

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

API 47-017-06846 County Doddridge District West Union
 Quad West Union 7.5' Pad Name Middle Pad Field/Pool Name -----
 Farm name William Randall Lynch & Dixie Craig Well Number Pickney Unit 2H
 Operator (as registered with the OOG) Antero Resources Corporation
 Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
 Top hole Northing 4352589.878m Easting 516687.887m
 Landing Point of Curve Northing 4352541.97m Easting 516816.60m
 Bottom Hole Northing 4350221.639m Easting 517807.716m

Elevation (ft) 843' 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)

Air - Foam & 4% KCL

Mud - Polymer

Date permit issued 7/17/2017 Date drilling commenced 9/29/2017 Date drilling ceased 3/30/2018
 Date completion activities began 6/5/2018 Date completion activities ceased 9/23/2018
 Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft None Identified Open mine(s) (Y/N) depths No
 Salt water depth(s) ft None Identified Void(s) encountered (Y/N) depths No
 Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
 Is coal being mined in area (Y/N) No

Reviewed by:

WR-35
Rev. 8/23/13

API 47-017 - 06846 Farm name William Randall Lynch & Dixie Craig Well number Pickney Unit 2H

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	24"	20"	112'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	551'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2627'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15211'	New	23#, HCP-110	N/A	Y
Tubing		2-3/8"	6581'		4.7#, P-110		
Packer type and depth set		N/A					

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	Class A	204 sx	15.6	1.18	241	0'	8 Hrs.
Surface	Class A	445 sx	15.6	1.21	538	0'	8 Hrs.
Coal							
Intermediate 1	Class A	870 sx	15.6	1.22	1061	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	670 sx (Lead) 1386 sx (Tail)	14(Lead), 15.2 (Tail)	1.45 (Lead), 1.83 (Tail)	3508	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15210' MD, 6547' TVD (BHL), 6547' (Deepest Point Drilled) Loggers TD (ft) 15210' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5890'

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 _____

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

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 N/A

WR-35
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API 47- 017 - 06846 Farm name William Randall Lynch & Dixie Craig Well number Pickney Unit 2H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6537' (TOP)	TVD	6627' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 13243.58 mcfpd Oil 109.76 bpd NGL --- bpd Water 645.97 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP		BOTTOM		DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

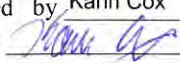
Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Nine Energy Service
Address 125 Museum Rd City Washington State PA Zip 15301

Cementing Company C&J Energy Services
Address 1650 Hackers Creek City Lane Jew State WV Zip 26378

Stimulating Company Haliburton
Address 121 Champion Way City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 2/2/2019

