

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

RECEIVED  
Office of Oil and Gas

OCT 12 2017

WV Department of  
Environmental Protection

API 47-095-02248 County Tyler District Meade  
Quad Pennsboro 7.5' Pad Name Hartley East Pad Field/Pool Name -----  
Farm name David M. Hartley Well Number Plum Run Unit 3H  
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 4357311m Easting 500596m  
Landing Point of Curve Northing 4357163.378m Easting 501207.152m  
Bottom Hole Northing 4354357m Easting 502362m

Elevation (ft) 1021' 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 05/28/2015 Date drilling commenced 06/23/2015 Date drilling ceased 11/04/2015  
Date completion activities began 10/17/2016 Date completion activities ceased 03/18/2017  
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 76', 135', 162' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 846' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 196', 1136', 1716' Cavern(s) encountered (Y/N) depths No

Is coal being mined in area (Y/N) No

**APPROVED**

NAME: Sean [Signature]  
DATE: 10-25-17

Reviewed by: \_\_\_\_\_

11/10/2017

API 47-095 - 02248

Farm name David M. Hartley

Well number Plum Run Unit 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	24"	20"	40'	New	133#, J-55	N/A	Y
Surface	17-1/2"	13-3/8"	362'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2521'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17460'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6736'		4.7#, N-80		
Packer type and depth set		N/A					

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	Class A	254 sx	15.6	1.18	300	0'	8 Hrs.
Surface	Class A	433 sx	15.6	1.18	511	0'	8 Hrs.
Coal							
Intermediate 1	Class A	988 sx	15.6	1.18	1166	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	837 sx (Lead) 1736 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.83 (Tail)	4382	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17460' MD, 6282' TVD (BHL), 6292' (Deepest Point Drilled)

Loggers TD (ft) 17411' MD

Deepest formation penetrated Marcellus, Onondaga

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5841'

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Freeland Unit 2H API #47-095-02127). Please reference the wireline logs submitted with Form WR-35 for Freeland Unit 2H. A Cement Bond Log has been included with this submittal.

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 \_\_\_\_\_

API 47- 095 - 02248 Farm name David M. Hartley Well number Plum Run Unit 3H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
<b>*PLEASE SEE ATTACHED EXHIBIT 1</b>					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

Please insert additional pages as applicable.

API 47- 095 - 02248 Farm name David M. Hartley Well number Plum Run Unit 3H

PRODUCING FORMATION(S)	DEPTHS			
	6245' (TOP)	TVD	6826' (TOP)	MD
Marcellus				

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 13967 mcfpd Oil 211 bpd NGL --- bpd Water 839 bpd  
GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> 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 Precision Drilling Company, LP  
Address 2640 Reach Road City Williamsport State PA Zip 17701

Logging Company Allied Horizontal Wireline Services  
Address 381 Colonial Manor Rd. City North Huntingdon State PA Zip 15642

Cementing Company Allied Oil & Gas Services, LLC  
Address 1036 East Main Street City Bridgeport State WV Zip 26330

Stimulating Company US Well Services  
Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Samantha Klaas Telephone 303-357-6759  
Signature  Title Permitting Agent Date 10/11/2017

