

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

API 47 - 061 - 01756 County Monongalia District Clay  
Quad Blacksville Pad Name MEPCO Field/Pool Name \_\_\_\_\_  
Farm name MEPCO, LLC Well Number MEPCO 3H  
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 4390698.2 Easting 572701.9  
Landing Point of Curve Northing 4390699.1 Easting 572643.8  
Bottom Hole Northing 4392714.6 Easting 571073.4

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Elevation (ft) 1,420' 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 11/27/2017 Date drilling commenced 02/12/2018 Date drilling ceased 8/7/2018  
Date completion activities began 12/3/2018 Date completion activities ceased 12/18/2018  
Verbal plugging (Y/N) N Date permission granted N Granted by N

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:  
MDK 11/26/2019

Reviewed

API 47-061 - 01756 Farm name MEPCO, LLC Well number MEPCO 3H

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	NA	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1400'	N	54.5	N/A	Y, 40 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2459	N	40	N/A	Y, 14
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	16,880'	N	20	N/A	N
Tubing	N/A	2-7/8"		N		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	36		3 Yds	-	CTS	48
Surface	Class A + 2%	1124	15.6	1.20	1340	CTS	8
Coal							
Intermediate 1	Class A + 1%	800	15.6	1.19	1088	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	1055	16	1.09	1152	1,959'	48
Tubing							

Drillers TD (ft) 16,880' Loggers TD (ft) 16,850'  
 Deepest formation penetrated Marcellus Plug back to (ft) NA  
 Plug back procedure NA

Kick off depth (ft) 5,723'

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 \_\_\_\_\_

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WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

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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 3H PERFORATION RECORD

Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	12/4/2018	16,732	-	-
2	12/4/2018	16,526	16,686	40
3	12/4/2018	16,324	16,484	40
4	12/5/2018	16,122	16,281	40
5	12/5/2018	15,919	16,079	40
6	12/5/2018	15,717	15,877	40
7	12/6/2018	15,515	15,675	40
8	12/6/2018	15,313	15,472	40
9	12/6/2018	15,110	15,270	40
10	12/7/2018	14,908	15,068	40
11	12/7/2018	14,706	14,866	40
12	12/7/2018	14,504	14,664	40
13	12/7/2018	14,302	14,461	40
14	12/8/2018	14,099	14,259	40
15	12/8/2018	13,897	14,057	40
16	12/9/2018	13,695	13,855	40
17	12/9/2018	13,493	13,652	40
18	12/10/2018	13,290	13,450	40
19	12/10/2018	13,088	13,248	40
20	12/10/2018	12,886	13,046	40
21	12/10/2018	12,684	12,844	40
22	12/11/2018	12,482	12,641	40
23	12/11/2018	12,279	12,439	40
24	12/11/2018	12,077	12,237	40
25	12/12/2018	11,875	12,035	40
26	12/12/2018	11,673	11,832	40
27	12/12/2018	11,470	11,630	40
28	12/12/2018	11,268	11,428	40
29	12/13/2018	11,066	11,226	40
30	12/13/2018	10,662	10,821	40
31	12/13/2018	10,662	10,821	40
32	12/14/2018	10,459	10,619	40
33	12/14/2018	10,257	10,417	40
34	12/14/2018	10,055	10,215	40
35	12/14/2018	9,853	10,012	40
36	12/15/2018	9,650	9,810	40
37	12/15/2018	9,448	9,608	40
38	12/15/2018	9,246	9,406	40
39	12/15/2018	9,044	9,203	40
40	12/16/2018	8,841	9,001	40
41	12/16/2018	8,639	8,799	40
42	12/16/2018	8,437	8,597	40

