

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

API 47-061-01799 County Monongalia District Clay
Quad Blacksville Pad Name Yost Field/Pool Name _____
Farm name Yost Heritage Inc. Well Number 1H
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 4388277.1 Easting 567087.8
Landing Point of Curve Northing 4388231.2 Easting 566735.9
Bottom Hole Northing 4390042.7 Easting 565419.3

Elevation (ft) 1,492' 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 7/9/2018 Date drilling commenced 2/13/2019 Date drilling ceased 3/7/2019
Date completion activities began 4/30/2019 Date completion activities ceased 6/1/2019
Verbal plugging (Y/N) NA 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 180', 480', 1,378' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2,410' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 775', 930', 1,115' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

API 47-061 - 01799 Farm name Yost Heritage Inc. Well number 1H

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	NA	Y
Surface	17-12"	13-3/8"	1,460'	N	54.5	NA	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,630'	N	40	NA	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	16,305'	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 + 2%	1,413	15.6	1.1979	1,692	CTS	8
Coal							
Intermediate 1	Class A + 1%	839	15.2	1.2618	1,059	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	3,210	14.5	1.15	4,310	CTS	48
Tubing							

Drillers TD (ft) 16,326' Loggers TD (ft) 16,296'

Deepest formation penetrated Marcellus Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) 6,869'

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 - 01799 Farm name Yost Heritage Inc. Well number 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>8,176'</u>	<u>TVD</u>	<u>16,326'</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3466 psi Bottom Hole 3960 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 3341 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 Highlands Drilling
Address 900 Virginia St. E City Charleston State WV Zip 25301

Logging Company Baker Hughes
Address 837 Phillippi Pike City Clarksburg State WV Zip 26301

Cementing Company BJ Services
Address 3415 Millennium Blvd SE City Massillon State OH Zip 44646

Stimulating Company Producers Services
Address 109 Graham St 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 10/24/19

Yost 1H Stimulation Information

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	5/10/19	4,514	7,744	7,618	79	470	6,394	300,720	362
2	5/11/19	5,080	8,360	8,074	81	438	8,417	400,020	357
3	5/11/19	5,138	7,194	8,303	80	373	8,064	402,140	354
4	5/12/19	4,803	7,126	8,331	80	375	8,127	400,180	348
5	5/12/19	5,011	7,360	8,320	81	277	8,067	400,560	342
6	5/13/19	5,256	7,372	8,421	83	391	8,389	403,170	342
7	5/13/19	5,834	7,178	7,952	80	211	8,007	402,040	336
8	5/14/19	4,850	7,105	7,998	80	344	8,028	403,150	333
9	5/14/19	5,486	7,490	8,331	83	389	8,187	402,380	324
10	5/15/19	5,634	6,940	8,228	83	301	7,816	401,520	326
11	5/15/19	4,954	7,016	8,549	79	195	7,674	401,040	323
12	5/16/19	5,695	7,033	8,386	81	330	7,958	402,080	321
13	5/16/19	5,493	7,754	8,483	80	362	8,016	400,360	310
14	5/17/19	5,319	7,377	8,537	79	314	7,467	404,240	300
15	5/17/19	5,319	7,797	8,476	81	245	7,812	347,860	288
16	5/18/19	5,790	7,060	8,206	79	198	7,695	401,300	295
17	5/18/19	5,790	7,089	8,367	81	380	8,080	406,200	291
18	5/19/19	5,567	7,401	8,452	81	403	7,352	310,360	287
19	5/22/19	6,065	7,098	8,623	79	300	6,787	341,780	283
20	5/22/19	6,007	7,415	8,436	80	280	7,426	350,860	277
21	5/23/19	5,642	7,487	8,422	79	205	6,698	326,300	274
22	5/23/19	6,424	6,971	8,177	80	182	6,237	326,870	271
23	5/23/19	5,922	6,639	8,106	81	238	6,980	333,530	264
24	5/23/19	5,725	6,678	7,984	80	551	8,258	349,220	260
25	5/24/19	6,130	6,532	7,771	79	451	7,026	350,730	259
26	5/24/19	4,968	6,679	7,812	80	403	7,581	351,100	248
27	5/25/19	5,296	7,020	7,813	82	170	7,394	351,080	257
28	5/25/19	5,003	6,895	7,843	80	335	7,495	351,080	243
29	5/26/19	5,122	7,103	7,811	80	180	6,959	348,920	237
30	5/27/19	5,647	7,085	7,645	80	295	8,032	350,240	232
31	5/27/19	5,311	6,821	7,698	80	305	7,519	350,420	236
32	5/28/19	5,058	7,087	7,675	78	102	7,190	355,180	223
33	5/28/19	5,243	6,590	7,469	79	199	6,977	351,480	221
34	5/29/19	5,806	6,887	7,631	80	198	7,200	351,380	212
35	5/29/19	5,297	7,050	7,574	80	77	7,160	345,210	212
36	5/30/19	4,997	7,317	7,583	81	368	7,586	350,440	206
37	5/30/19	5,392	7,232	7,570	80	145	6,921	359,500	203
38	5/31/19	5,197	7,295	7,729	80	228	7,143	350,460	200
39	5/31/19	5,038	8,006	7,318	80	150	6,901	349,640	195

