



west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

June 09, 2016

WELL WORK PERMIT

Vertical Well

This permit, API Well Number: 47-9502363, issued to ANTERO RESOURCES CORPORATION, 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 all 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 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.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-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) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: Jackman #1V
Farm Name: Donald E. Moore
API Well Number: 47-9502363
Permit Type: Vertical Well
Date Issued: 06/09/2016

Promoting a healthy environment.

06/10/2016

PERMIT CONDITIONS

West Virginia Code §22-6-11 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.

CONDITIONS

1. 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 §22-6-20, 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 fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
2. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.
3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.
4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
5. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.
6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours.
7. Well work activities shall not constitute a hazard to the safety of persons.
8. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced, drilling ceased, 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 within 30 days of commencement of drilling.

4709502363

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Office of Oil and Gas

JUN 06 2016

WW - 2B
(Rev. 8/10)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WV Department of Environmental Protection
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corporation 494507062 095 - Tyler McElroy Shirley 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Jackman #1V 3) Elevation: 1042'

4) Well Type: (a) Oil _____ or Gas X
(b) If Gas: Production X / Underground Storage _____
Deep _____ / Shallow X

5) Proposed Target Formation(s): Marcellus Proposed Target Depth: 6900'

6) Proposed Total Depth: 6900' Feet Formation at Proposed Total Depth: Marcellus

7) Approximate fresh water strata depths: 341', 407'

8) Approximate salt water depths: 1208', 1302', 2112'

9) Approximate coal seam depths: 421', 615', 729'

10) Approximate void depths,(coal, Karst, other): None Identified

11) Does land contain coal seams tributary to active mine? No

*DMH JS
6/2/16 6/2/16*

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)

Drill, perforate, fracture a new vertical shallow well and complete the Marcellus formation.

*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	20"	J-55	106.5#	40'	40'	38 Cu. Ft - CTS
Fresh Water	13-3/8"	H-40	48#	460'	460' *see #12	639 Cu. Ft. - CTS
Coal	9-5/8"	J-55	36#	2510'	2510'	1022 Cu. Ft. - CTS
Intermediate						
Production	5-1/2"	P-110	20#	6900'	6900'	1488 Cu Ft.
Tubing	2-7/8"	L-80	6.5#	6500'		
Liners						

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

06/10/2016

WW-2A1
(Rev. 1/11)

Operator's Well Number Jackman #1V

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
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
Loren E. Bagley, et al	Sancho Oil & Gas Corporation	1/8	0361/0752
Sancho Oil & Gas Corporation	Antero Resources Corporation	Assignment & Bill of Sale	0436/0316

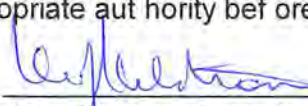
**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

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:
By: Its:



Antero Resources Corporation

Kevin Kilstrom, Senior Vice President of Production

MAY 16 2016
Office of Oil and Gas
WV Department of
Environmental Protection

WW-2B1
(5-12)

Well No. Jackman 1V

West Virginia Department of Environmental Protection
Office of Oil and Gas

NOTICE TO SURFACE OWNERS

The well operator named below is preparing to file for a permit from the state to drill a new well. Before a well work permit can be filed with the Chief of the Office of Oil and Gas, the well operator is required to have given notice of the right to request water well or spring analytical testing. This notice shall be given to the owners or occupants of land which have a water well or spring being utilized for human consumption, domestic animals, or other general use and which is located within 1000 feet of the proposed well site.

With this form, the operator is giving you notice of your right to request analytical testing. The operator is required to sample and analyze the water wells or springs of all owners or occupants who request it. Therefore, if you wish to have your water well or spring tested, contact the operator named below.

All sampling shall be completed prior to drilling. Within thirty (30) days of the receipt of such sample analyses the operator shall submit the results to the Chief of the Office of Oil and Gas and to the owners or occupants who may have requested them.

Be advised, you have the right to sample and analyze any water supply at your own expense.

Listed below is the laboratory chosen by operator to perform analysis, and contactor chosen to collect sample.

Certified Laboratory Name	<u>Pace Analytical</u>
Sampling Contractor	<u>GHD Pty Ltd</u>

Well Operator	<u>Antero Resources Corporation</u>
Address	<u>1615 Wynkoop Street</u>
	<u>Denver, CO 80212</u>
Telephone	<u>303-357-7310</u>

FOR OPERATOR'S USE ONLY: Below, or on an attached page, list those persons which were given this notice. Place an asterisk beside the one(s) that contacted you and requested sampling and analyses. If there were no requests made, indicate by underling which one you have selected to sample and analyze. If there are no water wells or springs within 1000 feet of the proposed site, the Chief may require the operator to test wells up to 2000 feet from the proposed site.

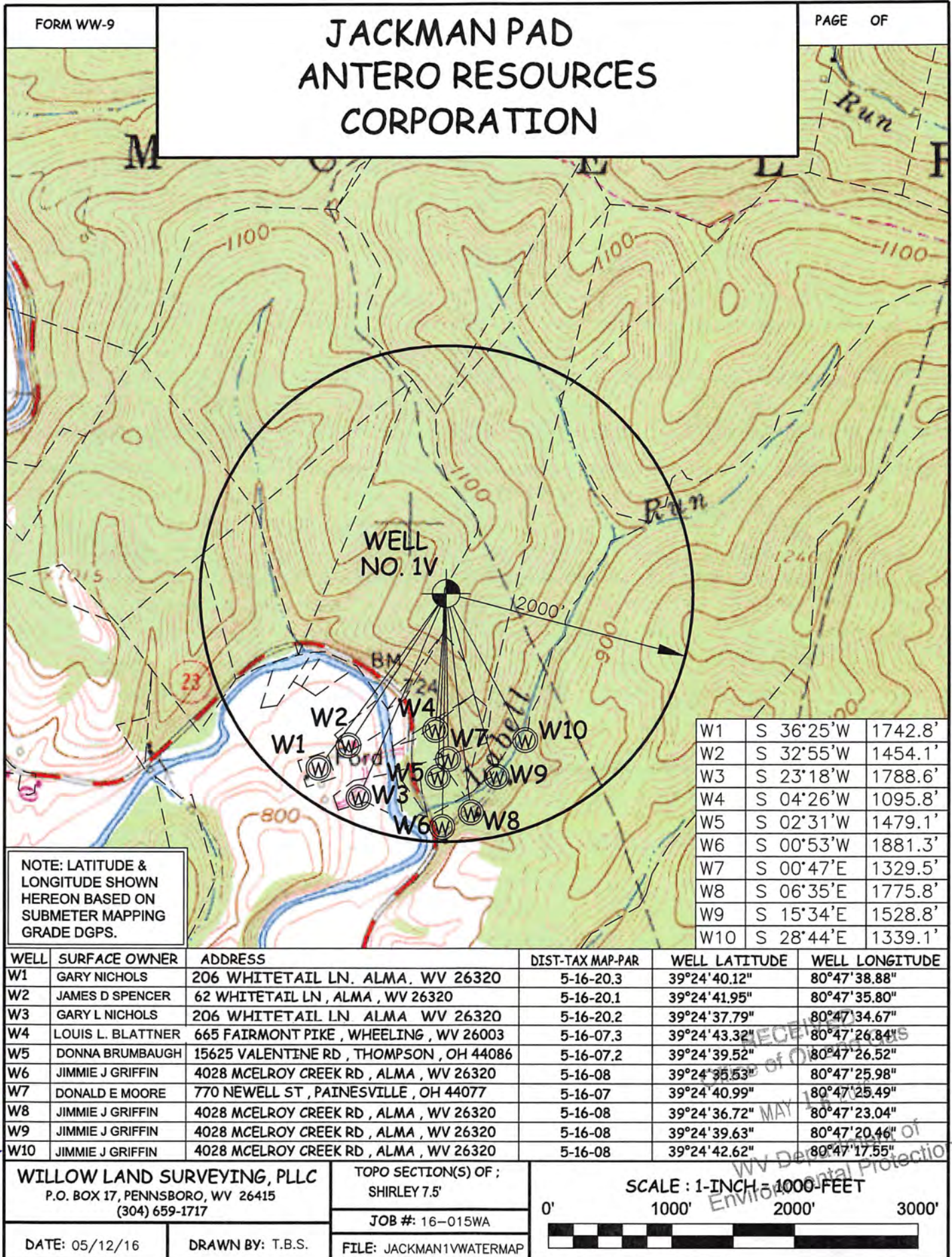
No water sources were identified within 1,000' of this well site and ten within 2000', however please be advised that Antero Resources Corporation will attempt sampling of the water source identified on the surface owner's property listed below.

Gary Nichols - 206 Whitetail Ln. Alma, WV 26320 (2 water sources)
James D. Spencer - 62 Whitetail Ln. Alma, WV 26320
Louis L. & Mary A. Blattner - 665 Fairmont Pike Wheeling, WV 26003
Donna Brumbaugh - 15625 Valentine Rd. Thompson, OH 44086
Jimmie J Griffin - 4028 McElroy Creek Rd. Alma, WV 26320 (4 water sources)
Donald E. Moore - 770 Newell St. Painesville, OH 44077

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06/10/2016



NOTE: LATITUDE & LONGITUDE SHOWN HEREON BASED ON SUBMETER MAPPING GRADE DGPS.

W1	S 36°25'W	1742.8'
W2	S 32°55'W	1454.1'
W3	S 23°18'W	1788.6'
W4	S 04°26'W	1095.8'
W5	S 02°31'W	1479.1'
W6	S 00°53'W	1881.3'
W7	S 00°47'E	1329.5'
W8	S 06°35'E	1775.8'
W9	S 15°34'E	1528.8'
W10	S 28°44'E	1339.1'

WELL	SURFACE OWNER	ADDRESS	DIST-TAX MAP-PAR	WELL LATITUDE	WELL LONGITUDE
✓ W1	GARY NICHOLS	206 WHITETAIL LN. ALMA, WV 26320	5-16-20.3	39°24'40.12"	80°47'38.88"
✓ W2	JAMES D SPENCER	62 WHITETAIL LN, ALMA, WV 26320	5-16-20.1	39°24'41.95"	80°47'35.80"
✓ W3	GARY L NICHOLS	206 WHITETAIL LN ALMA WV 26320	5-16-20.2	39°24'37.79"	80°47'34.67"
✓ W4	LOUIS L. BLATTNER	665 FAIRMONT PIKE, WHEELING, WV 26003	5-16-07.3	39°24'43.32"	80°47'26.84"
✓ W5	DONNA BRUMBAUGH	15625 VALENTINE RD, THOMPSON, OH 44086	5-16-07.2	39°24'39.52"	80°47'26.52"
✓ W6	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD, ALMA, WV 26320	5-16-08	39°24'35.53"	80°47'25.98"
✓ W7	DONALD E MOORE	770 NEWELL ST, PAINESVILLE, OH 44077	5-16-07	39°24'40.99"	80°47'25.49"
✓ W8	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD, ALMA, WV 26320	5-16-08	39°24'36.72"	80°47'23.04"
✓ W9	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD, ALMA, WV 26320	5-16-08	39°24'39.63"	80°47'20.46"
✓ W10	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD, ALMA, WV 26320	5-16-08	39°24'42.62"	80°47'17.55"

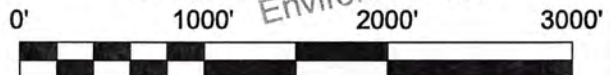
WILLOW LAND SURVEYING, PLLC
 P.O. BOX 17, PENNSBORO, WV 26415
 (304) 659-1717

TOPO SECTION(S) OF :
 SHIRLEY 7.5'

JOB #: 16-015WA

FILE: JACKMAN1VWATERMAP

SCALE: 1-INCH = 1000- FEET



DATE: 05/12/16

DRAWN BY: T.B.S.

WW-2A
(Rev. 6-14)

1.) Date: May 13, 2016
2.) Operator's Well Number Jackman #1V
State County Permit
3.) API Well No.: 47-095

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

4) Surface Owner(s) to be served:
(a) Name Donald E. Moore
Address 770 Newell St.
Painesville, OH 44077
(b) Name Robert J. Kocher
Address 845 Middle Island Rd.
Middlebourne, WV 26149
(c) Name *PLEASE SEE ATTACHMENT
Address _____
6) Inspector Derek Hauht
Address 601 57th Street, SE
Charleston, WV 25304
Telephone 304-477-4148
5) (a) Coal Operator
Name NO DECLARATIONS ON RECORD
Address WITH COUNTY
(b) Coal Owner(s) with Declaration
Name NO DECLARATIONS ON RECORD
Address WITH COUNTY
(c) Coal Lessee with Declaration
Name NO DECLARATIONS ON RECORD
Address WITH COUNTY

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

OR Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas

X Included is the information required by Chapter 22, Article 6, Section 8(d) of the Code of West Virginia (see page 2)

I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through ___ on the above named parties by:

- ____ Personal Service (Affidavit attached)
- X Certified Mail (Postmarked postal receipt attached)
- ____ Publication (Notice of Publication attached)

I have read and understand Chapter 22-6 and 35 CSR 4, and I agree to the terms and conditions of any permit issued under this application.

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, 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.

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028297
MY COMMISSION EXPIRES JULY 21, 2018

Well Operator: Antero Resources Corporation
By: Kevin Kilstrom
Its: Senior Vice President of Production
Address: 1615 Wynkoop Street
Denver, CO 80202
Telephone: 303-357-7310
Email: _____

Subscribed and sworn before me this 13 day of May, 2016

Kara Quackenbush
Notary Public, Office of Oil and Gas

My Commission Expires July 21, 2018

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a 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 of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov

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WW-2A Notice of Application Attachment (JACKMAN PAD):**List of Surface Owner(s) with Proposed Disturbance associated with Jackman Well Pad:**

ROAD AND/OR OTHER DISTURBANCE – These owners were only notified if their tract is overlying the oil and gas leasehold being developed by the proposed well work as outlined in WV Code 22-6-9(c)(2).