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### MEPCO 3H 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	12/4/2018	78	8,717	8,644	5,946	305,200	378	6,400	540
2	12/4/2018	80	8,921	7,840	5,723	399,420	370	7,865	475
3	12/4/2018	80	9,043	8,162	6,054	400,760	365	7,480	297
4	12/5/2018	75	9,250	7,961	5,906	400,580	360	8,619	202
5	12/5/2018	75	9,074	8,386	6,481	393,220	356	8,722	429
6	12/5/2018	80	8,480	8,299	6,984	400,360	745	7,853	206
7	12/6/2018	71	8,917	7,741	6,086	399,620	346	8,699	470
8	12/6/2018	70	9,153	7,535	5,412	399,640	341	8,888	475
9	12/6/2018	75	9,061	7,592	6,076	399,800	335	8,212	80
10	12/7/2018	76	9,119	8,156	6,187	400,330	334	8,432	100
11	12/7/2018	74	9,121	7,519	6,178	400,320	318	8,174	620
12	12/7/2018	76	9,049	7,397	5,751	400,920	328	8,044	66
13	12/7/2018	73	9,000	7,968	5,947	400,000	318	8,174	68
14	12/8/2018	80	8,984	7,429	5,734	381,310	319	8,565	454
15	12/8/2018	77	8,913	7,480	6,370	404,590	309	7,985	100
16	12/9/2018	78	8,961	7,908	#N/A	401,400	308	8,514	400
17	12/9/2018	78	8,896	7,498	5,751	403,700	303	8,123	60
18	12/10/2018	76	8,978	7,870	6,290	399,940	302	7,832	110
19	12/10/2018	79	8,956	7,994	6,146	401,120	295	7,640	90
20	12/10/2018	77	9,180	8,138	5,809	400,286	290	8,154	210
21	12/10/2018	79	8,935	7,322	5,617	399,840	286	7,781	98
22	12/11/2018	80	8,733	7,072	6,257	399,817	282	8,022	73
23	12/11/2018	79	9,113	7,726	6,071	324,500	305	7,357	125
24	12/11/2018	79	9,018	7,143	5,865	351,680	272	7,153	135
25	12/12/2018	79	8,945	7,078	6,179	399,760	301	8,308	166
26	12/12/2018	82	8,928	7,277	5,300	372,320	262	7,794	126
27	12/12/2018	82	8,742	7,344	5,579	400,000	257	8,078	125
28	12/12/2018	79	8,350	7,235	6,078	402,280	276	8,943	175
29	12/13/2018	80	8,597	7,612	5,600	400,860	249	8,157	153
30	12/13/2018	81	8,676	7,540	5,327	399,780	244	7,998	103
31	12/13/2018	79	8,159	7,832	5,661	399,620	241	7,965	150
32	12/14/2018	79	8,346	7,579	5,554	395,120	239	7,872	275
33	12/14/2018	82	8,465	7,670	5,990	399,240	231	7,934	165
34	12/14/2018	86	8,494	7,218	6,163	399,540	238	7,920	115
35	12/14/2018	79	8,140	7,200	6,057	401,500	222	7,458	150
36	12/15/2018	80	8,118	7,293	5,610	402,060	217	8,157	103
37	12/15/2018	86	8,284	7,782	6,050	403,480	213	8,193	130
38	12/15/2018	79	8,397	7,093	5,282	403,220	214	7,841	175
39	12/15/2018	83	8,532	7,722	5,841	399,540	204	6,914	200
40	12/16/2018	84	8,146	7,583	5,665	397,580	196	8,043	250
41	12/16/2018	85	7,649	7,383	5,812	398,240	195	7,938	85
42	12/16/2018	85	8,080	6,975	5,682	439,000	221	7,835	175

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Customer: NORTHEAST NATURAL ENERGY LLC	Date: 2/15/2018	Serv. Supervisor: Anthony Barbara
Cust. Rep.:	Ticket #: BPA-1802-0021	Serv. Center: Black Lick, PA
Lease: Mepeco 3H	API Well #:	County: Monongalia State: WV
Well Type:	Rig: 00	Type of Job: Intermediate 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			25	
Lead							
Tail: CJ910 + 1% CJ110		800	15.6	1.19	5.23	169	100

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)
12 1/4		2500	Casing	9 5/8	40		2459		8.84		

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
13 3/8	54.5	12.61	1398					2453	2408		

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				
AIR		179 bbl	H2O	8.3 ppg			927	1177	1800

