

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

API 47 - 085 - 10193 County Ritchie District Clay  
Quad Pennsboro 7.5' Pad Name Kelly Pad Field/Pool Name ----  
Farm name Eddy D. Waggoner, et al Well Number Aubie Unit 1H  
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 4351658m Easting 503213m  
Landing Point of Curve Northing 4351656.25m Easting 503500.27m  
Bottom Hole Northing 4348782m Easting 504677m

Elevation (ft) 1127' 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

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

Date permit issued 2/26/2015 Date drilling commenced 8/10/2016 Date drilling ceased 12/8/2016  
Date completion activities began 5/14/2017 Date completion activities ceased 9/19/2017  
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 337' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1099' 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  
*Michael Goff*

*9/5/18*

Reviewed by:  
09/07/2018

API 47-085 - 10193 Farm name Eddy D. Waggoner, et al Well number Aubie Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	40'	New	94# H-40	N/A	Y
Surface	17-1/2"	13-3/8"	532'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2606'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17330'	New	23# P-110	N/A	Y
Tubing		2-3/8"	6639'		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>2</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	102 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	630 sx	15.6	1.19	750	0'	8 Hrs.
Coal							
Intermediate 1	Class A	1006 sx	15.6	1.18	1187	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	688 sx (Lead) 1528 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.65 (Lead), 1.83 (Tail)	3931	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17330' MD, 6424' TVD (BHL) & 6430' TVD (Deepest Point Drilled) Loggers TD (ft) 17305' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5941'

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

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of Environmental Protection

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- 085 - 10193 Farm name Eddy D. Waggoner, et al Well number Aubie Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6379' (TOP)</u> TVD	<u>6652' (TOP)</u> MD
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 7973 mcfpd Oil --- bpd NGL --- bpd Water 1177 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

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

**\*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 Pro Oilfield Services LLC  
Address 3141 Pulaski Rd City New Castle State PA Zip 16105

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

Stimulating Company FTS International  
Address 1432 Route 519 City Eighty Four State PA Zip 15330

Please insert additional pages as applicable.

Completed by Mallory Stanton Telephone 303-357-7233  
Signature *Mallory Stanton* Title Permitting Agent Date 5/9/2018

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

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

09/07/2018

API 47-085-10193 Farm Name Eddy D. Waggoner et al Well Number Aubie Unit 1H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	5/14/2017	17059	17227	48	Marcellus
2	5/26/2017	16859	17028	48	Marcellus
3	5/27/2017	16660	16828	48	Marcellus
4	5/28/2017	16461	16629	48	Marcellus
5	5/29/2017	16261	16429	48	Marcellus
6	5/29/2017	16062	16230	48	Marcellus
7	5/30/2017	15863	16031	48	Marcellus
8	5/30/2017	15663	15831	48	Marcellus
9	5/31/2017	15464	15632	48	Marcellus
10	6/1/2017	15264	15433	48	Marcellus
11	6/2/2017	15065	15233	48	Marcellus
12	6/3/2017	14866	15034	48	Marcellus
13	6/3/2017	14666	14834	48	Marcellus
14	8/2/2017	14467	14635	48	Marcellus
15	8/3/2017	14268	14436	48	Marcellus
16	8/3/2017	14068	14236	48	Marcellus
17	8/4/2017	13869	14037	48	Marcellus
18	8/4/2017	13669	13838	48	Marcellus
19	8/4/2017	13470	13638	48	Marcellus
20	8/5/2017	13271	13439	48	Marcellus
21	8/5/2017	13071	13239	48	Marcellus
22	8/6/2017	12872	13040	48	Marcellus
23	8/6/2017	12672	12841	48	Marcellus
24	8/6/2017	12473	12641	48	Marcellus
25	8/7/2017	12274	12442	48	Marcellus
26	8/7/2017	12074	12243	48	Marcellus
27	8/8/2017	11875	12043	48	Marcellus
28	8/8/2017	11676	11844	48	Marcellus
29	8/8/2017	11476	11644	48	Marcellus
30	8/8/2017	11277	11445	48	Marcellus
31	8/9/2017	11077	11246	48	Marcellus
32	8/9/2017	10878	11046	48	Marcellus
33	8/10/2017	10679	10847	48	Marcellus
34	8/14/2017	10479	10647	48	Marcellus
35	8/15/2017	10280	10448	48	Marcellus
36	8/15/2017	10081	10249	48	Marcellus
37	8/16/2017	9881	10049	48	Marcellus
38	8/16/2017	9682	9850	48	Marcellus
39	8/16/2017	9482	9651	48	Marcellus
40	8/16/2017	9283	9451	48	Marcellus
41	8/16/2017	9084	9252	48	Marcellus
42	8/17/2017	8884	9052	48	Marcellus
43	8/17/2017	8685	8853	48	Marcellus
44	8/17/2017	8486	8654	48	Marcellus
45	8/17/2017	8286	8454	48	Marcellus
46	8/18/2017	8087	8255	48	Marcellus
47	8/18/2017	7887	8056	48	Marcellus
48	8/18/2017	7688	7856	48	Marcellus
49	8/18/2017	7489	7657	48	Marcellus
50	8/19/2017	7289	7457	48	Marcellus
51	8/19/2017	7090	7258	48	Marcellus
52	8/19/2017	6890	7059	48	Marcellus
53	8/19/2017	6691	6859	48	Marcellus

