



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Monday, July 22, 2019
PERMIT MODIFICATION APPROVAL
Horizontal 6A / Horizontal 6A Well - 1

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

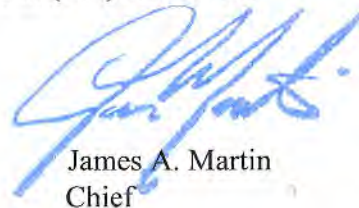
Re: Permit Modification Approval for PIPER UNIT 1H
47-085-10291-00-00

Modified lateral design

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.



James A. Martin
Chief

Operator's Well Number: PIPER UNIT 1H
Farm Name: DARRELL A. NOLAND ET AL
U.S. WELL NUMBER: 47-085-10291-00-00
Horizontal 6A Horizontal 6A Well - 1
Date Modification Issued: July 22, 2019

Promoting a healthy environment.

WW-6B
(04/15)

API NO. 47-085 - 10291 mod

OPERATOR WELL NO. Piper Unit 1H

Well Pad Name: Noland Pad

API# 47-085-10291 PERMIT MODIFICATION

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corpora 494507062 085 - Ritchie Clay Pennsboro 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Piper Unit 1H Well Pad Name: Noland Pad

3) Farm Name/Surface Owner: Darrell A. Noland, et al Public Road Access: CR 50/22

4) Elevation, current ground: 1143' Elevation, proposed post-construction: 1143'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 6421' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6421' TVD *

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15742' MD *

11) Proposed Horizontal Leg Length: 8758'

12) Approximate Fresh Water Strata Depths: 54', 135', 227'

13) Method to Determine Fresh Water Depths: Fresh Water Depths from Penns Park Unit 1H (API# 47-085-10099) on same pad.

14) Approximate Saltwater Depths: 1658', 1705', 1747'

15) Approximate Coal Seam Depths: 798', 1225'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

API# 47-085-10291 PERMIT MODIFICATION

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	300'	300'	CTS, 417 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	15742'	15742'	3921 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#	17000	7100'	
Liners							

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	24"	0.438"	1530	50	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	1000	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12,630	2500	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

API# 47-085-10291 PERMIT MODIFICATION

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs

Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 18.62 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.85 acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

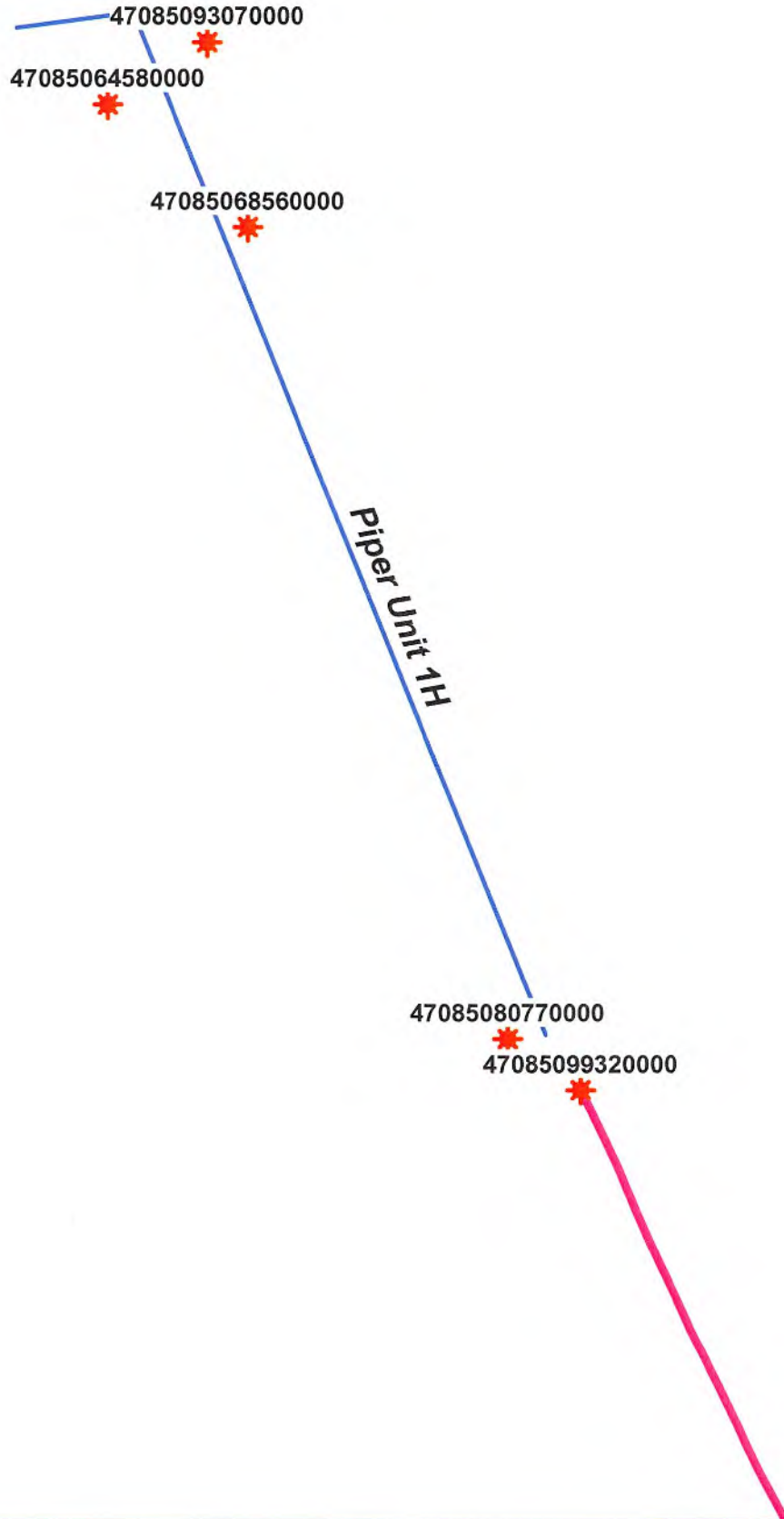
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.



API# 47-085-10291 PERMIT MODIFICATION
AOR Western-Piper Units

85-010291MOD



PIPER UNIT 1H (NOLAND PAD) - AREA OF REVIEW 35-8-5.11 PAGE 2

API# 47-085-10291 PERMIT MODIFICATION

UWI (API#)	Well Name	Operator	TD	ELEV. GR	TD (SSSTD)	Gross Perf Interval (ft)	Producing Formations	Producible formations not Perf'd
42085099320000	TAYLOR	EOT PRODUCTION CO	11955	1116	-5250	6801-11073	Marcellus	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speecheley, Balltown, Bradford, Alexander, Riley, Benson
42085064580000	HAZELBAKER BRENDEN	HARPER HYDRO ENERGY KA	5987	1144	-4843	4995-5810	lava, Angola, Rhinestreet	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speecheley, Balltown, Bradford, Alexander, Riley, Benson
42085080770000	BOWMAN ROBERT & OGDEN VIOLET	ENERGY CORP OF AMER	5488	1063	-4425	4554-5202	Riley, Benson, Alexander	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speecheley, Balltown, Bradford
42085091070000	DULANEY R	KEY OIL COMPANY	5344	1030	-4314	4533-5370	Riley, Benson, Alexander	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speecheley, Balltown, Bradford
42085068360000	HUMPHREY R A ET UX	LIPPICAN PETRO INCOR	5300	1076	-4224	3462-5200	Lower Huron, Angola	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speecheley, Balltown, Bradford, Alexander, Riley, Benson

*All formations listed as "producible formations" have been filed out using data from the WVISS website near the area of interest.

