



Antero Resources
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August 9, 2019

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells:

- Beem Unit 3H (API # 47-095-02474)—Pyle Run Pad
- Heintzman Unit 1H (API # 47-095-02526)—Pyle Run Pad
- Heintzman Unit 2H (API # 47-095-02527)—Pyle Run Pad
- Heintzman Unit 3H (API # 47-095-02528)—Pyle Run Pad
- Spock Unit 1H (API # 47-095-02478)—Pyle Run Pad
- Spock Unit 2H (API # 47-095-02427)—Pyle Run Pad
- Spock Unit 3H (API # 47-095-02428)—Pyle Run Pad

If you have any questions please feel free to contact me at (303) 357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "MGriffith", written over a horizontal dotted line.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

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

API 47- _____ - _____ County _____ District _____
Quad _____ Pad Name _____ Field/Pool Name _____
Farm name _____ Well Number _____
Operator (as registered with the OOG) _____
Address _____ City _____ State _____ Zip _____

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

Elevation (ft) _____ 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)

Date permit issued _____ Date drilling commenced _____ Date drilling ceased _____
Date completion activities began _____ Date completion activities ceased _____
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft _____ Open mine(s) (Y/N) depths _____
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths _____
Coal depth(s) ft _____ Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) _____

Reviewed by:

API 47- _____ - _____ Farm name _____ Well number _____

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							
Surface							
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
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							
Surface							
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) _____ Loggers TD (ft) _____
 Deepest formation penetrated _____ Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) _____

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 _____

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- ____ - ____ Farm name _____ Well number _____

PERFORATION RECORD

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

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)
*PLEASE SEE ATTACHED EXHIBIT 2								

Please insert additional pages as applicable.

API 47- _____ - _____ Farm name _____ Well number _____

PRODUCING FORMATION(S)

DEPTHS

_____	_____ TVD	_____ MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ 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 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 _____
Address _____ City _____ State _____ Zip _____

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company _____
Address _____ City _____ State _____ Zip _____

Stimulating Company _____
Address _____ City _____ State _____ Zip _____

Please insert additional pages as applicable.

Completed by _____ Telephone _____
Signature _____ Title _____ Date _____

API 47-095-0428 Farm Name Tyrone L. Beem et al Well Number Spock Unit 3H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/10/2019	17571		60	Marcellus
2	2/10/2019	17440.35	17274.1	60	Marcellus
3	2/10/2019	17238.45	17072.2	60	Marcellus
4	2/11/2019	17036.55	16870.3	60	Marcellus
5	2/12/2019	16834.65	16668.4	60	Marcellus
6	2/12/2019	16632.75	16466.5	60	Marcellus
7	2/12/2019	16430.85	16264.6	60	Marcellus
8	2/12/2019	16228.95	16062.7	60	Marcellus
9	2/13/2019	16027.05	15860.8	60	Marcellus
10	2/13/2019	15825.15	15658.9	60	Marcellus
11	2/13/2019	15623.25	15457	60	Marcellus
12	2/13/2019	15421.35	15255.1	60	Marcellus
13	2/14/2019	15219.45	15053.2	60	Marcellus
14	2/14/2019	15017.55	14851.3	60	Marcellus
15	2/14/2019	14815.65	14649.4	60	Marcellus
16	2/15/2019	14613.75	14447.5	60	Marcellus
17	2/16/2019	14411.85	14245.6	60	Marcellus
18	2/16/2019	14209.95	14043.7	60	Marcellus
19	2/16/2019	14008.05	13841.8	60	Marcellus
20	2/17/2019	13806.15	13639.9	60	Marcellus
21	2/17/2019	13604.25	13438	60	Marcellus
22	2/17/2019	13402.35	13236.1	60	Marcellus
23	2/17/2019	13200.45	13034.2	60	Marcellus
24	2/18/2019	12998.55	12832.3	60	Marcellus
25	2/18/2019	12796.65	12630.4	60	Marcellus
26	2/19/2019	12594.75	12428.5	60	Marcellus
27	2/21/2019	12392.85	12226.6	60	Marcellus
28	2/21/2019	12190.95	12024.7	60	Marcellus
29	2/22/2019	11989.05	11822.8	60	Marcellus
30	2/22/2019	11787.15	11620.9	60	Marcellus
31	2/22/2019	11585.25	11419	60	Marcellus
32	2/22/2019	11383.35	11217.1	60	Marcellus
33	2/23/2019	11181.45	11015.2	60	Marcellus
34	2/24/2019	10979.55	10813.3	60	Marcellus
35	2/26/2019	10777.65	10611.4	60	Marcellus
36	2/26/2019	10575.75	10409.5	60	Marcellus
37	2/26/2019	10373.85	10207.6	60	Marcellus
38	2/27/2019	10171.95	10005.7	60	Marcellus
39	2/27/2019	9970.05	9803.8	60	Marcellus
40	2/27/2019	9768.15	9601.9	60	Marcellus
41	3/1/2019	9566.25	9400	60	Marcellus
42	3/1/2019	9364.35	9198.1	60	Marcellus
43	3/1/2019	9162.45	8996.2	60	Marcellus
44	3/2/2019	8960.55	8794.3	60	Marcellus
45	3/2/2019	8758.65	8592.4	60	Marcellus
46	3/2/2019	8556.75	8390.5	60	Marcellus
47	3/2/2019	8354.85	8188.6	60	Marcellus
48	3/2/2019	8152.95	7986.7	60	Marcellus
49	3/3/2019	7951.05	7784.8	60	Marcellus
50	3/3/2019	7749.15	7582.9	60	Marcellus
51	3/3/2019	7547.25	7381	60	Marcellus
52	3/3/2019	7345.35	7179.1	60	Marcellus