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

09/07/2018

**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 (bbbls)	Amount of Nitrogen/ other (unlts)
1	5/14/2017	79.0	7643	5129.0	3833.0	413901	8556.0	N/A
2	5/26/2017	74.0	7434	5112.0	3637.0	410675	8784.0	N/A
3	5/27/2017	74.0	0	5496.0	3191.0	410675	8465.0	N/A
4	5/28/2017	74.0	7675	5462.0	3326.0	410675	8471.0	N/A
5	5/29/2017	73.0	7434	6438.0	7750.0	410675	8377.0	N/A
6	5/29/2017	73.0	7646	5464.0	3360.0	415787	8596.0	N/A
7	5/30/2017	77.0	7666	5230.0	3353.0	410993	8339.0	N/A
8	5/30/2017	74.0	7501	4760.0	3467.0	413544	8482.0	N/A
9	5/31/2017	74.0	7652	5918.0	3598.0	412221	8521.0	N/A
10	6/1/2017	78.0	7764	5659.0	0.0	413376	8453.0	N/A
11	6/2/2017	80.0	7721	5424.0	3465.0	413985	8441.0	N/A
12	6/3/2017	76.0	7840	5651.0	3576.0	414383	8421.0	N/A
13	6/3/2017	74.0	7511	5343.0	3758.0	409606	8540.0	N/A
14	8/2/2017	77.0	7690	5337.0	3785.0	415654	8341.0	N/A
15	8/3/2017	74.0	7490	5854.0	3503.0	408746	8453.0	N/A
16	8/3/2017	78.0	7836	5609.0	3746.0	406141	8082.0	N/A
17	8/4/2017	73.0	7648	5914.0	3544.0	403874	8161.0	N/A
18	8/4/2017	74.0	7486	5731.0	3781.0	413072	9759.0	N/A
19	8/4/2017	73.0	8217	5676.0	4176.0	408715	9852.0	N/A
20	8/5/2017	73.0	6715	5680.0	3755.0	415518	10323.0	N/A
21	8/5/2017	71.0	7838	5537.0	3666.0	411140	10043.0	N/A
22	8/6/2017	72.0	7557	5574.0	3744.0	415267	8553.0	N/A
23	8/6/2017	74.0	7481	5880.0	3678.0	407485	8284.0	N/A
24	8/6/2017	76.0	7218	5802.0	3786.0	407412	8167.0	N/A
25	8/7/2017	75.0	7287	5727.0	3948.0	408515	10081.0	N/A
26	8/7/2017	72.0	7349	5693.0	3632.0	407402	8143.0	N/A
27	8/8/2017	76.0	7236	6293.0	4009.0	410677	8211.0	N/A
28	8/8/2017	76.0	7424	5983.0	3742.0	404209	8057.0	N/A
29	8/8/2017	73.0	7015	5834.0	3669.0	396955	8041.0	N/A
30	8/8/2017	72.0	6933	5762.0	4016.0	410868	10196.0	N/A
31	8/9/2017	72.0	7540	6255.0	3577.0	413534	8427.0	N/A
32	8/9/2017	71.0	7140	5591.0	3706.0	407811	8445.0	N/A
33	8/10/2017	70.0	7466	5445.0	4638.0	340409	10123.0	N/A
34	8/14/2017	78.0	7836	5609.0	3746.0	406141	8082.0	N/A
35	8/15/2017	63.0	7385	5687.0	3830.0	411042	10401.0	N/A
36	8/15/2017	73.0	8217	5676.0	4176.0	408715	9852.0	N/A
37	8/16/2017	73.0	7283	5871.0	4115.0	412631	8233.0	N/A
38	8/16/2017	73.0	6859	6221.0	4075.0	414069	8275.0	N/A
39	8/16/2017	74.0	7449	5916.0	3956.0	410592	8168.0	N/A
40	8/16/2017	75.0	7618	6229.0	4170.0	411844	8184.0	N/A
41	8/16/2017	72.0	7646	6625.0	3871.0	411298	8311.0	N/A
42	8/17/2017	73.0	7619	6698.0	3955.0	409113	8535.0	N/A
43	8/17/2017	68.0	7240	6140.0	3725.0	406689	9212.0	N/A
44	8/17/2017	74.0	6992	5954.0	3992.0	419550	8057.0	N/A
45	8/17/2017	71.0	7501	5845.0	4065.0	410847	8051.0	N/A
46	8/18/2017	73.0	7797	6044.0	3895.0	409942	8089.0	N/A
47	8/18/2017	75.0	7611	5574.0	4277.0	419550	8057.0	N/A
48	8/18/2017	76.0	7442	6190.0	3920.0	411896	8002.0	N/A
49	8/18/2017	75.0	7370	6197.0	3785.0	417475	7869.0	N/A
50	8/19/2017	63.0	6930	6182.0	3954.0	416120	9869.0	N/A
51	8/19/2017	76.0	7133	5796.0	4127.0	413282	8068.0	N/A
52	8/19/2017	68.0	7176	5276.0	4043.0	410531	7969.0	N/A
53	8/19/2017	73.0	6244	5512.0	4149.0	414624	8298.0	N/A
AVG=		73.5	7,309	5,764	3,816	21,719,851	457,770	TOTAL