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>The Haught Family Trust Lease</u>			
The Haught Family Trust, Ira M. Haught, Trustee	Antero Resources Corporation	1/8+	0272/0974
<u>Mary V. Wedekamm Lease</u>			
Mary V. Wedekamm	Kepeco, Inc.	1/8	0161/0687
Kepeco, Inc.	Union Drilling, Inc.	Merger	Corporation Record 0004/0322
Union Drilling, Inc.	Equitable Resources Exploration, Inc.	Merger	Corporation Record 0004/0673
Equitable Resources Exploration, Inc.	Equitable Resources Energy Company	Confirmatory Deed & Assignment	0230/0047
Equitable Resources Energy Company	Mike Ross, Inc.	Assignment	0223/0575
Mike Ross, Inc.	Antero Resources Appalachian Corporation	Assignment	0262/0164
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>C.E. Giebell Lease</u>			
C.E. Giebell	Gene Stalnaker	1/8	0161/0644
Gene Stalnaker	Angus Energy, Inc.	Assignment	0212/0137
Angus Energy, Inc.	Stalnaker Energy, Inc.	Merger/Name Change	CR 0006/0225
Stalnaker Energy, Inc.	Antero Resources Appalachian Corporation	Assignment	0263/1065
Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation	Name Change	Exhibit 1
<u>Byron Taylor, et al Lease</u>			
Byron Taylor, et al	Key Oil Company	1/8	0239/0402
Key Oil Company	Antero Resources Appalachian Corporation	*Partial Assignment	0253/0747
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Carroll Shinn, et al Lease</u>			
Carroll Shinn, et al	West Virginia Energies, Inc.	1/8	0149/0398
West Virginia Energies, Inc.	C & P Oil & Gas Company, Inc.	Assignment	0157/0296
C & P Oil & Gas Company, Inc.	Rare Earth Energy, Inc.	Assignment	0191/0762
Rare Earth Energy, Inc.	Stephen L. Thompson	Assignment	0236/0001
Stephen L. Thompson	Tri-County Oil & Gas, Inc.	Assignment	0236/0237
Tri-County Oil & Gas, Inc.	May Gas, Inc.	Assignment	0239/0229
May Gas, Inc.	Harper Crosby Holdings, LLC	Assignment	0265/0872
Harper Crosby Holdings, LLC	Piney Holdings, Inc.	Assignment	0265/0910
Piney Holdings, Inc.	Antero Resources Corporation	*Partial Assignment	0275/0625

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>John A Statler, et ux Lease</u>			
John A. Statler, et ux	Gene Stalnaker	1/8	0167/0669
Gene Stalnaker	Angus Energy, Inc.	Assignment	0212/0137
Angus Energy, Inc.	Stalnaker Energy Corporation	Name Change	CRB 006/0225
Stalnaker Energy Corporation	Antero Resources Appalachian Corporation	Assignment	0264/0875
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Hummer Properties, LLC Lease</u>			
Hummer Properties, LLC	Antero Resources Corporation	1/8	0267/0662
<u>William C. Shepherd Lease</u>			
William C. Shepherd	Antero Resources Corporation	1/8+	0277/0989
<u>Donald B. Cottrill, et ux Lease</u>			
Donald B. Cottrill, et ux	Antero Resources Corporation	1/8+	0270/0883
<u>David S. Lord Lease</u>			
David S. Lord	Antero Resources Corporation	1/8+	0297/0966
<u>Ardie D. Markle Lease</u>			
Ardie D. Markle	Antero Resources Corporation	1/8+	0272/0658
<u>Lawerence A. Villers Lease</u>			
Lawerence A. Villers	Antero Resources Corporation	1/8+	0269/0634
<u>Robert Matheny, Jr. Lease</u>			
Robert Matheny, Jr.	Antero Resources Corporation	1/8+	0283/0490
<u>John E. Doll, et ux Lease</u>			
John E. Doll, et ux	Antero Resources Corporation	1/8+	0277/0467
<u>Curtis Hackathorn Lease</u>			
Curtis Hackathorn	Antero Resources Corporation	1/8+	0269/0195
<u>Martha J. Higgenbotham Lease</u>			
Martha J. Higgenbotham	Antero Resources Corporation	1/8+	0279/0272
<u>RR Hamco, Inc. Lease</u>			
RR Hamco, Inc.	Antero Resources Corporation	1/8+	0296/0418

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Francis I. Sellers Lease</u> Francis I. Sellers	Antero Resources Corporation	1/8+	0270/0192
<u>Jeremiah Richards, et ux Lease</u> Jeremiah Richards, et ux	Antero Resources Corporation	1/8+	0299/0655
<u>Charles P. Andrews Lease</u> Charles P. Andrews	Antero Resources Corporation	1/8+	0277/0998
<u>Larry Horner, et al Lease</u> Larry Horner, et al	Antero Resources Corporation	1/8+	0270/1069
<u>Robert Morrison Lease</u> Robert Morrison	Antero Resources Corporation	1/8+	0296/0874
<u>Wesley S. Merritt, et ux Lease</u> Wesley S. Merritt, et ux	Antero Resources Corporation	1/8+	0270/0761
<u>Roman Catholic Church of Pennsboro Lease</u> Roman Catholic Church of Pennsboro	Antero Resources Corporation	1/8+	0298/0276
<u>Sandra Workman Lease</u> Sandra Workman	Antero Resources Corporation	1/8+	0275/0428
<u>Rhett Koslosky Lease</u> Rhett Koslosky	Antero Resources Corporation	1/8+	0277/04810
<u>Deborah Cronin Lease</u> Deborah Cronin	Antero Resources Corporation	1/8+	0274/0773
<u>Mountain State Land Company Lease</u> Mountain State Land Company	Antero Resources Corporation	1/8+	0273/0993
<u>Jean E. Pierpoint Lease</u> Jean E. Pierpoint	Antero Resources Corporation	1/8+	0270/0433
<u>Denzil E. Smith Lease</u> Denzil E. Smith	Antero Resources Corporation	1/8+	0271/0173
<u>Pennsboro Church of Christ Lease</u> Pennsboro Church of Christ	Antero Resources Corporation	1/8+	0277/1086