Yost 1H Stimulation Information				
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	5/10/2019	16,162		40
2	5/11/2019	15,962	16,118	40
3	5/11/2019	15,565	15,721	40
4	5/12/2019	15,366	15,523	40
5	5/12/2019	15,167	15,324	40
6	5/13/2019	14,969	15,126	40
7	5/13/2019	14,770	14,927	40
8	5/14/2019	14,572	14,729	40
9	5/14/2019	14,373	14,530	40
10	5/15/2019	14,175	14,332	40
11	5/15/2019	13,976	14,133	40
12	5/16/2019	13,778	13,934	40
13	5/16/2019	13,579	13,736	40
14	5/17/2019	13,381	13,537	40
15	5/17/2019	13,187	13,339	40
16	5/18/2019	12,983	13,140	40
17	5/18/2019	12,785	12,942	40
18	5/19/2019	12,586	12,743	40
19	5/22/2019	12,586	12,743	40
20	5/22/2019	12,388	12,545	40
21	5/23/2019	12,189	12,346	40
22	5/23/2019	12,030	12,168	40
23	5/23/2019	11,792	11,949	40
24	5/23/2019	11,594	11,750	40
25	5/24/2019	11,395	11,552	40
26	5/24/2019	11,196	11,353	40
27	5/25/2019	10,998	11,155	40
28	5/25/2019	10,799	10,956	40
29	5/26/2019	10,601	10,758	40
30	5/27/2019	10,402	10,559	40
31	5/27/2019	10,204	10,361	40
32	5/28/2019	10,005	10,162	40
33	5/28/2019	9,807	9,963	40
34	5/29/2019	9,608	9,765	40
35	5/29/2019	9,410	9,566	40
36	5/30/2019	9,211	9,368	40
37	5/30/2019	9,012	9,169	40
38	5/31/2019	8,814	8,971	40
39	5/31/2019	8,615	8,772	40

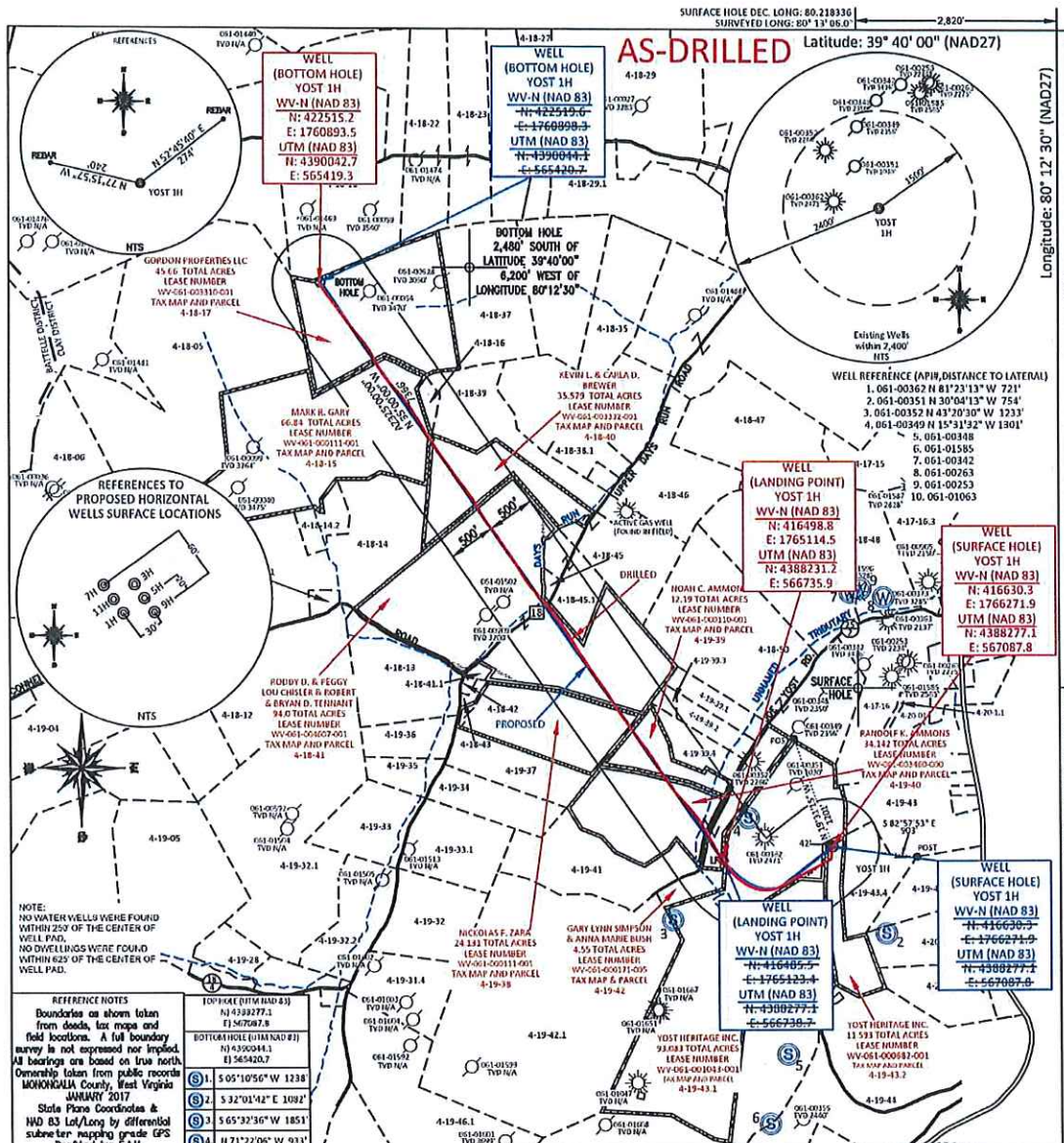
Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)

