

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

API 47 - 061 - 01814 County Monongalia District Clay
Quad Osage, WV Pad Name Bogges Field/Pool Name _____
Farm name Blake R. & H. Preston Bogges Well Number 13H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia St. E, Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4391554.3 Easting 577783.0
Landing Point of Curve Northing 4392018.1 Easting 578360.6
Bottom Hole Northing 4394817.0 Easting 576687.9

Elevation (ft) 1,266' 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 12/18/2018 Date drilling commenced 1/10/19 Date drilling ceased 6/19/19
Date completion activities began 8/31/19 Date completion activities ceased 9/19/19
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 320', 1010', 1125' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1550', 1900' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 348', 620', 680', 1010' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

API 47-061 - 01814 Farm name Blake R. & H. Preston Bogges 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	58	N	NA	NA	Y, CTS
Surface	17.5	13 3/8	1,221'	N	54.5	NA	Y, 1 bbl
Coal							
Intermediate 1	12.25	9 5/8	2,501'	N	40	NA	Y, 25 bbl
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	20,417'	N	20	NA	N
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	4500 psi ready mix	35		.75	27	CTS	48
Surface	Class A	1,218	15.6	1.19	1,459	CTS	8+
Coal							
Intermediate 1	Class A	808	15.2	1.26	1,019	CTS	8+
Intermediate 2							
Intermediate 3							
Production	Class A	4,035	14.5	1.16	4,668	64'	8+
Tubing							

Drillers TD (ft) 20,442' Loggers TD (ft) 20,412'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure NA

Kick off depth (ft) 6,365'