API 47-017-06846 Farm Name William Randall Lynch & Dixie Janet Craig Well Number Pickney Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	6/5/2018	15007.6	15107.4	60	Marcellus
2	7/16/2018	14809.3	14976.55	60	Marcellus
3	7/17/2018	14611	14778.25	60	Marcellus
4	7/17/2018	14412.7	14579.95	60	Marcellus
5	7/18/2018	14214.4	14381.65	60	Marcellus
6	7/18/2018	14016.1	14183.35	60	Marcellus
7	7/19/2018	13817.8	13985.05	60	Marcellus
8	7/19/2018	13619.5	13786.75	60	Marcellus
9	7/20/2018	13421.2	13588.45	60	Marcellus
10	7/20/2018	13222.9	13390.15	60	Marcellus
11	7/21/2018	13024.6	13191.85	60	Marcellus
12	7/21/2018	12826.3	12993.55	60	Marcellus
13	7/23/2018	12628	12795.25	60	Marcellus
14	7/23/2018	12429.7	12596.95	60	Marcellus
15	7/24/2018	12231.4	12398.65	60	Marcellus
16	7/24/2018	12033.1	12200.35	60	Marcellus
17	7/25/2018	11834.8	12002.05	60	Marcellus
18	7/25/2018	11636.5	11803.75	60	Marcellus
19	7/26/2018	11438.2	11605.45	60	Marcellus
20	7/26/2018	11239.9	11407.15	60	Marcellus
21	7/26/2018	11041.6	11208.85	60	Marcellus
22	7/27/2018	10843.3	11010.55	60	Marcellus
23	7/27/2018	10645	10812.25	60	Marcellus
24	7/28/2018	10446.7	10613.95	60	Marcellus
25	7/28/2018	10248.4	10415.65	60	Marcellus
26	7/28/2018	10050.1	10217.35	60	Marcellus
27	7/29/2018	9851.8	10019.05	60	Marcellus
28	7/29/2018	9653.5	9820.75	60	Marcellus
29	7/30/2018	9455.2	9622.45	60	Marcellus
30	7/30/2018	9256.9	9424.15	60	Marcellus
31	7/31/2018	9058.6	9225.85	60	Marcellus
32	7/31/2018	8860.3	9027.55	60	Marcellus
33	8/1/2018	8662	8829.25	60	Marcellus
34	8/2/2018	8463.7	8630.95	60	Marcellus
35	8/2/2018	8265.4	8432.65	60	Marcellus
36	8/3/2018	8067.1	8234.35	60	Marcellus
37	8/3/2018	7868.8	8036.05	60	Marcellus
38	8/3/2018	7670.5	7837.75	60	Marcellus
39	8/4/2018	7472.2	7639.45	60	Marcellus
40	8/4/2018	7273.9	7441.15	60	Marcellus
41	8/5/2018	7075.6	7242.85	60	Marcellus
42	8/5/2018	6877.3	7044.55	60	Marcellus
43	8/6/2018	6679	6846.25	60	Marcellus

API 47-017-06846 Farm Name William Randall Lynch & Dixie Janet Craig Well Number Pickney Unit 2H

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	6/5/2018	75.88	7743	5895	4220	258730	6268.095	N/A
2	7/16/2018	72.57	7380	5991	4177	408100	8362.667	N/A
3	7/17/2018	77.72	7634	5757	5850	416080	8539.881	N/A
4	7/17/2018	75.4	7492	5117	4088	414260	8555.31	N/A
5	7/18/2018	76	7790	5704	4741	415880	8263.762	N/A
6	7/18/2018	77.9	7653	5943	5367	408000	8198.095	N/A
7	7/19/2018	75.52	7662	5852	3790	408960	8179.762	N/A
8	7/19/2018	68.6	7062	6107	5302	365000	9965.571	N/A
9	7/20/2018	70.3	7564	5420	3699	413140	8606.238	N/A
10	7/20/2018	66.05	7232	5862	3604	414280	8346.952	N/A
11	7/21/2018	62.5	7648	8390	3859	408620	11263.98	N/A
12	7/21/2018	61	6940	6011	5956	143170	6142.262	N/A
13	7/23/2018	70.7	6997	5628	4023	408040	8336.119	N/A
14	7/23/2018	65.62	7248	5761	4214	342060	7607.381	N/A
15	7/24/2018	69.6	7301	6122	3831	426770	9011.619	N/A
16	7/24/2018	74.1	7045	5707	3987	450400	8801.357	N/A
17	7/25/2018	68.8	6869	4917	4198	447380	8723.857	N/A
18	7/25/2018	73.8	6012	6012	4021	402520	8380.119	N/A
19	7/26/2018	68.9	6653	5897	4246	402920	8255.31	N/A
20	7/26/2018	68.1	7796	5787	3932	407220	9622.143	N/A
21	7/26/2018	65.84	7531	4833	4213	402180	9033.095	N/A
22	7/27/2018	67.48	7443	5770	4448	410120	9610	N/A
23	7/27/2018	70.05	7285	5655	5299	406500	8020.833	N/A
24	7/28/2018	69.27	7294	6179	3879	400340	8227.262	N/A
25	7/28/2018	72.9	6832	5646	3918	408820	8150.952	N/A
26	7/28/2018	60.24	7066	4885	4164	407640	10766.57	N/A
27	7/29/2018	74.6	6703	5637	3799	408280	7970.19	N/A
28	7/29/2018	67.45	6969	5511	4216	406380	8203.452	N/A
29	7/30/2018	78.7	6631	5517	4169	404620	8058.214	N/A
30	7/30/2018	78.65	6734	5857	4782	401220	8248.595	N/A
31	7/31/2018	78.16	6699	5740	3992	400280	8024.81	N/A
32	7/31/2018	76.35	6831	5813	3548	406240	7994.071	N/A
33	8/1/2018	73.9	7015	5424	4138	408470	10814.76	N/A
34	8/2/2018	68.43	7961	5745	6561	407980	10281.31	N/A
35	8/2/2018	70.22	7117	6108	3724	398760	9470.167	N/A
36	8/3/2018	71.9	7225	5737	3658	398380	8176.881	N/A
37	8/3/2018	76.15	7056	6024	3986	399740	7828.095	N/A
38	8/3/2018	76.82	6972	6067	4683	402720	8018.333	N/A
39	8/4/2018	75.32	7318	6276	3817	399100	8818.976	N/A
40	8/4/2018	70.89	6564	5957	3827	402200	7876.476	N/A
41	8/5/2018	75.14	6924	6038	3904	412060	8186.167	N/A
42	8/5/2018	74.86	6835	6174	4118	405580	8362.976	N/A
43	8/6/2018	77.36	6897	6225	3937	406580	8062.429	N/A
	AVG=	72	7,154	5,830	4,276	17,065,720	367,635	TOTAL

