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west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Thursday, November 5, 2020  
WELL WORK PERMIT  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET  
DENVER, CO 80202

Re: Permit approval for VISHNU UNIT 2H  
47-095-02717-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless 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: VISHNU UNIT 2H  
Farm Name: KENNETH TOMBLIN ET AL  
U.S. WELL NUMBER: 47-095-02717-00-00  
Horizontal 6A New Drill  
Date Issued: 11/5/2020

**PERMIT CONDITIONS**

4709502717

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

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**CONDITIONS**

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

**PERMIT CONDITIONS**      4709502717

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to [DEPOOGNotify@wv.gov](mailto:DEPOOGNotify@wv.gov).

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

1) Well Operator: Antero Resources Corporation | 494507062 | 095-Tyler | Ellsworth | Porter Falls 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Vishnu Unit 2H Well Pad Name: Grand Pad

3) Farm Name/Surface Owner: Kenneth Tomblin et al Public Road Access: Gorrells Run Road

4) Elevation, current ground: 1268' Elevation, proposed post-construction: ~1243'

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: 7300' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 7300' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 7300' MD

11) Proposed Horizontal Leg Length: 0'

12) Approximate Fresh Water Strata Depths: 25'

13) Method to Determine Fresh Water Depths: 47-095-02267

14) Approximate Saltwater Depths: 2305'

15) Approximate Coal Seam Depths: 431'


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: \_\_\_\_\_

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John Cragin Blevins Digitally signed by John Cragin Blevins Date: 2020.10.28 09:38:07 -0400  10/28/2020

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<b>Size (in)</b>	<b>New or Used</b>	<b>Grade</b>	<b>Weight per ft. (lb/ft)</b>	<b>FOOTAGE: For Drilling (ft)</b>	<b>INTERVALS: Left in Well (ft)</b>	<b>CEMENT: Fill-up (Cu. Ft.)/CTS</b>
Conductor	20"	New	H-40	94#	80	80	CTS, 218 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	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	23#	7300	7300	1601 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

*JCB*  
10/28/2020

<b>TYPE</b>	<b>Size (in)</b>	<b>Wellbore Diameter (in)</b>	<b>Wall Thickness (in)</b>	<b>Burst Pressure (psi)</b>	<b>Anticipated Max. Internal Pressure (psi)</b>	<b>Cement Type</b>	<b>Cement Yield (cu. ft./k)</b>
Conductor	20"	24"	0.438"	1530	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	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"	0.415"	12,630	2500	Lead-H/POZ & Tel-H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

**PACKERS**

Kind:	N/A			RECEIVED Office of Oil and Gas  OCT 28 2020  WV Department of Environmental Protection
Sizes:	N/A			
Depths Set:	N/A			

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): Existing 44.34 acres

22) Area to be disturbed for well pad only, less access road (acres): Existing 13.72 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.

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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

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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.

47-9502717



Vishnu Unit 2H



**Antero Resources Corporation**

Vishnu Unit 2H - AOR



**REMARKS**  
No Wells of Interest

September 29, 2020

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WW-9  
(4/16)

47-9502717

API Number 47 - 095 - \_\_\_\_\_  
Operator's Well No. Vishnu Unit 2H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) Outlet Middle Island Creek Quadrangle Porter Falls 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled off site.)

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_ \*UIC Permit # will be provided on Form WR-34 )
- Reuse (at API Number \_\_\_\_\_ Future permitted well locations when applicable. API# will be provided on Form WR-34 )
- Off Site Disposal (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
- Other (Explain \_\_\_\_\_ Northwestern Landfill Permit #SWF-1025/WV0109410)

Will closed loop system be used? If so, describe: Yes, fluids stored in tanks, cuttings removed offsite and taken to landfill.

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc.  
Surface - Air/Freshwater, Intermediate - Dust/Stiff Foam, Production - Water Based Mud

-If oil based, what type? Synthetic, petroleum, etc. Synthetic

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Drill cuttings stored in tanks, removed offsite and taken to landfill.

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98), Northwestern Landfill (Permit # SWF-1025/WV0109410)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto 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 or imprisonment.

Company Official Signature Gretchen Kohler

Company Official (Typed Name) Gretchen Kohler

Company Official Title Senior Environmental & Regulatory Manager

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WV Department of  
Environmental Protection

Subscribed and sworn before me this 30th day of SEPTEMBER, 2020

Notary Public

My commission expires MARCH 13, 2022

MEGAN GRIFFITH  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID 20184011666  
MY COMMISSION EXPIRES MARCH 13, 2022



Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 44.34 acres Prevegetation pH \_\_\_\_\_

Lime 2-4 Tons/acre or to correct to pH 6.5

Fertilizer type Hay or straw or Wood Fiber (will be used where needed)

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Main Access Road (12.10 acres) + Well Pad (13.72 acres) + Staging Area (4.57 acres) + Excess/Topsoil Stockpiles (13.95 acres) = 44.34 Acres

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
Field Bromegrass	40	Tall Fescue	30

See attached Table 3 for additional seed type (Grand Pad Design Sheet Page 4)

See attached Table 4A for additional seed type (Grand Pad Design Sheet Page 4)

\*or type of grass seed requested by surface owner

\*or type of grass seed requested by surface owner

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: J Cragin Blevins

Comments: \_\_\_\_\_

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Title: Oil & Gas Inspector Date: 10/28/2020

Field Reviewed? (  ) Yes (  ) No

***Form WW-9 Additives Attachment*****SURFACE INTERVAL**

1. Fresh Water
2. Soap –Foamer AC
3. Air

**INTERMEDIATE INTERVAL*****STIFF FOAM RECIPE:***

- 1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
- 2) 1 ppb Conqor 404 ( 11.76 ppg) / Corrosion Inhibitor
- 3) 4 ppb KLA-Gard ( 9.17 ppg) / Amine Acid Complex-Shale Stabilizer
- 4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
- 5) 12 ppb KCL / Potassium Chloride-inorganic Salt
- 6) Fresh Water 80 bbls
- 7) Air

**PRODUCTION INTERVAL**

1. Alpha 1655  
Salt Inhibitor
2. Mil-Carb  
Calcium Carbonate
3. Cottonseed Hulls  
Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal  
Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol  
Amine Acid Complex – Shale Stabilizer
6. Xan-Plex  
Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)  
Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill  
Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda  
Sodium Hydroxide – Alkalinity Control
10. Mil-Lime  
Calcium Hydroxide – Lime
11. LD-9  
Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica  
Hydro-Biotite Mica – LCM

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13. Escaid 110  
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligo  
Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep  
Polypropylene – Hole Cleaning Agent
16. Sulfatrol K  
Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous  
Inorganic Salt
18. D-D  
Drilling Detergent – Surfactant
19. Terra-Rate  
Organic Surfactant Blend
20. W.O. Defoam  
Alcohol-Based Defoamer
21. Perma-Lose HT  
Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D  
Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells  
Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite  
Natural Graphite – LCM
25. Mil Bar  
Barite – Weighting Agent
26. X-Cide 102  
Biocide
27. Soda Ash  
Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol  
Amine Acid complex – Shale Stabilizer
29. Sulfatrol  
Sulfonated Asphalt – Shale Control Additive
30. Xanvis  
Viscosifier For Water-Based Muds
31. Milstarch  
Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube  
Drilling Fluid Lubricant

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**911 Address**  
**6083 Gorrells Run Road**  
**Middlebourne, WV 26149**

## **Well Site Safety Plan**

### **Antero Resources**

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**Well Name: Grand Unit 5H, Tapeats Unit 1H-3H & Vishnu Unit 1H-2H**