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 _____

Bogges 13H Perforation Information

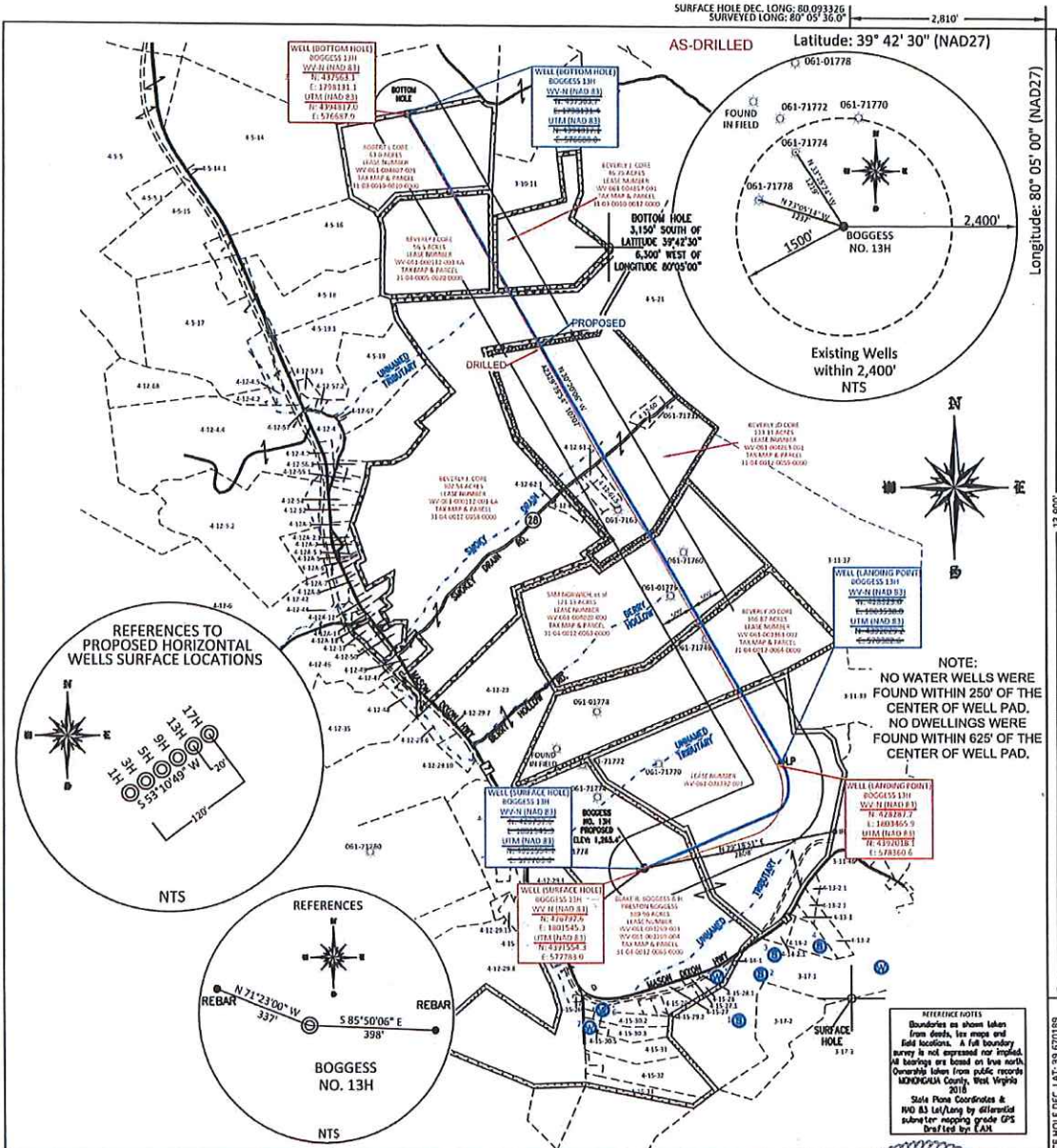
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	9/1/19	20,274	0	40
2	9/2/19	20,074	20,231	40
3	9/2/19	19,876	20,033	40
4	9/3/19	19,678	19,834	40
5	9/5/19	19,480	19,636	40
6	9/3/19	19,281	19,438	40
7	9/4/19	19,083	19,240	40
8	9/4/19	18,885	19,042	40
9	9/4/19	18,687	18,843	40
10	9/5/19	18,489	18,645	40
11	9/5/19	18,290	18,447	40
12	9/5/19	18,092	18,249	40
13	9/6/19	17,894	18,051	40
14	9/6/19	17,696	17,852	40
15	9/6/19	17,498	17,654	40
16	9/7/19	17,299	17,456	40
17	9/7/19	17,101	17,258	40
18	9/7/19	16,903	17,059	40
19	9/7/19	16,705	16,861	40
20	9/8/19	16,506	16,663	40
21	9/8/19	16,308	16,465	40
22	9/8/19	16,110	16,267	40
23	9/9/19	15,912	16,068	40
24	9/9/19	15,714	15,870	40
25	9/9/19	15,515	15,672	40
26	9/10/19	15,317	15,474	40
27	9/10/19	15,119	15,276	40
28	9/10/19	14,921	15,077	40
29	9/10/19	14,723	14,879	40
30	9/11/19	14,524	14,681	40
31	9/11/19	14,326	14,483	40
32	9/7/19	14,128	14,284	40
33	9/11/19	13,930	14,086	40
34	9/12/19	13,731	13,888	40
35	9/12/19	13,533	13,690	40
36	9/13/19	13,335	13,492	40
37	9/13/19	13,137	13,293	40
38	9/13/19	12,939	13,095	40
39	9/14/19	12,740	12,897	40
40	9/14/19	12,542	12,699	40
41	9/7/19	12,344	12,501	40
42	9/15/19	12,146	12,302	40
43	9/15/19	11,948	12,104	40
44	9/15/19	11,749	11,906	40
45	9/15/19	11,551	11,708	40
46	9/15/19	11,353	11,509	40
47	9/16/19	11,155	11,311	40
48	9/16/19	10,956	11,113	40
49	9/16/19	10,758	10,915	40
50	9/17/19	10,560	10,717	40
51	9/17/19	10,362	10,518	40
52	9/17/19	10,164	10,320	40
53	9/18/19	9,965	10,122	40
54	9/18/19	9,767	9,924	40
55	9/18/19	9,569	9,726	40