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<u>WVSRA Lease</u>			
West Virginia State Rail Authority	Antero Resources Appalachian Corporation	1/8+	0253/0409
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>William E. Mahaney Lease</u>			
William E. Mahaney	Antero Resources Corporation	1/8+	0299/0600
<u>David Satterfield Lease</u>			
David Satterfield	Antero Resources Corporation	1/8+	0275/0960
<u>Krista Smith Lease</u>			
Krista Smith	Antero Resources Corporation	1/8+	0300/0431
<u>Wilson Davis Lease</u>			
Wilson Davis	Antero Resources Corporation	1/8+	0271/0475
<u>Waco Oil & Gas Lease</u>			
Waco Oil & Gas	Antero Resources Corporation	1/8+	0299/0172
<u>W.G. Carpenter, et al Lease</u>			
W.G. Carpenter, et al	C.I. Collins	1/8	0083/0252
C.I. Collins	Edward E. Smyth	Assignment	0110/0027
Edward E. Smyth	Robert L. Williams	Assignment	0112/0226
Robert L. Williams	Willard Flanagan	Assignment	0114/0494
Willard Flanagan	Gary L. Riddle	Assignment	0193/0581
Gary L. Riddle	Ritchie Petroleum Corp.	Assignment	0245/0796
Ritchie Petroleum Corp.	Charity Gas Company	Assignment	0222/0739
Charity Gas Company	Antero Resources Appalachian Corporation	Assignment	0258/0439
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>John Gaston, et ux Lease</u>			
John Gaston, et ux	Antero Resources Corporation	1/8+	0275/0749
<u>John L. Gaston Lease</u>			
John L. Gaston	Antero Resources Corporation	1/8+	0273/0074
<u>Champion Agate, Co. Lease</u>			
Champion Agate, Co.	Antero Resources Corporation	1/8+	0280/0622

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<u>City of Pennsboro Lease</u> City of Pennsboro	Antero Resources Corporation	1/8+	0282/1018
<u>Gina Hall Lease</u> Gina Hall	Antero Resources Corporation	1/8+	0274/0401
<u>Larry C. Broadwater, et ux Lease</u> Larry C. Broadwater, et ux	Antero Resources Corporation	1/8+	0273/0368
<u>Alonzo L. Shuman Lease</u> Alonzo L. Shuman	Antero Resources Corporation	1/8+	0274/0407
<u>William Ward Lease</u> William Ward	Antero Resources Corporation	1/8+	0270/1049
<u>Ritchie County Educational Trust Lease</u> Ritchie County Educational Trust	Antero Resources Corporation	1/8+	0296/0521

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Violet Ogden Lease</u>	Violet Ogden	Annie B. Haymond	1/8	0211/0670
	Annie B. Haymond	Eastern American Energy Corp.	Assignment	0217/0383
	Eastern American Energy Corp.	Energy Corporation of America	Assignment	0250/0393
	Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0257/0377
	Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation
 By: Kevin Kilstrom
 Its: Senior Vice President - Production

**FORM WW-6A1
EXHIBIT 1**

FILED

JUN 10 2013

Natalie E. Tennant
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305



Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsos.com
E-mail: business@wvsos.com

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

Office Hours: Monday - Friday
8:30 a.m. - 5:00 p.m. ET

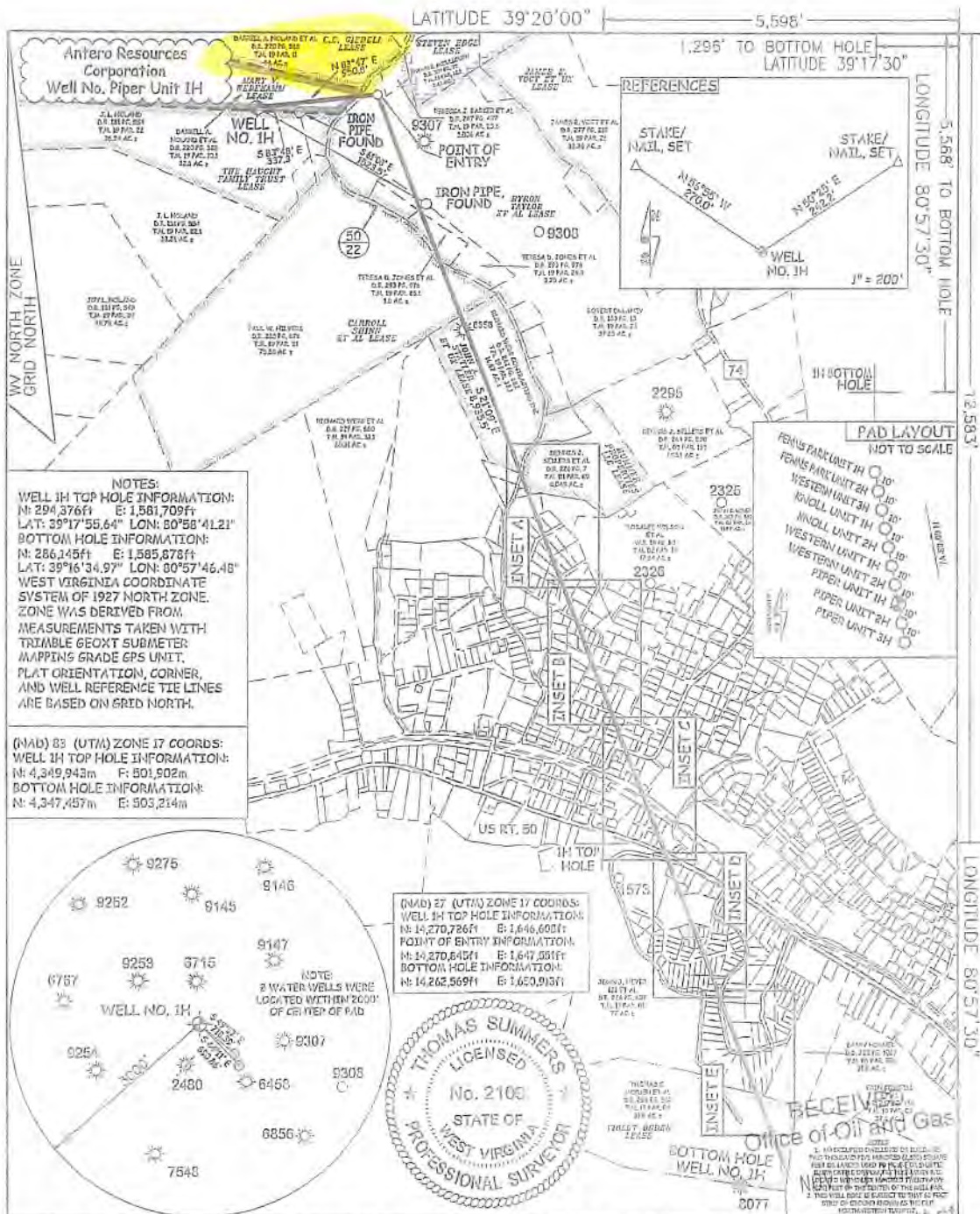
**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ****
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/25/2008
- Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of Incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: (attach additional pages if necessary)
- Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