**Pad Location: GRAND PAD**

Tyler County/Ellsworth District

**GPS Coordinates:**

**Entrance - Lat 39°50'00.66"/Long -80°81'03.33" (NAD83)**

**Pad Center - Lat 39°50'74.76"/Long -80°81'06.74" (NAD83)**

*JCB*  
10/28/2020

### **Driving Directions:**

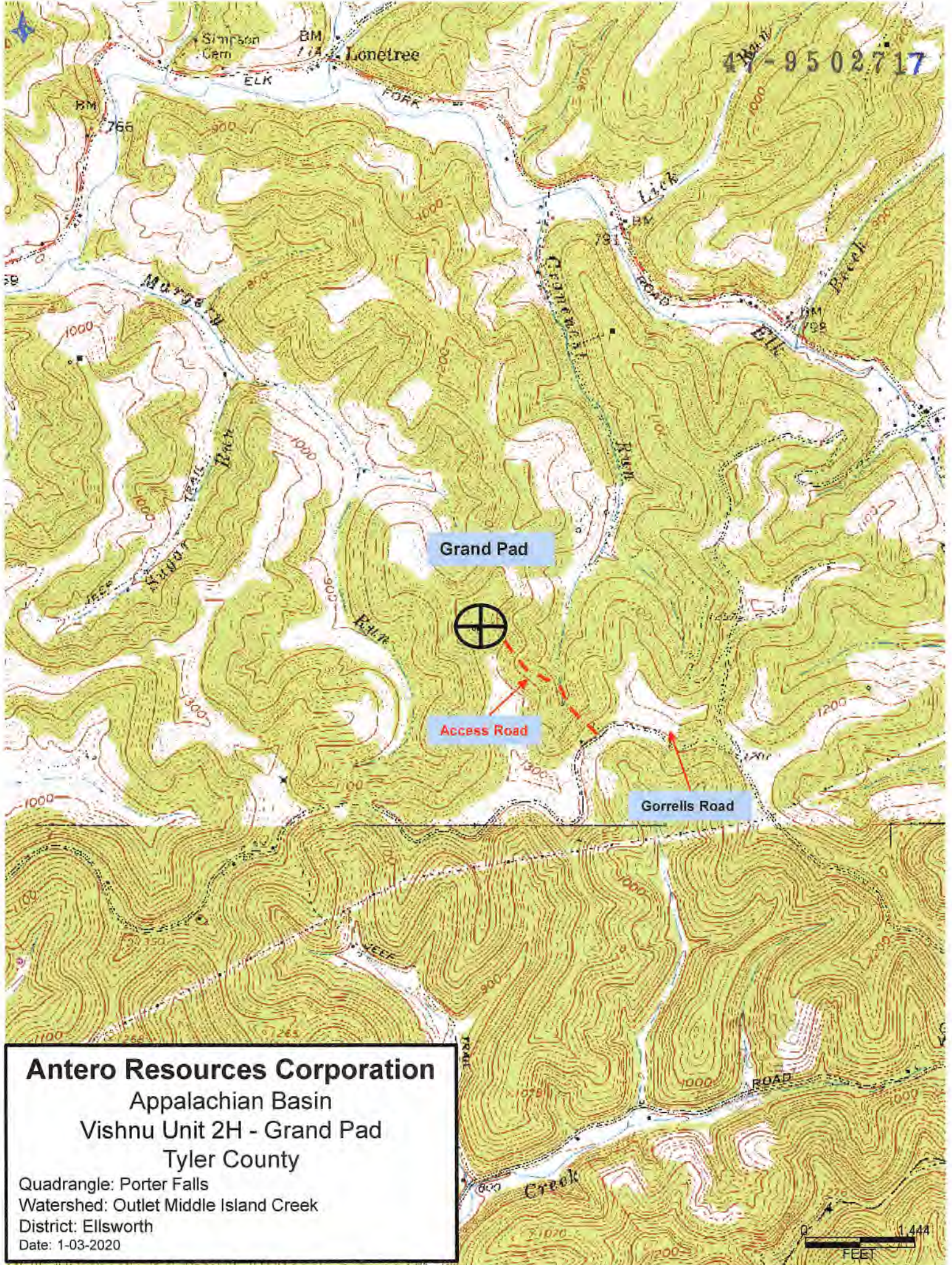
From Middlebourne: head northeast on Main Street toward Court Street/Dodd Street for 0.2 miles - turn right onto park Avenue for 397 feet - turn left onto Gorrells Run Road for 0.4 miles - continue onto Gorrells Run Road for 2.8 miles - turn right to stay on Gorrells Run Road for 3.2 miles - lease road will be on your left.

### **Alternate Route:**

From Centerville: Head south on Klondike Ridge toward WV-18 S for 0.2 miles - turn left onto WV-18 N for 2.0 miles - turn right onto Indian Creek Road for 1.0 mile - turn left onto Big Run Road for 4.8 miles - continue onto Left Hand Fork Walnut Run for 0.3 miles - turn left onto Gorrells Run/Kingsley Ridge for 3.7 miles - lease road will be on your right.

**EMERGENCY (24 HOUR) CONTACT 1-800-878-1373**

1



47-9502717

Grand Pad



Access Road

Gorrells Road

**Antero Resources Corporation**  
Appalachian Basin  
Vishnu Unit 2H - Grand Pad  
Tyler County  
Quadrangle: Porter Falls  
Watershed: Outlet Middle Island Creek  
District: Ellsworth  
Date: 1-03-2020



LATITUDE 39°32'30"

5,360'

# Antero Resources Corporation Well No. Vishnu Unit #2H

WV NORTH ZONE  
GRID NORTH

ALFRED STEELE  
D.B. 228 PG. 369  
T.M. 16 PAR. 17  
55.13 AC. ±

HARVEY MILLER  
D.B. 500 PG. 536  
T.M. 16 PAR. 15  
65 AC. ±

MICHAEL TOMBLIN  
D.B. 244 PG. 411  
T.M. 16 PAR. 29  
55 AC. ±

BARBARA KITTLE  
D.B. 336 PG. 677  
T.M. 16 PAR. 26  
67.31 AC. ±

WELL NO. 2H

S. A. SMITH AND  
C. B. MORRIS HEIRS  
TRUST LEASE

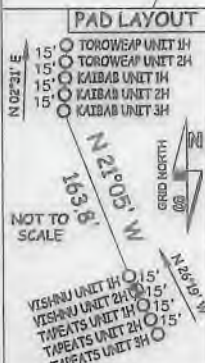
KENNETH TOMBLIN  
D.B. 244 PG. 413  
T.M. 16 PAR. 28  
290.32 AC. ±



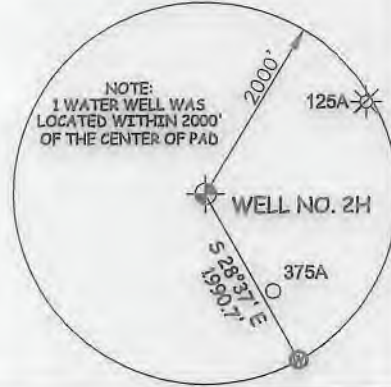
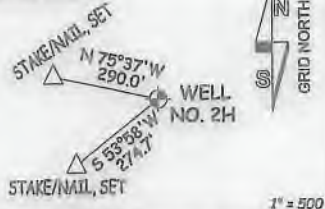
GILBERT EDDY  
W.B. 22 PG. 44  
T.M. 16 PAR. 27  
92.25 AC. ±

- NOTES**
- 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. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE PROPOSED WELL.
  - LEASE BOUNDARY AND BEARINGS AND DISTANCES SHOWN HEREON ARE TAKEN FROM TYLER COUNTY DEED BOOK 244 AT PAGE 413.

**NOTES:**  
WELL 2H TOP HOLE INFORMATION:  
WV STATE PLANE NAD 27 COORDS:  
N: 369,514ft E: 1,630,199ft  
GEOGRAPHIC NAD 27 COORDS:  
LAT: 39°30'25.65" LON: 80°48'38.39"  
(NAD) 83 (UTM) ZONE 17 COORDS:  
N: 4,373,081m E: 516,292m  
(NAD) 27 (UTM) ZONE 17 COORDS:  
N: 14,346,636ft E: 1,693,821ft  
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.