Bottom Depth in FT TVD

Top Depth in FT TVD

Lithology/Formation

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	120	Shale/Sand
Shale/sand/silt	120	390	Shale/sand/silt with water @ 180'
sand/shale	390	510	sand/shale with water @ 480'
sandstone/siltstone	510	775	sandstone/siltstone
coal	775	780	coal
sandstone/limestone	780	930	sandstone/limestone
coal	930	940	coal
sandstone/limestone	940	1020	sandstone/limestone
Limestone	1020	1050	Limestone
Limestone/siltstone	1050	1110	Limestone/siltstone
coal	1110	1115	coal
Limestone	1115	1140	Limestone
Limestone/sandstone/shale	1114	1260	Limestone/sandstone/shale
red shale/siltstone	1260	1440	red shale/siltstone with water @ 1378'
sandstone/siltstone	1440	1680	sandstone/siltstone
sandstone/siltstone/lime	1680	2310	sandstone/siltstone/lime
Big Lime	2310	2400	Big Lime
Big Injun	2400	2580	Big Injun
siltstone	2580	2620	siltstone
Gantz	2620	2680	Gantz
siltstone	2680	3050	siltstone
Sandstone	3050	3180	Sandstone
Upper Devonian undifferentiated	3180	6000	Upper Devonian undifferentiated
siltstone/shale/gray shale	6000	6450	siltstone/shale/gray shale
Devonian silt/sand/shale	6450	7550	Devonian silt/sand/shale
Middlesex	7550	7770	Middlesex
Burkett	7770	7960	Burkett
Geneseo	7960	8011	Geneseo
Tully	8011	8062	Tully
Hamilton	8062	8176	Hamilton
Marcellus	8176	TD	Marcellus



FILE #: NNE16
 DRAWING #: 2759
 SCALE: PLAT: 1" = 1500'
TICK: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMITTER 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 5TH STREET
 CHARLESTON, WV 25304

DATE: OCTOBER 22, 2019
 OPERATOR'S WELL #: YOST 1H
 API WELL #: 47 61
 STATE COUNTY PERMIT

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

WATERSHED: DUNKARD CREEK
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: YOST HERITAGE INC.
 OIL & GAS ROYALTY OWNER: Joe Pogue, et al
 LEASE NUMBERS: _____

AS-BUILT ELEVATION: 1,492'
 QUADRANGLE: BLACKSVILLE
 ACREAGE: 11.593 +/-
 ACREAGE: 421.768 +/-

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

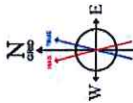
TARGET FORMATION: MARCELLUS
 AS-DRILLED DEPTH: TVD: 8,239' TMD: 16,326'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