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-095-022448 Farm Name David M. Hartley Well Number Plum Run Unit 3H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	11/3/2016	17181	17349	60	Marcellus
2	11/4/2016	16982	17150	60	Marcellus
3	11/4/2016	16783	16951	60	Marcellus
4	11/4/2016	16585	16752	60	Marcellus
5	11/5/2016	16386	16554	60	Marcellus
6	11/5/2016	16187	16355	60	Marcellus
7	11/5/2016	15988	16156	60	Marcellus
8	11/6/2016	15790	15957	60	Marcellus
9	11/6/2016	15591	15759	60	Marcellus
10	11/6/2016	15392	15560	60	Marcellus
11	11/7/2016	15193	15361	60	Marcellus
12	11/7/2016	14995	15162	60	Marcellus
13	11/7/2016	14796	14964	60	Marcellus
14	11/8/2016	14597	14765	60	Marcellus
15	11/8/2016	14398	14566	60	Marcellus
16	11/8/2016	14200	14367	60	Marcellus
17	11/8/2016	14001	14169	60	Marcellus
18	11/9/2016	13802	13970	60	Marcellus
19	11/9/2016	13603	13771	60	Marcellus
20	11/10/2016	13405	13572	60	Marcellus
21	11/10/2016	13206	13374	60	Marcellus
22	11/10/2016	13007	13175	60	Marcellus
23	11/11/2016	12808	12976	60	Marcellus
24	11/11/2016	12610	12777	60	Marcellus
25	11/11/2016	12411	12579	60	Marcellus
26	11/11/2016	12212	12380	60	Marcellus
27	11/13/2016	12013	12181	60	Marcellus
28	11/13/2016	11815	11982	60	Marcellus
29	11/14/2016	11616	11784	60	Marcellus
30	11/14/2016	11417	11585	60	Marcellus
31	11/14/2016	11218	11386	60	Marcellus
32	11/15/2016	11020	11187	60	Marcellus
33	11/15/2016	10821	10989	60	Marcellus
34	11/15/2016	10622	10790	60	Marcellus
35	11/15/2016	10423	10591	60	Marcellus
36	11/15/2016	10225	10392	60	Marcellus
37	11/16/2016	10026	10194	60	Marcellus
38	11/17/2016	9827	9995	60	Marcellus
39	11/17/2016	9628	9796	60	Marcellus
40	11/17/2016	9430	9597	60	Marcellus
41	11/18/2016	9231	9399	60	Marcellus
42	11/18/2016	9032	9200	60	Marcellus
43	11/18/2016	8833	9001	60	Marcellus
44	11/18/2016	8635	8802	60	Marcellus
45	11/19/2016	8436	8604	60	Marcellus
46	11/19/2016	8237	8405	60	Marcellus
47	11/19/2016	8038	8206	60	Marcellus
48	11/19/2016	7840	8007	60	Marcellus
49	11/20/2016	7641	7809	60	Marcellus
50	11/20/2016	7442	7610	60	Marcellus
51	11/20/2016	7243	7411	60	Marcellus
52	11/21/2016	7045	7212	60	Marcellus
53	11/21/2016	6846	7014	60	Marcellus