### REFERENCES



12,581'

LONGITUDE 80°47'30"

JOB # 20-002WA  
DRAWING # VISHNU2HSHORT  
SCALE 1" = 500'  
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.



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

**LEGEND**  
----- Surface Owner Boundary Lines +/-  
----- Adjoining Surface Tracts +/-  
⊕ Found monument, as noted

DOUGLAS R. ROWE P.S. 2202

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

WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ 47 - 095 - 02717  
(IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW  STATE COUNTY PERMIT

LOCATION: ELEVATION ORIGINAL - 1,268' PROPOSED - 1,243' WATERSHED OUTLET MIDDLE ISLAND CREEK  
QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER

SURFACE OWNER KENNETH TOMBLIN ET AL ACREAGE 290.32 ACRES +/-  
OIL & GAS ROYALTY OWNER S. A. SMITH AND C. B. MORRIS HEIRS TRUST LEASE ACREAGE 290.32 ACRES ±

PROPOSED WORK: DRILL  CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION

OTHER PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_  
PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_ ESTIMATED DEPTH 7,300' TVD 7,300' MD  
TARGET FORMATION MARCELLUS DIANNA STAMPER

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM  
ADDRESS 1815 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

LATITUDE 39°32'30"

5,360'

# Antero Resources Corporation Well No. Vishnu Unit #2H

WV NORTH ZONE  
GRID NORTH

ALFRED STEELE  
D.B. 228 PG. 369  
T.M. 16 PAR. 17  
55.13 AC. ±

HARVEY MILLER  
D.B. 300 PG. 536  
T.M. 16 PAR. 15  
65 AC. ±

MICHAEL TOMBLIN  
D.B. 244 PG. 411  
T.M. 16 PAR. 29  
55 AC. ±

BARBARA KITTLE  
D.B. 336 PG. 677  
T.M. 16 PAR. 26  
67.31 AC. ±

WELL NO. 2H

S. A. SMITH AND  
C. B. MORRIS HEIRS  
TRUST LEASE

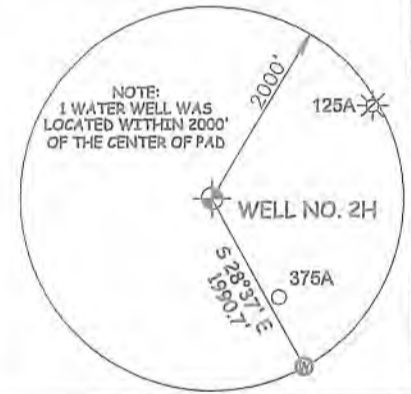
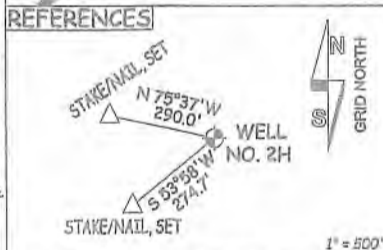
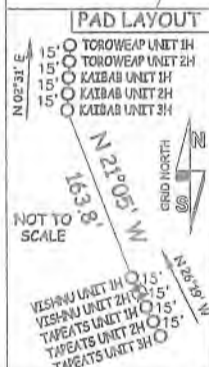
KENNETH TOMBLIN  
D.B. 244 PG. 413  
T.M. 16 PAR. 28  
290.32 AC. ±



GILBERT EDDY  
W.B. 22 PG. 44  
T.M. 16 PAR. 27  
92.25 AC. ±

- NOTES**
- 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. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE PROPOSED WELL.
  - LEASE BOUNDARY AND BEARINGS AND DISTANCES SHOWN HEREON ARE TAKEN FROM TYLER COUNTY DEED BOOK 244 AT PAGE 413.

**NOTES:**  
WELL 2H TOP HOLE INFORMATION:  
WV STATE PLANE NAD 27 COORDS:  
N: 369,514ft E: 1,630,199ft  
GEOGRAPHIC NAD 27 COORDS:  
LAT: 39°30'25.65" LON: 80°48'38.39"  
(NAD) 83 (UTM) ZONE 17 COORDS:  
N: 4,373,081m E: 516,292m  
(NAD) 27 (UTM) ZONE 17 COORDS:  
N: 14,346,636ft E: 1,693,821ft  
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.



12,581'

LONGITUDE 80°47'30"

JOB # 20-002WA  
DRAWING # VISHNU2HSHORT  
SCALE 1" = 500'  
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.

**LEGEND**  
----- Surface Owner Boundary Lines +/-  
----- Adjoining Surface Tracts +/-  
⊕ Found monument, as noted

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



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

DOUGLAS R. ROWE P.S. 2202

DATE 09/15/20  
OPERATOR'S WELL# VISHNU UNIT #2H

WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ 47 - 095 -  
(IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW  STATE COUNTY PERMIT  
LOCATION: ELEVATION ORIGINAL - 1,268' PROPOSED - 1,243' WATERSHED OUTLET MIDDLE ISLAND CREEK  
QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER  
SURFACE OWNER KENNETH TOMBLIN ET AL ACREAGE 290.32 ACRES +/-  
OIL & GAS ROYALTY OWNER S. A. SMITH AND C. B. MORRIS HEIRS TRUST LEASE ACREAGE 290.32 ACRES ±  
PROPOSED WORK: DRILL  CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR  
STIMULATE  PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION   
OTHER PHYSICAL CHANGE IN WELL (SPECIFY)  
PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_ ESTIMATED DEPTH 7,300' TVD 7,300' MD  
TARGET FORMATION MARCELLUS DIANNA STAMPER  
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

COUNTY NAME PERMIT

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)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>S.A. Smith &amp; C. B. Morris Heirs Trust Lease</u>			
S.A. Smith & C. B. Morris Trust Heirs	Antero Resources Corporation	1/8+	0022/0268

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 Environmental Protection

\*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.



**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)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>S.A. Smith &amp; C.B. Morris Heirs Trust Lease</u>	S.A. Smith & C. B. Morris Heirs Trust	Antero Resources Corporation	1/8+	0022/0268

\*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.

**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: Tim Rady  
 Its: VP of Land

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WV Department of Environmental Protection

47-9502717



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

West Virginia Department of Environmental Protection  
Chief, Office of Oil and Gas  
Attn: Mr. James Martin  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

RE: Vishnu Unit 2H  
Quadrangle: Porter Falls 7.5'  
Tyler County/Ellsworth District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Vishnu Unit 2H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas for all leases through which the Vishnu Unit 2H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

A handwritten signature in black ink, appearing to read "Tyler Adams", is written over a large, light-colored scribble or watermark.

Tyler Adams  
Landman

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STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE CERTIFICATION

Date of Notice Certification: 09/29/2020

API No. 47- 095 -  
Operator's Well No. Vishnu Unit 2H  
Well Pad Name: Grand Pad

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State:	West Virginia	UTM NAD 83	Easting:	516292m
County:	Tyler		Northing:	4373081m
District:	Ellsworth	Public Road Access:	Gorrells Run Road	
Quadrangle:	Porter Falls 7.5'	Generally used farm name:	Kenneth Tomblin et al	
Watershed:	Outlet Middle Island Creek			

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
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Required Attachments:

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

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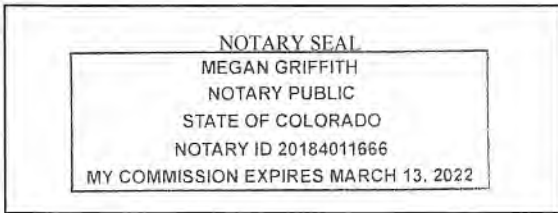
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**Certification of Notice is hereby given:**

THEREFORE, I Diana Hoff, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all 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.