NORTHEAST NATURAL ENERGY, LLC

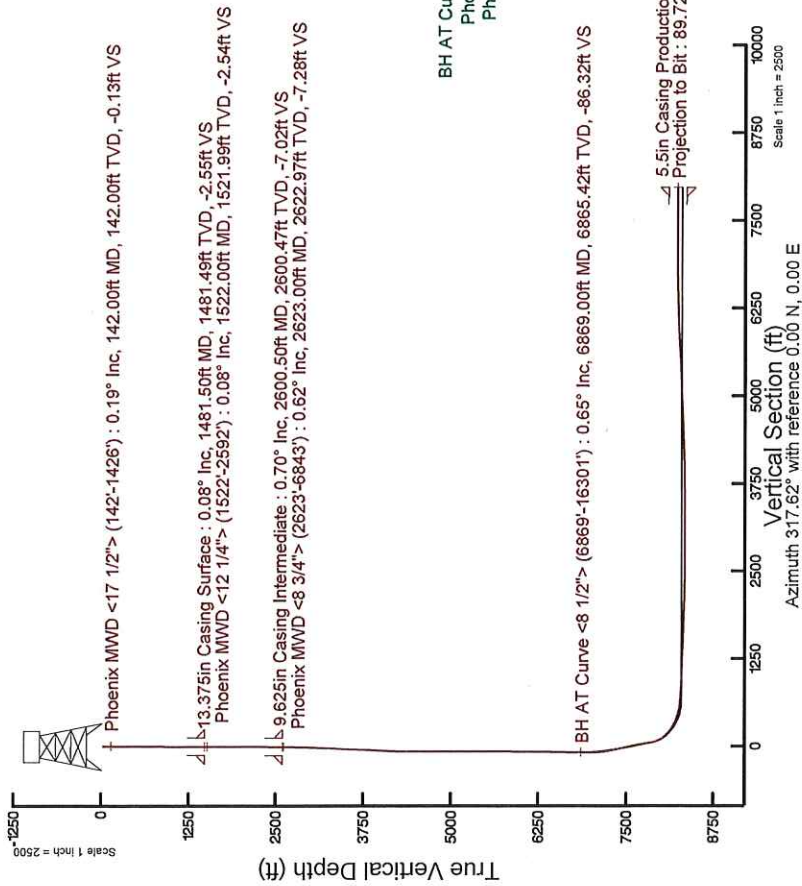
Location: Monongalia County, WV
 Field: Monongalia
 Facility: Yost Pad

Slot: Slot 01
 Well: Yost 1H
 Wellbore: Yost 1H.PWB

Plot reference wellpath is Yost 1H.PWB Rev-A.0	Grid System: NAD83 Lambert West Virginia SP, Northern Zone (4701), US feet
True vertical depths are referenced to Precision 228 (RKB)	North Reference, Grid north
Measured depths are referenced to Precision 228 (RKB)	Scale: True distance
Precision 228 (RKB) to Mean Sea Level: 1514.5 feet	Depths are in feet
Mean Sea Level to Ground level (At Slot Slot 01): -1492 feet	Created by: alienjn on 2019-03-21
Coordinates are in feet referenced to Slot	Database: WA_WPL_EASTERNUS_Defn



User specified Dip: 68.72°, Field: 52179 nT
 Magnetic North is 9.08 degrees West of True North (at 05/Feb/2019)
 Grid south mag. 68.88 degrees West of True North
 To correct azimuth from Magnetic to Grid subtract 6.83 degrees
 To correct azimuth from Magnetic to Grid subtract 6.83 degrees