<u>Alvyn A. Schopp</u>	<u>(303) 357-7310</u>
Contact Name	Phone Number
- Signature information (See below Important Legal Notice Regarding Signature):

Print Name of Signer: <u>Alvyn A. Schopp</u>	Title/Capacity: <u>Authorized Person</u>
Signature: <u><i>Alvyn A. Schopp</i></u>	Date: <u>June 10, 2013</u>

***Important Legal Notice Regarding Signature:** Per West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.



JOB # 16-005WA DRAWING # PIPER1HR SCALE 1" = 1000' MINIMUM DEGREE OF ACCURACY SUBMETER PROVEN SOURCE OF ELEV. 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 RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.	WILLOW LAND SURVEYING PLLC 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26410	DATE 11/07/16 OPERATOR'S WELL# PIPER UNIT 1H API WELL # 47-085-10281 STATE COUNTY PERMIT
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS WELL TYPE: OIL GAS <input checked="" type="checkbox"/> LIQUID INJECTION WASTE DISPOSAL (IF "GAS") PRODUCTION <input checked="" type="checkbox"/> STORAGE DEEP SHALLOW <input checked="" type="checkbox"/> LOCATION: ELEVATION 1,159' ORIGINAL - 1,143' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PENNSBORO 7.5 DISTRICT CLAY COUNTY RITCHIE		STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS	RECEIVED Office of Oil and Gas
SURFACE OWNER DARRELL A. NOLAND ET AL ACREAGE 32.5 ACRES +/- OIL & GAS ROYALTY OWNER SEE ATTACHED PAGES FOR LEASE INFORMATION LEASE ACREAGE SEE ATTACHED PAGES	PROPOSED WORK: DRILL CONVERT DRILL DEEPER <input checked="" type="checkbox"/> REDRILL FRACTURE OR STIMULATE <input checked="" type="checkbox"/> PLUG OFF OLD FORMATION PERFORATE NEW FORMATION <input checked="" type="checkbox"/> OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,500' TVD 17,000 MD	WILLOW LAND SURVEYING PLLC 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26410	THOMAS SUMMERS P.S. 2109
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD DENVER, CO 80202 CHARLESTON, WV 25313			

LATITUDE 39°20'00"

5,598'

1,336' TO BOTTOM HOLE
LATITUDE 39°17'30"

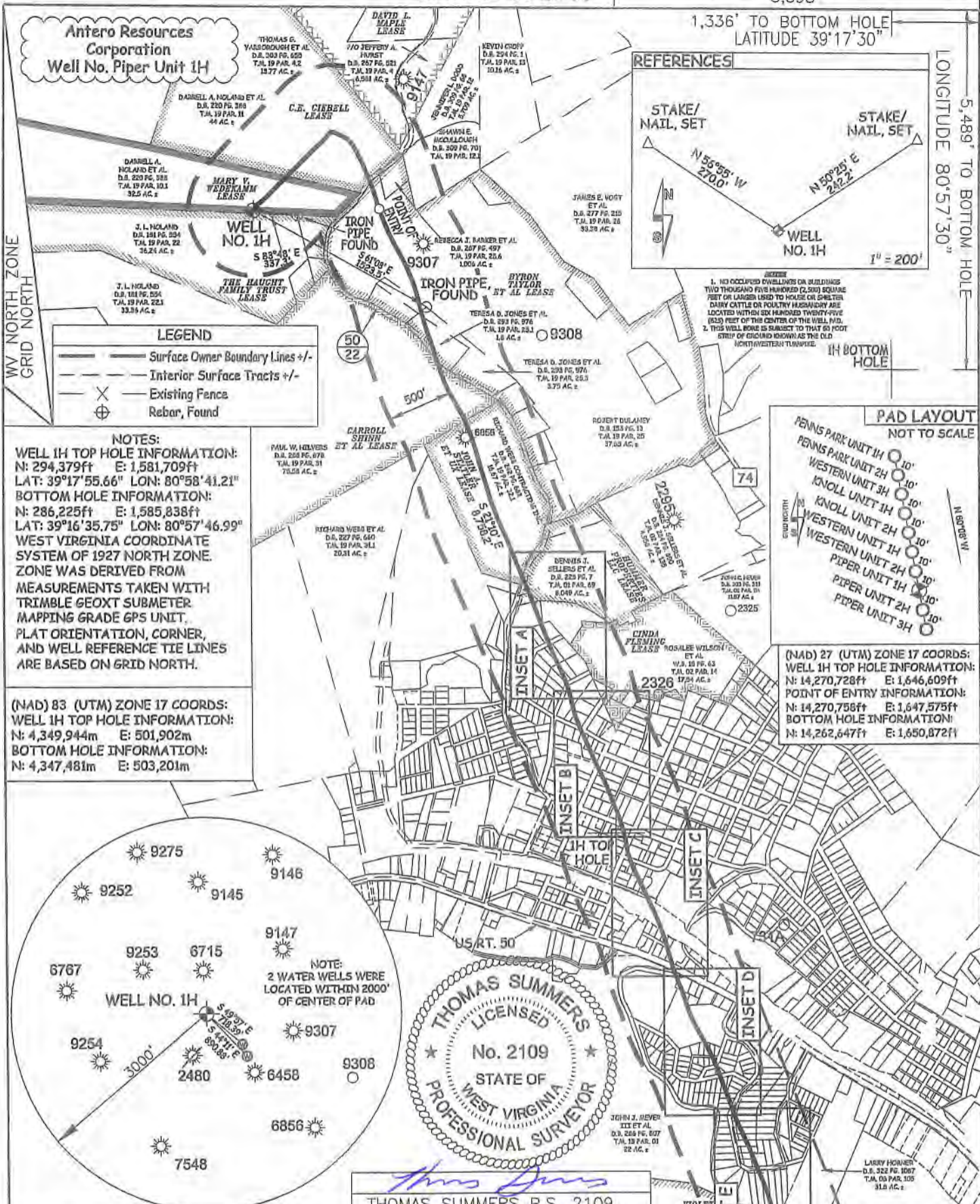
LONGITUDE 80°57'30"

5,489' TO BOTTOM HOLE

LONGITUDE 80°57'30"

COUNTY NAME

PERMIT



LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Rebar, Found

NOTES:

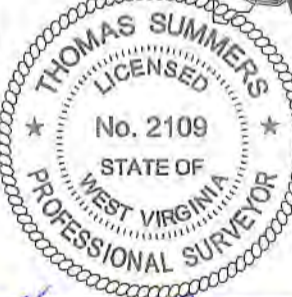
WELL 1H TOP HOLE INFORMATION:
N: 294,379ft E: 1,581,709ft
LAT: 39°17'55.66" LON: 80°58'41.21"

BOTTOM HOLE INFORMATION:
N: 286,225ft E: 1,585,838ft
LAT: 39°16'35.75" LON: 80°57'46.99"

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 1H TOP HOLE INFORMATION:
N: 4,349,944m E: 501,902m

BOTTOM HOLE INFORMATION:
N: 4,347,481m E: 503,201m



THOMAS SUMMERS P.S. 2109

JOB # 16-005WA
DRAWING # PIPER1HMOD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,143' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER
QUADRANGLE PENNSBORO 7.5 DISTRICT CLAY COUNTY RITCHIE
SURFACE OWNER DARRELL A. NOLAND ET AL ACREAGE 32.5 ACRES +/-
OIL & GAS ROYALTY OWNER SEE ATTACHED PAGES FOR LEASE INFORMATION LEASE ACREAGE SEE ATTACHED PAGES

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.