Well Operator: Antero Resources Corporation  
By: Diana Hoff *Diana O. Hoff*  
Its: Senior VP of Operations  
Telephone: 303-357-7223

Address: 1615 Wynkoop Street  
Denver, CO 80202  
Facsimile: 303-357-7315  
Email: mgriffith@anteroresources.com



Subscribed and sworn before me this 30th day of SEPTEMBER, 2020  
*Megan Griffith* Notary Public  
My Commission Expires MARCH 13, 2022

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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WV Department of  
Environmental Protection

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 9/30/2020 **Date Permit Application Filed:** 9/30/2020

**Notice of:**

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

**Delivery method pursuant to West Virginia Code § 22-6A-10(b)**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice  WSSP Notice  E&S Plan Notice  Well Plat Notice is hereby provided to:

SURFACE OWNER(s) ✓  
 Name: Kenneth Tomblin et ux  
 Address: 5913 Greencrest Drive  
 Hamilton, OH 45011  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
 Name: NO DECLARATIONS ON RECORD WITH COUNTY  
 Address: \_\_\_\_\_

SURFACE OWNER(s) (Road and/or Other Disturbance) ✓  
 Name: Kenneth Tomblin et ux  
 Address: 5913 Greencrest Drive  
 Hamilton, OH 45011  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

COAL OPERATOR  
 Name: NO DECLARATIONS ON RECORD WITH COUNTY  
 Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE  
 Name: NONE IDENTIFIED WITHIN 1500'  
 Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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 WV Department of  
 Environmental Protection

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

**This Notice Shall Include:**

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

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WV DEPARTMENT OF ENVIRONMENTAL PROTECTION

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

**Water Well Testing:**

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

**Water Testing Laboratories:**

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

**Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:**

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

**Written Comment:**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

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Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

**Time Limits and Methods for Filing Comments.**

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

**Comment Requirements**

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

**Permit Denial or Condition**

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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WW-6A  
(8-13)

API NO. 47-9502717  
OPERATOR WELL NO. Vishnu Unit 2H  
Well Pad Name: Grand Pad

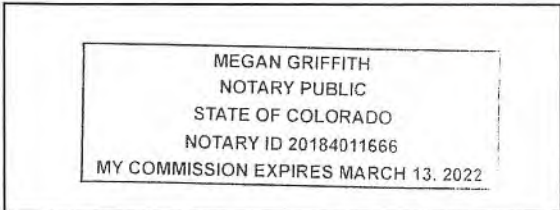
**Notice is hereby given by:**

Well Operator: Antero Resources Corporation  
Telephone: (303) 357-7223 Diana O. Hoff  
Email: mgriffith@anteroresources.com

Address: 1615 Wynkoop Street  
Denver, CO 80202  
Facsimile: 303-357-7315

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



Subscribed and sworn before me this 30th day of September, 2020  
[Signature] Notary Public  
My Commission Expires March 13, 2022

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**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**NOTICE OF INTENT TO DRILL**

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

**Notice Time Requirement:** Notice shall be provided at least **TEN (10)** days prior to filing a permit application.

**Date of Notice:** 02/05/2020 **Date Permit Application Filed:** 09/30/2020

**Delivery method pursuant to West Virginia Code § 22-6A-16(b)**

HAND DELIVERY  CERTIFIED MAIL RETURN RECEIPT REQUESTED

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: *Provided*, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: *Provided, however*, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

**Notice is hereby provided to the SURFACE OWNER(s):**

Name: Kenneth Tomblin  
Address: 5913 Greencrest Drive  
Hamilton, OH 45011

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(b), notice is hereby given that the undersigned well operator has an intent to enter upon the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State: West Virginia UTM NAD 83 Easting: 516292m  
County: Tyler Northing: 4373081m  
District: Ellsworth Public Road Access: Gorrells Run Road  
Quadrangle: Porter Falls 7.5' Generally used farm name: Kenneth Tomblin et al  
Watershed: Outlet Middle Island Creek

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: Antero Resources Appalachian Corporation  
Address: 1615 Wynkoop St.  
Denver, CO 80202  
Telephone: 303-357-7223  
Email: mgriffith@anteroresources.com  
Facsimile: 303-357-7315

Authorized Representative: Megan Griffith  
Address: 1615 Wynkoop St.  
Denver, CO 80202  
Telephone: 303-357-7310  
Email: mgriffith@anteroresources.com  
Facsimile: 303-357-7315

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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF PLANNED OPERATION

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 09/30/2020 **Date Permit Application Filed:** 09/30/2020

**Delivery method pursuant to West Virginia Code § 22-6A-16(c)**

- CERTIFIED MAIL  
RETURN RECEIPT REQUESTED
- HAND  
DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

**Notice is hereby provided to the SURFACE OWNER(s)**

(at the address listed in the records of the sheriff at the time of notice):

Name: Kenneth Tomblin ✓ Name: \_\_\_\_\_  
 Address: 5913 Greencrest Drive Address: \_\_\_\_\_  
Hamilton, OH 45011

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>516292m</u>
County:	<u>Tyler</u>		Northing:	<u>4373081m</u>
District:	<u>Ellsworth</u>	Public Road Access:	<u>Gorrells Run Road</u>	
Quadrangle:	<u>Porter Falls 7.5'</u>	Generally used farm name:	<u>Kenneth Tomblin et al</u>	
Watershed:	<u>Outlet Middle Island Creek</u>			

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: Antero Resources Corporation  
 Telephone: (303) 357-7223  
 Email: mgriffith@anteroresources.com

Address: 1615 Wynkoop Street  
Denver, CO 80202  
 Facsimile: 303-357-7315

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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
**Division of Highways**

1900 Kanawha Boulevard East • Building Five • Room 110  
 Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III  
 Secretary of Transportation/  
 Commissioner of Highways

September 29, 2020

Jimmy Wriston, P. E.  
 Deputy Secretary/  
 Deputy Commissioner

James A. Martin, Chief  
 Office of Oil and Gas  
 Department of Environmental Protection  
 601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304

Subject: DOH Permit for the Grand Pad, Tyler County  
 Vishnu Unit 2H Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2020-0048 which has been issued to Antero Resources for access to the State Road for a well site located off Tyler County Route 34 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. Operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated October 1, 2018.

Very Truly Yours,

Gary K. Clayton, P.E.  
 Regional Maintenance Engineer  
 Central Office O&G Coordinator

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Cc: Megan Griffith  
 Antero Resources  
 CH, OM, D-6  
 File

# List of Anticipated Additives Used for Fracturing or Stimulating Well

47-9502717

Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	Proprietary
Anionic polymer	Proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	Proprietary
Demulsifier Base	Proprietary
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
Guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	Proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7
Solvent Naphtha, petroleum, heavy aliph	64742-96-7
Soybean Oil, Me ester	67784-80-9
Copolymer of Maleic and Acrylic Acid	52255-49-9
DETA phosphonate	15827-60-8
Hexamethylene Triamine Penta	34690-00-1
Phosphino Carboxylic acid polymer	71050-62-9
Hexamethylene Diamine Tetra	23605-75-5
2-Propenoic acid, polymer with 2 propanamide	9003-06-9
Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5
Diethylene Glycol	111-46-6
Methenamine	100-97-0
Polyethylene polyamine	68603-67-8
Coco amine	61791-14-8
2-Propyn-1-olcompound with methyloxirane	38172-91-7

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## Antero Resources Corporation Erosion and Sediment Control Plan for Grand Well Site

*Antero Resources Corporation (Antero) is submitting the following narrative and set of drawings in compliance with §35-8-5.4. This plan is submitted in conjunction with the Grand Well Site Erosion & Sediment Control Plan & Site Restoration Plan prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Dieffenbauch & Hritz, LLC, a West Virginia registered professional engineer.*

**Requirement §5.4.b.1.** *A general sequence of events that describe in relative terms how and when each construction phase (i.e. clearing and grubbing, mass grading, stabilization) will occur and when each erosion and sediment control best management practice ("BMP") will be installed;*

### **Antero Response:**

The following includes a general sequence of events that describe in relative terms how and when each construction phase is anticipated to occur and erosion and sediment control BMPs to be installed. Please refer to the "Grand Well Site Erosion & Sediment Control Plan & Site Restoration Plan" (Site Design) prepared and certified by Dieffenbauch & Hritz, LLC for specific construction measures. Compliance with the measures outlined in the Site Construction Plan (§35-8-5.4) submitted in conjunction with this plan will also be maintained.