TM 16 PCL 7.2

Owner: Donna Brumbaugh ✓
(ON LEASE)
Address: 15625 Valentine Rd.
Thompson, OH 44086

TM 6 PCL 7.3

Owner: Louis L. & Mary A. Blattner ✓
(ON LEASE)
Address: 665 Fairmont Pike
Wheeling, WV 26003

TM 16 PCL 7 & 7.4

Owner: Donald E. Moore ✓
(ON LEASE)
Address: 770 Newell St.
Painesville, OH 44077

TM 16 PCL 7.5

Owner: Robert J. Kocher ✓
(ON LEASE)
Address: 845 Middle Island Rd.
Middlebourne, WV 26149

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WV Department of
Environmental Protection

06/10/2016

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WV-9
Office of Oil and Gas

Page _____ of _____
API Number 47-095
Operator's Well No. Jackman #1V

JUN 06 2016

WV Department of
Environmental Protection

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) McElroy Creek Quadrangle Shirley 7.5'

Elevation 1042' County Tyler District McElroy

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

Will a pit be used for drill cuttings? Yes _____ No X

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 X 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? Yes _____

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Silt Foam, Production - Water Based Mud

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

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. 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)

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 [Signature]

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager



Subscribed and sworn before me this 13 day of May, 20 16

[Signature]

Notary Public

My commission expires July 21, 2018

06/10/2016

4709502363

JUN 06 2016

Form WW-9
WV Department of
Environmental Protection

Operator's Well No. Jackman #1V

(Well #1.2) + Access Rd. (2.72) + Topsoil/Excess (0.57) + Existing Additional Area (4.67) = 11.65 acres

Proposed Revegetation Treatment: Acres Disturbed 11.65 acres Prevegetation pH _____

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

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2-3 Tons/acre Hay or straw or Wood Fiber (will be used where needed)

Seed Mixtures

Area I		Area II	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
		Tall Fescue	30

*or type of grass seed requested by surface owner

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: _____

Title: Oil + Gas Inspector Date: 6/2/16

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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MAY 20 2016

13. Escaid 110
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligco
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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OFFICE OF OIL AND GAS

MAY 20 2016



June 1, 2016

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

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Mr. Josh Westbrook
601 57th Street
Charleston, WV 25304

RE: Jackman Unit 1V (API # 47-095-02363)
Sent via Email

Mr. Westbrook:

After submitting the original application for the Jackman Unit 1V vertical well permit, we were notified by one of the surface owners that the surface tract where the well is located was mistakenly mislabeled due to inaccurate information at the county courthouse.

Therefore, we have updated the plat and design to show the correct owner for Tax Map 16 Parcel 7 (changed from Donald E. Moore to Robert J. Kocher). Please note that this update should not affect the notifications originally submitted as Mr. Kocher was notified as a surface owner on 5/13/2016.

The mylar plat is being overnighted via FedEx to your office. Please find enclosed the updated plat and design.

If you have any questions please feel free to contact me at (303) 357-7323.

Sincerely,

A handwritten signature in blue ink that reads "Ashlie Steele".

Ashlie Steele
Permitting Supervisor
Antero Resources Corporation

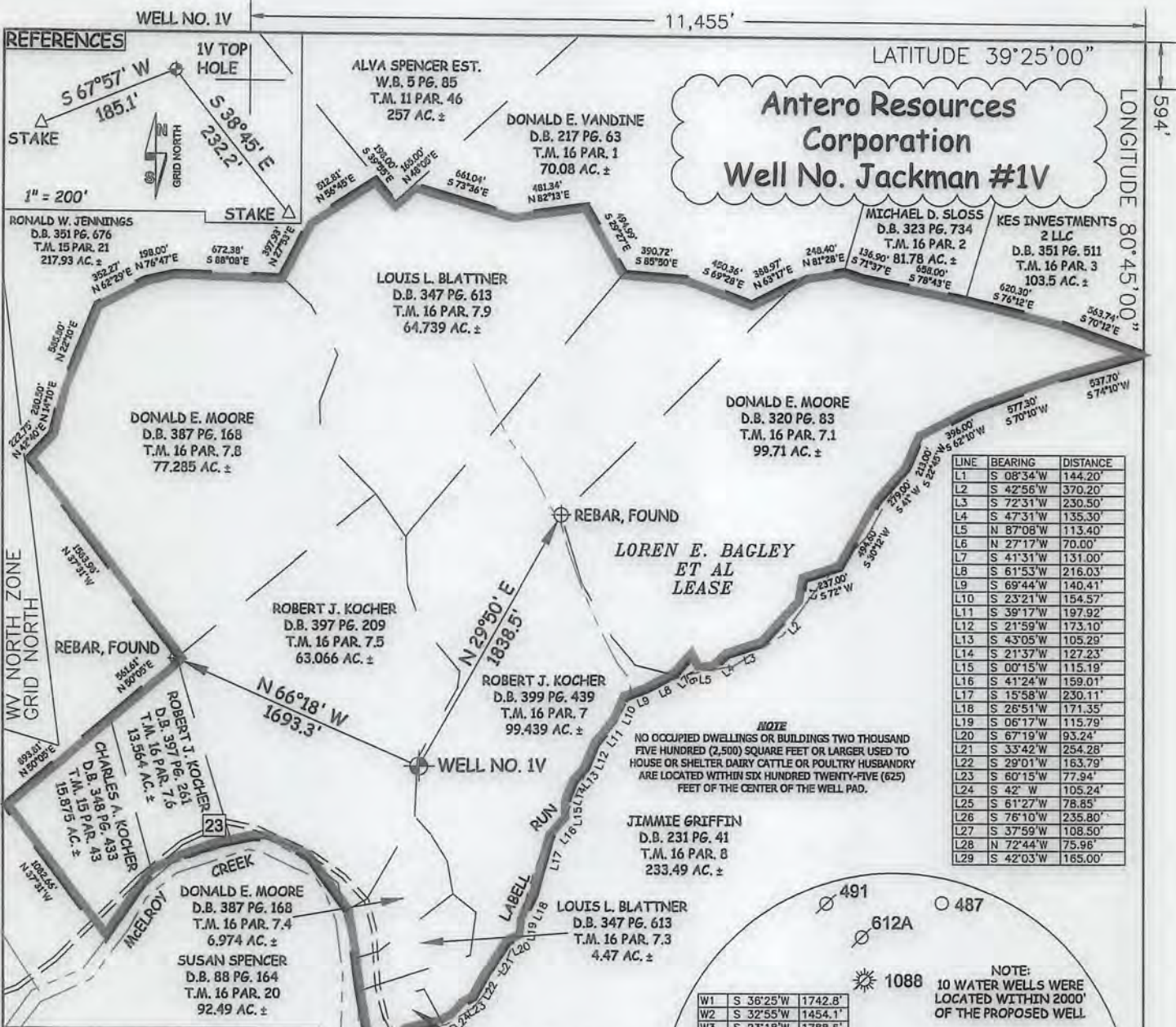
Enclosures

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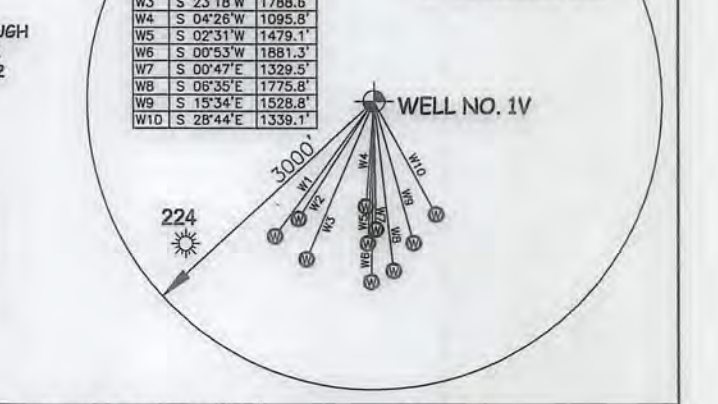
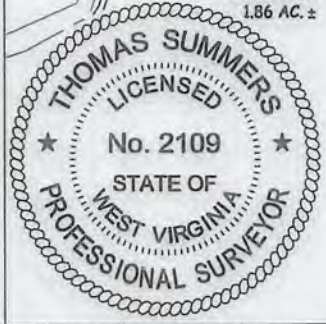
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OFFICE OF OIL AND GAS

JUN 02 2016

06/10/2016



NOTES:
WELL 1V INFORMATION:
 WV STATE PLANE NAD 27 COORDS:
 N: 335,894ft E: 1,635,393ft
 GEOGRAPHIC NAD 27 COORDS:
 LAT: 39°24'54.13" LON: 80°47'25.96"
 (NAD) 83 (UTM) ZONE 17 COORDS:
 N: 4,362,865m E: 518,046m
 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.



JOB # 16-015WA
 DRAWING # JACKMAN1V
 SCALE 1" = 500'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
 LOCATION: ELEVATION 1,050' - ORIGINAL 1,042' - AS-BUILT WATERSHED McELROY CREEK
 QUADRANGLE SHIRLEY 7.5' DISTRICT McELROY COUNTY TYLER
 SURFACE OWNER ROBERT J. KOCHER ACREAGE 99.439 ACRES +/-
 OIL & GAS ROYALTY OWNER LOREN E. BAGLEY ET AL LEASE ACREAGE 502.5 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 6,900'
 TARGET FORMATION MARCELLUS
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

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.

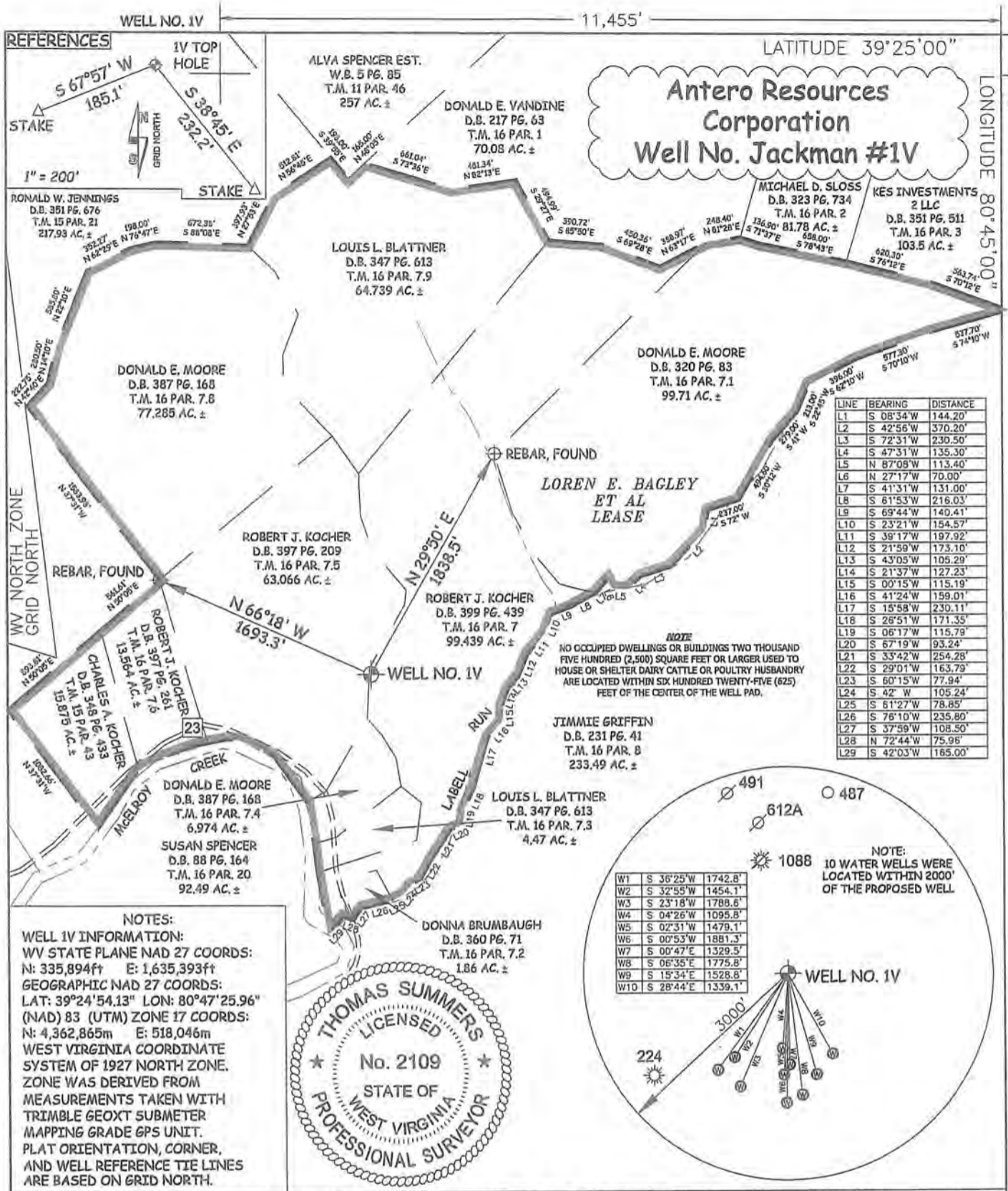


STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415

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

Thomas Summers
 THOMAS SUMMERS P.S. 2109
 DATE 05/31/16
 OPERATOR'S WELL# JACKMAN #1V
 API WELL # 47 - 095 - 02363
 STATE COUNTY PERMIT

06/10/2016



JOB # 16-015WA
DRAWING # JACKMAN1V
SCALE 1" = 500'