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

WILLOW LAND SURVEYING PLLC
266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415



DATE 01/18/18
OPERATOR'S WELL# PIPER UNIT 1H
API WELL # 47 085 10291 MID
STATE COUNTY PERMIT
WATERSHED NORTH FORK HUGHES RIVER
DISTRICT CLAY COUNTY RITCHIE
ACREAGE 32.5 ACRES +/-
LEASE ACREAGE SEE ATTACHED PAGES

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) MOD-POE PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,421' TVD 15,742 MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

LATITUDE 39°20'00"

5,598'

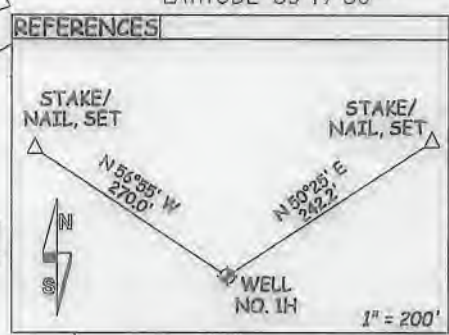
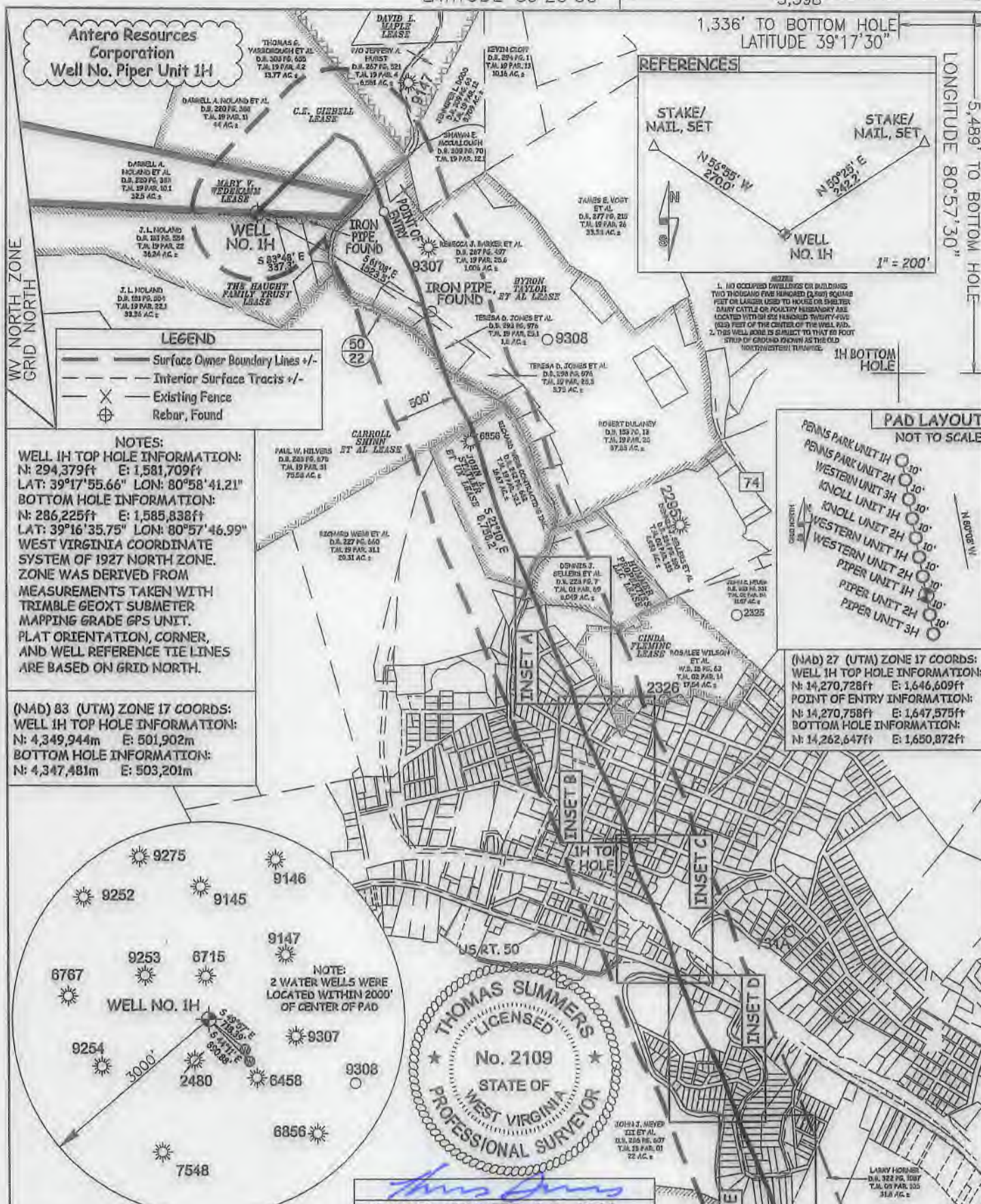
1,336' TO BOTTOM HOLE
LATITUDE 39°17'30"

LONGITUDE 80°57'30"

5,489' TO BOTTOM HOLE

12,580'

LONGITUDE 80°57'30"

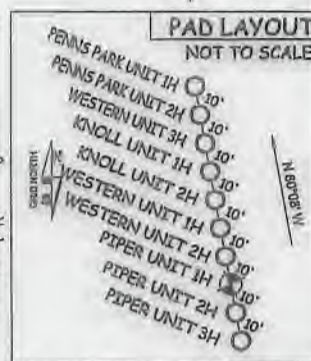


LEGEND

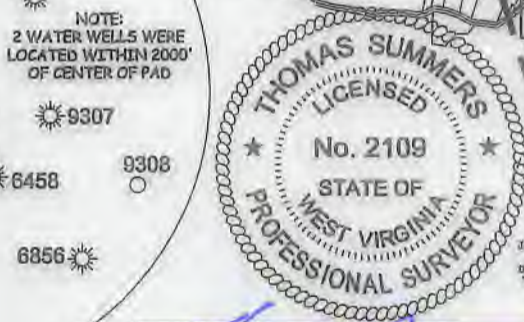
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Rebar, Found