1. Stake the limits of construction and mark/flag all identified wetlands, streams, utilities, and other areas of concern for construction activities. Install signs to designate the areas and orange safety fence to identify important project attributes such as approved access roads, no refueling zones, wetlands/steam bounds, etc.
2. A pre-construction conference with the contactor and the appropriate erosion and sediment control inspector 48 hours prior to beginning work to review the construction drawings and provide any requested guidance.
3. Construct the rock construction entrance. All vehicles entering and exiting the site shall do so via the rock construction entrance.
4. Construct all BMP's as soon as clearing and grubbing operations allow. Once installed, the area encompassing the BMP's outside the grading limits shall be seeded and mulched immediately.
5. If applicable, convey upslope drainage around the Access Road, Well Pad, and Water Containment Pad areas by constructing all diversion berm(s) and/or compost filter sock diversion(s) as shown on the plans.
6. Clear and grub the site. All woody material, brush, trees, stumps, large roots, boulders, and debris shall be cleared from the site area and kept to the minimum necessary for proper construction, including the installation of necessary sediment controls. Trees, brush, & stumps shall be cut and/or grubbed and burned (as per WV forest fire laws), removed from site, or disposed of by other methods approved by WV DEP.
7. If applicable, install all wetland or stream crossings as shown on the plans.
8. Strip the topsoil from the access road. Topsoil stripping shall be kept to a minimum necessary to construct access road. Prior to placing any fill, the exposed subgrade shall be compacted and proof rolled to produce a stable and unyielding site. All stripped topsoil shall be stockpiled in

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- areas shown in the plans, or re-spread at an approximate depth of 2-4 inches on all proposed 2:1 or flatter slopes, and immediately stabilized. Additional BMP measures shall be constructed around topsoil stockpiles, if necessary.
9. Construct the access road. All fill areas, including excess material stockpiles, shall be "Keyed In" and compacted in horizontal lifts with a maximum loose lift thickness of 12" and maximum particle size as outlined in the geotechnical report. All fill shall be compacted by a vibrating sheepsfoot roller to 95% per the standard proctor test (ASTM – D698). Moisture content will be controlled in accordance with the standard proctor test (ASTM – D698) results. It is also recommended that each lift be proof rolled with a loaded haul truck where applicable. Ditch relief culverts shall be installed at a grade of 1-8% to minimize outlet velocities to the extent possible. Install outlet protection once ditch relief culverts are installed, as shown on plans. Stabilize the road with geotextile fabric & stone and side slopes as specified with permanent seeding. Excess material shall be stockpiled (if necessary) in areas shown in the plans and immediately stabilized. Topsoil shall be stripped from all stockpile areas prior to construction of stockpiles. After stockpiles are constructed, topsoil is to be reapplied at a depth of 2"-4". Slopes shall be tracked by running tracked machinery up and down the slope, leaving tread marks parallel to the contour. All ditch lines shall be cleaned prior to installation of lined protection.
  10. Strip the topsoil from the well pad and water containment pad. Topsoil stripping shall be kept to a minimum necessary to construct well pad and water containment pad. Prior to placing any fill, the exposed subgrade shall be compacted and proof rolled to produce a stable and unyielding site. All stripped topsoil shall be stockpiled in areas shown in the plans, or re-spread at an approximate depth of 2-4 inches on all proposed 2:1 or flatter slopes, and immediately stabilized. Additional BMP measures shall be constructed around topsoil stockpiles, if necessary.
  11. Grade the well pad and water containment pad areas as shown on the plans. Install pad sumps (with 4" PVC drain pipe and outlet protection) and containment berm liner system. Immediately stabilize the outer areas of the well pad and water containment pad. The well pad and water containment pad areas shall be stabilized with geotextile fabric & stone and the side slopes with seed and mulch. Install all straw wattles as shown on plans. Apply seed and mulch to all disturbed areas. This shall include all areas that will not be subject to regular traffic activity (to be stabilized with stone), or any disturbed area that will not be re-disturbed before site reclamation begins.
  12. The construction site should be stabilized as soon as possible after completion. Establishment of final stabilization must be initiated no later than 7 days after reaching final grade. Final stabilization means that all soil-disturbing activities are completed, and that either a permanent vegetative cover with a density of 70% or greater has been established or that the surface has been stabilized by hard cover such as pavement or buildings. It should be noted that the 70% requirement refers to the total area vegetated and not just a percent of the site.
  13. Commence well drilling activity.
  14. All BMP's must remain in place and functional until all areas within the limit of disturbance are complete and permanently stabilized. Maintenance must include inspection of all erosion and sediment controls after each runoff event in excess of 0.5" in twenty-four (24) hour period.
  15. All permanent sediment control measures can be removed after the site is permanently stabilized and approval is received from the WVDEP.
  16. Any areas disturbed by removal of controls shall be repaired, stabilized, and permanently seeded.

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**Requirement §5.4.b.2.** *A description of the stabilization methods to be used, including the application rates for temporary and permanent seeding and mulching, and provide the timeframes for establishing stabilization*

**Antero Response:**

Stabilization methods used include seeding and mulching of disturbed areas as well as the implementation of erosion and sediment control BMPs. Please refer to “General Notes” on page 2 and “E&S Details” and “Construction Details” on pages 22-30 for detailed descriptions of the different stabilization methods to be used. Seeding and mulching is to be in accordance with the WVDOT Standard Specifications unless specified otherwise in the plans or unless specified otherwise by the construction engineer or Antero representative. Please refer to “Erosion and Sediment Control Narrative” under “General Notes” on page 2 as well as “Construction Details” on page 30 of the Site Design for more specific information regarding application, liming, and mulching rates.

Erosion and sediment BMPs will be constructed, stabilized, and functional before site disturbance begins within the tributary areas of those BMPs. In a timely manner after earth disturbance activities cease, Antero shall stabilize any areas disturbed by the activities. During non-germination periods, mulch must be applied at the specified rates. Disturbed areas which are not at finish grade and which will be re-disturbed within 1 year will be stabilized in accordance with the temporary vegetative stabilization and specifications. Disturbed areas which are finished grade or which will not be re-disturbed within 1 year will be stabilized in accordance with the permanent vegetative stabilization specification. Please refer to “General Notes” on page 2 for more information regarding timeframes for establishing stabilization and erosion and sediment BMPs.

The site shall be considered to have achieved full stabilization when it has a minimum uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics to resist sliding and other movements. Until the site achieves final stabilization, Antero will assure that the best management practices (BMPs) are implemented, inspected, operated, and maintained. As such, Antero will maintain written inspection logs. All maintenance work, including cleaning, repair, replacement, regarding, and re-stabilization shall be performed immediately upon discovery of deficiency. After final stabilization has been achieved, temporary erosion and sediment BMPs controls will be removed. Areas disturbed during removal of the BMPs will be stabilized immediately.

**Requirement §5.4.b.3.** *Details of specifications for the erosion and sediment control BMPs employed on the project.*

**Antero Response:**

Please refer to the “General Notes” on page 2 and “E&S Details” and “Construction Details” on pages 22-30 in the Site Design for specifications including instructions for installation, inspection, and maintenance for erosion and sediment control BMPs employed at this site.

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**Requirement §5.4.c.1.** *A vicinity map locating the site in relation to the surrounding area and roads;* WV Department of Environmental Protection

**Antero Response:**

A vicinity map locating the site in relation to the surrounding area and roads is included on page 1 of the Site Design.