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

MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



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

THOMAS SUMMERS P.S. 2109

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

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

DATE 05/31/16

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
LOCATION: ELEVATION 1,050' - ORIGINAL 1,042' - AS-BUILT WATERSHED McELROY CREEK

QUADRANGLE SHIRLEY 7.5' DISTRICT McELROY COUNTY TYLER

SURFACE OWNER ROBERT J. KOCHER ACREAGE 99.439 ACRES +/-
OIL & GAS ROYALTY OWNER LOREN E. BAGLEY ET AL LEASE ACREAGE 502.5 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 ___
TARGET FORMATION MARCELLUS
WELL OPERATOR ANTERO RESOURCES CORP. ESTIMATED DEPTH 6,900'
ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202

RECEIVED
OFFICE OF OIL AND GAS

DIANNA STAMPER
CT CORPORATION SYSTEM
5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

06/10/2016

n Well Pad

-Built
 Resources Corporation
 er County
 roy District
 : 39.415093°
 de -80.790363°
 d Creek Watershed

RECEIVED
 Office of Oil and Gas
 JUN 06 2016
 WV Department of
 Environmental Protection

Pertinent Site Information
 Jackman Well Pad
 Emergency Number: 304-758-4275
 McElroy District, Tyler County, WV
 Watershed: Middle Island Creek
 Antero Resources Emergency Number: 800-878-1373

4709502363

Site As-Built

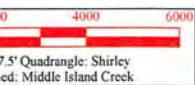


WV State Plane Coordinate System
 North Zone, NAD 83
 Elevations Based on NAV88
 Established By Survey Grade GPS
 and OPUS Post-Processing

Property Owner Information - Jackman Drill Pad						
McElroy District - Tyler County						
Owner	TM - Parcel	Well Pad	Access Road	Topsoil Excess	Existing Add. Area	Total Disturbed
Donna Brumbaugh	16-7-2	0.00	0.44	0.00	0.18	0.62
Robert J Kocher	16-7-3	1.71	1.73	0.27	2.07	5.78
Mary Ann Blattner	16-7-3	0.00	0.50	0.00	0.08	0.58
Donald E Moore	16-7-4	0.00	0.06	0.00	0.19	0.25
Robert J Kocher	16-7-5	1.91	0.06	0.30	2.15	4.42
Site Totals (Ac)	3.62	2.79	0.57	4.67	11.65	

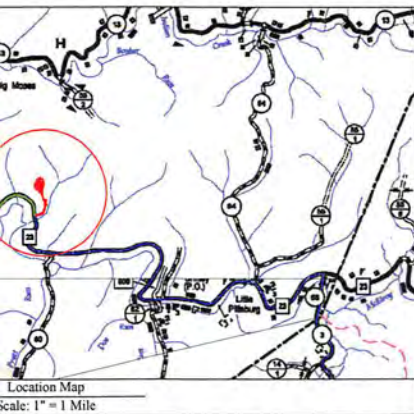
Access Road			
Surface Owner	TM - Parcel	Road Length	Type
Donna Brumbaugh	16-7-2	325.16'	Existing Access Road
Robert J Kocher	16-7	1,490.94'	Existing Access Road
Mary Ann Blattner	16-7-3	58.40'	Existing Access Road

Disturbed Area	
Well Pad Construction	3.62 Ac
Access Road Construction	2.79 Ac
Topsoil / Excess Material	0.57 Ac
Existing Additional Area	4.67 Ac
Total Disturbed Area	11.65 Ac
Additional Information	
Total Linear Feet of Access Road	1,874.50'



7.5' Quadrangle: Shirley
 ed: Middle Island Creek

Site Locations (NAD 83)		
Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.410435	-80.790954
Center of Well Pad	39.415093	-80.790363



Well Location Restrictions

- All Pad construction complies with the following restrictions.
- *250' from an existing well or developed spring used for poultry or dairy
 - *625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.
 - *100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
 - *300' from the edge of disturbance to a naturally reproducing trout stream.
 - *1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6A-12)

*DMT
 6/2/16
 PS
 6/2/16*

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities and Volumes
N1-N3	Site Notes
2	Overall Plan View
3	Overall Plan View (Aerial)
4-5	Plan View
6-7	Rehabilitation Plan View
8	Cross Sections - Well Pad
9	Cross Sections - Well Pad Access Road
G1	Grading Plan
S1	Site Reclamation
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details
M1	Midstream Production Details

As-Built Certification

This as-built certification certifies that the depicted topography, property, and structures are representative of the existing conditions. The gas well drilling pad site was designed and constructed under the supervision of another company and therefore, the reasonable clear conformance with the design drawings cannot be certified nor can the construction means and methods used to develop the site be certified. It is recommended that gas well drilling pads included in the existing comprehensive maintenance and inspection program for gas well drilling pads or that a comprehensive maintenance and inspection program be developed to monitor the pads conditions to insure the continued safe operation.



John P. See RPE 0051

Date: 05/19/2016

Revision

Date

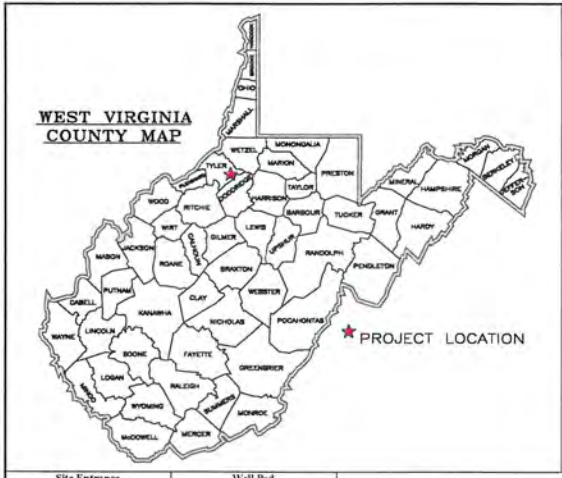


THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION



Cover Sheet
 Jackman Drill Pad
 McElroy District
 Tyler County, WV

Date: 05/19/2016
 Scale: As Shown
 Designed By: BC
 06/10/2016
 Sheet: 1 of 9



Site Entrance	Well Pad
WV-N NAD 83 N: 334226.07	WV-N NAD 83 N: 335920.09
WV-N NAD 83 E: 1603762.92	WV-N NAD 83 E: 1603954.28
WV-N NAD 27 N: 334190.72	WV-N NAD 27 N: 335884.74
WV-N NAD 27 E: 1635204.10	WV-N NAD 27 E: 1635395.47
Lat. NAD 83: 39.410435	Lat. NAD 83: 39.415093
Lon. NAD 83: -80.790954	Lon. NAD 83: -80.790363
Lat. NAD 27: 39.410354	Lat. NAD 27: 39.415012
Lon. NAD 27: -80.791127	Lon. NAD 27: -80.790536
UTM 17 NAD 83 N: 4362345.44	UTM 17 NAD 83 N: 4362862.50
UTM 17 NAD 83 E: 517996.65	UTM 17 NAD 83 E: 518046.34
	Pad Elev.: 1042.00'



Jackman IV
WV-N NAD 83 N: 335929.40
WV-N NAD 83 E: 1603951.80
WV-N NAD 27 N: 335894.04
WV-N NAD 27 E: 1635392.99
Lat. NAD 83: 39.415118
Lon. NAD 83: -80.790372
Lat. NAD 27: 39.415037
Lon. NAD 27: -80.790545
UTM 17 NAD 83 N: 4362865.32
UTM 17 NAD 83 E: 518045.54

Well Table

Project Contacts	
Antero Resources	Survey and Engineer
Robert Wilks - Project Coordinator 304-842-4100 Ofl. 304-627-7405 Cell	Kenneth Kelly 304-338-6985 Ofl.
Shawn Bennett - Construction Coordinator 304-842-4100 Ofl. 304-641-0071 Cell	John P. Seo 304-442-0220 Ofl.
	Zackary Summerfield 304-338-6987 Ofl.
	Geotechnical Engineer
	American Geotech, Inc. Kanti Patel 304-340-4277 Ofl.

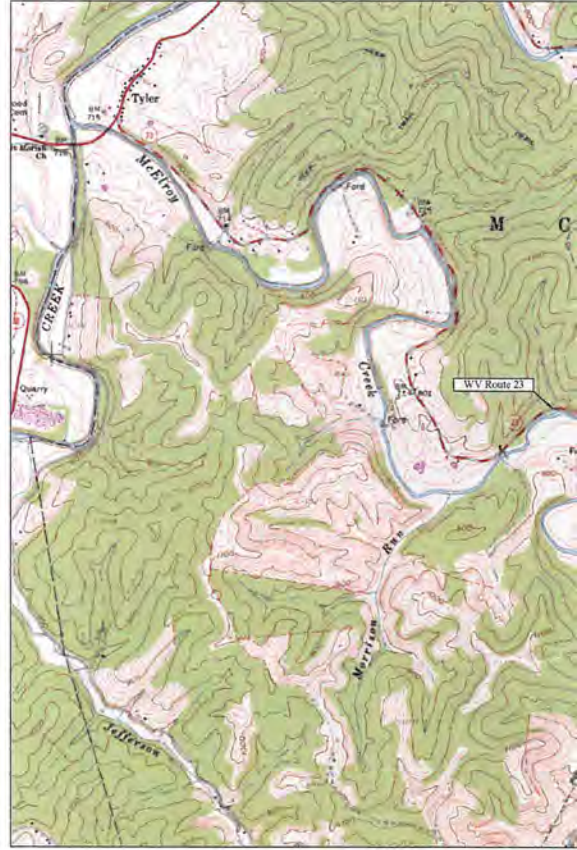
Environmental:
Wetland Delineations as provided by GAI Consultants dated March 14, 2016

Topographic Information:
The topographic information shown herein is based on aerial photography by Kelly Surveying PLLC, Daley, WV

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
West Virginia State Law Section 24-2-10 requires that you call two business days before you dig in the state of West Virginia.
IT'S THE LAW



Floodplain Conditions	
Do site construction activities take place in a floodplain?	NO
Permit needed from county floodplain coordinator?	NO
Flood Hazard Zone?	N
HEC-RAS Study completed?	N/A
Floodplain shown on drawings?	N/A
FIRM Map Number(s) for site:	54095C0173C
Acres of construction in floodplain:	N/A

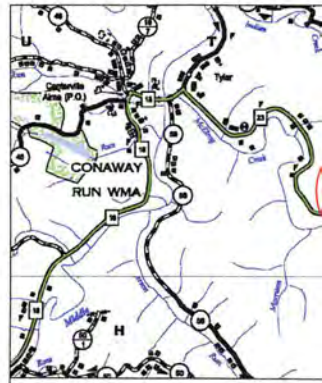


Site Locations (NAD 27)		
Structure	Latitude (DD)	Longitude
Site Entrance	39.410354	-80.791
Center of Well Pad	39.415012	-80.790

Approach Routes:

* From US Rt 50 West, Turn right onto Co Rt 9 (Tarklin Run Rd). Follow Co Rt 9 for 157 ft. Turn Left onto Co Rt 3 (Big Flint Rd). Follow Co Rt 3 for 0.2 mi. Turn Right to stay on Co Rt 3. Follow Co Rt 3 for 11.6 mi. Turn Left onto WV Rt 23 West. Follow WV Rt 23 West for 4.9 mi. The site entrance will be on the Right (East) side of the road.

From US Rt 50 East, Turn left onto Bunnell Run. Follow Bunnell Run for 0.5 mi. Continue on W Myles Ave (Old US 50 W). Follow W Myles Ave for 0.9 mi. Turn Left on Masonic Ave. Follow Masonic Ave for 0.2 mi. Turn Left onto Broadway St. Follow Broadway St for 318 ft. Turn Right onto Main St. Follow Main St for 305 ft. Turn Right onto Wells Ave. Follow Wells Ave for 308 ft. Turn Left onto 1st St. Follow 1st St for 0.1 mi. Continue on WV Rt 74 North (Mountain Dr). Follow WV Rt 74 North for 10.8 mi. Turn Slight Left onto WV Rt 18 North. Follow WV Rt 18 North for 5.2 mi. Turn Right onto WV Rt 23 East. Follow WV Rt 23 East for 3.7 mi. The site entrance will be on the Left (East) side of the road.