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
5:00 AM						0	Yard Call				
6:15 AM						0	Pre Convoy Meeting				
10:10 AM						0	Waiting for Casing Crew				
11:45 AM						0	Rig Up Meeting				
12:00 PM						0	Rig Up				
2:00 PM						0	Safety Meeting with Company Man and Rig Crew				
2:17 PM	5	100			5	5	Load Lines	H2O Temp-	52.4	PH- 8	
2:20 PM		3400				5	Pressure Test				
2:24 PM	8	250			182	187	Pump Processed water Clear Shoe				
2:41 PM	8	260			10	197	Pump Spacer of Fresh				
2:43 PM	5	85			25	222	Pump Gelled Water				
2:47 PM	5	85			5	227	Pump Spacer of Fresh				
2:52 PM	8	500			169	396	Mix and Pump Cement @ 15.6# PPG Scaled. Red Lion-16.8#				
3:14 PM						396	Drop Plug Cement Temp- 66.4				
2:15 PM	2	80			1	397	Start Displacement Fresh				
3:19 PM	8.2	225			9	406	Switch to Processed water @ 10bbbls				
3:24 PM	7	120			40	446	Rate and Pressure Check @ 50bbbls				
3:31 PM	7	300			50	496	Rate and Pressure Check @ 100bbbls				
3:36 PM	5	505			30	526	Rate and Pressure Check @ 130bbbls				
3:46 PM	3.3	830			30	556	Rate and Pressure Check @ 160bbbls				
3:48 PM	4	900			10	566	Rate and Pressure Check @ 170bbbls				
3:50 PM	3.5	900			10	576	Rate and Pressure Check @ 180bbbls				
3:51 PM		1550			3	579	Plug Landed @ 183bbbls				
3:56 PM							Release Pressure got back .5bbl/ Wash up Rig Down				

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Left Yard	2/15/18 6:30 AM	Left Loc.	2/15/18 4:50 PM	Start Pump	2/15/18 2:17 PM
Arrived Loc.	2/15/18 10:10 AM	Returned Yd	2/15/18 8:15 PM	End Pump	2/15/18 3:50 PM

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)	Anthony Barbara WV Department of Environmental Protection Service Supervisor		
Yes	900	Yes	0	14	Yes	900	1			





# NORTHEAST NATURAL ENERGY, LLC

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

Slot: Slot #03  
 Well: MEPCO LLC 3H ST01  
 Wellbore: MEPCO LLC 3H ST01 PWB

File reference wellbore is MEPCO LLC 3H ST01 PWB Rev=0.0  
 True vertical depth is referenced to Patterson 334 (KB)  
 \* - \* Wellpath was transformed from a different geoid: datum  
 North Reference: Grid north  
 Scale: True distance  
 Depths are in feet  
 Coordinates are in feet referenced to SBT  
 Created by: thomaz on 2016-06-17  
 Database: WA, Pennsylvania

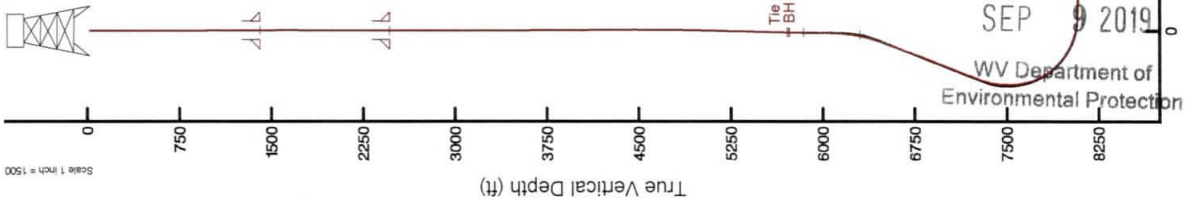


Scale 1 inch = 1500

13.375in Casing : 0.34° Inc, 1410.00ft MD, 1409.96ft TVD, 2.7ft VS

9.625in Casing : 0.62° Inc, 2469.00ft MD, 2468.94ft TVD, 1.13ft VS

Tie On to Pilot Hole : 1.36° Inc, 5710.00ft MD, 5709.64ft TVD, -12.07ft VS  
 BH AT Curve <8.5°> (5723-1681ft) : 1.51° Inc, 5723.00ft MD, 5722.64ft TVD, -12.37ft VS