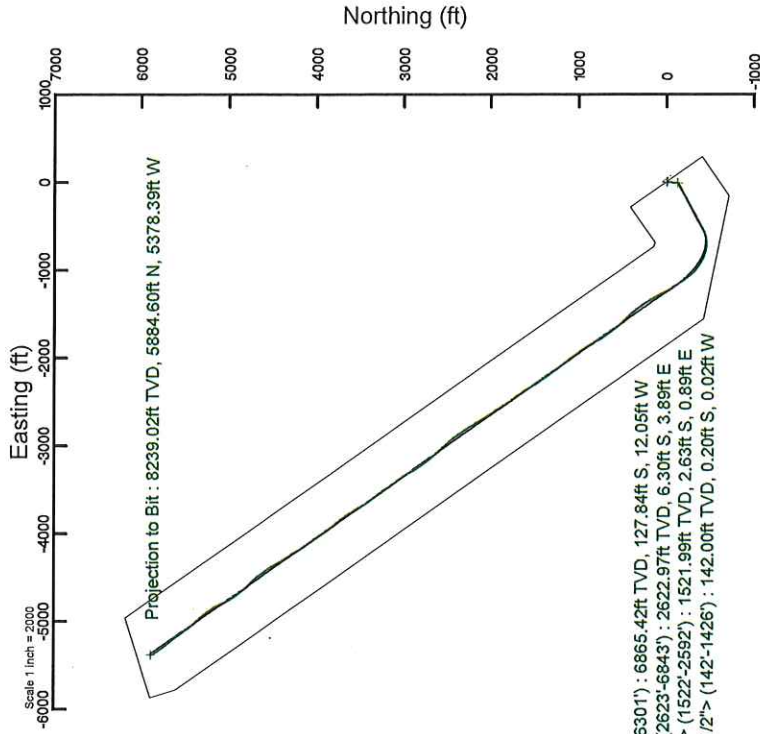


Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Yost Pad	1766284.700	416664.100	39°38'30.274"N	80°13'05.121"W
Local N (ft)	Local E (ft)	Grid North (US ft)	Latitude	Longitude
Slot 01	-33.80	1766271.900	39°38'29.939"N	80°13'05.281"W
Precision 228 (RKB) to Ground level (At Slot Slot 01)	-12.80	416630.300	22.5ft	
Mean Sea Level to Ground level (At Slot Slot 01)			-1492ft	
Precision 228 (RKB) to Mean Sea Level			1514.5ft	

Comments

API: 47-061-01799-0000
 BH Job #: 109629579
 Rig: Precision 228
 Duration: 02/21/2019 - 03/04/2019



State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Discharge Monitoring Report
Oil and Gas General Permit

Company Name: Northeast Natural Energy LLC
API No: 47-061-01799 County: Monongalia
District: Clay Well No: 1H
Farm Name: Northeast Natural Energy LLC

Discharge Date/s From:(MMDDYY) NA To: (MMDDYY) NA
Discharge Times. From: _____ To: _____

Total Volume to be Disposed from this facility (gallons): _____

Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: _____ (Include a topographical map of the Area.)
- (2) UIC: _____ Permit No. _____
- (3) Offsite Disposal: _____ Site Location: _____
- (4) Reuse: _____ Alternate Permit Number: _____
- (5) Centralized Facility: _____ Permit No. _____
- (6) Other method: _____ (Include an explanation)

Follow Instructions below to determine your treatment category:

Optional Pretreatment test: _____ Cl- mg/l _____ DO mg/l

1. Do you have permission to use expedited treatment from the Director or his representative?
(Y/N) _____ If yes, who? _____ and place a four (4) on line 7.
If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) _____ If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) _____ If yes, go to line 4
If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) _____ If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) _____ If yes, go to line 6
If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l?(Y/N) _____ If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. _____ is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: Utilized a closed loop system

Name of Principal Exec. Officer: Hollie Medley

Title of Officer: Regulatory Manager

Date Completed: 10/24/19

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Hollie Medley

Signature of a Principal Exec. Officer or Authorized agent.

Category 1
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

*** Al is only reported if the pH is above 9.0

Category 2
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____ Date: _____
 ** Include a description of your aeration technique. Aeration Code: _____
 *** Al is only reported if the pH is above 9.0

Category 3
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**			Monitor	_____	mg/l
Oil and Grease			Monitor	_____	mg/l
Total Al***			Monitor	_____	mg/l
TSS			Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume			Monitor	_____	Gal
Flow			Monitor	_____	Gal/min
Disposal Area			Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0.

Category 4
Sampling Results
API No: _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**			Monitor	_____	mg/l
Oil and Grease			Monitor	_____	mg/l
TSS			Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume			Monitor	_____	Gal
Flow			Monitor	_____	Gal/min
Activated Carbon (0.175)			N/A	N/A	lb/Bl
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area			Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/10/2019
Job End Date:	5/31/2019
State:	West Virginia
County:	Monongalia
API Number:	47-061-01799-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Yost 1H
Latitude:	39.64156900
Longitude:	-80.21833600
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,248
Total Base Water Volume (gal):	12,249,886
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	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.43057	None
Sand (Proppant)	Producers Service Corp	Proppant					
StimSTREAM FR 9800	Producers Service Corp	Friction Reducer	Silica Substrate	14808-60-7	100.00000	12.20942	None
			copolymer of 2-propenamide	Proprietary	30.00000	0.01774	None
			Petroleum Distillate	64742-47-8	20.00000	0.01183	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00118	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00118	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00059	None
7.5% HCL	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	7.50000	0.02032	None
BIOC1139A	Producers Service Corp	Biocide					
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00669	None
			Glutaraldehyde	111-30-8	10.00000	0.00223	None