06/10/2016

Schedule of Quantities & Volumes

Earthwork

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As Built

Volumes		
Existing Surface	*Cut (CY)	**Fill (CY)
Grading Plan	863.83	1,876.58
Access Road Slip Repair	1,846.32	1,846.32
Well Pad Slip Repair	2,618.19	2,618.19

Access Road Face Drains		220 LF
#57 Stone		60.00 tons
4" Perforated Pipe		220 LF
Site Drain Materials 50% Coverage		550 SF
Solid Outlet Pipe		40 LF
Nonwoven Geotextile		220 SY

Access Road Toe Key Drains		110 LF
R-5 Stone		552.44 tons

Well Pad Face Drains		400 LF
#57 Stone		110.00 tons
4" Perforated Pipe		400 LF
Site Drain Materials 50% Coverage		1000 SF
Solid Outlet Pipe		320 LF
Nonwoven Geotextile		400 SY

Well Pad Toe Key Drains		100 LF
R-5 Stone		287.99 tons

Well Pad Gallery Drains and Outlets		240 LF
R-5 Stone		200.00 tons

Access Road Surfacing		4,506 SY
12" Min. 8% Ratio		4,506 SY
2" Stone Surfacing 3/4" or 1-1/2"		475.57 Tons
6" Stone Surfacing #1 & #2		1,426.71 Tons
10 oz Filter Fabric		4,506 SY

Well Pad Surfacing		9,724 SY
12" Min. 8% Ratio		9,724 SY
2" Stone Surfacing 3/4" or 1-1/2"		1,026.34 Tons
6" Stone Surfacing #1 & #2		3,079.02 Tons
10 oz Filter Fabric		9,724 SY

Erosion and Sediment Control

Super Silt Fence				1292
SSF#1	78	SSF#16	81	
SSF#2	39	SSF#17	58	
SSF#3	43	SSF#18	70	
SSF#4	75	SSF#19	56	
SSF#5	54	SSF#20	59	
SSF#6	55	SSF#21	31	
SSF#7	48	SSF#22	36	
SSF#8	41	SSF#23	40	
SSF#9	30	SSF#24	23	
SSF#10	28	SSF#25	35	
SSF#11	40	SSF#26	35	
SSF#12	39	SSF#27	12	
SSF#13	30	SSF#28	40	
SSF#14	25	SSF#29	35	
SSF#15	30	SSF#30	26	

12" Filter Sock		395
FS12#1	395	

12" Wattles				123
W12#1	117	W12#3	98	
W12#2	102	W12#4	106	

Seeding and Mulching		0.29 Acres

***NOTE:**

THE ACTUAL CROSS SECTIONS TO BE CONSTRUCTED WILL, UNLESS OTHERWISE DIRECTED BY THE ENGINEER, BE DERIVED FROM APPLICATION OF THE TYPICAL CROSS SECTIONS SHOWN ON THE DESIGN DRAWINGS. EXISTING GROUND SURFACE AND ESTIMATED TOP OF ROCK LINES INDICATED ON THE DESIGN DRAWINGS CROSS SECTIONS AND/OR PLAN VIEW DRAWINGS ARE APPROXIMATE. THE ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED ON THE SITE MAY DIFFER FROM THE TYPICAL CROSS SECTIONS. THESE DIFFERENCES MAY BE SIGNIFICANT. AND IF SO, THE DESIGN CROSS SECTIONS MAY NOT REPRESENT THE ACTUAL WORK NECESSARY TO COMPLETE THE WORK TO BE PERFORMED UNDER THE SCOPE OF THE PROJECT.

Revision: _____
 Date: _____

 THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

 Schedule of Quantities & Volumes
Jackman Drill Pad
 Mcleroy District
 Tyler County, WV
 Date: 07/10/2020
 Scale: As Shown
 Drawn: BJC/KW
 1 of 1
 Sheet 11 of 11