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
Environmental Protection

09/07/2018

## 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	337'	N/A	337'	N/A
Sandstone	0	221	0	221
siltstone	est. 221	241	est. 221	241
shale	est. 241	381	est. 241	381
Coal	est. 381	401	est. 381	401
Sandstone	est. 401	441	est. 401	441
Limestone	est. 441	561	est. 441	561
Sandstone	est. 561	621	est. 561	621
Sandstone	est. 621	761	est. 621	761
Sandstone	est. 761	941	est. 761	941
Limstone	est. 941	1,989	est. 941	2,004
Big Lime	1,989	2,502	2,004	2,529
Gantz	2,502	2,882	2,529	2,916
Fifty Foot Sandstone	2,882	2,981	2,916	3,018
Gordon	2,981	3,357	3,018	3,403
Fifth Sandstone	3,357	3,415	3,403	3,462
Bayard	3,415	3,955	3,462	4,014
Speechley	3,955	4,224	4,014	4,289
Baltown	4,224	4,615	4,289	4,692
Bradford	4,615	5,001	4,692	5,087
Benson	5,001	5,240	5,087	5,332
Alexander	5,240	5,532	5,332	5,630
Elk	5,532	5,811	5,630	5,913
Rhinestreet	5,811	6,133	5,913	6,262
Sycamore	6,133	6,229	6,262	6,382
Middlesex	6,229	6,334	6,382	6,545
Burkett	6,334	6,361	6,545	6,603
Tully	6,361	6,379	6,603	6,652
Marcellus	6,379	NA	6,652	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.

RECEIVED  
Office of Oil and Gas

MAY 10 2018

WV Department of  
Environmental Protection

09/07/2018

# Hydraulic Fracturing Fluid Product Component Information Disclosure

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

Job Start Date:	5/25/2017
Job End Date:	8/19/2017
State:	West Virginia
County:	Ritchie
API Number:	47-085-10193-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Aubie 1H
Latitude:	39.31436000
Longitude:	-80.96260200
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,400
Total Base Water Volume (gal):	19,273,548
Total Base Non Water Volume:	58,031



## 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	Supplied by Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.84961	
Other Chemical (s)	Listed Above	See Trade Name (s) List					
			Water	7732-18-5	30.00000	0.00008	



RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

			Water	7732-18-5	97.00000	0.01465	
			Water	7732-18-5	30.00000	0.00348	
			Water	7732-18-5	85.00000	0.12681	
			Water	7732-18-5	60.00000	0.04034	
HVG-1 4.0	FTSI	Water gelling agent					
				Listed Below			
LTB-1	FTSI	Breaker					
				Listed Below			
APB-1	FTSI	Gel breaker					
				Listed Below			
K-BAC-1020	FTSI	Biocide					
				Listed Below			
10.1%-15.0% HCL	FTSI	Acid					
				Listed Below			
FRW-900	FTSI	Friction Reducer					
				Listed Below			
100 Mesh Sand	FTSI	Proppant					

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

				Listed Below			
CI-150	FTSI	Acid Corrosion Inhibitor					
				Listed Below			
40/70 White	FTSI	Proppant					
				Listed Below			
CS-750 SI	FTSI	Scale Inhibitor					
				Listed Below			
30/50 White	FTSI	Proppant					
				Listed Below			

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

			Silica, Quartz	14808-60-7	100.00000	5.39976	
			Silica, Quartz	14808-60-7	100.00000	3.46906	
			Silica, Quartz	14808-60-7	100.00000	2.99074	
			Hydrotreated Light Distillate	64742-47-8	40.00000	0.02689	
			Anionic polymer	Proprietary	40.00000	0.02689	
			Hydrogen Chloride	7647-01-0	15.00000	0.02238	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.02017	
			Raffinates, Sorption Process	64741-85-1	55.00000	0.01941	
			Guar gum	9000-30-0	55.00000	0.01941	
			Petroleum Distillate	64742-47-8	55.00000	0.01941	
			Ammonium Persulfate	7727-54-0	84.00000	0.01022	
			Glycerol	56-81-5	10.00000	0.00672	

RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of  
Environmental Protection

			Polyethylene glycol	25322-68-3	50.00000	0.00580	
			Alcohols, C10-C16, ethoxylated	68002-97-1	5.00000	0.00336	
			Ethoxylated Alcohols	Proprietary	5.00000	0.00336	
			Sorbitan, mono-(9Z)-9-octadecenoate	1338-43-8	5.00000	0.00336	
			Sodium chloride (NaCl)	7647-14-5	5.00000	0.00336	
			Cured acrylic resin	25085-19-2	22.00000	0.00268	
			2,2-Dibromo-3-nitrilopropionamide	10222-01-2	21.00000	0.00243	
			Suspending Agent	1302-78-9	5.00000	0.00176	
			Proprietary Scale Inhibitor	Proprietary	10.00000	0.00151	
			Quartz	14808-60-7	4.00000	0.00141	
			Isotridecanol, ethoxylated	9043-30-5	2.00000	0.00071	
			Isopropanol	67-63-0	60.00000	0.00016	
			Fatty amino compound salt	Proprietary	30.00000	0.00008	
			Ethoxylated fatty alcohol	Proprietary	30.00000	0.00008	
			Talc	14807-96-6	0.60000	0.00007	
			Ethoxylated Alcohol	Proprietary	10.00000	0.00003	
			Aromatic aldehyde	Proprietary	8.00000	0.00002	
			Alkoxylated fatty amine	Proprietary	5.00000	0.00001	
			Methanol	67-56-1	0.10000	0.00000	
			Ammonium Persulfate	7727-54-0	100.00000		

\* 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)