API 47-017-06846 Farm Name William Randall Lynch & Dixie Janet Craig Well Number Pickney Unit 2H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Sandstone	0	177	0	177
Sandstone tr coal	est. 177	217	est. 177	217
Sandy shale	est. 217	232	est. 217	232
Calcareous Shale	est. 232	319	est. 232	319
Sandstone	est. 319	373	est. 319	373
Calcareous Shale	est. 373	1,065	est. 373	1,065
Silty Sandstone	est. 1065	1,137	est. 1065	1,137
Silty shale	est. 1137	1,287	est. 1137	1,287
Sandy Shale	est. 1287	1,357	est. 1287	1,357
Shale	est. 1357	1,550	est. 1357	1,552
Big Lime	1,550	2,197	1,552	2,199
Fifty Foot Sandstone	2,197	2,443	2,199	2,445
Gordon	2,443	2,665	2,445	2,667
Fifth Sandstone	2,665	2,729	2,667	2,731
Bayard	2,729	3,504	2,731	3,512
Speechley	3,504	3,815	3,512	3,828
Balltown	3,815	4,311	3,828	4,330
Bradford	4,311	4,739	4,330	4,764
Benson	4,739	4,989	4,764	5,016
Alexander	4,989	5,984	5,016	6,037
Sycamore	5,984	6,155	6,037	6,242
Middlesex	6,155	6,286	6,242	6,461
Burkett	6,286	6,314	6,461	6,517
Tully	6,314	6,357	6,517	6,627
Marcellus	6,357	NA	6,627	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/6/2018
Job End Date:	8/6/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06846-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Pickney 2H
Latitude:	39.32165800
Longitude:	-80.80487000
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,679
Total Base Water Volume (gal):	15,782,574
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
Fresh Water	Operator	Base Fluid	Water	7732-18-5	100.00000	88.36109	Density = 8.340
Ingredients	Listed Above	Listed Above	Water	7732-18-5	100.00000	0.12263	



SAND-COMMON WHITE - 100 MESH, 3307 LB BAG	Halliburton	Proppant		Listed Below				
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor		Listed Below				
EXCELERATE PS-2	Halliburton	Friction Reducer		Listed Below				
HYDROCHLORI C ACID	Halliburton	Solvent		Listed Below				
SP BREAKER	Halliburton	Breaker		Listed Below				
WG-36 GELLING AGENT	Halliburton	Gelling Agent		Listed Below				
SAND- PREMIUM WHITE-40/70, BULK	Halliburton	Proppant		Listed Below				
SCALECHECK LP-70	Halliburton	Scale Inhibitor		Listed Below				