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

- 1. PERMITS:**
THE CONTRACTOR IS RESPONSIBLE IN OBTAINING WITH THE OWNER ALL ASSOCIATED AND JURISDICTIONAL PERMITS HAVE BEEN OBTAINED AND ARE IN PLACE BEFORE DISTURBING ANY HISTORICAL OR ENVIRONMENTAL RESOURCE. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL PERMITS FROM THE AGENCY OR AGENCIES HAVING JURISDICTION OVER THE PROPOSED PROJECT (E.G. LAND, STREAM, US ARMY CORPS OF ENGINEERS, STORM WATER, OFFICE OF OIL AND GAS, WADSWORTH ETC.) THIS PLAN SET DOES NOT ACKNOWLEDGE THAT ALL PERMITS HAVE BEEN OBTAINED.
- 2. PROJECT CONTROL DATUM:**
SURVEY GRADE DATUM WAS USED TO ESTABLISH PROJECT CONTROL, POST PROCESSED BY ORUS ONLINE POSITIONING USER SERVICE. <http://www.orus.com/opus/>
- 3. PROJECT HORIZONTAL DATUM:**
THE HORIZONTAL DATUM FOR THE PROJECT IS BASED ON THE WV STATE PLANE COORDINATE SYSTEM (SPCS) NORTH AMERICAN DATUM 1983 (NAD83).
- 4. PROJECT VERTICAL DATUM:**
ALL ELEVATIONS FOR THE PROJECT ARE GIVEN IN FEET, AND DATUM IN MEAN SEA LEVEL (MSL). ELEVATIONS ARE BASED ON THE NATIONAL GEODESIC SURVEY, NORTH AMERICAN VERTICAL DATUM 1983 OR AS PUBLISHED BY NOAA. <http://www.ngs.noaa.gov/datumtools/>
- 3. MATERIAL TESTING AND INSTALLATION GOVERNING CRITERIA:**
IF THE PROJECT PLAN SET INFORMATION OR DETAILS DO NOT DEPICT A SPECIFIC INSTALLATION PROCESS OF MATERIAL, THE ITEM OF MATERIAL SHALL BE INSTALLED, TESTED OR CONSTRUCTED ACCORDING TO THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES OR FEDERAL HIGHWAY PROJECTS ASHES, CURRENT EDITION AND INSTALLED, TESTED ACCORDING TO THE AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) CURRENT EDITION. THE MORE STRINGENT OF THE TWO ABOVE, ASTM SHALL APPLY. IN CONFLICT, ANY COMMERCIAL PRODUCT OR ITEM SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. IF THE ITEM OF PRODUCT SHALL BE INSTALLED OR USED THAT EXCEEDS THE MANUFACTURER'S RECOMMENDATIONS.
- 4. DESIGNER, SIGNING ENGINEER AND SIGNING SURVEYOR:**
KELLY SURVEYING PLLC, KELLY SURVEYING ENGINEER, SIGNING ENGINEER, SIGNING SURVEYOR SHALL MEAN KELLY SURVEYING PLLC OR A REPRESENTATIVE OF KELLY SURVEYING PLLC. CONTRACTOR, TECHNICAL OR ANY INDIVIDUAL PERFORMING TASKS, DUTIES OR PREPARATION OF PROJECT PLAN COMPONENTS UNDER THE DIRECTION OF KELLY SURVEYING PLLC AND THE SIGNING ENGINEER.
- 5. PROJECT PLAN SET, WELL SITE PLAN, CONSTRUCTION DRAWINGS**
PLAN OR ANY REFERENCE THERE TO:
PROJECT PLAN, PROJECT, PROJECT PLAN SET, CONSTRUCTION DRAWINGS, DESIGN, DESIGN, ANY REFERENCE TO PROJECT, PROJECT PLAN SET, CONSTRUCTION DRAWINGS, DESIGN, DESIGN, DESIGN, SCOPE OF WORK AND OR SIMILAR WORDS IN THE CONSTRUCTION NOTES, CONSTRUCTION OR DESIGN DRAWINGS, CONSTRUCTION OR DESIGN SPECIFICATIONS OR ANY PORTION OF THE PROJECT PLAN SET, CONTRACTOR SHALL MEAN KELLY SURVEYING PLLC, SHALL MEAN AND INCLUDE COMMON SENSE ITEMS, THE PLAN VIEWS, CROSS SECTIONS, PROFILES, DETAILS, NOTES, ADDITIONAL ATTACHMENTS AND OTHER ELEMENTS, APPENDICES OR REFERENCES CITED IN THE NOTES, INCLUDING ITEMS REQUIRED BY THIS TYPE OF CONSTRUCTION WHICH A COMPETENT CONTRACTOR SHOULD BE FAMILIAR WITH.
- a. OWNER:**
OWNER SHALL MEAN THAT ORGANIZATION IDENTIFIED IN THE PROJECT PLAN SET TITLE BORDER AS THE "THIS DOCUMENT IS PREPARED FOR (OWNER)" OR ANY INDIVIDUAL OR ORGANIZATION PERFORMING TASKS, DUTIES OR ANY FUNCTIONS FOR THE OWNER. THE OWNER HAS FINAL APPROVAL IN ALL MATERIALS, WORKMANSHIP, MEASUREMENTS, OR ANY AND ALL AFFIRMANCES.
- b. CONTRACTOR:**
CONTRACTOR SHALL MEAN ANY ORGANIZATION OF INDIVIDUAL ASSOCIATED WITH INSTALLATION OF AN ITEM ON THE PROJECT PLAN SET OR ANY ORGANIZATION OR INDIVIDUAL ASSOCIATED WITH THE WORKMANSHIP OF AN ITEM OR MATERIAL LISTED IN THE PROJECT PLAN SET. ANY ORGANIZATION OR INDIVIDUAL PERFORMING DUTIES OR ASSOCIATED WITH THE SCOPE OF WORK FOR THE PROJECT PLAN SET SHALL MEAN KELLY SURVEYING PLLC. CONTRACTOR OR A PRIME CONTRACTOR WITH SUBCONTRACTORS THE OWNER MAY DESIGNATE PORTIONS OF THE PROJECT TO BE COMPLETED BY CONTRACTORS SPECIALIZING IN VARIOUS MATERIAL INSTALLATION (E.G. CONCRETE AND SEWER/STORM CONTROL, INSTALLERS) ANY INDIVIDUAL, FIRM OR ORGANIZATION ASSOCIATED WITH THE SCOPE OF WORK OTHER THAN KELLY SURVEYING PLLC OR THE OWNER.
- 6. EQUIPMENT:**
THE CONTRACTOR SHALL PROVIDE EQUIPMENT SUFFICIENT TO PERFORM THE SCOPE OF WORK EFFICIENTLY AND IN A TIMELY MANNER. THE EQUIPMENT SHALL BE OF SIZE AND CAPABILITY TO PERFORM EARTH WORK AND INSTALLATION OF ITEMS DEPICTED ON THE PROJECT PLAN SET. A SINGLE DRAIN VIBRATORY ROLLER 11 TO 18 TONS, ARTICULATED TRUCKS (3), PAVES, DOUBLE DRUM OR PAVES ROLLERS, SHIMERS, WALKER, KELLY CATERPILLAR 855 SIZES OF EQUIPMENT, MEDIUM AND LARGE CLASS DOZERS, CATERPILLAR 625, 635, 645, 655, 665, 675, 685, 695, 705, 715, 725, 735, 745, 755, 765, 775, 785, 795, 805, 815, 825, 835, 845, 855, 865, 875, 885, 895, 905, 915, 925, 935, 945, 955, 965, 975, 985, 995, 1005, 1015, 1025, 1035, 1045, 1055, 1065, 1075, 1085, 1095, 1105, 1115, 1125, 1135, 1145, 1155, 1165, 1175, 1185, 1195, 1205, 1215, 1225, 1235, 1245, 1255, 1265, 1275, 1285, 1295, 1305, 1315, 1325, 1335, 1345, 1355, 1365, 1375, 1385, 1395, 1405, 1415, 1425, 1435, 1445, 1455, 1465, 1475, 1485, 1495, 1505, 1515, 1525, 1535, 1545, 1555, 1565, 1575, 1585, 1595, 1605, 1615, 1625, 1635, 1645, 1655, 1665, 1675, 1685, 1695, 1705, 1715, 1725, 1735, 1745, 1755, 1765, 1775, 1785, 1795, 1805, 1815, 1825, 1835, 1845, 1855, 1865, 1875, 1885, 1895, 1905, 1915, 1925, 1935, 1945, 1955, 1965, 1975, 1985, 1995, 2005, 2015, 2025, 2035, 2045, 2055, 2065, 2075, 2085, 2095, 2105, 2115, 2125, 2135, 2145, 2155, 2165, 2175, 2185, 2195, 2205, 2215, 2225, 2235, 2245, 2255, 2265, 2275, 2285, 2295, 2305, 2315, 2325, 2335, 2345, 2355, 2365, 2375, 2385, 2395, 2405, 2415, 2425, 2435, 2445, 2455, 2465, 2475, 2485, 2495, 2505, 2515, 2525, 2535, 2545, 2555, 2565, 2575, 2585, 2595, 2605, 2615, 2625, 2635, 2645, 2655, 2665, 2675, 2685, 2695, 2705, 2715, 2725, 2735, 2745, 2755, 2765, 2775, 2785, 2795, 2805, 2815, 2825, 2835, 2845, 2855, 2865, 2875, 2885, 2895, 2905, 2915, 2925, 2935, 2945, 2955, 2965, 2975, 2985, 2995, 3005, 3015, 3025, 3035, 3045, 3055, 3065, 3075, 3085, 3095, 3105, 3115, 3125, 3135, 3145, 3155, 3165, 3175, 3185, 3195, 3205, 3215, 3225, 3235, 3245, 3255, 3265, 3275, 3285, 3295, 3305, 3315, 3325, 3335, 3345, 3355, 3365, 3375, 3385, 3395, 3405, 3415, 3425, 3435, 3445, 3455, 3465, 3475, 3485, 3495, 3505, 3515, 3525, 3535, 3545, 3555, 3565, 3575, 3585, 3595, 3605, 3615, 3625, 3635, 3645, 3655, 3665, 3675, 3685, 3695, 3705, 3715, 3725, 3735, 3745, 3755, 3765, 3775, 3785, 3795, 3805, 3815, 3825, 3835, 3845, 3855, 3865, 3875, 3885, 3895, 3905, 3915, 3925, 3935, 3945, 3955, 3965, 3975, 3985, 3995, 4005, 4015, 4025, 4035, 4045, 4055, 4065, 4075, 4085, 4095, 4105, 4115, 4125, 4135, 4145, 4155, 4165, 4175, 4185, 4195, 4205, 4215, 4225, 4235, 4245, 4255, 4265, 4275, 4285, 4295, 4305, 4315, 4325, 4335, 4345, 4355, 4365, 4375, 4385, 4395, 4405, 4415, 4425, 4435, 4445, 4455, 4465, 4475, 4485, 4495, 4505, 4515, 4525, 4535, 4545, 4555, 4565, 4575, 4585, 4595, 4605, 4615, 4625, 4635, 4645, 4655, 4665, 4675, 4685, 4695, 4705, 4715, 4725, 4735, 4745, 4755, 4765, 4775, 4785, 4795, 4805, 4815, 4825, 4835, 4845, 4855, 4865, 4875, 4885, 4895, 4905, 4915, 4925, 4935, 4945, 4955, 4965, 4975, 4985, 4995, 5005, 5015, 5025, 5035, 5045, 5055, 5065, 5075, 5085, 5095, 5105, 5115, 5125, 5135, 5145, 5155, 5165, 5175, 5185, 5195, 5205, 5215, 5225, 5235, 5245, 5255, 5265, 5275, 5285, 5295, 5305, 5315, 5325, 5335, 5345, 5355, 5365, 5375, 5385, 5395, 5405, 5415, 5425, 5435, 5445, 5455, 5465, 5475, 5485, 5495, 5505, 5515, 5525, 5535, 5545, 5555, 5565, 5575, 5585, 5595, 5605, 5615, 5625, 5635, 5645, 5655, 5665, 5675, 5685, 5695, 5705, 5715, 5725, 5735, 5745, 5755, 5765, 5775, 5785, 5795, 5805, 5815, 5825, 5835, 5845, 5855, 5865, 5875, 5885, 5895, 5905, 5915, 5925, 5935, 5945, 5955, 5965, 5975, 5985, 5995, 6005, 6015, 6025, 6035, 6045, 6055, 6065, 6075, 6085, 6095, 6105, 6115, 6125, 6135, 6145, 6155, 6165, 6175, 6185, 6195, 6205, 6215, 6225, 6235, 6245, 6255, 6265, 6275, 6285, 6295, 6305, 6315, 6325, 6335, 6345, 6355, 6365, 6375, 6385, 6395, 6405, 6415, 6425, 6435, 6445, 6455, 6465, 6475, 6485, 6495, 6505, 6515, 6525, 6535, 6545, 6555, 6565, 6575, 6585, 6595, 6605, 6615, 6625, 6635, 6645, 6655, 6665, 6675, 6685, 6695, 6705, 6715, 6725, 6735, 6745, 6755, 6765, 6775, 6785, 6795, 6805, 6815, 6825, 6835, 6845, 6855, 6865, 6875, 6885, 6895, 6905, 6915, 6925, 6935, 6945, 6955, 6965, 6975, 6985, 6995, 7005, 7015, 7025, 7035, 7045, 7055, 7065, 7075, 7085, 7095, 7105, 7115, 7125, 7135, 7145, 7155, 7165, 7175, 7185, 7195, 7205, 7215, 7225, 7235, 7245, 7255, 7265, 7275, 7285, 7295, 7305, 7315, 7325, 7335, 7345, 7355, 7365, 7375, 7385, 7395, 7405, 7415, 7425, 7435, 7445, 7455, 7465, 7475, 7485, 7495, 7505, 7515, 7525, 7535, 7545, 7555, 7565, 7575, 7585, 7595, 7605, 7615, 7625, 7635, 7645, 7655, 7665, 7675, 7685, 7695, 7705, 7715, 7725, 7735, 7745, 7755, 7765, 7775, 7785, 7795, 7805, 7815, 7825, 7835, 7845, 7855, 7865, 7875, 7885, 7895, 7905, 7915, 7925, 7935, 7945, 7955, 7965, 7975, 7985, 7995, 8005, 8015, 8025, 8035, 8045, 8055, 8065, 8075, 8085, 8095, 8105, 8115, 8125, 8135, 8145, 8155, 8165, 8175, 8185, 8195, 8205, 8215, 8225, 8235, 8245, 8255, 8265, 8275, 8285, 8295, 8305, 8315, 8325, 8335, 8345, 8355, 8365, 8375, 8385, 8395, 8405, 8415, 8425, 8435, 8445, 8455, 8465, 8475, 8485, 8495, 8505, 8515, 8525, 8535, 8545, 8555, 8565, 8575, 8585, 8595, 8605, 8615, 8625, 8635, 8645, 8655, 8665, 8675, 8685, 8695, 8705, 8715, 8725, 8735, 8745, 8755, 8765, 8775, 8785, 8795, 8805, 8815, 8825, 8835, 8845, 8855, 8865, 8875, 8885, 8895, 8905, 8915, 8925, 8935, 8945, 8955, 8965, 8975, 8985, 8995, 9005, 9015, 9025, 9035, 9045, 9055, 9065, 9075, 9085, 9095, 9105, 9115, 9125, 9135, 9145, 9155, 9165, 9175, 9185, 9195, 9205, 9215, 9225, 9235, 9245, 9255, 9265, 9275, 9285, 9295, 9305, 9315, 9325, 9335, 9345, 9355, 9365, 9375, 9385, 9395, 9405, 9415, 9425, 9435, 9445, 9455, 9465, 9475, 9485, 9495, 9505, 9515, 9525, 9535, 9545, 9555, 9565, 9575, 9585, 9595, 9605, 9615, 9625, 9635, 9645, 9655, 9665, 9675, 9685, 9695, 9705, 9715, 9725, 9735, 9745, 9755, 9765, 9775, 9785, 9795, 9805, 9815, 9825, 9835, 9845, 9855, 9865, 9875, 9885, 9895, 9905, 9915, 9925, 9935, 9945, 9955, 9965, 9975, 9985, 9995, 10005, 10015, 10025, 10035, 10045, 10055, 10065, 10075, 10085, 10095, 10105, 10115, 10125, 10135, 10145, 10155, 10165, 10175, 10185, 10195, 10205, 10215, 10225, 10235, 10245, 10255, 10265, 10275, 10285, 10295, 10305, 10315, 10325, 10335, 10345, 10355, 10365, 10375, 10385, 10395, 10405, 10415, 10425, 10435, 10445, 10455, 10465, 10475, 10485, 10495, 10505, 10515, 10525, 10535, 10545, 10555, 10565, 10575, 10585, 10595, 10605, 10615, 10625, 10635, 10645, 10655, 10665, 10675, 10685, 10695, 10705, 10715, 10725, 10735, 10745, 10755, 10765, 10775, 10785, 10795, 10805, 10815, 10825, 10835, 10845, 10855, 10865, 10875, 10885, 10895, 10905, 10915, 10925, 10935, 10945, 10955, 10965, 10975, 10985, 10995, 11005, 11015, 11025, 11035, 11045, 11055, 11065, 11075, 11085, 11095, 11105, 11115, 11125, 11135, 11145, 11155, 11165, 11175, 11185, 11195, 11205, 11215, 11225, 11233, 11245, 11255, 11265, 11275, 11285, 11295, 11305, 11315, 11325, 11335, 11345, 11355, 11365, 11375, 11385, 11395, 11405, 11415, 11425, 11435, 11445, 11455, 11465, 11475, 11485, 11495, 11505, 11515, 11525, 11535, 11545, 11555, 11565, 11575, 11585, 11595, 11605, 11615, 11625, 11633, 11645, 11655, 11665, 11677, 11689, 11701, 11713, 11725, 11737, 11749, 11761, 11773, 11785, 11797, 11809, 11821, 11833, 11845, 11857, 11869, 11881, 11893, 11905, 11917, 11929, 11941, 11953, 11965, 11977, 11989, 12001, 12013, 12025, 12037, 12049, 12061, 12073, 12085, 12097, 12109, 12121, 12133, 12145, 12157, 12169, 12181, 12193, 12205, 12217, 12229, 12241, 12253, 12265, 12277, 12289, 12301, 12313, 12325, 12337, 12349, 12361, 12373, 12385, 12397, 12409, 12421, 12433, 12445, 12457, 12469, 12481, 12493, 12505, 12517, 12529, 12541, 12553, 12565, 12577, 12589, 12601, 12613, 12625, 12637, 12649, 12661, 12673, 12685, 12697, 12709, 12721, 12733, 12745, 12757, 12769, 12781, 12793, 12805, 12817, 12829, 12841, 12853, 12865, 12877, 12889, 12901, 12913, 12925, 12937, 12949, 12961, 12973, 12985, 12997, 13009, 13021, 13033, 13045, 13057, 13069, 13081, 13093, 13105, 13117, 13129, 13141, 13153, 13165, 13177, 13189, 13201, 13213, 13225, 13237, 13249, 13261, 13273, 13285, 13297, 13309, 13321, 13333, 13345, 13357, 13369, 13381, 13393, 13405, 13417, 13429, 13441, 13453, 13465, 13477, 13489, 13501, 13513, 13525, 13537, 13549, 13561, 13573, 13585, 13597, 13609, 13621, 13633, 13645, 13657, 13669, 13681, 13693, 13705, 13717, 13729, 13741, 13753, 13765, 13777, 13789, 13801, 13813, 13825, 13837, 13849, 13861, 13873, 13885, 13897, 13909, 13921, 13933, 13945, 13957, 13969, 13981, 13993, 14005, 14017, 14029, 14041, 14053, 14065, 14077, 14089, 14101, 14113, 14125, 14137, 14149, 14161, 14173, 14185, 14197, 14209, 14221, 14233, 14245, 14257, 14269, 14281, 14293, 14305, 14317, 14329, 14341, 14353, 14365, 14377, 14389, 14401, 14413, 14425, 14437, 14449, 14461, 14473, 14485, 14497, 14509, 14521, 14533, 14545, 14557, 14569, 14581, 14593, 14605, 14617, 14629, 14641, 14653, 14665, 14677, 14689, 14701, 14713, 14725, 14737, 14749, 14761, 14773, 14785, 14797, 14809, 14821, 14833, 14845, 14857, 14869, 14881, 14893, 14905, 14917, 14929, 14941, 14953, 14965, 14977, 14989, 15001, 15013, 15025, 15037, 15049, 15061, 15073, 15085, 15097, 15109, 15121, 15133, 15145, 15157, 15169, 15181, 15193, 15205, 15217, 15229, 15241, 15253, 15265, 15277, 15289, 15301, 15313, 15325, 15337, 15349, 15361, 15373, 15385, 15397, 15409, 15421, 15433, 15445, 15457, 15469, 15481, 15493, 15505, 15517, 15529, 15541, 15553, 15565, 15577, 15589, 15601, 15613, 15625, 15637, 15649, 15661, 15673, 15685, 15697, 15709, 15721, 15733, 15745, 15757, 15769, 15781, 15793, 15805, 15817, 15829, 15841, 15853, 15865, 15877, 15889, 15901, 15913, 15925, 15937, 15949, 15961, 15973, 15985, 15997, 16009, 16021, 16033, 16045, 16057, 16069, 16081, 16093, 16105, 16117, 16129, 16141, 16153, 16165, 16177, 16189, 16201, 16213, 16225, 16237, 16249, 16261, 16273, 16285, 16297, 16309, 16321, 16333, 16345, 16357, 16369, 16381, 16393, 16405, 16417, 16429, 16441, 16453, 16465, 16477, 16489, 16501, 16513, 16525, 16537, 16549, 16561, 16573, 16585, 16597, 16609, 16621, 16633, 16645, 16657, 16669, 16681, 16693, 16705, 16717, 16729, 16741, 16753, 16765, 16777, 16789, 16801, 16813, 16825, 16837, 16849, 16861, 16873, 16885, 16897, 16909, 16921, 16933, 16945, 16957, 16969, 16981, 16993, 17005, 17017, 17029, 17041, 17053, 17065, 17077, 17089, 17101, 17113, 17125, 17137, 17149, 17161, 17173, 17185, 17197, 17209, 17221, 17233, 17245, 17257, 17269, 17281, 17293, 17305, 17317, 17329, 17341, 17353, 17365, 17377, 17389, 17401, 17413, 17425, 17437, 17449, 17461, 17473, 17485, 17497, 17509, 17521, 17533, 17545, 17557, 17569, 17581, 17593, 17605, 17617, 17629, 17641, 17653, 17665, 17677, 17689, 17701, 17713, 17725, 17737, 17749, 17761, 17773, 17785, 17797, 17809, 17821, 17833, 17845, 17857, 17869, 17881, 17893, 17905, 17917, 17929, 17941, 17953, 17965, 17977, 17989, 18001, 18013, 18025, 18037, 18049, 18061, 18073, 18085, 18097, 18109, 18121, 18133, 18145, 18157, 18169, 18181, 18193, 18205, 18217, 18229, 18241, 18253, 18265, 18277, 18289, 18301, 18313, 18325, 18337, 18349, 18361, 18373, 18385, 18397, 18409, 18421, 18433, 18445, 18457, 18469, 18481, 18493, 18505, 18517, 18529, 18541, 18553, 18565, 18577, 18589, 18601, 18613, 18625, 18637, 18649, 18661, 18673, 18685, 18697, 18709, 18721, 18733, 18745, 18