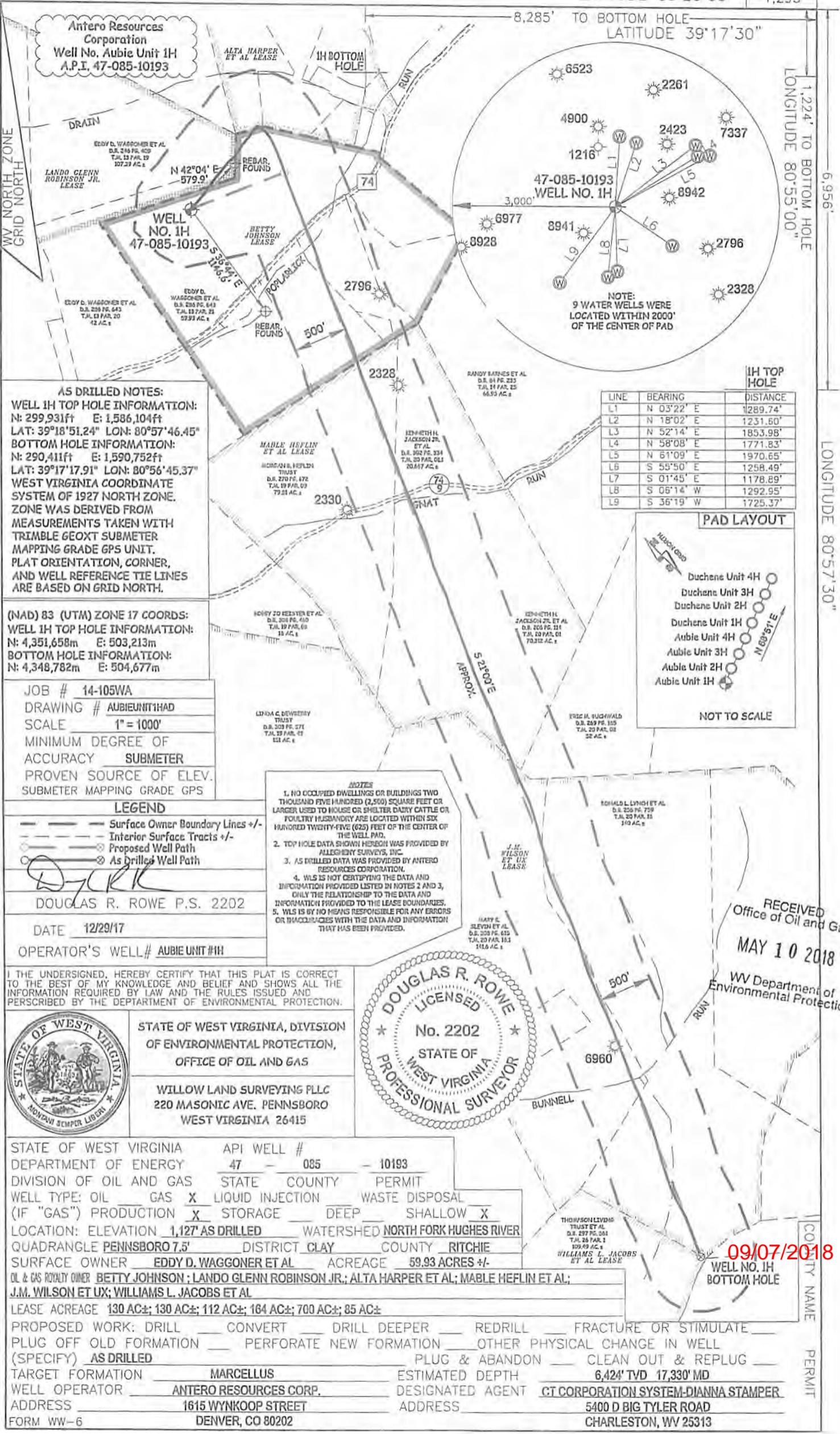
LATITUDE 39°20'00" | -1,293'

8,285' TO BOTTOM HOLE  
LATITUDE 39°17'30"

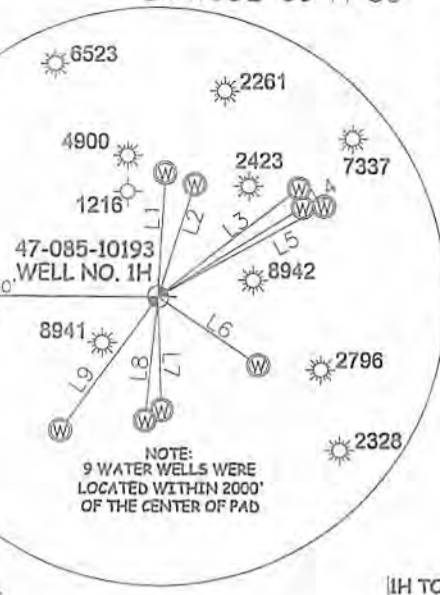
LONGITUDE 80°55'00"

6,956'

LONGITUDE 80°57'30"



Antero Resources Corporation  
Well No. Aubie Unit 1H  
A.P.I. 47-085-10193



**AS DRILLED NOTES:**  
WELL 1H TOP HOLE INFORMATION:  
N: 299,931ft E: 1,586,104ft  
LAT: 39°18'51.24" LON: 80°57'46.45"  
BOTTOM HOLE INFORMATION:  
N: 290,411ft E: 1,590,752ft  
LAT: 39°17'17.91" LON: 80°56'45.37"  
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE 600XT 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 1H TOP HOLE INFORMATION:  
N: 4,351,658m E: 503,213m  
BOTTOM HOLE INFORMATION:  
N: 4,348,782m E: 504,677m