SCAL16486A	Producers Service Corp	Scale Inhibitor	Ethanol	64-17-5	5.00000	0.00112	None
			Amine Triphosphate	Proprietary	30.00000	0.00213	None
			Ethylene Glycol	107-21-1	30.00000	0.00213	None
			Sodium Phosphate	7632-05-5	30.00000	0.00213	None
4-N-1	Producers Service Corp	Inhibitor					
			Acetic acid	64-19-7	90.00000	0.00048	None
			Methanol	67-56-1	10.00000	0.00005	None
			2-Ethylhexanol	104-76-7	10.00000	0.00005	None
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00003	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					
			Petroleum Distillate	64742-47-8	20.00000	0.01183	
			Glutaraldehyde	111-30-8	10.00000	0.00223	
			Sodium Phosphate	7632-05-5	30.00000	0.00213	
			Amine Triphosphate	Proprietary	30.00000	0.00213	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00118	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00118	
			Ethanol	64-17-5	5.00000	0.00112	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00059	
			Methanol	67-56-1	10.00000	0.00005	
			2-Ethylhexanol	104-76-7	10.00000	0.00005	
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00003	
			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)

Cementing Treatment



Start Date	9/22/2018	Field Ticket#	
End Date	9/22/2018	Well	YOST 1H
Client	NORTHEAST NATURAL ENERGY LLC	API#	47-061-01799
Client Field Rep.		Well Classification	
Service Sup.	Michael Peck	County	MONONGALIA
District	Bridgeport, WV	State/Province	WV
Type of Job	Surface	Formation	
Execution ID	EXC-11209-W4B2X902	Rig	Highlands 8
Project ID	PRJ1011003		

WELL GEOMETRY

Type	ID (in)	OD (in)	Wt. (lb/ft)	MD (ft)	TVD (ft)	Excess(%)	Grade	Thread
Previous Casing	23.25	24.00	94.58	40.00	40.00			
Open Hole	17.50			1,480.00	1,480.00	60.00		
Casing	12.62	13.38	54.50	1,460.00	1,460.00			

Shoe Length (ft): 43

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	1,431.00
Bottom Plug Size		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)	2,730.00
Top Plug Size	13.375	Max Casing Pressure - Operated (psi)	2,180.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	BTC
Landing Collar Depth (ft)	1,490	Top Connection Size	13.375

CIRCULATION PRIOR TO JOB

Well Circulated By	BJ	Solids Present at End of Circulation	No
Circulation Prior to Job	No	10 sec SGS	
Circulation Time (min)		10 min SGS	
Circulation Rate (bpm)	7.00	30 min SGS	
Circulation Volume (bbls)	230.00	Flare Prior to/during the Cement Job	No

Cementing Treatment



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

TEMPERATURE

Ambient Temperature (°F) **Slurry Cement Temperature (°F)** 85.00
Mix Water Temperature (°F) 74.40 **Flow Line Temperature (°F)**

BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H2O Req. (gals/sk)	Planned Top of Fluid (Ft)	Length (Ft)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	Fresh Water	8.3400			0.00				10.0000
Spacer / Pre Flush / Flush	Gel Spacer	8.6100			0.00				25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400			0.00				10.0000
Tail Slurry	Cement Slurry	15.6000	1.1979	5.23	0.00	1,460.00	1,413	1,692.0000	301.3000
Displacement Final	Fresh Water	8.3400			0.00			0.0000	219.5000
Top-Out / Scavenger Slurry	Top-out	15.6000	1.1796	5.23		0.00	1,101	1,298.0000	231.2000

Fluid Type	Fluid Name	Component	Concentration	UOM
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	IntegraSeal POLI	1.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT
Tail Slurry	Cement Slurry	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	BWOB
Top-Out / Scavenger Slurry	Top-out	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	200.0000	LBS
Top-Out / Scavenger Slurry	Top-out	FOAM PREVENTER, FP-13L	0.5000	GALS/100SK
Top-Out / Scavenger Slurry	Top-out	CEMENT, CLASS A	100.0000	PCT

Cementing Treatment



TREATMENT SUMMARY

Time	Fluid	Rate (bpm)	Fluid Vol. (bbls)	Pipe Pressure (psi)	Annulus Pressure (psi)	Comments
9/22/2018 9:36 AM	Fresh Water	7.00	230.00		160.00	Fresh Water to clear casing
9/22/2018 10:05 AM	Gel Spacer	4.00	25.00		75.00	Gel Spacer
9/22/2018 10:14 AM	Fresh Water	5.00	5.00		80.00	Fresh Water Spacer
9/22/2018 10:15 AM	Cement Slurry	5.00	301.30		220.00	Scaled Throughout 15.6-15.9
9/22/2018 11:15 AM	Fresh Water	6.00	221.00		600.00	Got 71 bbl of cement to surface
	Top-out	0.00	231.20			
			Min		Max	Avg
Pressure (psi)			75.00		600.00	220.00
Rate (bpm)			4.00		7.00	5.00