11/10/2017

API 47-095-02248 Farm Name David M. Hartley Well Number Plum Run Unit 3H

**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	11/3/2016	69.9	7942	0.0	4263	402200	9150.0	N/A
2	11/4/2016	71.2	7673	6073.0	4674	399950	9606.0	N/A
3	11/4/2016	68.8	7449	5511.0	3712	402000	9091.0	N/A
4	11/4/2016	73.0	7749	5797.0	4052	400090	9139.0	N/A
5	11/5/2016	72.9	7767	5608.0	4549	387500	9383.0	N/A
6	11/5/2016	70.2	7616	5579.0	3841	402100	10133.0	N/A
7	11/5/2016	72.7	7555	5429.0	4839	400500	9004.0	N/A
8	11/6/2016	73.9	7607	5704.0	4646	389000	9605.0	N/A
9	11/6/2016	68.4	7353	5507.0	5132	401800	9014.0	N/A
10	11/6/2016	72.9	7624	5454.0	4352	399500	9102.0	N/A
11	11/7/2016	70.6	7524	5411.0	4746	403800	10426.0	N/A
12	11/7/2016	68.8	7342	5307.0	4406	404900	10253.0	N/A
13	11/7/2016	73.8	7507	5472.0	3523	404400	8989.0	N/A
14	11/8/2016	68.7	7462	5515.0	4871	404350	10621.0	N/A
15	11/8/2016	71.1	7244	5472.0	4184	404850	9265.0	N/A
16	11/8/2016	71.3	7288	5454.0	3963	404950	9488.0	N/A
17	11/8/2016	71.6	7226	5690.0	3201	404700	8982.0	N/A
18	11/9/2016	63.9	7491	6441.0	4985	354450	16440.0	N/A
19	11/9/2016	71.0	7345	5633.0	3426	404000	9022.0	N/A
20	11/10/2016	71.9	6983	5958.0	3033	403625	9117.0	N/A
21	11/10/2016	72.6	7287	6065.0	3115	404800	9345.0	N/A
22	11/10/2016	62.4	7917	5944.0	4699	291100	11297.0	N/A
23	11/11/2016	73.2	7620	5561.0	5125	404650	10199.0	N/A
24	11/11/2016	70.8	7670	5608.0	5343	397250	9179.0	N/A
25	11/11/2016	73.5	7598	5558.0	5500	404150	9079.0	N/A
26	11/11/2016	74.8	7423	5404.0	4971	403850	8842.0	N/A
27	11/13/2016	72.7	7433	5311.0	5389	403570	11760.0	N/A
28	11/13/2016	75.1	7529	5490.0	4764	379000	8936.0	N/A
29	11/14/2016	72.9	7587	5125.0	6248	373300	9226.0	N/A
30	11/14/2016	78.0	7606	5039.0	5014	343440	10166.0	N/A
31	11/14/2016	76.8	7319	5136.0	4177	404321	8786.0	N/A
32	11/15/2016	74.7	7234	5164.0	5225	404380	8813.0	N/A
33	11/15/2016	72.9	7094	5282.0	4041	402080	8773.0	N/A
34	11/15/2016	73.7	6992	5146.0	4914	400050	8850.0	N/A
35	11/15/2016	73.9	7153	5121.0	5293	403600	8858.0	N/A
36	11/15/2016	74.8	7038	5193.0	4964	404100	8761.0	N/A
37	11/16/2016	73.2	6964	5075.0	4131	404500	8746.0	N/A
38	11/17/2016	74.0	6791	5275.0	3884	407850	8685.0	N/A
39	11/17/2016	74.0	6889	5361.0	3612	402584	9417.0	N/A
40	11/17/2016	67.5	7558	5490.0	5976	309050	11426.0	N/A
41	11/18/2016	74.5	6931	5482.0	3244	403650	8653.0	N/A
42	11/18/2016	72.3	7246	6441.0	4088	403500	10073.0	N/A
43	11/18/2016	69.6	6805	5540.0	4413	403320	8812.0	N/A
44	11/18/2016	71.9	7080	5250.0	4785	404000	9787.0	N/A
45	11/19/2016	73.6	6658	5136.0	4388	404800	8755.0	N/A
46	11/19/2016	67.1	6744	5293.0	4853	403500	9333.0	N/A
47	11/19/2016	69.6	6485	5454.0	3930	403940	8822.0	N/A
48	11/19/2016	71.5	6802	5708.0	3383	404450	8755.0	N/A
49	11/20/2016	69.9	6732	4874.0	4163	403080	8830.0	N/A
50	11/20/2016	70.2	6537	5186.0	4842	403730	8744.0	N/A
51	11/20/2016	71.1	6387	5640.0	4699	404350	8729.0	N/A
52	11/21/2016	71.8	6430	6534.0	3508	405200	8635.0	N/A
53	11/21/2016	70.5	6244	5275.0	3122	404070	8784.0	N/A
	AVG=	<b>71.7</b>	<b>7,236</b>	<b>5,400</b>	<b>4,419</b>	<b>20,977,880</b>	<b>501,686</b>	TOTAL

## EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	76'	N/A	76'	N/A
Fresh Water	135'	N/A	135'	N/A
Fresh Water	162'	N/A	162'	N/A
Shale/ Sandstone	est. -11	196	est. -11	196
Shale/ Trace Coal	est. 196	236	est. 196	236
Sandstone	est. 236	456	est. 236	456
Shale/ Limestone	est. 456	556	est. 456	556
Sandstone	est. 556	616	est. 556	616
Shale/ Trace Limestone	est. 616	776	est. 616	776
Siltstone	est. 776	801	est. 776	801
Shale/ Limestone	est. 801	956	est. 801	956
Sandstone	est. 956	1036	est. 956	1036
Shale/ Limestone	est. 1036	1136	est. 1036	1136
Shale/ Trace Coal	est. 1136	1176	est. 1136	1176
Sandstone/ Trace Coal	est. 1176	1236	est. 1176	1236
Shale/ Trace Limestone	est. 1236	1316	est. 1236	1316
Sandstone/ Shale	est. 1316	1416	est. 1316	1416
Sanstone/ Coal	est. 1416	1556	est. 1416	1556
Shale/ Trace Coal	est. 1556	1716	est. 1556	1716
Siltstone/ Trace Coal	est. 1716	1956	est. 1716	1966
Big Lime	1956	3309	1966	3334
Fifth Sandstone	3309	3398	3334	3429
Bayard	3398	3940	3429	4034
Speechley	3940	4229	4034	4353
Baltown	4229	4629	4353	4801
Bradford	4629	4926	4801	5137
Benson	4926	5158	5137	5397
Alexander	5158	5413	5397	5682
Elk	5413	5724	5682	6028
Rhinestreet	5724	6038	6028	6424
Sycamore	6038	6134	6424	6572
Middlesex	6134	6222	6572	6756
Burkett	6222	6235	6756	6793
Tully	6235	6245	6793	6826
Marcellus	6245	NA	6826	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:	11/3/2016
Job End Date:	11/21/2016
State:	West Virginia
County:	Tyler
API Number:	47-095-02248-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Plum Run 3H
Latitude:	39.36518056
Longitude:	-80.99325278
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,292
Total Base Water Volume (gal):	22,015,254
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Antero Resources	Carrier/Base Fluid	Water	7732-18-5	100.00000	89.50177	
Sand	J.S. Well Services, LLC	Proppant					
HCL Acid (12.6%-17.5%)	J.S. Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	10.22598	
LGC-15	J.S. Well Services, LLC	Gelling Agents	Water Hydrogen Chloride	7732-18-5 7647-01-0	87.40000 17.50000	0.10649 0.02476	
WFRA-405	J.S. Well Services, LLC	Friction Reducer	Guar Gum Petroleum Distillates Suspending agent (solid) Surfactant	9000-30-0 64742-47-8 14808-60-7 68439-51-0	50.00000 60.00000 3.00000 3.00000	0.04127 0.03908 0.00631 0.00248	
			2-Propenoic acid, polymer with 2-propenamide Hydrated light distillate (petroleum)	29003-06-9 64742-47-8	30.00000 30.00000	0.01863 0.01500	



SI-1100	J.S. Well Services, LLC	Scale Inhibitor						
		Ethylene Glycol	107-21-1			40.00000	0.00728	
		Copolymer of Maleic and Acrylic acid	62255-49-9			10.00000	0.00150	
		Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8			3.00000	0.00052	
		Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1			3.00000	0.00050	
		Phosphino carboxylic acid polymer	71050-62-9			3.00000	0.00050	
Bioclear 2000	J.S. Well Services, LLC	Anti-Bacterial Agent						
		2,2-dibromo-3-nitripropionamide	10222-01-2			20.00000	0.00412	
AP One	J.S. Well Services, LLC	Gel Breakers				28.00000	0.00235	
		Deionized Water	7732-18-5					
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors				100.00000	0.00138	
		Ammonium Persulfate	7727-54-0					
		Ethylene glycol	107-21-1			40.00000	0.00004	
		Butyl cellosolve	111-76-2			20.00000	0.00001	
		Cinnamaldehyde	104-55-2			20.00000	0.00001	
		Formic acid	64-18-6			20.00000	0.00001	
		Polyether	60828-78-6			10.00000	0.00001	
		Acetophenone,thiourea,formaldehyde polymer	68527-49-1			5.00000	0.00000	

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.