Boggess 13H 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	9/1/19	5,122	7,152	8,683	80	520	6,945	306,000	453
2	9/2/19	5,583	6,524	8,985	82	566	9,236	400,860	448
3	9/2/19	5,448	5,982	9,220	84	80	8,922	399,760	449
4	9/3/19	5,680	5,814	8,761	81	590	8,975	399,160	440
5	9/5/19	5,828	6,097	8,922	81	550	9,013	397,640	435
6	9/3/19	5,816	5,800	9,282	85	53	8,341	399,820	443
7	9/4/19	5,578	5,969	8,862	81	515	8,799	399,160	427
8	9/4/19	5,566	5,848	8,925	83	80	8,300	399,500	422
9	9/4/19	5,398	6,099	8,881	84	50	7,924	399,800	418
10	9/5/19	5,799	5,874	9,176	85	50	7,688	407,080	413
11	9/5/19	5,762	5,825	9,011	82	520	8,640	398,100	411
12	9/5/19	5,228	5,708	9,028	84	67	7,719	399,740	405
13	9/6/19	5,538	6,059	8,927	84	51	8,123	399,440	402
14	9/6/19	6,580	5,740	8,595	80	453	8,830	399,260	396
15	9/6/19	5,897	5,812	9,186	86	412	8,502	404,100	391
16	9/7/19	5,374	5,984	9,071	86	71	8,427	402,440	387
17	9/7/19	5,547	5,958	8,905	85	100	8,558	398,880	382
18	9/7/19	5,617	5,882	9,012	84	100	8,549	399,020	378
19	9/7/19	5,746	5,944	8,897	83	64	7,744	394,050	374
20	9/8/19	6,468	5,866	8,617	82	145	8,624	401,140	370
21	9/8/19	6,027	5,824	8,640	81	122	8,090	399,020	363
22	9/8/19	5,631	5,853	8,887	84	68	8,092	401,680	365
23	9/9/19	5,814	5,918	8,672	82	105	8,042	401,360	355
24	9/9/19	5,617	5,938	8,625	84	100	8,028	400,000	353
25	9/9/19	5,438	6,106	8,632	84	68	7,528	400,560	352
26	9/10/19	6,271	6,070	8,892	83	58	6,949	361,840	343
27	9/10/19	5,998	5,790	8,515	82	60	7,422	400,020	343
28	9/10/19	6,730	5,906	8,598	82	47	7,317	395,620	340
29	9/10/19	6,225	5,797	8,388	83	61	7,543	400,430	328
30	9/11/19	5,947	5,756	8,347	85	39	7,037	404,740	332
31	9/11/19	6,099	6,107	8,431	82	88	7,302	400,100	328
32	9/7/19	5,790	5,919	8,616	85	62	7,189	399,740	322
33	9/11/19	5,920	5,904	8,474	84	51	7,748	397,600	316
34	9/12/19	6,095	6,450	8,361	85	45	7,650	398,800	310
35	9/12/19	6,430	6,394	8,384	83	69	7,412	404,520	304
36	9/13/19	6,150	6,443	8,485	85	42	7,362	400,400	304
37	9/13/19	5,972	6,165	8,616	84	42	7,265	400,573	297
38	9/13/19	5,992	6,016	8,397	82	62	6,757	403,900	289
39	9/14/19	5,681	6,061	8,214	81	60	6,870	398,240	285
40	9/14/19	5,999	6,439	8,313	83	52	7,280	400,440	284
41	9/7/19	3,165	6,178	8,030	80	40	6,979	403,140	279
42	9/15/19	5,942	6,070	8,211	82	34	7,062	398,740	270
43	9/15/19	5,720	6,210	8,391	85	29	7,705	401,700	275
44	9/15/19	5,802	6,353	7,986	82	40	8,038	400,220	272
45	9/15/19	5,540	6,307	8,155	83	39	7,167	399,340	263
46	9/15/19	5,726	6,240	8,167	84	46	7,176	405,500	253
47	9/16/19	5,948	6,184	7,962	85	54	7,233	400,220	250
48	9/16/19	5,993	6,419	8,097	86	44	7,256	400,380	246
49	9/16/19	6,176	6,257	7,941	85	260	7,364	403,260	244
50	9/17/19	6,123	6,260	7,940	85	58	6,818	401,040	243
51	9/17/19	6,066	6,360	7,762	85	58	6,829	400,240	250
52	9/17/19	5,499	6,115	7,717	83	60	6,947	379,000	232
53	9/18/19	5,851	6,015	7,777	85	45	7,528	400,940	220
54	9/18/19	6,146	6,178	7,897	86	49	6,869	400,120	224
55	9/18/19	5,407	6,509	7,889	85	93	7,182	399,480	219