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amount of Cement Returned/Reversed	71.00
Calculated Displacement Volume (bbls)	221.00	Method Used to Verify Returns	Visual
Actual Displacement Volume (bbls)	221.00	Amount of Spacer to Surface	25.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amount Bled Back After Job	1.00
Bump Plug Pressure (psi)	1,100.00	Total Volume Pumped (bbls)	781.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement returns During Job		Lost Circulation During Cement Job	No

CEMENT PLUG

Bottom of Cement Plug?	No	Wiper Balls Used?	No
Wiper Ball Quantity		Plug Catcher	No
Number of Plugs			

SQUEEZE

Injection Rate (bpm)		Fluid Density (ppg)	
Injection Pressure (psi)		ISIP (psi)	
Type of Squeeze		FSIP (psi)	
Operators Max SQ Pressure (psi)			

Cementing Treatment



COMMENTS

Treatment Report

230 BBL FRESH WATER TO CLEAR CASING
25 BBL GEL SPACER
5 BBL WATER SPACER
300 BBL CEMENT @ 15.6
221 BBL DISPLACEMENT
PLUG LANDED ON DEPTH
FLOATS HELD 1 BBL BACK TO PUMP
NO TOP OUT CEMENT USED

Job Summary

Cementing Treatment



Start Date	9/26/2018	Field Ticket#	
End Date	9/26/2018	Well	YOST 1H
Client	NORTHEAST NATURAL ENERGY LLC	API#	47-061-01799
Client Field Rep.		Well Classification	
Service Sup.	Matthew Deel	County	MONONGALIA
District	Bridgeport, WV	State/Province	WV
Type of Job	Intermediate	Formation	Marcellus Shale
Execution ID	EXC-11470-J9W7B902	Rig	Highlands 8
Project ID	PRJ1011148		

WELL GEOMETRY

Type	ID (in)	OD (in)	Wt. (lb/ft)	MD (ft)	TVD (ft)	Excess(%)	Grade	Thread
Previous Casing	12.62	13.38	54.50	1,474.00	1,480.00			
Open Hole	12.25			2,630.00	2,630.00	40.00		
Casing	8.84	9.63	40.00	2,593.00	2,630.00			

Shoe Length (ft): 40.00

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	2,553.00
Bottom Plug Size		Max Tubing Pressure - Rated (psi)	
Top Plug Used?	Yes	Max Tubing Pressure - Operated (psi)	

Cementing Treatment



Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	3,950.00
Top Plug Size	9.625	Max Casing Pressure - Operated (psi)	3,357.00
Centralizers Used	No	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type		Top Connection Thread	BTC
Landing Collar Depth (ft)	2,590	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

Well Circulated By	BJ	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	10 sec SGS	
Circulation Time (min)		10 min SGS	
Circulation Rate (bpm)		30 min SGS	
Circulation Volume (bbls)	200.00	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			

TEMPERATURE

Cementing Treatment



Ambient Temperature (°F)	70.00	Slurry Cement Temperature (°F)	80.00
Mix Water Temperature (°F)	76.00	Flow Line Temperature (°F)	

BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H2O Req. (gals/sk)	Planned Top of Fluid (Ft)	Length (Ft)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	Gel Spacer	8.6100			0.00				25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400			0.00				10.0000
Tail Slurry	Cement Slurry	15.2000	1.2618	5.75	0.00	2630	839	1,059.0000	188.4000
Displacement Final	Fresh Water	8.3400			0.00			0.0000	196.4000

Fluid Type	Fluid Name	Component	Concentration	UOM
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	1.5000	BWOB
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT
Tail Slurry	Cement Slurry	FOAM PREVENTER, FP-13L	0.7000	GALS/100SK

TREATMENT SUMMARY

Time	Fluid	Rate (bpm)	Fluid Vol. (bbls)	Pipe Pressure (psi)	Annulus Pressure (psi)	Comments
------	-------	------------	-------------------	---------------------	------------------------	----------

Cementing Treatment



9/26/2018 6:09:00 AM	Gel Spacer	5.00	25.00	120.00	
9/26/2018 6:15:00 AM	Fresh Water	5.00	10.00	125.00	
9/26/2018 6:17:00 AM	Cement Slurry	6.00	188.40	200.00	
9/26/2018 6:57:00 AM	Fresh Water	6.00	196.40	500.00	
		Min	Max	Avg	
Pressure (psi)		120.00	500.00	236.25	
Rate (bpm)		5.00	6.00	5.50	

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amount of Cement Returned/Reversed	8.00
Calculated Displacement Volume (bbls)	293.00	Method Used to Verify Returns	Visual
Actual Displacement Volume (bbls)	287.00	Amount of Spacer to Surface	25.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amount Bled Back After Job	1.00
Bump Plug Pressure (psi)	1,242.00	Total Volume Pumped (bbls)	611.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement returns During Job	Partial	Lost Circulation During Cement Job	No