\* 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)

LATITUDE 39°22'30"

9,873'

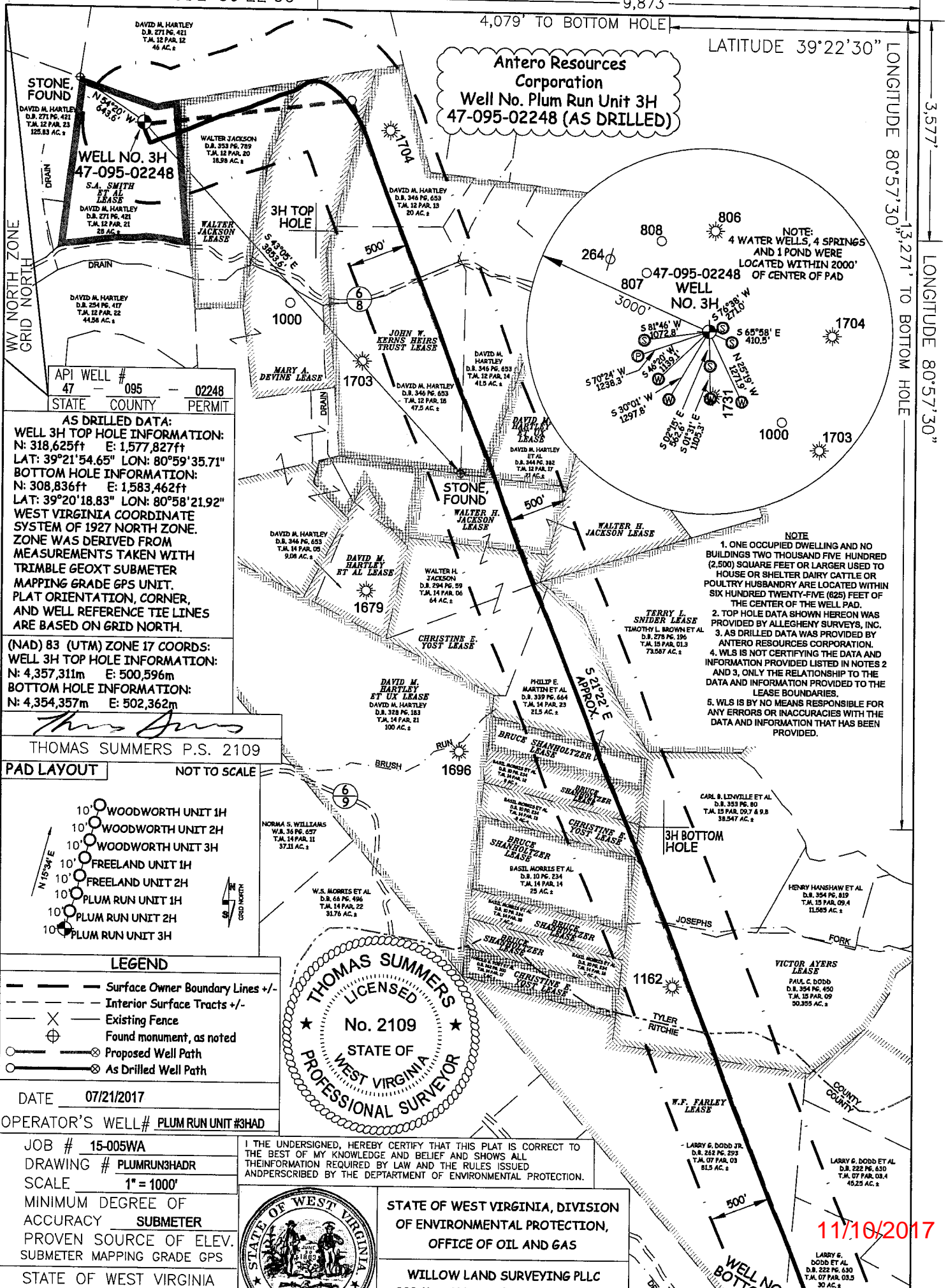
4,079' TO BOTTOM HOLE

LATITUDE 39°22'30"

LONGITUDE 80°57'30"

3,577'

LONGITUDE 80°57'30"



