK  
 COUNTY/DISTRICT: MONONGALIA / CLAY  
 SURFACE OWNER: MEPCO LLC  
 OIL & GAS ROYALTY OWNER: NNE LLC ET AL  
 LEASE NUMBERS: \_\_\_\_\_

DATE: AUGUST 5, 2019  
 OPERATOR'S WELL #: MEPCO 8H (AS-DRILLED)  
 API WELL #: 47 61 01759  
 STATE COUNTY PERMIT

AS-BUILT ELEVATION: 1,420.20'  
 QUADRANGLE: BLACKSVILLE  
 ACREAGE: 103.49 +/-  
 ACREAGE: 537.39 +/-

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: 8,222' TMD:17,007.41'  
 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