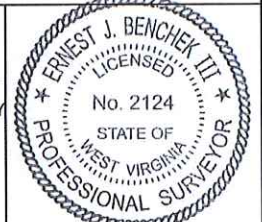
Bogges Pad Lithology

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Shale/Sand	0	270	Shale/Sand
Sand/silt	270	320	Sand/silt
sand/shale	320	348	sand/shale
coal	348	352	coal
Sand/silt	352	380	Sand/silt
sandstone/limestone	380	500	sandstone/limestone
Sand/silt	500	620	Sand/silt
coal	620	625	coal
Siltstone/Limestone	625	680	Siltstone/Limestone
coal	680	684	coal
Limestone/Siltstone	684	770	Limestone/Siltstone
Siltstone/Shale	770	920	Siltstone/Shale
Sandstone	920	1010	Sandstone
coal	1010	1017	coal
sandstone/siltstone	1017	1280	sandstone/siltstone
sandstone/siltstone	1280	1850	sandstone/siltstone
Red Shale/Siltstone	1850	1970	Red Shale/Siltstone
Limestone	1970	2030	Limestone
Big Injun	2030	2150	Big Injun
sandstone/siltstone	2150	2210	sandstone/siltstone
Gantz	2210	2240	Gantz
siltstone/shale	2240	2510	siltstone/shale
Upper Devonian undifferentiated	2510	6350	Upper Devonian undifferentiated
siltstone/shale	6350	7008	siltstone/shale
Middlesex	7008	7310	Middlesex
Burkett	7310	7640	Burkett
Geneseo	7640	7692	Geneseo
Tully	7692	7745	Tully
Hamilton	7745	7870	Hamilton
Marcellus	7870	TD	Marcellus



FILE #: NEE14
 DRAWING #: 2866
 SCALE: PLAT: 1" = 2000'
TRK MAPS: 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 5TH STREET
 CHARLESTON, WV 25304
 Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow
 WATERSHED: DUNKARD CREEK
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: BLAKE R. & PRESTON H. BOGESS
 OIL & GAS ROYALTY OWNER: BLAKE R. & PRESTON H. BOGESS 'et al'
 LEASE NUMBERS: _____

DATE: JANUARY 13, 2020
 OPERATOR'S WELL #: BOGESS NO. 13H
 API WELL #: 47 61 47-061-01814
 STATE COUNTY PERMIT
 AS-BUILT
 ELEVATION: 1,266.2'
 QUADRANGLE: OSAGE, WV
 ACREAGE: 389.96 +/-
 ACREAGE: 1219.86 +/-

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: 8,019' TMD: 20,442'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

SURFACE HOLE DEC. LONG: 80.093326 SURVEYED LONG: 80° 05' 36.0" Longitude: 80° 05' 00" (NAD27) 13,500'

Borehole: Original Borehole	Well: Bogges 13H	Field: WV Monongalia County (NAD 83)	Structure: Northeast Natural Bogges Pad
Gravity & Magnetic Parameters		Surface Location	Miscellaneous
Model: HDGM 2018	Dip: 66.664°	Date: 08-Apr-2019	NAD83 West Virginia State Plane, Northern Zone, US Feet
MagDec: -8.267°	FS: 52123.773mT	Gravity FS: 999.334mgm (8,80665 Based)	Lat: N 39 40 12.97
			North: 426797.610US
			Grid Conv: -0.3783'
			Lon: W 80 5 35.22
			East: 1801545.310US
			Scale Fact: 0.99991104
			Plan: Northeast Natural Bogges 13H Rev2 JLV/08Apr19
			TVD Ref: KG(1293ft above MSL)