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	2/10/2019	70.9092	7672.861	5362	3422	267800	8280	N/A
2	2/10/2019	79	7791	5358	3900	398600	9048	N/A
3	2/10/2019	77.3135	8361.32	5273	3660	396800	8298	N/A
4	2/11/2019	71.9922	7996.217	5951	4307	396700	7489	N/A
5	2/12/2019	71.2668	8511.807	5968	3728	396750	7755	N/A
6	2/12/2019	69.9165	8188.409	5528	3833	398600	7708	N/A
7	2/12/2019	74.7638	8136.914	4887	4228	398600	7670	N/A
8	2/12/2019	74.0286	8343.731	6050	4047	397720	7553	N/A
9	2/13/2019	77.5147	8373.25	5768	4372	396960	7527	N/A
10	2/13/2019	74.5672	7921.451	5217	4334	408000	7686	N/A
11	2/13/2019	75.4308	7940.009	5820	3551	397600	7582	N/A
12	2/13/2019	76.3737	8256.867	5736	3610	397030	7499	N/A
13	2/14/2019	75.6047	7995.617	5119	3613	398600	7427	N/A
14	2/14/2019	73.1822	7676.153	5084	3474	398200	6884	N/A
15	2/14/2019	79.401	8076.264	5461	4211	392800	6862	N/A
16	2/15/2019	79.7635	8089.715	6743	3961	396050	6941	N/A
17	2/16/2019	78.6884	7991.182	5366	3808	399400	7027	N/A
18	2/16/2019	74.2211	8182.452	6149	4119	398830	6968	N/A
19	2/16/2019	79.5683	8192.46	7893	4609	402000	6983	N/A
20	2/17/2019	79.5533	8080.164	5770	4265	395030	7060	N/A
21	2/17/2019	77.6873	8153.536	5561	4380	398200	6935	N/A
22	2/17/2019	78.9644	7915.753	5523	3686	400100	6955	N/A
23	2/17/2019	80.2538	7897.294	5262	3919	395080	6842	N/A
24	2/18/2019	79.7952	7868.005	5360	3998	395000	6769	N/A
25	2/18/2019	79.7551	7970.178	5603	4047	397960	6796	N/A
26	2/19/2019	79.0725	8066.76	5507	3888	400010	6866	N/A
27	2/21/2019	66.6184	8110.999	6002	3498	398820	8529	N/A
28	2/21/2019	75.0087	7887.412	6254	3813	401080	6887	N/A
29	2/22/2019	78.3147	7925.056	5688	3997	399150	6856	N/A
30	2/22/2019	77.3629	8090.045	5870	3314	399580	6829	N/A
31	2/22/2019	78.675	7627.8	5742	3420	399280	6812	N/A
32	2/22/2019	78.9164	8139.19	5752	3607	399200	8887	N/A
33	2/23/2019	76.4665	7940.207	5413	4300	399080	8383	N/A
34	2/24/2019	67.0714	8102.359	5865	3511	399090	6953	N/A
35	2/26/2019	78.4285	7638.125	6097	3492	398620	6808	N/A
36	2/26/2019	78.7769	7630.981	5802	3576	398000	6828	N/A
37	2/26/2019	79.2668	7646.363	5704	3673	399100	6776	N/A
38	2/27/2019	78.7874	7715.164	5068	3802	398840	6819	N/A
39	2/27/2019	78.2908	7488.743	6107	3673	398820	6815	N/A
40	2/27/2019	79.5513	7671.954	5368	3730	403540	6884	N/A
41	3/1/2019	75.2404	7813.61	6390	3512	401200	7468	N/A
42	3/1/2019	79.5511	7544.082	5588	3633	399860	6765	N/A
43	3/1/2019	79.7871	7818.895	5439	3557	401200	6815	N/A
44	3/2/2019	79.9818	7723.2	5764	3576	400500	6662	N/A
45	3/2/2019	80.3719	7172.086	5282	3599	398200	6679	N/A
46	3/2/2019	79.9135	7172.768	5186	3657	399720	6709	N/A
47	3/2/2019	79.8327	7243.756	4587	3438	399840	6720	N/A
48	3/2/2019	80.528	7032.098	4178	3635	400500	6636	N/A
49	3/3/2019	80.3134	7136.602	4976	3535	401100	6616	N/A
50	3/3/2019	78.4583	7217.015	4951	4091	399140	8085	N/A
51	3/3/2019	77.8386	7074.796	5623	4055	399660	7476	N/A
52	3/3/2019	79.5576	6813.729	5137	3485	400040	6660	N/A
		76.8	7,941	5,700	3,828	17,811,580	326,865	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
Silty Sandstone	75	175	75	175
Silty Shale	175	335	175	335
shaly sand	335	425	335	425
Shale	425	855	425	855
Dolomitic Shale	855	1,005	855	1,005
Shaly Siltstone	1,005	1,105	1,005	1,105
Silty Sandstone	1,105	1,325	1,105	1,325
Shaly Sand	1,325	1,475	1,325	1,475
Sandstone	1,475	1,725	1,475	1,725
Silty, Shaly, Sandstone	1,725	1,765	1,725	1,765
Sandstone, Tr Shale, Tr Coal	1,765	1,805	1,765	1,805
Silty Sandstone	1,805	1,885	1,805	1,885
Shaly Siltstone	1,885	1,967	1,885	2,045
Big Lime	1,992	2,825	2,070	2,969
Fifty Foot Sandstone	2,825	3,001	2,969	3,158
Gordon	3,001	3,157	3,158	3,327
Fifth Sandstone	3,157	3,436	3,327	3,631
Bayard	3,436	3,904	3,631	4,137
Speechley	3,904	4,125	4,137	4,375
Balltown	4,125	4,661	4,375	4,957
Bradford	4,661	5,030	4,957	5,354
Benson	5,030	5,218	5,354	5,557
Alexander	5,218	6,350	5,557	6,824
Sycamore	6,205	6,325	6,636	6,799
Middlesex	6,325	6,420	6,799	6,967
Burkett	6,420	6,454	6,967	7,046
Tully	6,454	6,481	7,046	7,132
Marcellus	6,481	NA	7,132	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:	2/9/2019
Job End Date:	3/3/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02428-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Spock 3H
Latitude:	39.40389400
Longitude:	-80.90389400
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,567
Total Base Water Volume (gal):	16,415,096
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	Antero Resources	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	86.67258	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	13.05334	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.40000	0.13600	
			Hydrogen Chloride	7647-01-0	17.50000	0.03162	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.02213	
			Petroleum Distillates	64742-47-8	60.00000	0.02096	
			Suspending agent (solid)	14808-60-7	3.00000	0.00339	
			Surfactant	68439-51-0	3.00000	0.00133	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			2-Propenoic acid, polymer with 2-propenamide	9003-06-9	30.00000	0.01820	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01465	