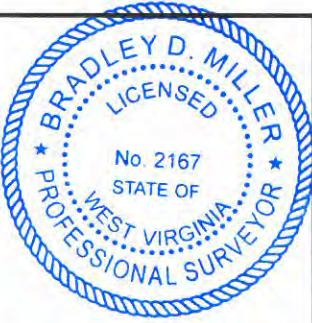
MC B-8614	Halliburton	Biocide		Listed Below					
Items above are Trade Names with the exception of Base Water. Items below are the individual ingredients.									
		Crystalline silica, quartz	14808-60-7	100.00000	11.46619				
		Guar gum	9000-30-0	100.00000	0.02095				
		Acrylamide acrylate polymer	Proprietary	30.00000	0.01660			Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226	
		Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01660				
		Inorganic salt	Proprietary	30.00000	0.01660				
		Hydrochloric acid	7647-01-0	15.00000	0.01091				
		Ethylene glycol	107-21-1	60.00000	0.00619				
		Glutaraldehyde	111-30-8	30.00000	0.00380				
		Telmer	Proprietary	10.00000	0.00103				
		Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00063				
		Sodium persulfate	7775-27-1	100.00000	0.00060				
		Ethanol	64-17-5	1.00000	0.00013				
		Sodium polyacrylate	9003-04-7	1.00000	0.00010				
		Methanol	67-56-1	60.00000	0.00010				
		Fatty acids, tall oil	Proprietary	30.00000	0.00004				
		Modified thiourea polymer	Proprietary	30.00000	0.00004				
		Ethoxylated alcohols	Proprietary	30.00000	0.00004				
		Olefins	Proprietary	5.00000	0.00002				
		Propargyl alcohol	107-19-7	10.00000	0.00001				
		Phosphoric acid	7664-38-2	0.10000	0.00001				
		Acrylic acid	79-10-7	0.01000	0.00000				

			Sodium sulfate	7757-82-6	0.10000	0.00000	
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* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