NOTES:
WELL 1H TOP HOLE INFORMATION:
 N: 294,379ft E: 1,581,709ft
 LAT: 39°17'55.66" LON: 80°58'41.21"
BOTTOM HOLE INFORMATION:
 N: 286,225ft E: 1,585,838ft
 LAT: 39°16'35.75" LON: 80°57'46.99"
 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 1H TOP HOLE INFORMATION:
 N: 4,349,944m E: 501,902m
BOTTOM HOLE INFORMATION:
 N: 4,347,481m E: 503,201m



(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
 N: 14,270,728ft E: 1,646,609ft
POINT OF ENTRY INFORMATION:
 N: 14,270,758ft E: 1,647,575ft
BOTTOM HOLE INFORMATION:
 N: 14,262,647ft E: 1,650,872ft

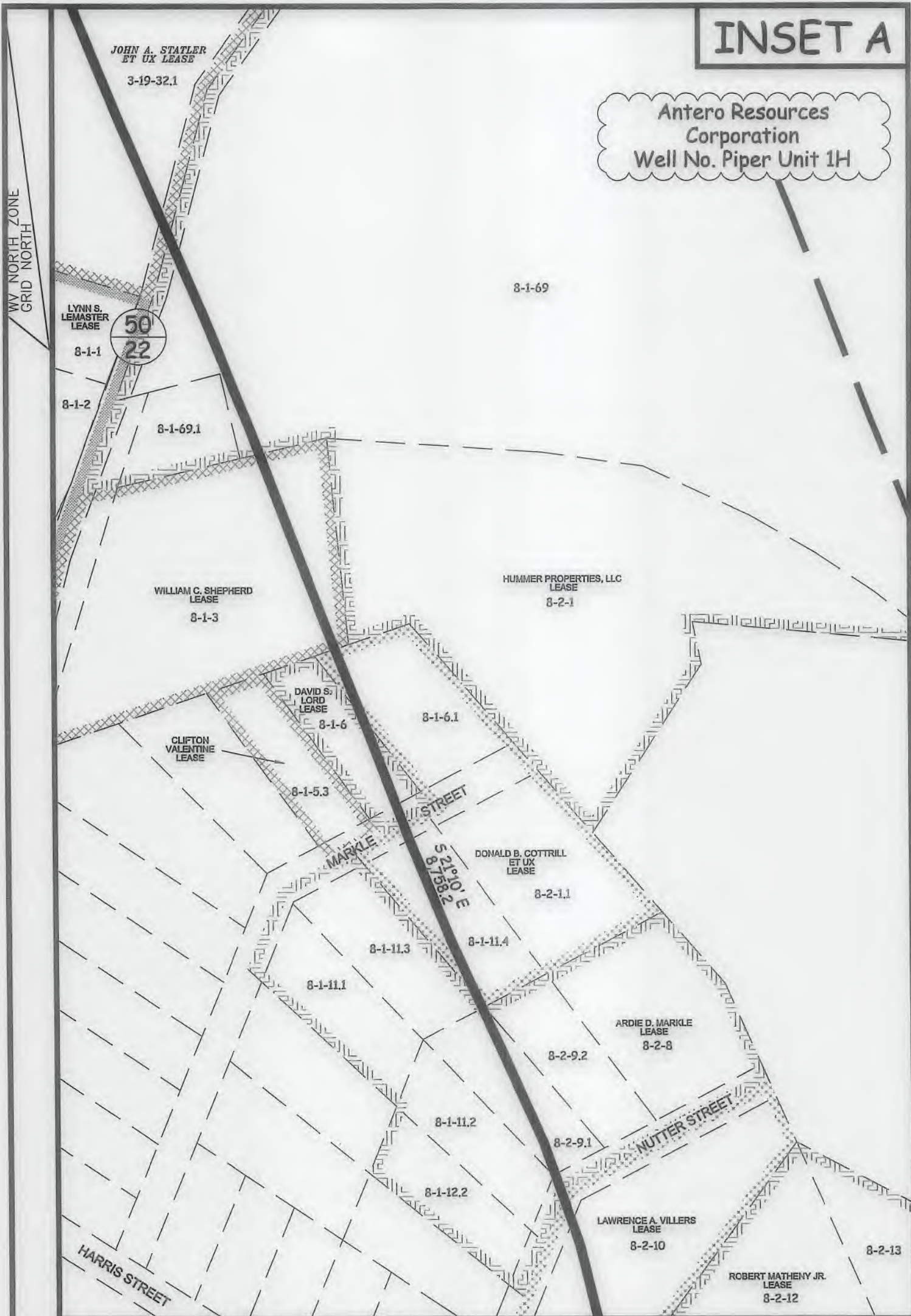


THOMAS SUMMERS P.S. 2109

JOB # 16-005WA	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.	
DRAWING # PIPER1HMOD	STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS	
SCALE 1" = 1000'	WILLOW LAND SURVEYING PLLC 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415	
MINIMUM DEGREE OF ACCURACY SUBMETER	DATE 01/18/18	
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS	OPERATOR'S WELL# PIPER UNIT 1H	
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS	API WELL # 47 - 085 - 10291	
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL	STATE COUNTY PERMIT	
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X	NORTH FORK HUGHES RIVER	
LOCATION: ELEVATION 1,143' AS DRILLED	DISTRICT CLAY COUNTY RITCHIE	
QUADRANGLE PENNSBORO 7.5'	ACREAGE 32.5 ACRES +/-	
SURFACE OWNER DARRELL A. NOLAND ET AL	LEASE ACREAGE SEE ATTACHED PAGES	
OIL & GAS ROYALTY OWNER SEE ATTACHED PAGES FOR LEASE INFORMATION	PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-POE PLUG & ABANDON CLEAN OUT & REPLUG	
TARGET FORMATION MARCELLUS	ESTIMATED DEPTH 6,421' TVD 15,742 MD	
WELL OPERATOR ANTERO RESOURCES CORP.	DESIGNATED AGENT DIANNA STAMPER	
ADDRESS 1615 WYNKOOP STREET	ADDRESS 5400 D BIG TYLER ROAD	
FORM WW-6 DENVER, CO 80202	CHARLESTON, WV 25313	