SI-1200	U.S. Well Services, LLC	Scale Inhibitor				
			Water	7732-18-5	80.00000	0.00958
			Ethylene Glycol	107-21-1	40.00000	0.00685
			Sodium Chloride	7647-14-5	10.00000	0.00120
			Sodium Salt of Diethylenetriaminepenta (methylenephosphonic acid)	68155-78-2	10.00000	0.00120
Bioclear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00400
			Deionized Water	7732-18-5	28.00000	0.00228
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00061
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene glycol	107-21-1	40.00000	0.00004
			Formic acid	64-18-6	20.00000	0.00001
			Cinnamaldehyde	104-55-2	20.00000	0.00001
			Butyl cellosolve	111-76-2	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)

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

Company Name: Antero Resources Corporation
API No: 47-095-02428 County: Tyler
District: Centerville Well No: Spock Unit 3H
Farm Name: Tyrone L. Beem et al
Discharge Date/s From:(MMDDYY) 05/31/19 To: (MMDDYY) 05/31/19
Discharge Times. From: 0:00 To: 24:00
Total Volume to be Disposed from this facility (gallons): 996,304

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

- (1) Land Application: _____ (Include a topographical map of the Area.)
(2) UIC: 130,517 Permit No. 3400923821, 3400923823, 3400923824, 3416729731, 3416729543, 3416729464, 3416729445
(3) Offsite Disposal: _____ Site Location: _____
(4) Reuse: 865,787 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: n/a Cl- mg/l n/a DO mg/l

1. Do you have permission to use expedited treatment from the Director or his representative?
(Y/N) n/a 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) n/a If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4
If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a 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) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. n/a is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: n/a No pit on site.

Name of Principal Exec. Officer: Gretchen Kohler
Title of Officer: Senior Environmental and Regulatory Manager
Date Completed: 8/9/19

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.



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/B1
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: _____

LATITUDE 39°25'00"

8,165'