**Antero Resources Corporation**  
**Well No. Plum Run Unit 3H**  
**47-095-02248 (AS DRILLED)**

**STONE FOUND**  
 DAVID M. HARTLEY  
 D.B. 271 PG. 421  
 T.M. 12 PAR. 22  
 46 AC. ±

**WELL NO. 3H**  
**47-095-02248**

S.A. SMITH  
 ET AL  
 LEASE

DAVID M. HARTLEY  
 D.B. 271 PG. 421  
 T.M. 12 PAR. 21  
 28 AC. ±

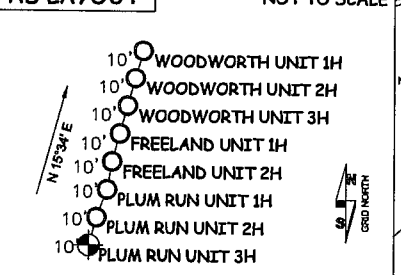
WALTER JACKSON  
 D.B. 353 PG. 789  
 T.M. 12 PAR. 20  
 18.98 AC. ±

API WELL # 47 - 095 - 02248  
 STATE COUNTY PERMIT

**AS DRILLED DATA:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 318,625ft E: 1,577,827ft  
 LAT: 39°21'54.65" LON: 80°59'35.71"  
**BOTTOM HOLE INFORMATION:**  
 N: 308,836ft E: 1,583,462ft  
 LAT: 39°20'18.83" LON: 80°58'21.92"  
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

**(NAD) 83 (UTM) ZONE 17 COORDS:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 4,357,311m E: 500,596m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,354,357m E: 502,362m

THOMAS SUMMERS P.S. 2109



**LEGEND**

- Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
- X Existing Fence
- ⊕ Found monument, as noted
- Proposed Well Path
- ⊗ As Drilled Well Path

DATE 07/21/2017  
 OPERATOR'S WELL# PLUM RUN UNIT #3HAD

JOB # 15-005WA  
 DRAWING # PLUMRUN3HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA

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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
 WILLOW LAND SURVEYING PLLC

NOTE:  
 4 WATER WELLS, 4 SPRINGS AND 1 POND WERE LOCATED WITHIN 2000' OF CENTER OF PAD

NOTE

- ONE OCCUPIED DWELLING AND NO BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
- TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
- AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
- WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
- WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

11/10/2017

LATITUDE 39°22'30"

9,873'

4,079' TO BOTTOM HOLE

LATITUDE 39°22'30"