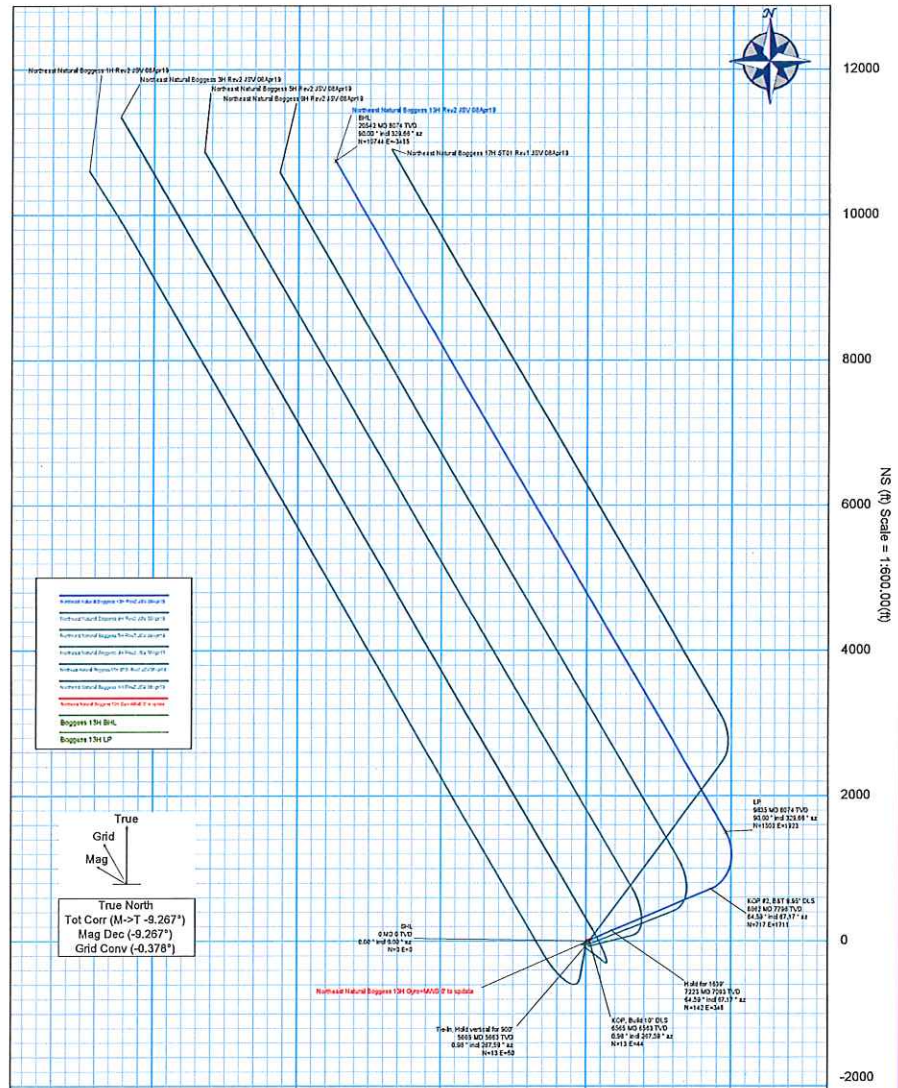
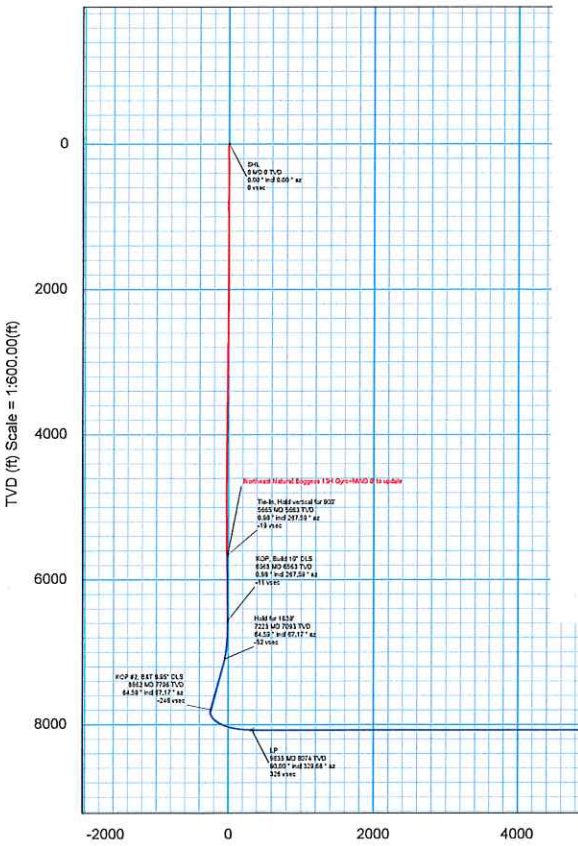
True North