2,488' TO BOTTOM HOLE

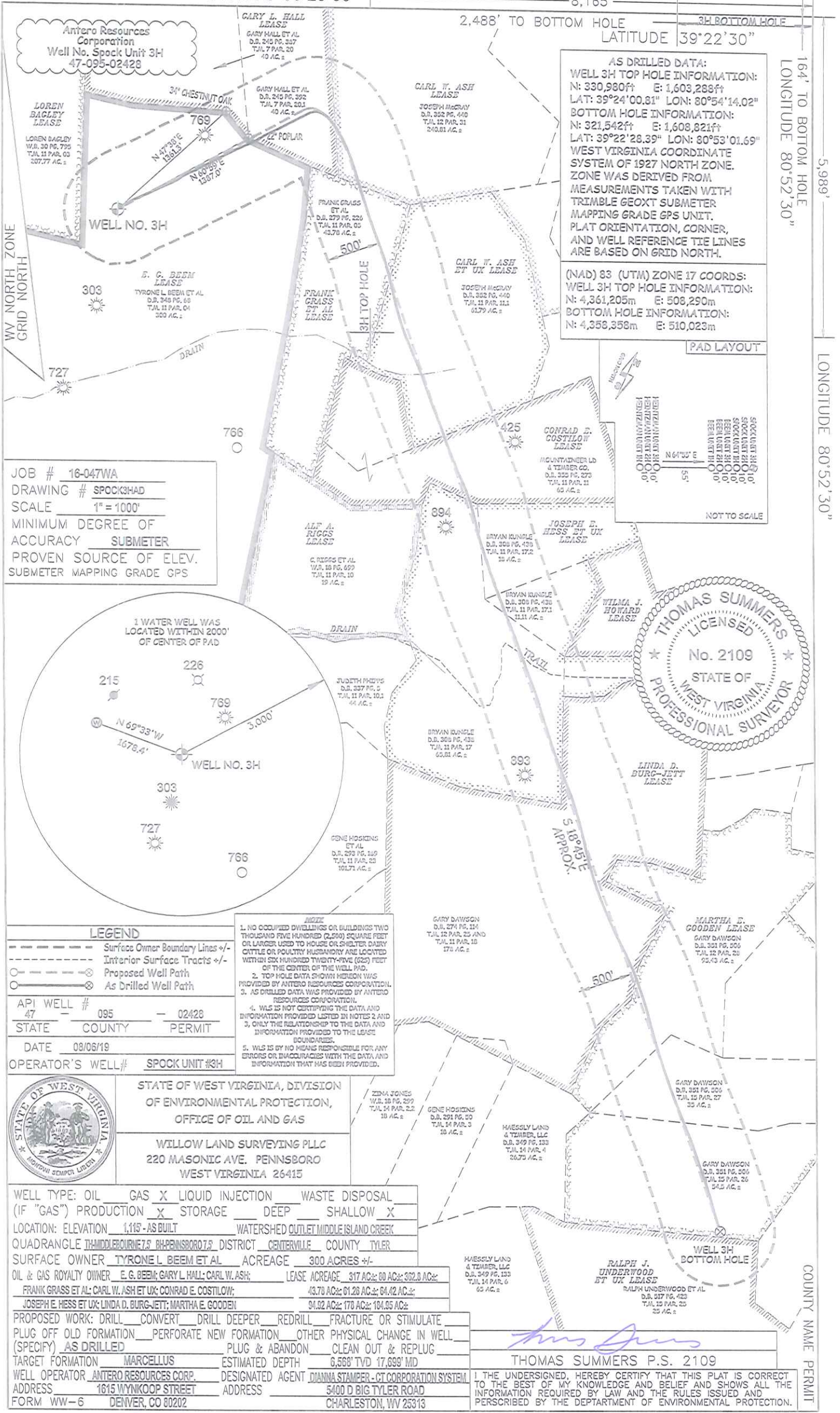
3H BOTTOM HOLE

LATITUDE 39°22'30"

164' TO BOTTOM HOLE
LONGITUDE 80°52'30"

5,989'

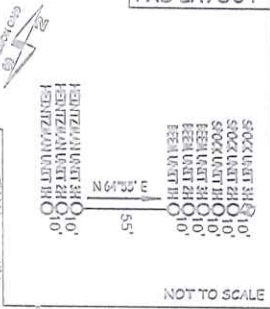
LONGITUDE 80°52'30"



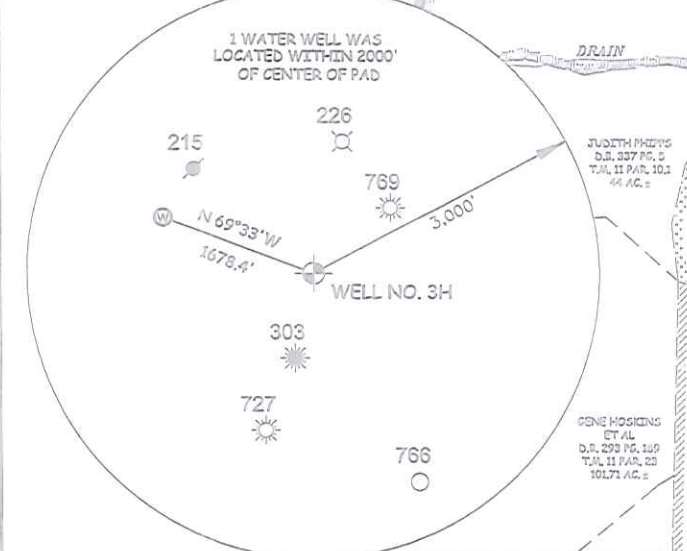
AS DRILLED DATA:
WELL 3H TOP HOLE INFORMATION:
 N: 330,980ft E: 1,603,288ft
 LAT: 39°24'00.81" LON: 80°54'14.02"
BOTTOM HOLE INFORMATION:
 N: 321,542ft E: 1,608,821ft
 LAT: 39°22'28.39" LON: 80°53'01.69"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH 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: 4,361,205m E: 508,290m
BOTTOM HOLE INFORMATION:
 N: 4,358,358m E: 510,023m

PAD LAYOUT



JOB # 16-047WA
 DRAWING # SPOCK3HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



LEGEND
 - - - - - Surface Owner Boundary Lines +/-
 - - - - - Interior Surface Tracts +/-
 - - - - - Proposed Well Path
 - - - - - As Drilled Well Path

API WELL # 47 095 - 02428
 STATE COUNTY PERMIT
 DATE 09/06/19
 OPERATOR'S WELL# SPOCK UNIT #3H

NOTE
 1. NO OCCUPIED DWELLINGS OR 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.
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
 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.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1,115' AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK
 QUADRANGLE THIDDLEBOURNE 7.5 RH PENNSBORO 7.5 DISTRICT CENTERVILLE COUNTY TYLER
 SURFACE OWNER TYRONE L. BEEM ET AL ACREAGE 300 ACRES +/-
 OIL & GAS ROYALTY OWNER E. G. BEEM; GARY L. HALL; CARL W. ASH; LEASE ACREAGE 317 AC.; 00 AC.; 302.8 AC.;
 FRANK GRASS ET AL; CARL W. ASH ET UX; CONRAD E. COSTILOU; 43.78 AC.; 01.28 AC.; 04.42 AC.;
 JOSEPH E. HESS ET UX; LINDA D. BURG-JETT; MARTHA E. GOODEN 94.92 AC.; 178 AC.; 104.05 AC.;

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,569' TVD 17,699' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
 ADDRESS 1615 WYNNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

THOMAS SUMMERS P.S. 2109
 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.

COUNTY NAME PERMIT