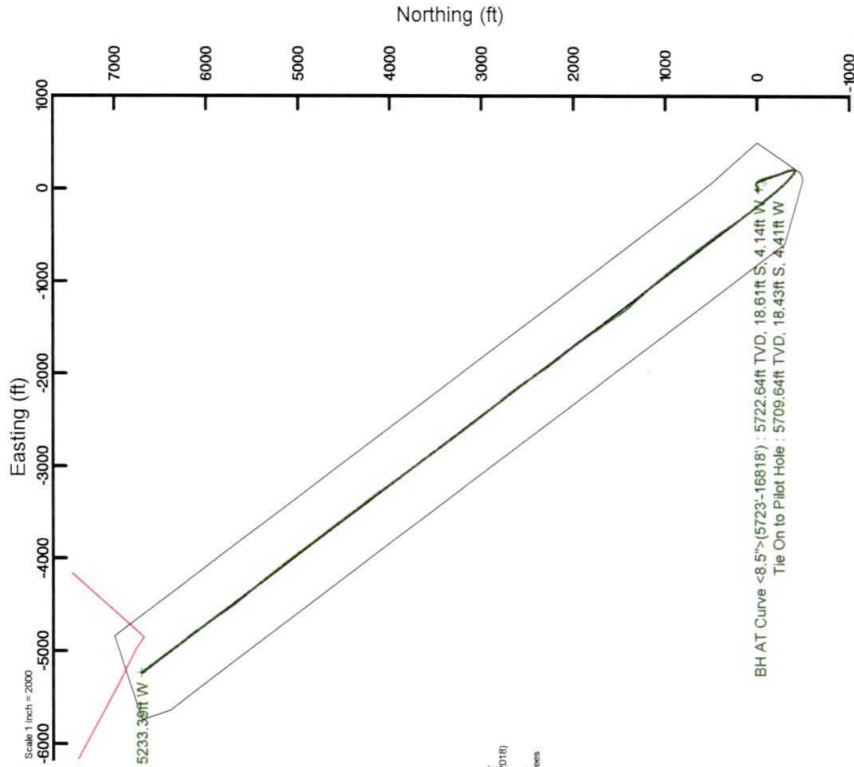
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Azimuth 323.00° with reference 0.00 N, 0.00 E



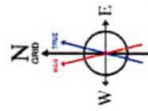
Location Information			
Facility Name	MEPCO Pad	Grid East (US ft)	Grid North (US ft)
Local N (ft)	-15.42	1764826.180	424282.090
Local E (ft)	4.95	1764826.180	424286.870
Slot	Slot #03	Latitude	Longitude
		39°39'46.862" N	80°09'08.866" W
Patterson 334 (KB) to Ground level (At Slot Slot #03)	25ft	Latitude	Longitude
Mean Sea Level to Ground level (At Slot Slot #03)	-142ft	39°39'46.817" N	80°09'08.801" W
Patterson 334 (KB) to Mean Sea Level	149ft		

**API: 47-061-01756-0000**  
**BH Job #: 9217379**  
**Rig: Patterson 334**  
**Duration: 07/29/2018 - 08/06/2018**



Projection to Bit : 8297.68ft TVD, 6705.95ft N, 5233.38ft W

BH AT Curve <8.5°> (5723-1681ft) : 5722.64ft TVD, 18.61ft S, 4.14ft W  
 Tie On to Pilot Hole : 5709.64ft TVD, 18.43ft S, 4.41ft W