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

- 1. WORK INCLUDED, BUT NOT LIMITED TO:**
 EXHAUSTIVE GRADING, INSTALLATION OF ANY ACTIVITY ASSOCIATED WITH THE GRADING, EXCAVATION, CUTTING OR INSTALLATION OF EARTH MATERIAL TO DEVELOP A SITE ACCEPTABLE TO PERFORM WITHOUT DETRIMENTAL IMPACTS TO THE ENVIRONMENT AND OPERATIONAL/LOGISTICAL SAFETY AS A WELL AS TO PROVIDE FOR IMPROVEMENT OR ANY ASSOCIATED FACILITY OF MAINTENANCE OF SUCH FACILITIES. ALL THE NOTES SHALL APPLY TO WORK ASSOCIATED WITH ACTIVITIES RELATED TO THE DRILL PAD AND GAS INDUSTRY, AS SHOWN ON THE PROJECT PLAN SET AND WITHIN THE WELL SITE BOUNDARIES, SPECIFIED THEREOF AND HEREIN, WHICH SHALL INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING:
 EXHAUSTIVE GRADING AND SITE PREPARATION, INCLUDING INSTALLATION OF ERS CONTROLS, INSTALLATION OF SUBSISTANCE DRAINAGE FEATURES, GRADING TO ESTABLISH SUBGRADES, AND FINAL GRADES, PAVEMENTS, GRAVEL SURFACES, AND GRASSED AREAS.
 EXCAVATION, FILLING AND BACKFILLING AND COMPACTION, DETERMINING OR ADDITION OF WATER AS REQUIRED.
 ADDITIONAL WORK AS SPECIFIED BY THE OWNER.
 PLACING OF TOPSOIL AND FINISH GRADING.
- 2. PROJECT CONDITION:**
a. WEATHER REAHER:
 WHEN FILL OPERATIONS ARE CEASED DUE TO WEATHER (RAIN, FREEZING, SNOW, ETC.) CONSTRUCTION SHALL NOT BE RESUMED UNTIL THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE HAS VERIFIED SOIL STRENGTH HAS NOT BEEN ADVERSELY AFFECTED. IF SOIL STRENGTH HAS BEEN DECREASED, THE AFFECTED PORTION OF FILL SHALL BE RECONSTRUCTED, MOISTENED, OR DRIED AS REQUIRED, AND RECOMPACTED TO THE SPECIFIED DENSITY.
- b. UTILITIES:**
 PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES WHICH MAY BE IN THE AREA.
 SHOULD UNCHARTERED, INCORRECTLY CHARTERED IN FIELD, OR INCORRECTLY MARKED UTILITIES BE FOUND, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY. EXCAVATION CONTRACTOR SHALL CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS. CONTRACTOR SHALL COOPERATE WITH OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN OPERATIONAL AND SHALL REPAIR OR ARRANGE FOR REPAIR, DAMAGED UTILITIES TO SATISFACTION OF UTILITY OWNER.
- c. DRAINAGE:** THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DRAINAGE OF THE SITE DURING CONSTRUCTION OF THE PROJECT. WATER SHALL NOT BE ALLOWED TO ACCUMULATE IN ANY OF THE EXCAVATED AREAS. STORM OR GROUND WATER COLLECTION ON SITE DURING CONSTRUCTION SHALL BE REMOVED BY PUMPING TO DITCHES OR OTHER SUITABLE MEANS.
- d. COORDINATION:**
 THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE BY NOTIFYING THE INSPECTOR OF SCHEDULED WORK IN ADVANCE.
 THE CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES WHOSE WORK WILL BE AFFECTED ON THE SITE.
- 3. DEFINITIONS:**
a. GEOTECHNICAL ENGINEER:
 A LICENSED INDEPENDENT GEOTECHNICAL ENGINEER AND TEST LABORATORY APPROVED BY THE OWNER SERVING IN THE SOILS ENGINEER TO ENSURE THAT EXHIBITWORK AND THE PROJECT PLAN SET REFLECTS THE AVAILABLE ON-SITE MATERIAL.
 THAT THE AVAILABLE ON-SITE MATERIAL AND COMMERCIAL MATERIAL IS TESTED TO MEET OR EXCEED THE SPECIFICATIONS FOR DENSITY AND MOISTURE CONTENT AND THE PARTICLE SIZE IS MAINTAINED OR APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
 THE GEOTECHNICAL ENGINEER SHALL PREPARE A REPORT OF HIS FINDINGS AND RECOMMENDATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO READ THE GEOTECHNICAL REPORT BEFORE BEGINS THE PROJECT. THE GEOTECHNICAL REPORT AND THE RECOMMENDATIONS PROVIDED SHALL GOVERN ALL ENGINEERED FILL OR CONTROLLED FILL. THE GEOTECHNICAL ENGINEER SHALL ATTEND THE PRE-CONSTRUCTION CONFERENCE. UNENGINEERED FILL, CONTROLLED FILL IS DEFINED AS MATERIAL REQUIRED IN ALL AREAS ON WHICH FINAL GRADE IS NOT PLACED ON ORIGINAL OF EXCAVATED SOIL. MATERIAL SHALL BE FINISHED AT MAXIMUM LOOSE LIFT THICKNESS 15 INCHES COMPACTED TO 12 INCHES.
- b. ROCK:**
 FOR THE PURPOSES OF CLASSIFIED EXCAVATION, ROCK SHALL BE DEFINED AS MATERIAL THAT CANNOT BE DISLOGGED BY A CATERPILLAR MODEL NO. D-80L HEAVY DUTY TRACK-TYPE TRACTOR, OR OF EQUALLY RATED AT NOT LESS THAN 250 HP FLOWMELT PUMPER AND EQUIPPED WITH A SINGLE SHANK HYDRAULIC BREAKER, CAPABLE OF EXERTING NOT LESS THAN 45,000 LBS BREAKOUT FORCE. THIS DEFINITION OF ROCK DOES NOT INCLUDE MATERIALS SUCH AS MANDRILL, LOOSE ROCK, OR OTHER MATERIALS THAT CAN BE REMOVED BY MEANS OTHER THAN DRILLING AND BLASTING, BUT WHICH FOR REASONS OF ECONOMY IN EXCAVATING THE CONTRACTOR CHOOSES TO REMOVE BY DRILLING AND BLASTING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ROCK AND IF BLASTING IS REQUIRED FOR THIS PROJECT. IF THE CONTRACTOR DETERMINES THAT BLASTING IS NECESSARY OR FOR REASONS OF ECONOMY CHOOSES TO BLAST THE MATERIAL, THE CONTRACTOR SHALL PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, HOLES, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS CREATED BY BLASTING OPERATIONS.
- c. UNSUITABLE MATERIAL:**
 UNSUITABLE MATERIAL SHALL BE DEFINED AS MATERIAL THAT EXHIBITS EXCESSIVE PLUMBING OR THAT DOES NOT MEET DENSITY REQUIREMENTS, THE MATERIAL CAN NOT MEET THE COMPACTION REQUIREMENTS OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- d. SATISFACTORY MATERIALS:**
 MATERIALS ARE SATISFACTORY AS FILL MATERIAL WHEN THEY CAN MEET THE STANDARD PROCTOR FOR THE MATERIAL CLASSIFICATION IN THE GEOTECHNICAL REPORT, CLASS A, CLASS B, CLASS C, USED AS PER THE GEOTECHNICAL REPORT.
 THE MOST DISCRETE MATERIAL, OBTAIN ON THE PROJECT SHALL BE PLACED IN THE 50% KEY AREA. RESPONSE UNIFORM TO PROMOTE GRADE WITH THE LOWER CLASS MATERIAL.
 MEETS THE DENSITY REQUIREMENTS. SATISFACTORY MATERIAL SHALL BE ABLE TO COMPACT TO 95 PERCENT OF THE STANDARD PROCTOR (PER ASTM D 698) SHALL BE WITHIN +/-4 PERCENT POINTS OF OPTIMUM MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698. BE THE CORRECT PARTICLE SIZE FOR THE PROJECT PLAN SET OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- e. UNSATISFACTORY MATERIALS:**
 INCLUDE THESE MATERIALS CONTAINING ROOTS AND OTHER ORGANIC MATTER, BRUSH, DEBRIS, FROZEN MATERIALS, EXCESSIVELY WET MATERIAL, MATERIAL THAT EXCEEDS THE PARTICLE SIZE OR MATERIAL, DETERMINE UNSATISFACTORY BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- f. DEGREE OF COMPACTION:**
 IS A PERCENTAGE OF THE MAXIMUM DENSITY OBTAINED BY THE TEST PROCEDURE PRESENTED IN ASTM D 698, AS A PERCENT OF LABORATORY MAXIMUM DENSITY, OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- g. OPTIMUM MOISTURE:**
 MAXIMUM DENSITY CURVE FOR EACH TYPE OF SOIL USED TOP ENGINEERED, CONTROLLED FILL.
- h. TOPSOIL:**
 MATERIAL OBTAINED FROM EXCAVATIONS, SUITABLE FOR TOP SOILS SHALL CONSIST OF FRAGILE CLAY LOAM, FREE FROM ROOTS, STONES, OTHER UNDESIRABLE MATERIAL AND SHALL BE CAPABLE OF SUPPORTING A GOOD GROWTH OF GRASS.
- i. SOIL BEARING CAPACITY:**
 SOIL UNDERNEATH FOOTINGS AND STRUCTURES SHALL HAVE A MINIMUM BEARING CAPACITY OF 2000 POUNDS PER SQUARE FOOT, AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE.
- 4. TEST BORINGS:**
 A SUBSURFACE INVESTIGATION HAS BEEN MADE AT THE SITE OF THE PROJECT IN ORDER TO ASCERTAIN CHARACTER OF MATERIALS TO BE EXCAVATED. THIS INFORMATION IS PROVIDED FOR GENERAL INFORMATION ONLY. ATTENTION IS DIRECTED TO THE FACT THAT THESE LOGS AND MATERIALS ENCOUNTERED AT BORINGS (LOCATING ONLY) INFORMING IN THE PLANS OR SPECIFICATIONS SHALL BE TAKEN AS A GUARANTEE THAT MATERIALS OTHER THAN THOSE DISCLOSED BY BORINGS WILL BE ENCOUNTERED OR THAT PROPORTIONS OF VARIOUS MATERIALS WILL NOT VARY FROM THOSE INDICATED. IF THE CONTRACTOR HAS ANY QUESTIONS OR DESIRES ADDITIONAL INFORMATION IT IS HIS RESPONSIBILITY TO ACQUIRE THIS INFORMATION AT HIS OWN EXPENSE. ALL EXCAVATION FOR PROJECT IS TO BE CONSIDERED AS AS-BUILT AND NO ALLOWANCES WILL BE MADE FOR ROCK ENCOUNTERED OR REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL.
- 5. CONSTRUCTION:**
a. CONTINUATION OF TOPSOIL:
 AS REQUIRED WITHOUT CONTAMINATION WITH SUBSOIL AND STORED AT CONVENIENT AREAS FOR LATER APPLICATION OR AT LOCATIONS SPECIFIED IN THE PROJECT PLAN SET. ANY SURPLUS OF TOPSOIL FROM EXCAVATIONS AND GRADING SHALL BE STOCKPILED IN A LOCATION APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- b. PLACING TOPSOIL:**
 ON AREAS TO RECEIVE TOPSOIL, THE COMPACTED AREA SHALL BE SCARIFIED TO A 2 INCH DEPTH OF BORING. TOPSOIL SHALL BE APPLIED TO THE AREAS AND GRADES INDICATED IN AND GRADDED TO THE ELEVATIONS AND SLOPES SHOWN. TOPSOIL SHALL NOT BE SPREAD WHEN FROZEN OR EXCESSIVELY WET OR DRY OR EXCEED FOUR (4) INCHES IN DEPTH ON SLOPES STEEPER THAN THREE TO ONE (3:1).
- c. EXCAVATION:**
 EXCAVATION SHALL BE, FOR THOSE ITEMS SPECIFICALLY INDICATED IN THE PROJECT PLAN SET, AFTER TOPSOIL REMOVAL HAS BEEN COMPLETED. EXCAVATION OF EVERY DESCRIPTION, REGARDLESS OF MATERIAL ENCOUNTERED, WITHIN THE GRADING LIMITS OF THE PROJECT SHALL BE PERFORMED TO REACH THE DEPTHS OF THE DITCHES AND GRADES INDICATED IN THE PROJECT PLAN SET. SATISFACTORY EXCAVATED MATERIAL SHALL BE TRANSPORTED TO AND PLACED IN FILL AREAS WITHIN THE LIMITS OF THE WORK. UNSATISFACTORY MATERIAL, SOFT OR OTHERWISE UNSATISFACTORY MATERIAL SHALL BE REPLACED WITH SATISFACTORY MATERIAL EXCAVATED MATERIAL OR OTHER APPROVED MATERIALS.
 ALL UNSUITABLE MATERIAL SHALL BE REGRASS SEEDING BY THE CONTRACTOR'S OPERATIONS AND SURPLUS MATERIAL SHALL BE REGRASS SEEDING AND MULCHED.
 EXCAVATION AND FILLING SHALL BE PERFORMED IN A MANNER AND SEQUENCE THAT WILL PROMOTE DRAINAGE AT ALL TIMES. EXCAVATIONS SHALL BE KEPT FREE FROM WATER UNTIL CONSTRUCTION THEREIN IS IN PROGRESS. IF THE CONTRACTOR FAILS TO PROVIDE ADEQUATE DRAINAGE AND THE MATERIAL BECOMES SOFT OR OTHERWISE UNSUITABLE AS A RESULT, SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SATISFACTORY ON-SITE MATERIAL. OR BORROW MATERIAL FROM APPROVED LOCATIONS, OR SHALL BE DRIED AND RECOMPACTED AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- d. DITCHES, CUTTERS AND CHANNEL CHANGES:**
 DITCHES, CUTTERS, AND CHANNEL CHANGES OR ANY SIMILAR CONSTRUCTED CONVEYANCE SHALL BE CUT ACCURATELY TO THE CROSS SECTIONS AND GRADES INDICATED. ALL ROOTS, STUMPS, ROCK, AND FOREIGN MATTER IN THE SIDES AND BOTTOM OF DITCHES, CUTTERS, AND CHANNEL CHANGES SHALL BE TRIMMED AND GROUND OR REMOVED TO CONFORM TO THE SLOPE, GRADE, AND SHAPE OF THE SECTION INDICATED. CARE SHALL BE TAKEN TO EXCAVATE DITCHES AND CUTTERS TO PROPERLY GRASS/SEED.
 EXCESSIVE DITCH AND CUTTER EXCAVATION SHALL BE BACKFILLED TO GRADE EITHER WITH COMPACTED TO SPECIFIED DENSITIES MATERIAL, OR WITH SUITABLE STONE OR AGGREGATE TO FORM AN ADEQUATE CONVEYANCE STRUCTURE AS DIRECTED. ALL DITCHES AND CUTTERS EXCAVATED SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE OF THE WORK.
 SATISFACTORY MATERIAL EXCAVATED FROM DITCHES AND CHANNEL CHANGES SHALL BE PLACED IN FILL AREAS OR AREAS APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
 UNSUITABLE AND EXCESSIVE MATERIAL SHALL BE DISPOSED OF IN DESIGNATED WASTE AREAS OR AS DIRECTED THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- e. STABILITY OF EXCAVATIONS:**
 MAINTAIN SIDES AND SLOPES OF EXCAVATIONS IN A MANNER SUCH THAT THE EXCAVATION PROVIDES SAFETY OF PERSONNEL. **CFR 29 PART 1226 SUBPART F** PROTECTION OF WORK, AND COMPLIANCE WITH REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES.
- f. PREPARATION OF GROUND SURFACE FOR FILL:**
 ALL VEGETATION SUCH AS ROOTS, BRUSH, HEAVY SOGS, HEAVY GROWTH OF GRASS, AND ALL OTHER VEGETATIVE MATTER, RUBBISH, AND OTHER UNSATISFACTORY MATERIAL WITHIN THE AREA UPON WHICH FILL IS TO BE PLACED, SHALL BE STRIPPED OR OTHERWISE REMOVED BEFORE THE FILL IS STARTED. IN NO CASE WILL UNSATISFACTORY MATERIAL REMAIN IN OR UNDER THE FILL AREA. THE AREAS SHALL THEN BE EXCAVATED TO DURABLE MATERIAL CAPABLE OF ACCEPTING SUPPORTING THE FILL.
 THE DITCH SHALL BE AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
 ALL AREAS TO RECEIVE FILL SHALL BE COMPACTED WITH VIBRATORY ROLLERS, DRUM ROLLERS, SHEEPSFOOT ROLLERS OR OTHER MECHANICAL MEANS ACCEPTABLE TO THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE. TO BE PLACED SHALL BE PLOUGHED, STEEPED, BENCHED, OR BROWN UP AS DIRECTED, IN SUCH MANNER THAT THE FILL MATERIAL WILL BOND WITH THE EXISTING SURFACE. PREPARED SURFACES ON WHICH COMPACTED FILL IS TO BE PLACED SHALL BE WETTED OR DRIED AS MAY BE REQUIRED TO OBTAIN THE SPECIFIED MOISTURE CONTENT AND DENSITY. BEFORE ANY AREA CAN RECEIVE FILL IT MUST BE APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- g. FILLS AND EMBANKMENTS:**
 FILLS AND EMBANKMENTS SHALL BE CONSTRUCTED AT THE LOCATIONS AND TO LIMITS AND GRADES INDICATED. THE COMPACTED FILL SHALL BE CONSTRUCTED WITHIN THE LIMITS OF THE IMPROVED MATERIAL OBTAINED DURING EXCAVATION MAY BE USED IN FORMING REQUIRED FILL. FILL SHALL BE CONSTRUCTED WITH SATISFACTORY MATERIAL AND SHALL BE FREE FROM ROOTS, OTHER ORGANIC MATERIAL, AND FROZEN MATERIAL. WILL BE PERMITTED IN THE FILL. ALL FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
- h. COMPACTION:**
 EACH LAYER OF THE FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM PROCTER DENSITY AS DETERMINED BY ASTM D 698. MOISTURE CONTENT SHALL BE WITHIN +/-4 PERCENT POINTS OF OPTIMUM MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698.