INSET A

Antero Resources Corporation
Well No. Piper Unit 1H



P.O. BOX 17
PENNSBORO, WV 26415
304-659-1717

SCALE: 1-INCH = 100-FEET



47-085-10291 MOD

FILE: 16-005WA
JOB: PIPER1HR INSETA MOD
DRAFTED BY: T.B.S. 02/01/18

LEGEND	
	Piper 1H Lateral
	Interior Surface Tracts +/-

INSET B

Antero Resources Corporation
Well No. Piper Unit 1H



P.O. BOX 17
PENNSBORO, WV 26415
304-659-1717

SCALE: 1-INCH = 100-FEET



RHETT KOSLOSKY
LEASE
8-4-140

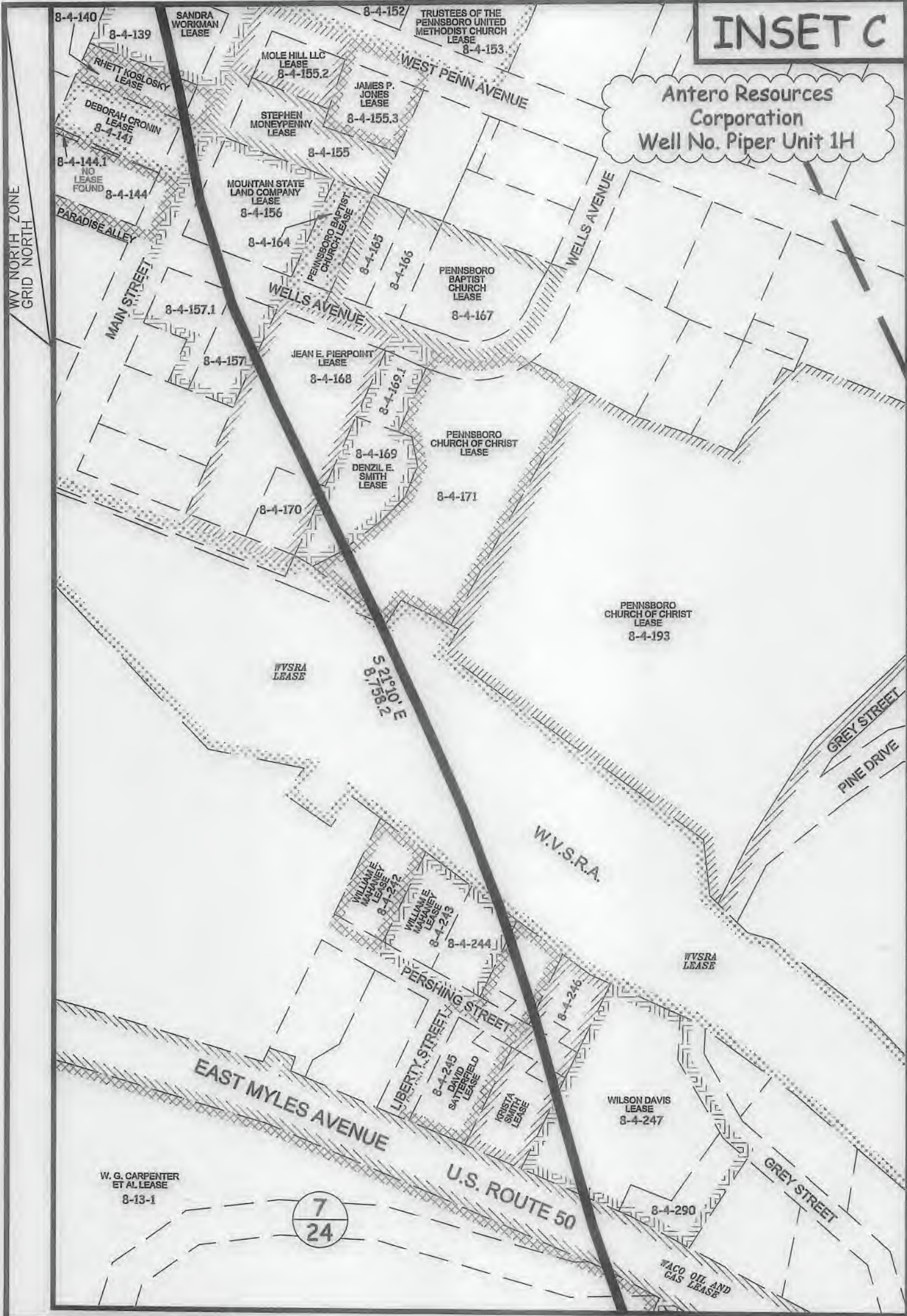
47-085-10291/MOD

FILE: 16-005WA
JOB: PIPER1HR INSETB MOD
DRAFTED BY: T.B.S. 02/01/18

LEGEND	
	Piper 1H Lateral
	Interior Surface Tracts +/-

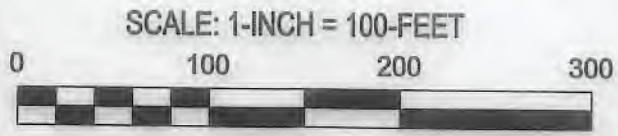
INSET C

Antero Resources Corporation
Well No. Piper Unit 1H



WILLOW
• LAND SURVEYING PLLC •

P.O. BOX 17
PENNSBORO, WV 26415
304-659-1717