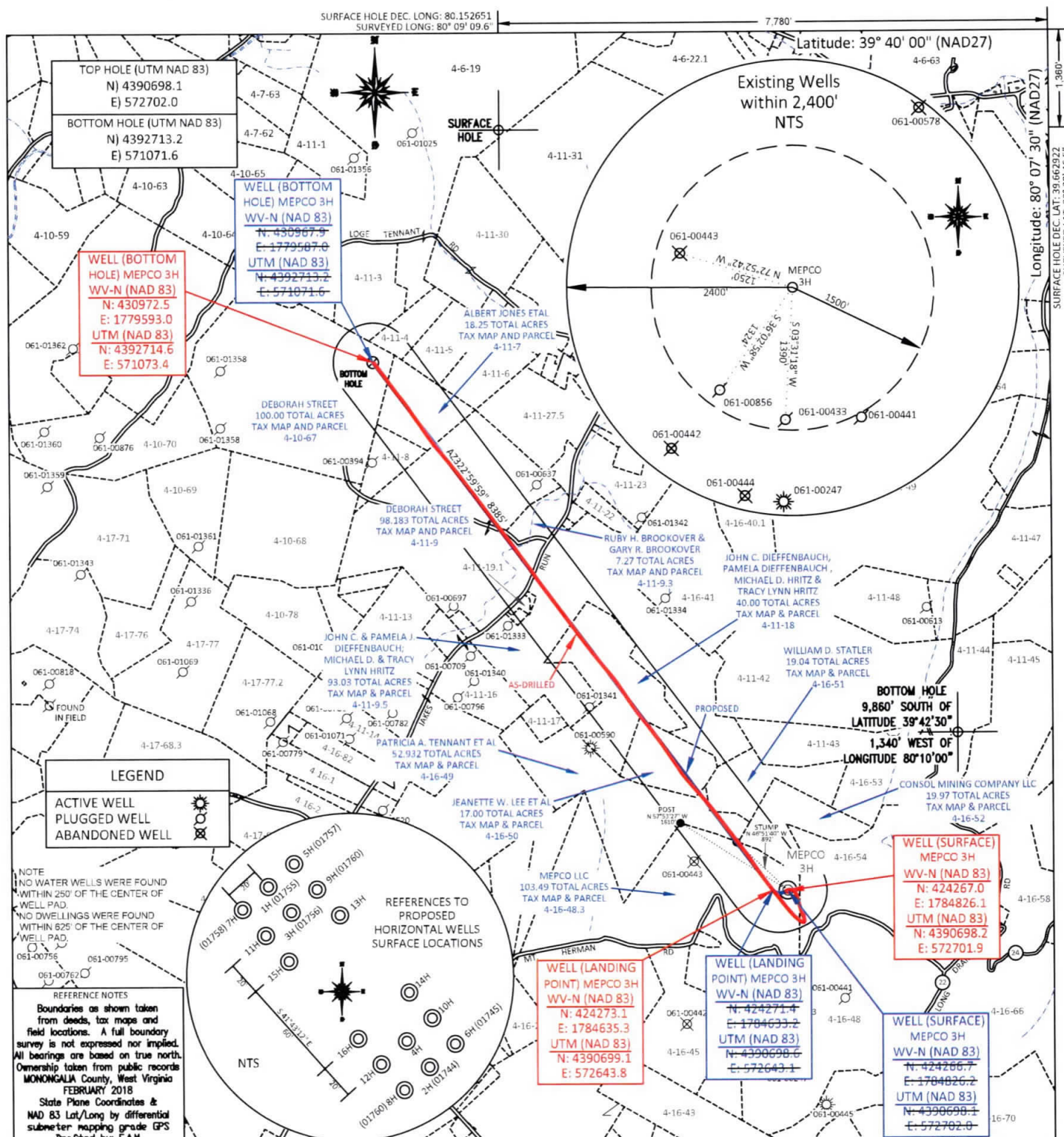


BGSN (1000.0 to 2019.0) Dip: 85.00° East, 11.94° S, 1.00° E  
 Magn: Grid North is 0.42 degrees West of True North (at 7/29/2018)  
 To correct azimuth from True to Grid add 0.42 degrees  
 To correct azimuth from Magnetic to Grid subtract 0.64 degrees

Projection to Bit : 88.00° Inc, 16880.00ft MD, 8297.68ft TVD, 8505.14ft VS

Scale 1 inch = 1500





FILE #: NNE16  
 DRAWING #: 2932  
 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 WYDEP

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\_3H (AS-DRILLED)  
 API WELL #: 47 STATE 61 COUNTY WV DEPT. OF ENVIRONMENTAL PROTECTION  
 AS-BUILT ELEVATION: 1,420.20'

QUADRANGLE: BLACKSVILLE  
 ACREAGE: 103.49 +/-  
 ACREAGE: 431.87 +/-

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: 16,995.16'  
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC  
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200  
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301