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- 7. PROOF ROLLING:**
 IMMEDIATELY FOLLOWING THE COMPLETION OF EARTH WORK OR COMPLETION OF THE LIFT IN THE AREA, TO BE PROOF ROLLED AND ONLY FOR THE LIFT THAT THE GEOTECHNICAL ENGINEER OR THE KELLY SURVEYING PLLC HAVE OBTAINED A WAIVER ON THE MATERIAL PARTICLE SIZE FOLLOWING A VISUAL INSPECTION. CONTRACTOR SHALL DEMONSTRATE THE FINISHED LIFT DOES NOT CONTAIN UNDESIRABLE UNIDENTIFIED SOFT AREAS, OBSERVING THE SURFACE FOR IMPROVEMENT OR DEFORMATION.
 THE COVERAGE AREAS AND METHODS SHALL BE AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
 THE LIFT SHALL THEN BE PROOF ROLLED.
 PROOF ROLLING SHALL BE DONE WITH ONE PASS OF A FULLY LOADED TANDUM DRUM TRUCK EQUAL TO OR EXCEEDING 50,000 LBS OF EQUIVALENT SIZED APPROVED CONSTRUCTION EQUIPMENT.
 THE EQUIPMENT SHALL BE OPERATED AT A SPEED THAT THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE CAN COMFORTABLY AND SLOWLY WALK ALONG SIDE THE EQUIPMENT.
 ANY AREAS WHICH REFLECT, BUT OF PUMP UNDER THE LOADED TRACK SHALL BE UNDERCUT AND REPLACED WITH COMPACTED FILL MATERIAL OR OF SMALLER MATERIAL WORKED UNTIL A RELATIVELY UNYIELDING SURFACE IS ACHIEVED.

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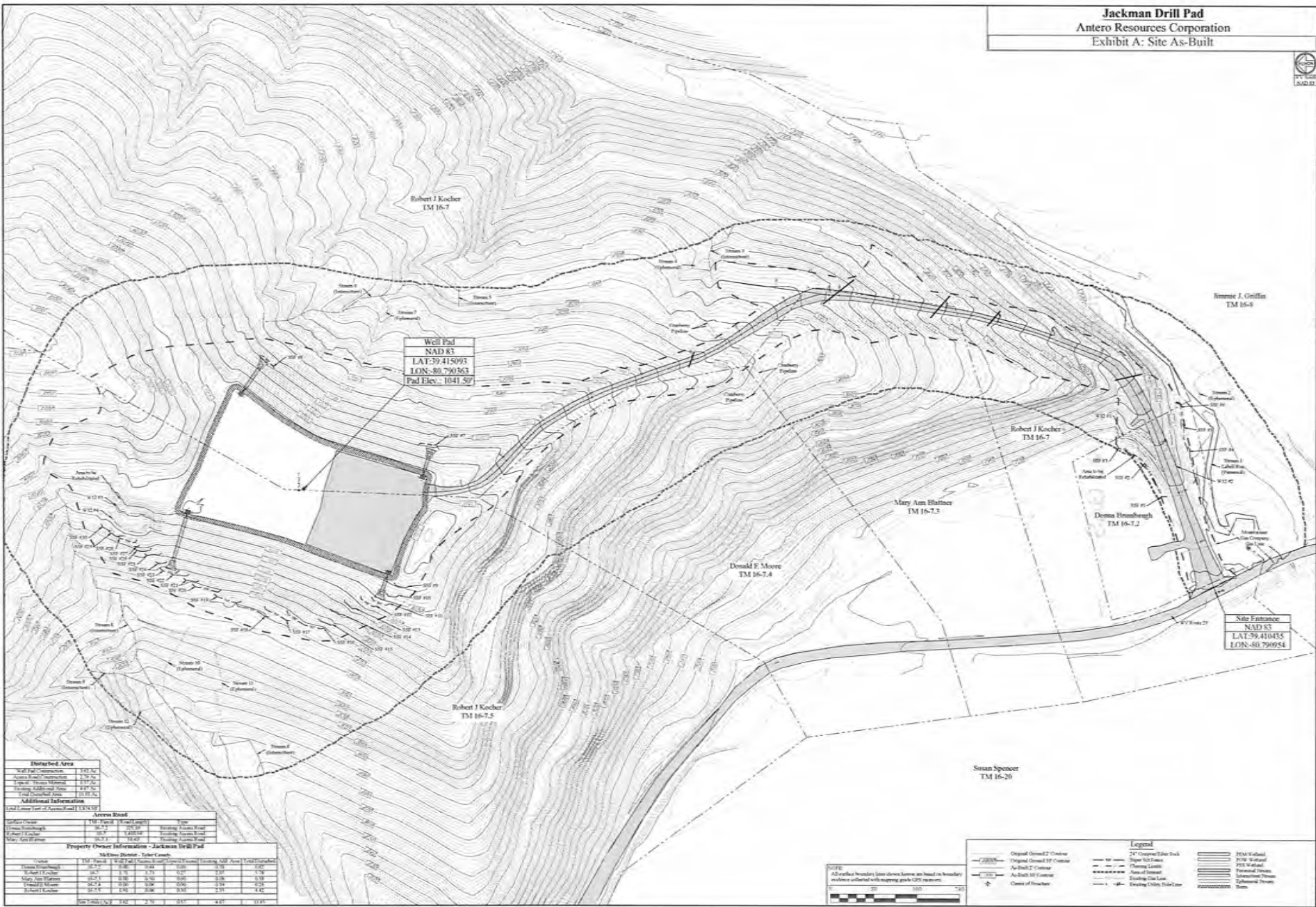
Jackman Drill Pad
 McHenry County, IL
 Tyler County, WV

Antero Resources

Jackman Drill Pad

Revision 05/16/2016
 Note: All Shaded
 Deleted
 Deleted
 Deleted

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



Well Pad
NAD 83
LAT: 39.415093
LON: -80.790363
Pad Elev: 1041.59'

Site Entrance
NAD 83
LAT: 39.410485
LON: -80.790954

Disturbed Area

Well Pad	120 Ac
Access Road/Infrastructure	270 Ac
Impervious Surface	139 Ac
Existing Subdivided Area	4,847 Ac
Total Disturbed Area	5,366 Ac

Additional Information

Land Use (per US Dept of Agriculture) 12.5% U2

Access Road

Location	Start	End	Width	Grade
Access Road	100+00	100+50	12	0.00%
Access Road	100+50	100+100	12	0.00%
Access Road	100+100	100+150	12	0.00%

Property Owner Information - Jackman Drill Pad

Tract	Acres	Owner	Address	City	State	Zip
Robert J Kocher	12.7	Robert J Kocher	10000 N. 100th St	Overland Park	KS	66214
Mary Ann Blatter	12.7	Mary Ann Blatter	10000 N. 100th St	Overland Park	KS	66214
Donald E Moore	12.7	Donald E Moore	10000 N. 100th St	Overland Park	KS	66214
Susan Spencer	12.7	Susan Spencer	10000 N. 100th St	Overland Park	KS	66214

Legend

Original Ground 2' Contour	24" Covered Ejector Stack	ETM - Ejector
Original Ground 10' Contour	Shore Hill Fence	PTR - Water Pad
As-Built 2' Contour	Flaming Lights	PTM - Water Pad
As-Built 10' Contour	Area of Impact	PTM - Water Pad
Existing Gas Line	Existing Gas Line	PTM - Water Pad
Existing Utility Trench	Existing Utility Trench	PTM - Water Pad
Crack of Structure		PTM - Water Pad



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Jackman Drill Pad
McElroy District,
Tyler County, WV

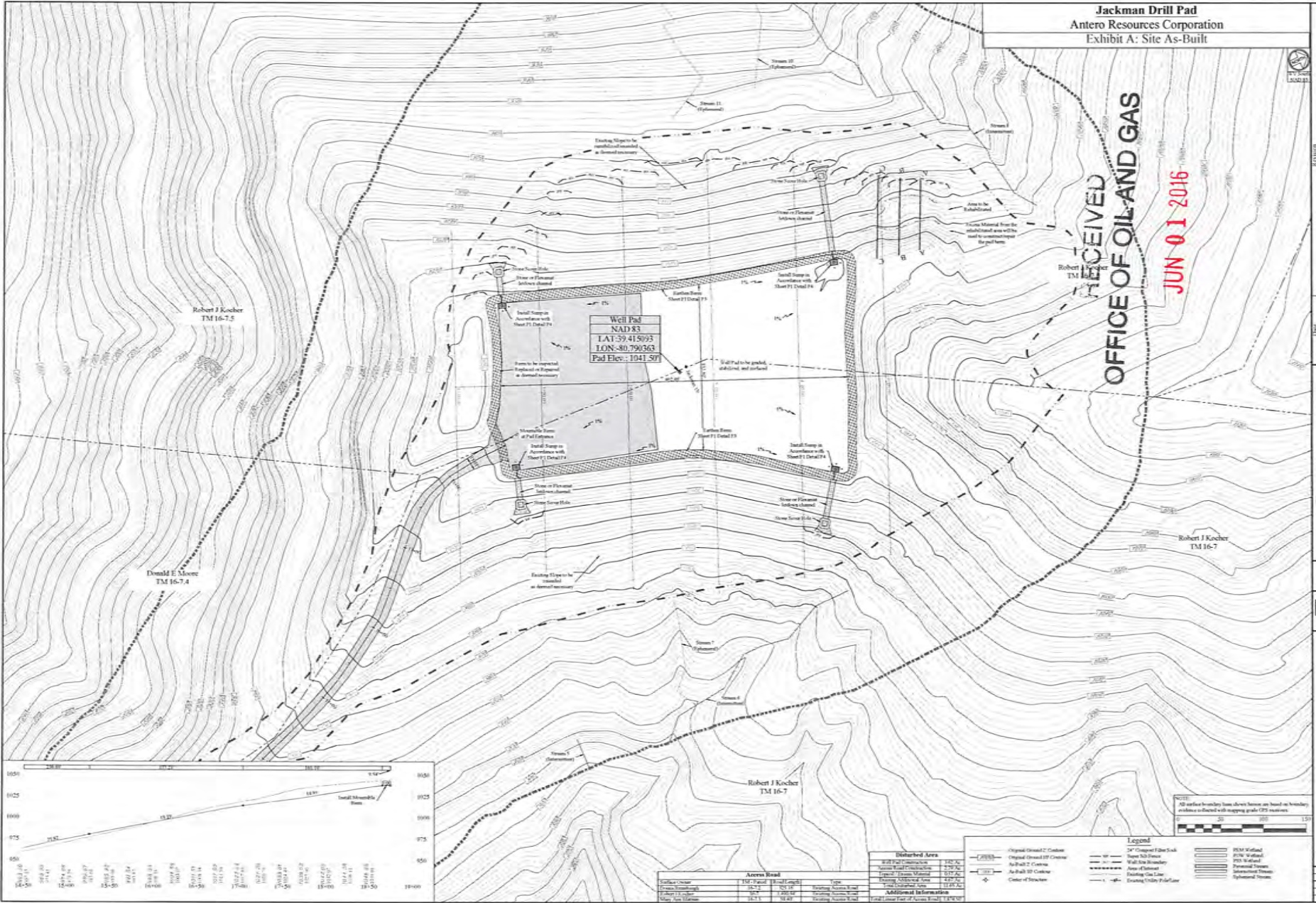
Overall Plan View

Drawn: 10/15/2010
Scale: As Shown
Designed By: BC
File No:
Sheet 2 of 8

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

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Aspen Road			
Station	100' Vertical Interval	100' Horizontal Interval	Grade
10+00	1041.50	1041.50	0.00%
10+10	1041.50	1041.50	0.00%
10+20	1041.50	1041.50	0.00%
10+30	1041.50	1041.50	0.00%
10+40	1041.50	1041.50	0.00%
10+50	1041.50	1041.50	0.00%