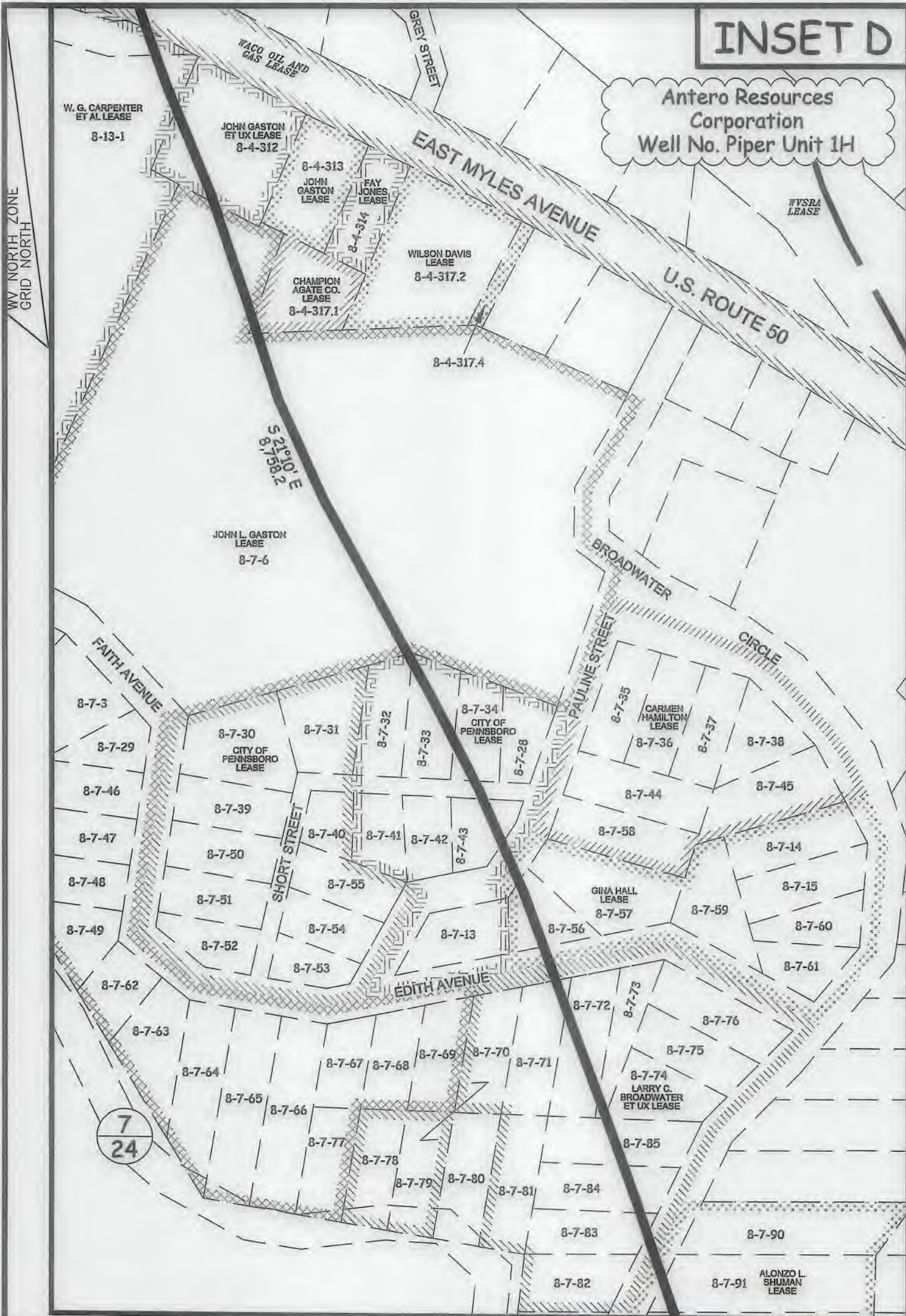
47-085-10291 MOD

FILE: 16-005WA
JOB: PIPER1HR INSETC MOD
DRAFTED BY: T.B.S. 02/01/18

LEGEND	
	Piper 1H Lateral
	Interior Surface Tracts +/-

INSET D

Antero Resources Corporation
Well No. Piper Unit 1H



47-085-10291 MOD



P.O. BOX 17
PENNSBORO, WV 26415
304-659-1717

SCALE: 1-INCH = 100-FEET

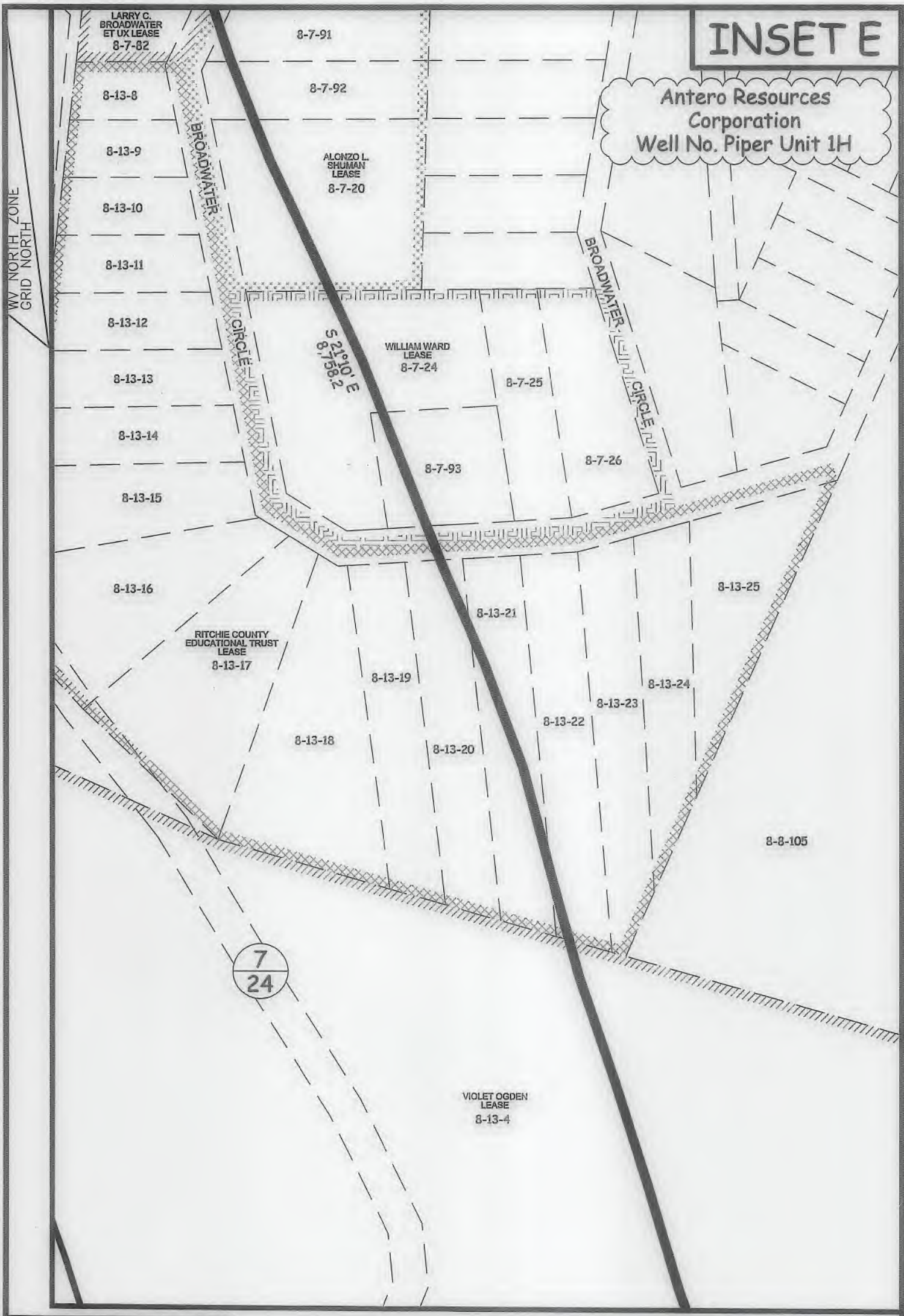


FILE: 16-005WA
JOB: PIPER1HR INSETD MOD
DRAFTED BY: T.B.S. 02/01/18

LEGEND	
	Piper 1H Lateral
	Interior Surface Tracts +/-

INSET E

Antero Resources Corporation
Well No. Piper Unit 1H



47-085-10291 MOD

WILLOW
• LAND SURVEYING PLLC •

P.O. BOX 17
PENNSBORO, WV 26415
304-659-1717

SCALE: 1-INCH = 100-FEET



FILE: 16-005WA
JOB: PIPER1HR INSETE MOD
DRAFTED BY: T.B.S. 02/01/18

LEGEND	
	Piper 1H Lateral
	Interior Surface Tracts +/-