**Requirement §5.4.c.2** *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater, showing appropriate detail of all site features, including the identification of site access that provides for a stabilized construction entrance and exit to reduce tracking of sediment onto public or private roads; and*

**Antero Response:**

"Overall E&S Plan" and "Proposed Site Plan" maps are included on pages 7-10 of the Site Design. Specific design, layout and inspection and maintenance notes for a stabilized construction entrance are included in the "General Notes" verbiage on page 2.

**Requirement §5.4.c.3.** *The location of all proposed erosion and sediment control BMPs*

**Antero Response:**

"Overall E&S Plan" and "Proposed Site Plan" maps are included on pages 7-10 of the Site Design to locate all proposed erosion and sediment control BMPs.

RECEIVED  
Office of Oil and Gas

OCT 01 2020

WV Department of  
Environmental Protection



**LOCATION COORDINATES**

SITE LOCATIONS	WGS84 (NORTH ZONE)		UTM N-17	
	LATITUDE	LONGITUDE	EASTING	NORTHING
MAIN ACCESS ROAD ENTRANCE	38.60988	-80.11023	417228.605	418507.402
CENTROID OF WELL PAD	38.60116	-80.10871	417121.207	418276.203

**GENERAL DESCRIPTION:**  
THE ACCESS ROADS, WATER CONTAINMENT PAD, AND WELL PAD ARE BEING CONSTRUCTED TO AND IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

**FLOODPLAIN NOTES:**  
THE PROPOSED SITE LOCATION IS NOT WITHIN ANY IDENTIFIED FLOODPLAIN AREA.

**MISS UTILITY STATEMENT:**  
ANTERO RESOURCES CORP. WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATION OF UTILITIES PRIOR TO THIS PROJECT DESIGN TICKET # 1923719735. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

**ENTRANCE PERMIT:**  
ANTERO RESOURCES CORP. WILL OBTAIN AN ENTRANCE PERMIT FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

**ENVIRONMENTAL NOTES:**  
STREAM AND WETLAND DELINEATION WERE PERFORMED ON NOVEMBER 2014 BY GAI CONSULTANTS TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE HELD UNDER THE REGULATORY JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE NOVEMBER 2014 STREAM AND WETLAND DELINEATION MAP WAS PREPARED BY GAI CONSULTANTS AND SUBMITTED TO THE REGULATORY AGENCIES. THE MAP DOES NOT IN ANY WAY REPRESENT A JURISDICTIONAL DETERMINATION OF THE LOWERWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REQUESTED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AGENCIES MENTIONED ASSIGNEES BE CONSULTED WITH BY THE CLIENT TO OBTAIN WRITTEN CONFORMATION OF THE SCALING AND ZONING OF THE CONSENT PRIOR TO ENGAGING IN CONSTRUCTION ON THE PROPERTIES DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATER OF THE U.S. INCLUDING WETLAND FILL AND STREAM DISCHARGE.

**GEOTECHNICAL NOTES:**  
THE PROPOSED CUT/FILL SLOPES (C/F) SHALL BE FIELD VERIFIED BY A CERTIFIED GEOTECHNICAL ENGINEER TO ENSURE THE PROPOSED SLOPES ARE ACQUISITELY STABLE TO CONSTRUCTION. SITE CONSTRUCTION SHALL BE MONITORED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER ON PROJECT DESIGN ENGINEER DURING CONSTRUCTION.

A SURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY GAI, INC. ON MARCH 6, 2020. REFLECTS THE RESULTS OF THE SURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SURFACE INVESTIGATION REPORT BY MAIL FILE FOR ADDITIONAL INFORMATION. (SEE WEBSITE)

**RESTRICTION NOTES:**

1. THERE ARE NO LAKES OR WETLANDS WITHIN 100 FEET OF THE WELL PAD LOD.
2. THERE ARE NO WETLANDS TO BE DISTURBED OR WITHIN 100' OF THE WELL PAD LOD.
3. THERE ARE NO UNDESIRABLE STREAM IMPACTS THAT WILL NEED TO BE PERMITTED BY THE APPROPRIATE AGENCIES.
4. THERE ARE NO SUBMERGED STREAMS WITHIN 100 FEET OF THE WELL PAD LOD.
5. THERE ARE NO NATURALLY OCCURRING FISH AND WILDLIFE SPECIES OF THE CENTER OF THE WELL PAD.
6. THERE ARE NO PROGNOSIS OF FISH OR FISH WATERS SUPPLY FACILITIES WITHIN 100 FEET OF THE WELL PAD LOD.
7. THERE ARE NO APPARENT EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 50 FEET OF THE WELL PAD LOD.
8. THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 425 FEET OF THE CENTER OF THE WELL PAD.
9. THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 250 SQUARE FEET WITHIN 25 FEET OF THE CENTER OF THE WELL PAD.

**PROJECT CONTACTS:**

**OPERATOR:**  
ANTERO RESOURCES CORPORATION  
600 WHITE OAK BLVD  
BRIARPORT, WV 26009  
PHONE: (204) 842-4180  
FAX: (204) 842-4180

SEI MANAGER - ENVIRONMENTAL & REGULATORY MANAGERS  
OFFICE: (204) 842-4108  
CELL: (204) 842-4108

ENVIRONMENTAL DIRECTOR/COMPLETION OPERATIONS  
OFFICE: (204) 842-4108  
CELL: (204) 842-4108

AMMON HENDERSON - CONSULTING USE MANAGER  
OFFICE: (204) 842-4108

BRANDY REYNOLDS - DESIGN ENGINEER  
OFFICE: (204) 842-4108  
CELL: (204) 842-4108

CHAMBERLAIN & COMPANY (C/C) PROJECT COORDINATOR  
CELL: (204) 842-4108

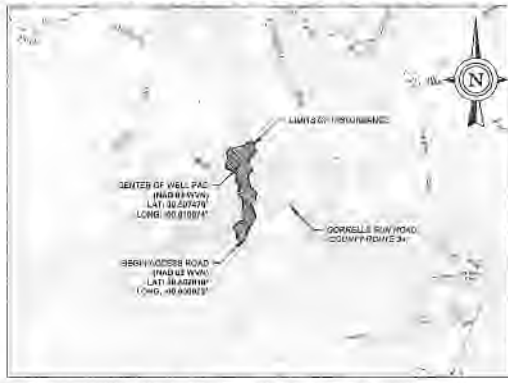
DAVID AVERY - LAND ACQUISITION  
OFFICE: (204) 842-4108



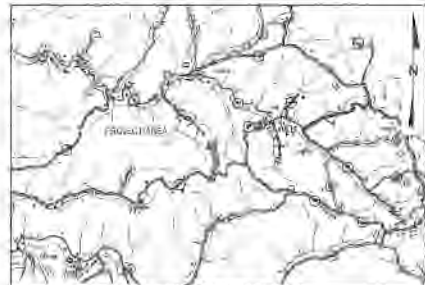
# EROSION & SEDIMENT CONTROL PLAN & SITE RESTORATION PLAN

## GRAND WELL SITE

### ELLSWORTH DISTRICT, TYLER COUNTY, WV FOR ANTERO RESOURCES CORPORATION



BY ENGINEERING STATES: GEOLOGICAL SURVEY - POWER AND ENGINEERING, W.V. & WHITE SERIES  
1:2500 0 1000 2000  
NAD 83



**VICINITY MAP**  
TYLER COUNTY ROAD MAP  
SCALE IN FEET  
1 INCH = 1 MILE

**INDEX**

DRAWING NO.	TITLE	DRAWING DATE	TITLE
1	TITLE SHEET	12-16	ACCESS ROAD CROSS SECTIONS
2	GENERAL NOTES	14-20	EAS TYPICAL SECTIONS
3	QUANTITIES LIST	21	QUANTITIES PROFILES
4	EAS CALCULATIONS	25-26	EAS DETAILS
5	ENCLOSURE STRUCTURES	26	CONSTRUCTION DETAILS
6	ENCLOSURE CONDITIONS	27	OVERALL RESTORATION PLAN
7	OVERALL EAS SITE PLAN	22-24	PROPOSED SITE RESTORATION PLAN
8/9	PROPOSED SITE PLAN	28-27	GEOTECHNICAL DETAILS
11	ACCESS ROAD PROFILE	30-31	GEOTECHNICAL SUBSURFACE SUMMARY