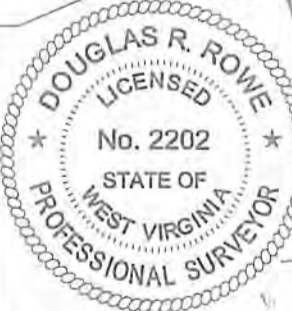
JOB # 14-105WA  
DRAWING # AUBIEUNIT1HAD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

DOUGLAS R. ROWE P.S. 2202  
DATE 12/29/17  
OPERATOR'S WELL # AUBIE UNIT #1H

**NOTES**  
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 ALLEGHENY 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.

LINE	BEARING	DISTANCE
L1	N 03°22' E	1289.74'
L2	N 18°02' E	1231.60'
L3	N 52°14' E	1853.98'
L4	N 58°08' E	1771.83'
L5	N 61°09' E	1970.65'
L6	S 55°50' E	1258.49'
L7	S 01°45' E	1178.89'
L8	S 05°14' W	1292.95'
L9	S 36°19' W	1725.37'



RECEIVED  
Office of Oil and Gas  
MAY 10 2018  
WV Department of Environmental Protection

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

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

API WELL # 47 - 085 - 10193

STATE COUNTY PERMIT

WELL TYPE: OIL GAS  LIQUID INJECTION WASTE DISPOSAL

(IF "GAS") PRODUCTION  STORAGE DEEP SHALLOW

LOCATION: ELEVATION 1,127' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER

QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE

SURFACE OWNER EDDY D. WAGGONER ET AL ACREAGE 59.93 ACRES +/-

OIL & GAS ROYALTY OWNER BETTY JOHNSON; LANDO GLENN ROBINSON JR.; ALTA HARPER ET AL; MABLE HEFLIN ET AL; J.M. WILSON ET UX; WILLIAMS L. JACOBS ET AL

LEASE ACREAGE 130 AC±; 130 AC±; 112 AC±; 164 AC±; 700 AC±; 85 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 6,424' TVD 17,330' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM-DIANNA STAMPER

ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD

FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

09/07/2018

COUNTY NAME

PERMIT

STATE OF WEST VIRGINIA  
 DEPARTMENT OF ENERGY  
 DIVISION OF OIL AND GAS  
 WELLS PERMIT # 47-085-10193

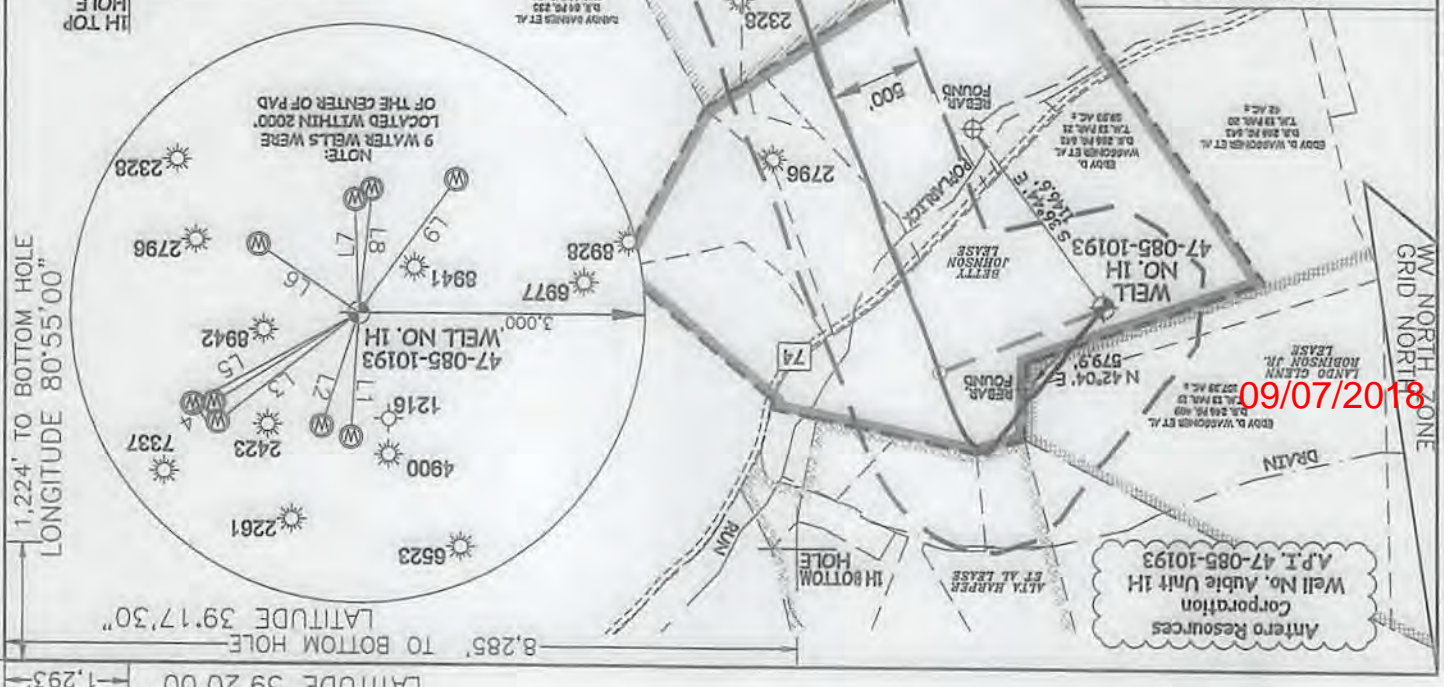
APPLICANT: ANTERO RESOURCES CORPORATION  
 OPERATOR: ANTERO RESOURCES CORPORATION  
 WELL OPERATOR: ANTERO RESOURCES CORPORATION  
 ADDRESS: 1615 WYNKOOP STREET, DENVER, CO 80202  
 COUNTY: DISTRICT CLAY  
 LOCATION: ELEVATION 1,127 AS DRILLED  
 QUADRANGLE: PENNSBORO 7.5  
 SURFACE OWNER: EDDY D. WAGGONER ET AL  
 LEASE ACRES: 130 AC. 130 AC. 112 AC. 164 AC. 700 AC. 85 AC.

PROFESSIONAL SURVEYOR  
 STATE OF WEST VIRGINIA  
 LICENSED  
 DOUGLAS R. ROWE  
 No. 2202  
 WEST VIRGINIA 26415  
 220 MASONIC AVE. PENNSBORO  
 WILLOW LAND SURVEYING PLLC

DATE: 12/29/17  
 OPERATOR'S WELL # AUBIE UNIT #4H  
 DOUGLAS R. ROWE P.S. 2202  
 AS DRILLED WELL PATH  
 PROPOSED WELL PATH  
 INTERIOR SURFACE TRACTS +/-  
 SURFACE OWNER BOUNDARY LINES +/-

LEGEND  
 DRAWING # AUBIEUNIT4HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY  
 PROVEN SOURCE OF ELEVATION  
 SUBMETER MAPPING GRADE GPS

AS DRILLED NOTES:  
 WELL 1H TOP HOLE INFORMATION: LAT: 39°18'51.24" N; LONG: 80°57'46.45" W; ZONE 17 COORDS: N: 4351.658m E: 503.213m  
 BOTTOM HOLE INFORMATION: N: 4346.782m E: 504.677m  
 JOB # 14-105VA  
 DRAWING # AUBIEUNIT4HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY  
 PROVEN SOURCE OF ELEVATION  
 SUBMETER MAPPING GRADE GPS



LONGITUDE 80°57'30"  
 LONGITUDE 80°55'00"  
 LONGITUDE 80°52'30"  
 LONGITUDE 80°50'00"  
 LONGITUDE 80°47'30"  
 LONGITUDE 80°45'00"  
 LONGITUDE 80°42'30"  
 LONGITUDE 80°40'00"  
 LONGITUDE 80°37'30"  
 LONGITUDE 80°35'00"  
 LONGITUDE 80°32'30"  
 LONGITUDE 80°30'00"  
 LONGITUDE 80°27'30"  
 LONGITUDE 80°25'00"  
 LONGITUDE 80°22'30"  
 LONGITUDE 80°20'00"  
 LONGITUDE 80°17'30"  
 LONGITUDE 80°15'00"  
 LONGITUDE 80°12'30"  
 LONGITUDE 80°10'00"  
 LONGITUDE 80°07'30"  
 LONGITUDE 80°05'00"  
 LONGITUDE 80°02'30"  
 LONGITUDE 80°00'00"