EW (ft) Scale = 1:600.00(ft)

Critical Points								
Critical Point	MD	INCL	AZIM	TVD	VEEC	N(1/4)C	E(1/4)W	DLR
Trk. Mid vertical for 907	5663.00	0.89	207.59	5663.32	-18.64	13.38	5676	
KOP, B. 8.55' DLS	6565.00	0.88	207.58	6565.18	-11.43	12.75	44.38	0.00
Mid for 183P	7223.49	64.53	47.37	7083.55	-32.23	142.29	345.48	8.65
KOP #2, B. 8.55' DLS	8022.43	64.50	47.17	7795.00	-29.81	718.82	1111.01	0.00
LP	9133.13	90.00	328.68	8074.00	326.00	1523.41	1923.29	8.65
DRL	20542.10	90.00	328.68	8074.00	11214.59	12744.01	-5453.14	0.00

PAR T	Seq	Survey Tool	Vendon Tool	Wells Size	CHPT9 Size	Expected MD From	MD To	Survey Frequency (Hz)	ECU Size (ft)	ECU Size (ft) Minus	Comment	Conductivity
1	1	NHL_N53-M5H0T-Cosh Only		30	30	0	25	Aut Drive	1.251	1.25		
1	2	NHL_N53-M5H0T		30	30	25	5655	Aut Drive	7.425	3.588		
1	3	NHL_MMO_18_DEG		30	30	5655	20542.00	1100	403.498	419.823		

Surface Location										
North: 426797.61	East: 1801545.31	Latitude: N 39 40 12.97	Longitude: W 80 5 35.22	VSec Admitt: 228.66						
Target Description	Shape	Dimension	Latitude	Longitude	North	East	TVD	VSec	N(1/4)C	E(1/4)W
Bogges 13H DRL	Point	N/A	N 39 41 53.15 W 80 5 19.81	427532.73	179131.33	8074.00	11032.89	10744.01	-3453.14	
Bogges 13H LP	Point	N/A	N 39 42 27.63 W 80 5 15.82	428216.19	1803478.38	8074.00	356.00	1533.41	1923.29	



Northeast Natural Bogges 13H Rev2 JLV/08Apr19	DLR	20542.10 MD 9074.00 TVD 11214.59
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	LP	9133.13 MD 8074.00 TVD 10259.13
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	KOP #2, B. 8.55' DLS	8022.43 MD 7795.00 TVD 2227.43
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	KOP, B. 8.55' DLS	6565.00 MD 6565.18 TVD 0.18
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	Mid for 183P	7223.49 MD 7083.55 TVD 139.94
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	Trk. Mid vertical for 907	5663.00 MD 5663.32 TVD -0.32
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	DLR	20542.10 MD 9074.00 TVD 11214.59
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	LP	9133.13 MD 8074.00 TVD 10259.13
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	KOP #2, B. 8.55' DLS	8022.43 MD 7795.00 TVD 2227.43
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	KOP, B. 8.55' DLS	6565.00 MD 6565.18 TVD 0.18
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	Mid for 183P	7223.49 MD 7083.55 TVD 139.94
Northeast Natural Bogges 13H Rev2 JLV/08Apr19	Trk. Mid vertical for 907	5663.00 MD 5663.32 TVD -0.32

True North
 Tot Corr (M→T) = -8.267°
 Mag Dec = (-9.267°)
 Grid Conv = (-0.378°)

CONTROLLED

Plan ref: Rev2 JLV/08Apr19
 Drawing ref: JLV/08Apr19
 Copy number: 1 of 3
 Date: 11-Apr-2019

Drawn by: [Signature]
 Checked by: [Signature]

City number: [Blank]

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: 47-061-01814 County: Monongalia
District: Clay Well No: Boguess 13H
Farm Name: Blake R. & H. Preston Boguess

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: 1/10/2020

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.