**LIMITS OF DISTURBANCE RAINFALL BREAK UPS - GRANDWELL SITE**

TYLER COUNTY, WEST VIRGINIA

OWNER	TOL PARCEL	DEED PAGE	TOTAL ACRES	TYPE OF DISTURBANCE	ACRES	WOODS	NON WOODS
TANIGLI, KENNETH & LOWE S. MICHAEL	19-20	228-473	284.32	ACCESS ROAD	16.42	13.61	2.80
				WELL PAD	14.72	0.00	0.00
				SPOIL PILE #1	1.07	1.07	0.00
				SPOIL PILE #2	1.42	0.00	0.00
				SPOIL PILE #4	3.23	3.23	0.00
				SPOIL PILE #6	1.44	1.44	0.00
TANIGLI MICHAEL LLC	19-20	224-411	25.00	SPOIL PILE #8	2.94	2.94	0.00
				SPOIL PILE #7	0.33	0.33	0.00
<b>PARCEL TOTAL</b>				<b>36.83</b>	<b>24.82</b>	<b>2.81</b>	
<b>PARCEL TOTAL</b>				<b>5.67</b>	<b>0.87</b>	<b>0.00</b>	

**GRADING VOLUMES**

DESCRIPTION	CUT (CY)	FILL (CY)	NET (CY)
ACCESS ROAD	38,779	14,300	24,479
WELL PAD	119,853	81,571	38,282
SPOIL PILE #5	0	8,728	-8,728
SPOIL PILE #6	0	8,322	-8,322
SPOIL PILE #4	0	27,151	-27,151
SPOIL PILE #8	0	7,107	-7,107
SPOIL PILE #2	0	10,976	-10,976
SPOIL PILE #7	0	5,000	-5,000
<b>TOTAL</b>	<b>148,632</b>	<b>174,324</b>	<b>-25,692</b>
<b>TOTAL GRADING</b>	<b>17,324 C.Y.</b>		
<b>TOTAL EXCAVATION</b>	<b>166,884</b>	<b>151,779</b>	<b>-15,105</b>

**L.S.S. AREAS**

DESCRIPTION	ACRES
MAIN ACCESS ROAD	16.42
WELL PAD	14.72
SPOIL PILE #2	1.07
SPOIL PILE #3	1.42
SPOIL PILE #4	3.23
SPOIL PILE #6	1.44
SPOIL PILE #8	2.94
SPOIL PILE #7	0.33
<b>TOTAL</b>	<b>41.86</b>
WOODS	31.19

**WELL LEGEND**

WELL HEAD	WV NORTH MAG 27	WV NORTH MAG 83	UTM	HAEPS
GRAND CUT 51	N 385204.772	N 713624.481	E 512224.412	4472.0637
	E 163079.742	E 159605.527		4472.0637



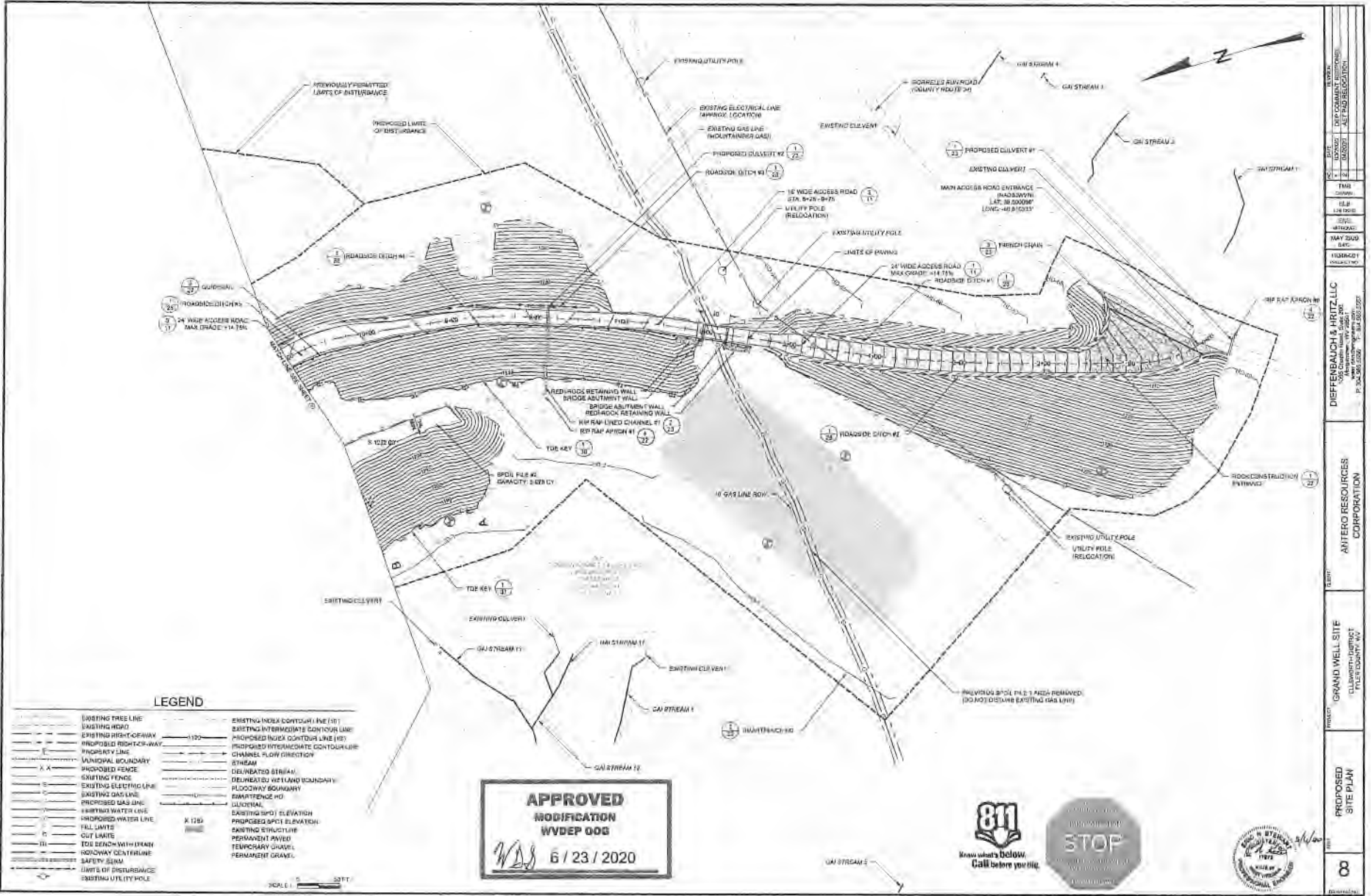
PROJECT NO. 19048-001  
MAY 2020

**DIEFFENBAUCH & HRITZ, LLC**

SCALE: 1/4" = 100 FEET UNLESS OTHERWISE NOTED. SEE SHEET 19048-002 FOR ADDITIONAL INFORMATION. DATE: 05/20/2020

PROJECT: GRAND WELL SITE, TYLER COUNTY, WV  
 SHEET: 1  
 DATE: 05/20/2020  
 DRAWN BY: [Name]  
 CHECKED BY: [Name]  
 APPROVED BY: [Name]  
 TITLE: [Title]  
 FIRM: DIEFFENBAUCH & HRITZ, LLC  
 ADDRESS: [Address]  
 PHONE: [Phone]  
 FAX: [Fax]