CEMENT PLUG

Bottom of Cement Plug?	No	Wiper Balls Used?	No
Wiper Ball Quantity		Plug Catcher	No
Number of Plugs			

Cementing Treatment



SQUEEZE

Injection Rate (bpm)

Fluid Density (ppg)

Injection Pressure (psi)

ISIP (psi)

Type of Squeeze

FSIP (psi)

Operators Max SQ Pressure (psi)

COMMENTS

Treatment Report

Job Summary

Cement Job Log



Customer: NORTHEAST NATURAL ENERGY LLC	Date: 3/6/2019	Serv. Supervisor: Jason Eason
Cust. Rep.: Troy Hamidi	Ticket #: JWV1003-0004	Serv. Center: Jane Lew - 3044
Lease: Yost 1H	API Well #: 47-061-01709	County: Monongalia State: WV
Well Type: Production casing	Rlg: Precision 224	Type of Job: Production Casing

Materials Furnished by CAJ ENERGY SERVICES

Phgs	Casing Hardware	Physical Slurry Properties					
		Bags of Cement	Fluid Dens (lb/gal)	Excess	Yield (cu/ft)	Mix Water (gal/bbl)	Final Volume (bbl)
13.5# PureScrub Spacer with Surfactant	+7.0 PPB CIX157011+60 0 PPB C111+1.0 GPB C/FPC35		13.5			100.00	
14.5# Cement	50 % C1010-74+50 % C1910 +0.2 % C1210K+0.25 % C1504+0.2 % CIX157011+0.2 % C1415	3210	14.5		1.16	4.68	060.11 373
Displacement			8.34				301.31
0							

Displacement Chemicals:

OPEN HOLE DATA		TUBULAR DATA						
12.25 in. O.H. (2,649 to 2,693 ft)	6.5 in. 20#, (0 to 16,305 ft)	SIZE WEIGHT	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
8.75 in. O.H. (2,693 to 6,900 ft)								
8.5 in. O.H. (6,900 to 16,326 ft)								

PREVIOUS CASING DATA		PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
0.626 in. 40# (0 to 2,649 ft)		TOP	BTM	SPP	SIZE	SHOE	FLOAT	STAGE	ACP

WELL FLUID		DISPLACEMENT FLUID		DIV PRESS (psf)	CAS LIFT (ft)	MAX PRESS (psf)	WATER ON LOG (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY			
		300 bbl	FRESH	8.3 ppg	2658	6985	5400

Time	Item (bbl/min)	Cog. Press. (psi)	Tog. Press. (psi)	Ann. Press. (psi)	Slg. Vol. (bbl)	Cum. Vol (bbl)	Slago Details
8:30 PM						0	ARRIVED ON LOCATION REQUESTED TIME
2:00 AM						0	rig down casing and pump
2:30 AM						0	spool trucks rig up
5:00 AM						0	safety meeting
6:05 AM						0	pat test @ 6000
6:08 AM	5.2	487			100	100	spacer
6:32 AM	5	359			693	763	tail cement @ 14.5 ppg
6:38 AM	9	1291				763	tail cement @ 14.5 ppg
7:07 AM	5	1411				763	land bottom plug
7:37 AM	9	1923				763	tail cement @ 14.5 ppg
8:09 AM						763	shut down wash lines drop top plug
8:11 AM	0	2524			360	1123	displace top plug
8:33 AM	0	3816				1123	displace top plug
8:56 AM	6	4263				1123	spacer to surface
9:11 AM	4.5	3800				1123	slow rate
9:14 AM		4463				1123	land bottom plug
9:19 AM						1123	float held 5 bbl return
9:20 AM	3	4823			5	1128	land plug
9:20 AM						1128	float held 5 bbl returned
						1128	
						1128	
						1128	
						1128	

Left Yard	3/5/19 8:00 PM	Left Loc	3/6/19 11:00 AM	Start Pump	3/6/19 6:00 AM
Arrived Loc.	3-5-19 2-30	Returned Yd		End Pump	3/6/19 9:15 AM

Bumped Plug (psi)	Final Differential (psi)	Floos Held (hrs)	PBI Lost on Casing	Cement to Surface (bbl)	Top of Cement (ft)	Pull Cks. During Job (hrs)	Mix Pump Pressure (psi)	Casing Rotation	Standby Charges (hrs)	Casing Recirculation
Yes	3000	Yes	0	5	surface	Yes	4023	no	11	no

Jason Eason **3/6/2019**
Service Supervisor Date