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:	9/1/2019
Job End Date:	9/18/2019
State:	West Virginia
County:	Monongalia
API Number:	47-061-01814-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Bogges 13H
Latitude:	39.67018900
Longitude:	-80.09332600
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,030
Total Base Water Volume (gal):	17,878,270
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	87.00731	None
Sand (Proppant)	Producers Service Corp	Proppant					
StimSTREAM FR 9800P	Producers Service Corp	Friction Reducer	Silica Substrate	14808-60-7	100.00000	12.75305	None
			copolymer of 2-propenamide	Proprietary	30.00000	0.01476	None
			Petroleum Distillate	64742-47-8	20.00000	0.00984	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00098	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00098	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00049	None
7.5% HCL	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	7.50000	0.01215	None
BIOC11139A	Producers Service Corp	Biocide	Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00665	None
			Glutaraldehyde	111-30-8	10.00000	0.00222	None

SCAL16486A	Producers Service Corp	Scale Inhibitor	Ethanol	64-17-5	5.00000	0.00111	None
			Sodium Phosphate	7632-05-5	30.00000	0.00180	None
			Amine Triphosphate	Proprietary	30.00000	0.00180	None
			Ethylene Glycol	107-21-1	30.00000	0.00180	None
4-N-1	Producers Service Corp	Inhibitor					
			Acetic acid	64-19-7	90.00000	0.00029	None
			Methanol	67-56-1	10.00000	0.00003	None
			2-Ethylhexanol	104-76-7	10.00000	0.00003	None
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00002	None
			Diethanolamine	111-42-2	1.00000	0.00000	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	0.00984	
			Glutaraldehyde	111-30-8	10.00000	0.00222	
			Amine Triphosphate	Proprietary	30.00000	0.00180	
			Sodium Phosphate	7632-05-5	30.00000	0.00180	
			Ethanol	64-17-5	5.00000	0.00111	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00098	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00098	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00049	
			2-Ethylhexanol	104-76-7	10.00000	0.00003	
			Methanol	67-56-1	10.00000	0.00003	
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00002	
			Diethanolamine	111-42-2	1.00000	0.00000	

* 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)

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Daniel Hensley	FORMATION	Marcellus Shale
CLIENT FIELD REPRESENTATIVE	DSM	RIG	Highlands 8
DISTRICT	Massillon, OH	COUNTY	MONONGALIA
SERVICE	Cementing	STATE / PROVINCE	WV

WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	24.00	23.25	94.58	40.00	40.00			
Open Hole	0.00	17.50	0.00	1,260.00	1,260.00	60.00		
Casing	13.38	12.62	54.50	1,221.00	1,221.00			

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	1,177.00
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)	
Top Plug Size	13.375	Max Casing Pressure - Operated (psi)	
Centralizers Used	No	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type		Top Connection Thread	Buttress
Landing Collar Depth (ft)	1,177	Top Connection Size	13.375

CIRCULATION PRIOR TO JOB

Well Circulated By		YP Mud In
Circulation Prior to Job	No	YP Mud Out
Circulation Time (min)		Solids Present at End of Circulation
Circulation Rate (bpm)		No
Circulation Volume (bbls)		10 sec SGS
Lost Circulation Prior to Cement Job	No	10 min SGS
Mud Density In (ppg)		30 min SGS
Mud Density Out (ppg)		Flare Prior to / during the Cement Job
PV Mud In		No
PV Mud Out		Gas Present
		No
		Gas Units

TEMPERATURE

Ambient Temperature (°F)		Slurry Cement Temperature (°F)	70.00
Mix Water Temperature (°F)	64.00	Flow Line Temperature (°F)	

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	Fresh Water	8.3400					10.0000
Spacer / Pre Flush / Flush	Gel Spacer	8.6100					25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400					10.0000
Tail Slurry	Cement Slurry	15.6000	1.1979	5.23	1218	1459.0000	259.7000
Displacement Final	Fresh Water	8.3400				0.0000	187.1000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	Gel Spacer	IntegraSeal POLI	1.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	BWOB
Tail Slurry	Cement Slurry	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESSURE (psi)	ANNULUS PRESSURE (psi)	COMMENTS
	Fresh Water	0.00	10.00			
	Gel Spacer	0.00	25.00			