**Antero Resources
Well No. Pickney Unit 2H
As-Drilled Plat
Antero Resources Corporation**



728' to Bottom Hole

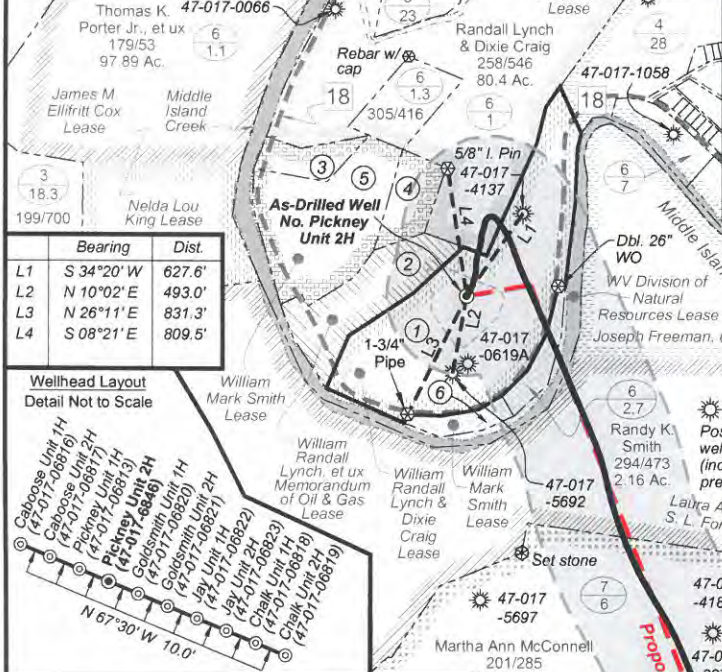
4,273' to Top Hole

LATITUDE 39 - 20 - 00

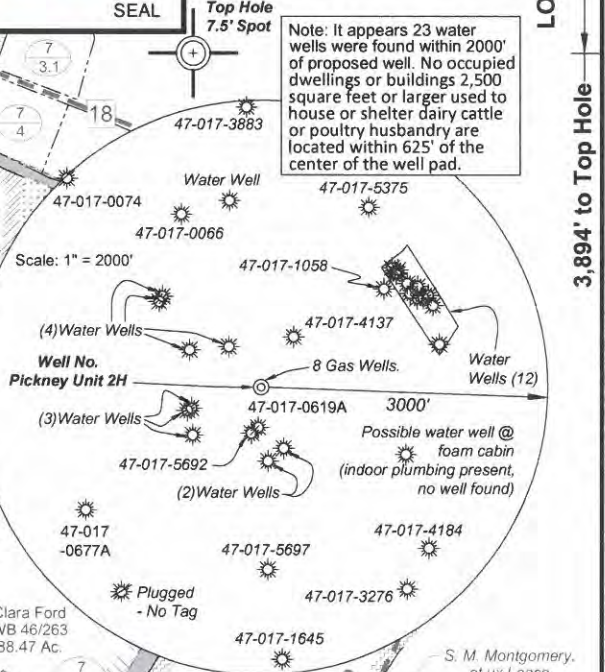
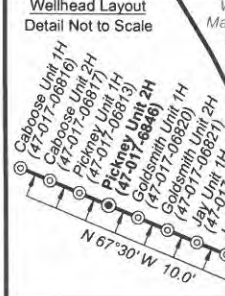
LONGITUDE 80 - 47 - 30

03/08/2019

Legend	
	Proposed gas well
	Found corner, as noted
	Existing Well, as noted
	Creek or Drain
	Existing Road
	Surface boundary (approx.)
	Interior surface tracts (approx.)



Bearing	Dist.
L1 S 34°20'W	627.6'
L2 N 10°02'E	493.0'
L3 N 26°11'E	831.3'
L4 S 08°21'E	809.5'



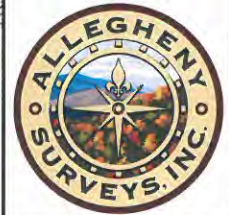
Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Pickney Unit 2H Top Hole coordinates are
N: 302,249.55' Latitude: 39°19'20.91"
E: 1,630,375.20' Longitude: 80°48'23.66"
Bottom Hole coordinates are
N: 294,416.71' Latitude: 39°18'04.00"
E: 1,633,920.32' Longitude: 80°47'37.11"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N: 4,352,589.878m N: 4,350,221.639m
E: 516,687.887m E: 517,807.716m
Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

Top Hole Coordinates, As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

TM/Par	Bk / Pg	Acres	Owner(s)	
1	6/2	214 / 279	32.19	William Randall Lynch & Dixie Janet Craig
2	6/2.5	253 / 222	8.66	
3	6/2.8	305 / 419	2.68	Dominion Field Services, Inc.
4	6/2.6	266 / 36	3.52	
5	6/2.4	163 / 44	14.98	Equitrans, Inc.
6	6/2.3	197/659	1.82	Carol & Alfreda Painter

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 rules issued and prescribed by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167



FILE NO: 238-30-WU-14
DRAWING NO: Pickney 2H As-Drilled Well Plat
SCALE: 1" = 1200'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: CORS, Marietta, OH

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: January 16 2019
Operator's Well No. Pickney Unit 2H
API WELL NO
47 - 017 - 06846
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: As-Built Grade - 843' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
DISTRICT: West Union COUNTY: Doddridge
SURFACE OWNER: William Randall Lynch & Dixie Janet Craig ACREAGE: 32.19 82.21; 56.07; 20.49
ROYALTY OWNER: Clarence Mutschelknaus; Laura A. Ford & S. L. Ford; Ida F. Ford; Alice H. Maxwell; LEASE NO: ACREAGE: 50; 202.28; 102.85
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled 6,547' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 15,210' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313