GRANDWELL SITE PLAN, 16.2 ACRES, AND COALWATER TREATMENT PLANT, GRANDWELL SITE, TOWN OF GRANDWELL, DEPT. OF ENVIRONMENTAL CONSERVATION, STATE OF NEW YORK



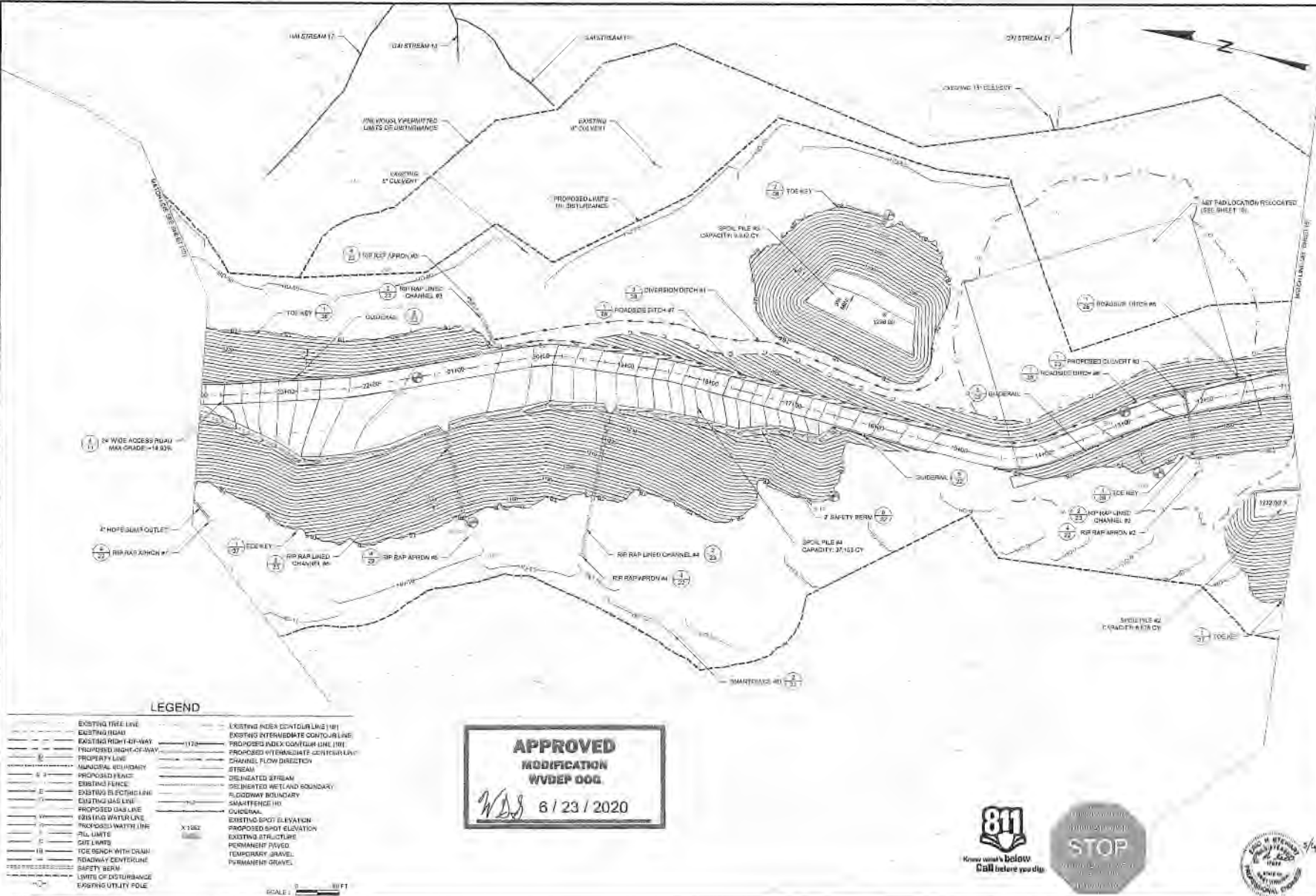
**LEGEND**

(---) EXISTING TREE LINE	(---) EXISTING INDEX CONTOUR LINE (10')
(---) EXISTING ROAD	(---) EXISTING INTERMEDIATE CONTOUR LINE
(---) EXISTING RIGHT-OF-WAY	(---) PROPOSED INDEX CONTOUR LINE (10')
(---) PROPOSED RIGHT-OF-WAY	(---) PROPOSED INTERMEDIATE CONTOUR LINE
(---) PROPERTY LINE	(---) CHANNEL FLOW DIRECTION
(---) MUNICIPAL BOUNDARY	(---) STREAM
(---) PROPOSED FENCE	(---) DELINEATED STRIP
(---) EXISTING FENCE	(---) DELINEATED WETLAND BOUNDARY
(---) EXISTING ELECTRIC LINE	(---) BLOODWAY BOUNDARY
(---) EXISTING GAS LINE	(---) SMART FENCE NO.
(---) PROPOSED GAS LINE	(---) DITCH
(---) EXISTING WATER LINE	(---) EXISTING SPOT ELEVATION
(---) PROPOSED WATER LINE	(---) PROPOSED SPOT ELEVATION
(---) FULL LIMITS	(---) EXISTING STRUCTURE
(---) OUT LIMITS	(---) PERMANENT PAVED
(---) TDS BENCH WITH DRAIN	(---) TEMPORARY GRAVEL
(---) ROADWAY CENTERLINE	(---) PERMANENT GRAVEL
(---) SAFETY SIGN	
(---) LIMITS OF DISTURBANCE	
(---) EXISTING UTILITY POLE	

**APPROVED**  
**MODIFICATION**  
**WVDEP 00G**  
 6/23/2020



SCALE: 1/8" = 1'-0" (NOTED) 6/23/2020 M. RILE, R.A.C. AND D:\SWAMPERS\DESIGN\ROADWAY\GRAND WELL SITE\CAD\DWG\65-394\CD\PROPOSED SITE PLAN 18.DWG



**LEGEND**

—	EXISTING TREE LINE	---	EXISTING INDEX CONTOUR LINE (10')
- - - -	EXISTING ROAD	- - - -	EXISTING INTERMEDIATE CONTOUR LINE
- - - -	EXISTING RIGHT-OF-WAY	---	PROPOSED INDEX CONTOUR LINE (10')
- - - -	PROPOSED RIGHT-OF-WAY	---	PROPOSED INTERMEDIATE CONTOUR LINE
---	PROPERTY LINE	- - - -	CHANNEL FLOW DIRECTION
- - - -	MUNICIPAL BOUNDARY	- - - -	STREAM
---	PROPOSED FENCE	- - - -	DELIMITED STREAM
- - - -	EXISTING FENCE	- - - -	DELIMITED WETLAND BOUNDARY
---	EXISTING ELECTRIC LINE	- - - -	FLOODWAY BOUNDARY
---	EXISTING GAS LINE	- - - -	SMALL FENCE (1') OUTCROP
- - - -	PROPOSED GAS LINE	- - - -	EXISTING SPOT ELEVATION
---	EXISTING WATER LINE	- - - -	PROPOSED SPOT ELEVATION
- - - -	PROPOSED WATER LINE	- - - -	EXISTING STRUCTURE
- - - -	PIL LIMITS	- - - -	PERMANENT PAVED
---	SITE LIMITS	- - - -	TEMPORARY GRAVEL
- - - -	TOE BENCH WITH GRAIN	- - - -	PERMANENT GRAVEL
---	ROADWAY CENTERLINE	- - - -	EXISTING UTILITY POLE
- - - -	SAFETY BERM	- - - -	
- - - -	LIMITS OF DISTURBANCE	- - - -	
- - - -	EXISTING UTILITY POLE	- - - -	

**APPROVED**  
**MODIFICATION**  
**WVDEP O&G**

*WDS* 6/23/2020