	Fresh Water	0.00	10.00		
	Cement Slurry	0.00	259.70		
	Fresh Water	0.00	182.10		
	Cement Slurry		125.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	0.00	900.00	200.00
Rate (bpm)	1.50	4.00	3.00



DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	1.00
Calculated Displacement Vol (bbls)	182.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	182.00	Amt of Spacer to Surface	
Did Float Hold?	Yes	Pressure Left on Casing (psi)	
Bump Plug	Yes	Amt Bled Back After Job	1.50
Bump Plug Pressure (psi)	850.00	Total Volume Pumped (bbls)	
Were Returns Planned at Surface	No	Top Out Cement Spotted	Yes
Cement Returns During Job	None	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)			

Comments

TREATMENT REPORT

JOB SUMMARY

Rigged in Pumped Casing down with 300 bbl water
filled lines 5 bbl tested kickouts 1000 psi tested lines 3000 psi
10 bbl water, 25 bbl gel with flake, 5 bbl water,
260 bbl cement @ 15.6 ppg (1218 sks)
Dropped Plug, 182 bbl Displacement bumped plug
held @ 850 psi for 5 mins, flowed 1.5 bbl to truck floats held
No Returns.
Grouted Basket: Dumped 100# cacl2 on basket and 10 bbl cement @ 15.6 ppg.
waited on cement sample 1 1/2 hour
topped off with 115 bbl cement at 15.6 ppg
600 sks used for Grout job

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Matthew Deel	FORMATION	Marcellus Shale
CLIENT FIELD REPRESENTATIVE	Nathan Caldwell	RIG	Highlands 8
DISTRICT	Massillon, OH	COUNTY	MONONGALIA
SERVICE	Cementing	STATE / PROVINCE	WV

WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	13.38	12.62	54.50	1,222.00	1,250.00			
Open Hole	0.00	12.25	0.00	2,550.00	2,550.00	40.00		
Casing	9.63	8.84	40.00	2,501.00	2,500.00			

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	2,454.00
Bottom Plug Size		Max Tubing Pressure - Rated (psi)	
Top Plug Used?	Yes	Max Tubing Pressure - Operated (psi)	
Top Plug Provided By	BJ	Max Casing Pressure - Rated (psi)	
Top Plug Size	9.625	Max Casing Pressure - Operated (psi)	
Centralizers Used	No	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type		Top Connection Thread	BTC
Landing Collar Depth (ft)	2,454	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

Well Circulated By	BJ	YP Mud In
Circulation Prior to Job	Yes	YP Mud Out
Circulation Time (min)		Solids Present at End of Circulation
Circulation Rate (bpm)	5.10	10 sec SGS
Circulation Volume (bbls)	265.00	10 min SGS
Lost Circulation Prior to Cement Job	No	30 min SGS
Mud Density In (ppg)		Flare Prior to / during the Cement Job
Mud Density Out (ppg)		Gas Present
PV Mud In		Gas Units
PV Mud Out		

TEMPERATURE

Ambient Temperature (°F)	35.00	Slurry Cement Temperature (°F)	61.00
Mix Water Temperature (°F)	50.00	Flow Line Temperature (°F)	

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	Gel Spacer	8.6100					25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400					10.0000
Tail Slurry	Cement Slurry	15.2000	1.2618	5.75	808	1019.0000	181.4000
Displacement Final	Fresh Water	8.3400				0.0000	186.5000

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	CEMENT, CLASS A	100.0000	PCT
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	1.5000	BWOB
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
1/17/2019 7:50:00 AM	Gel Spacer	5.20	25.00	125.00		
1/17/2019 8:04:00 AM	Fresh Water	3.00	10.00	125.00		
1/17/2019 8:07:00 AM	Cement Slurry	2.80	165.00	95.00		

1/17/2019 9:08:00
AM

Fresh Water

5.00

186.00

500.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	95.00	500.00	211.25
Rate (bpm)	2.80	5.20	4.00



DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	25.00
Calculated Displacement Vol (bbls)	186.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	186.00	Amt of Spacer to Surface	25.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	1.00
Bump Plug Pressure (psi)	1475.00	Total Volume Pumped (bbls)	638.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Full	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)			

Comments

TREATMENT REPORT

JOB SUMMARY