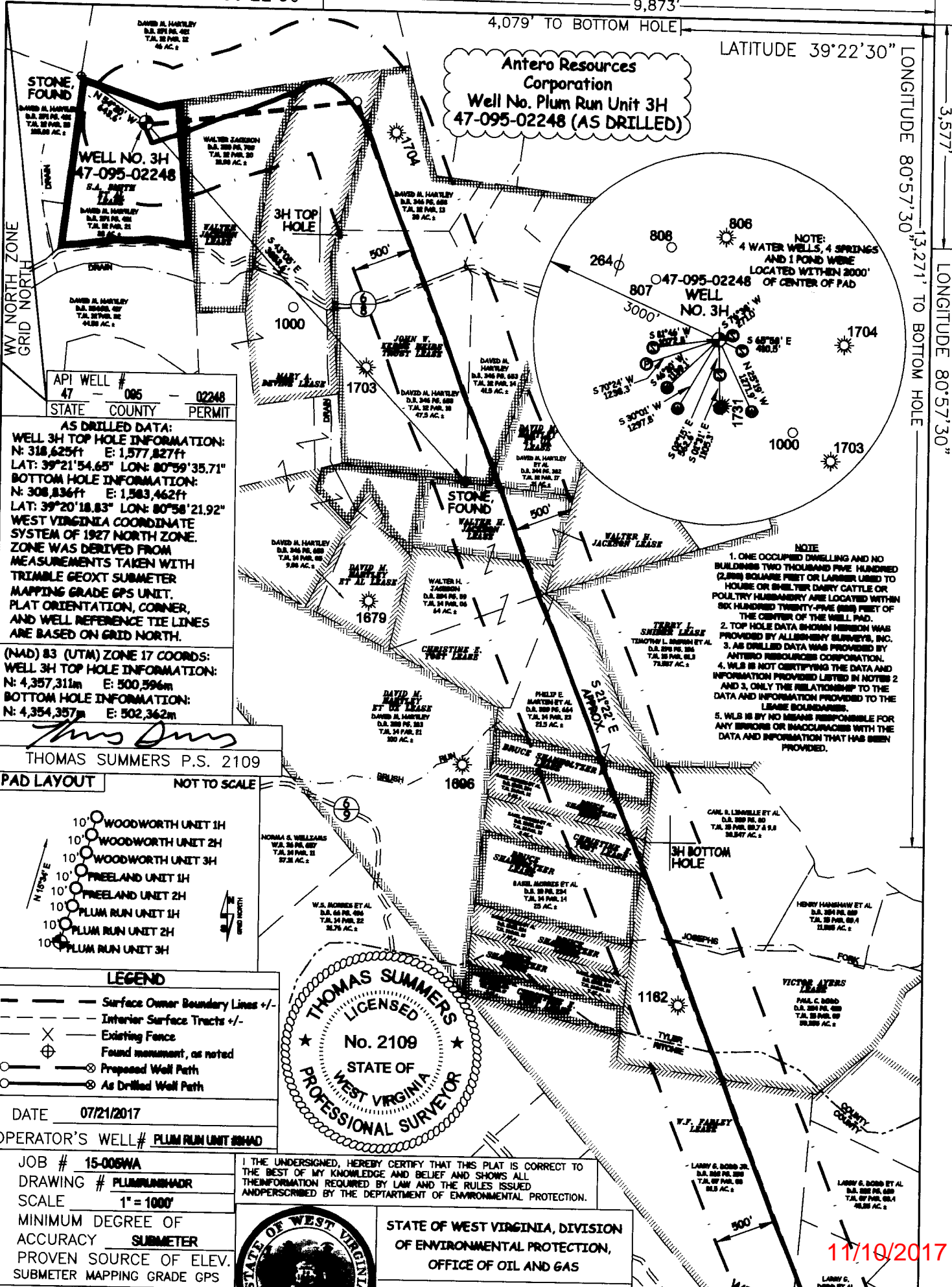
LONGITUDE 80°57'30"

3,577'

13,271' TO BOTTOM HOLE

LONGITUDE 80°57'30"

Antero Resources Corporation  
Well No. Plum Run Unit 3H  
47-095-02248 (AS DRILLED)



NOTE:  
4 WATER WELLS, 4 SPRINGS  
AND 1 POND WERE  
LOCATED WITHIN 2000'  
OF CENTER OF PAD

NOTE  
1. ONE OCCUPIED DWELLING AND NO BUILDINGS TWO THOUSAND FIVE HUNDRED (2005) SQUARE FEET OR LARGER LISTED TO HOUSE OR SHED, TEN DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.  
2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLSHERY SURVEYS, INC. 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.  
4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3. ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.  
5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

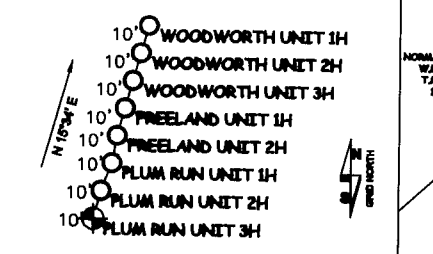
API WELL #	47	095	02248
STATE	COUNTY	PERMIT	

AS DRILLED DATA:  
WELL 3H TOP HOLE INFORMATION:  
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N: 4,357,311m E: 500,596m  
BOTTOM HOLE INFORMATION:  
N: 4,354,357m E: 502,362m

THOMAS SUMMERS P.S. 2109

PAD LAYOUT NOT TO SCALE



LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE 07/21/2017

OPERATOR'S WELL # PLUM RUN UNIT 3H40

JOB # 15-006WA  
DRAWING # PLUMRUN3HADR  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
STATE OF WEST VIRGINIA

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STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC

11/10/2017