Legend

- Original Ground Contour
- Original Ground 10' Contour
- As-Fill 2' Contour
- As-Fill 10' Contour
- Center of Station
- 2" Contour Elev Scale
- Sheet A-D Index
- Well Site Boundary
- Site of Interest
- Existing Gas Line
- Existing Utility Pole/Line
- DEM Wallpad
- POTW Wallpad
- POC Wallpad
- Perennial Stream
- Intermittent Stream
- Supplemental Stream

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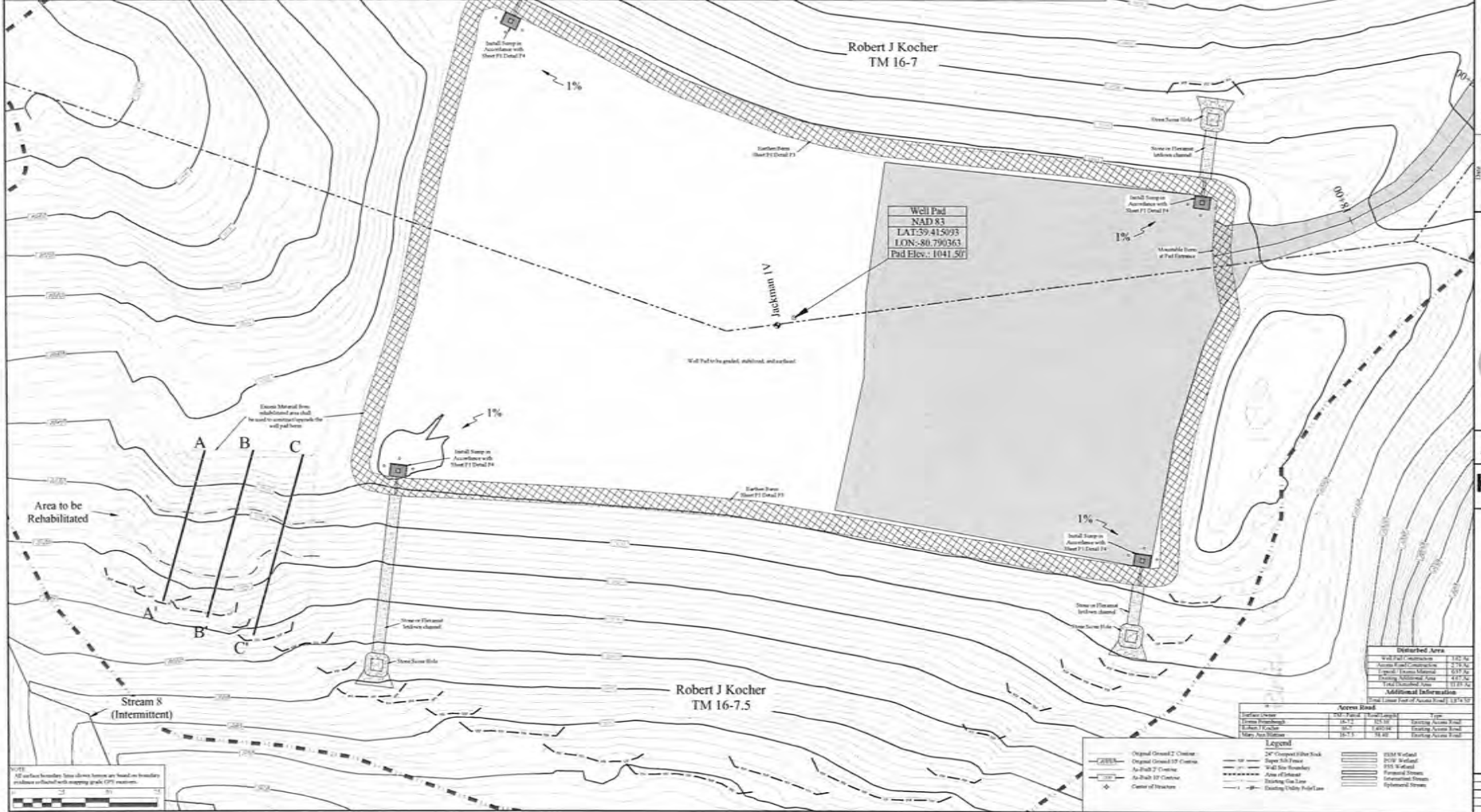
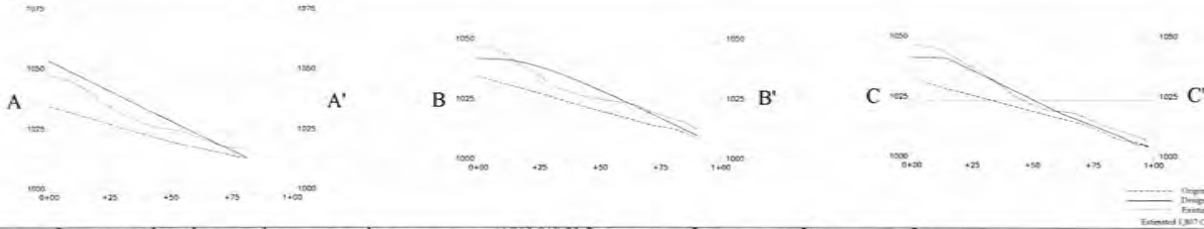
Antero Resources

K&S

Plan View
Jackman Drill Pad
 McElroy District,
 Tyler County, WV

DATE: 05/19/2016
 SCALE: As Shown
 DESIGNED BY: ZS
 FILE NO:
 SHEET 8 OF 8

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



Disturbed Area

Category	Area (Acres)
Well Pad Construction	1.02
Access Road Construction	2.76
Gravel	1.00
Existing Additional Area	4.97
Estimated Total	11.75

Additional Information

Well Center Point of Access Road: 13° 14' 12"

Access Road

Category	Area (Acres)	Length (ft)	Type
Well Pad	1.02	1,000	Gravel
Access Road	2.76	1,000	Gravel
Gravel	1.00	1,000	Gravel
Existing Additional Area	4.97	1,000	Gravel
Estimated Total	11.75	1,000	Gravel

Legend

Original Ground 22 Contour	25' Compacted Filter Bank	200M Wellpad
Original Ground 10' Contour	Drainage Pad Frame	100M Wellpad
As-Built 2' Contour	Well Site Boundary	P15 Wellpad
As-Built 10' Contour	Align of Channel	Proposed Stream
Center of Structure	Existing Gas Line	Intermittent Stream
	Existing Utility Profile Line	Disturbed Stream



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Jackman Drill Pad
 McElroy District,
 Tyler County, WV

Well Pad Rehabilitation Area
Jackman Drill Pad
 McElroy District,
 Tyler County, WV

Date: 08/16/2016
 Scale: As Shown
 Designed By: JES
 File No.
 Sheet 2 of 2

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

Jimmie J. Griffin
TM 16-8

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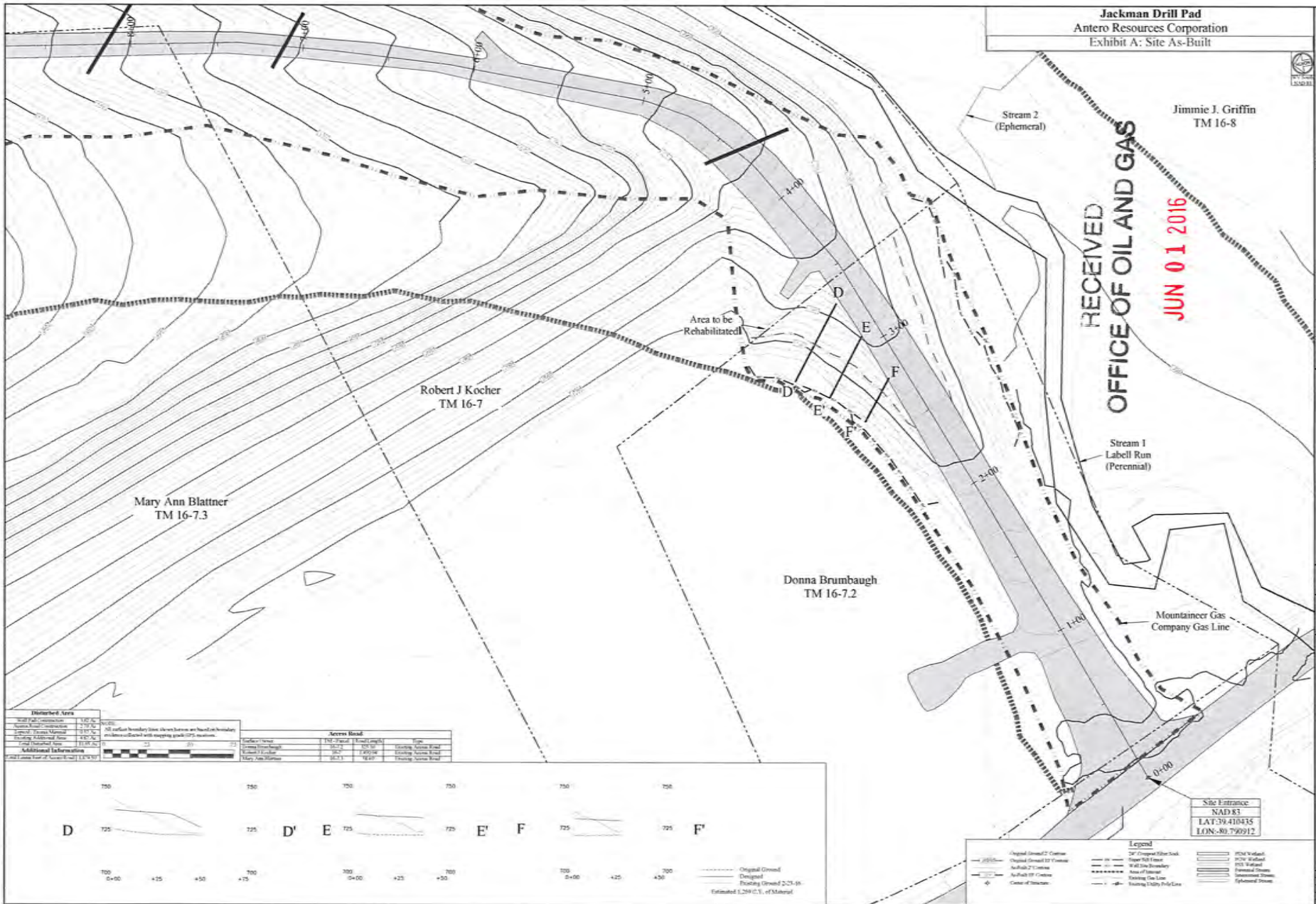
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Access Road Rehabilitation Area
Jackman Drill Pad
McIntoy District,
Tyler County, WV



Disturbed Area

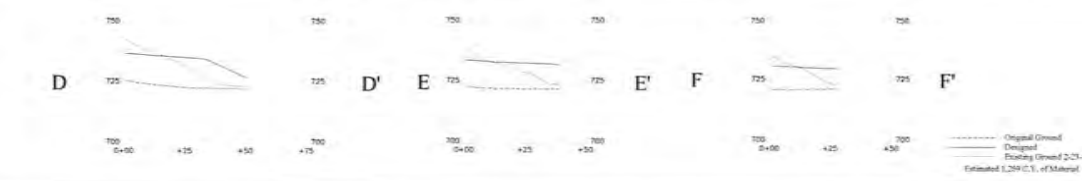
Acres	Percentage
11.0	100%

Additional Information

Estimated 1,284 C.Y. of Material

Access Road

Station	Original	Proposed	Width	Type
1+00	10.0	10.0	10.0	Existing Access Road
2+00	10.0	10.0	10.0	Existing Access Road
3+00	10.0	10.0	10.0	Existing Access Road
4+00	10.0	10.0	10.0	Existing Access Road
5+00	10.0	10.0	10.0	Existing Access Road

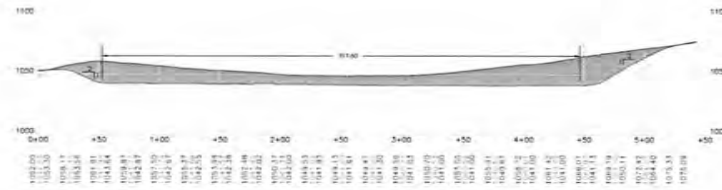


Legend

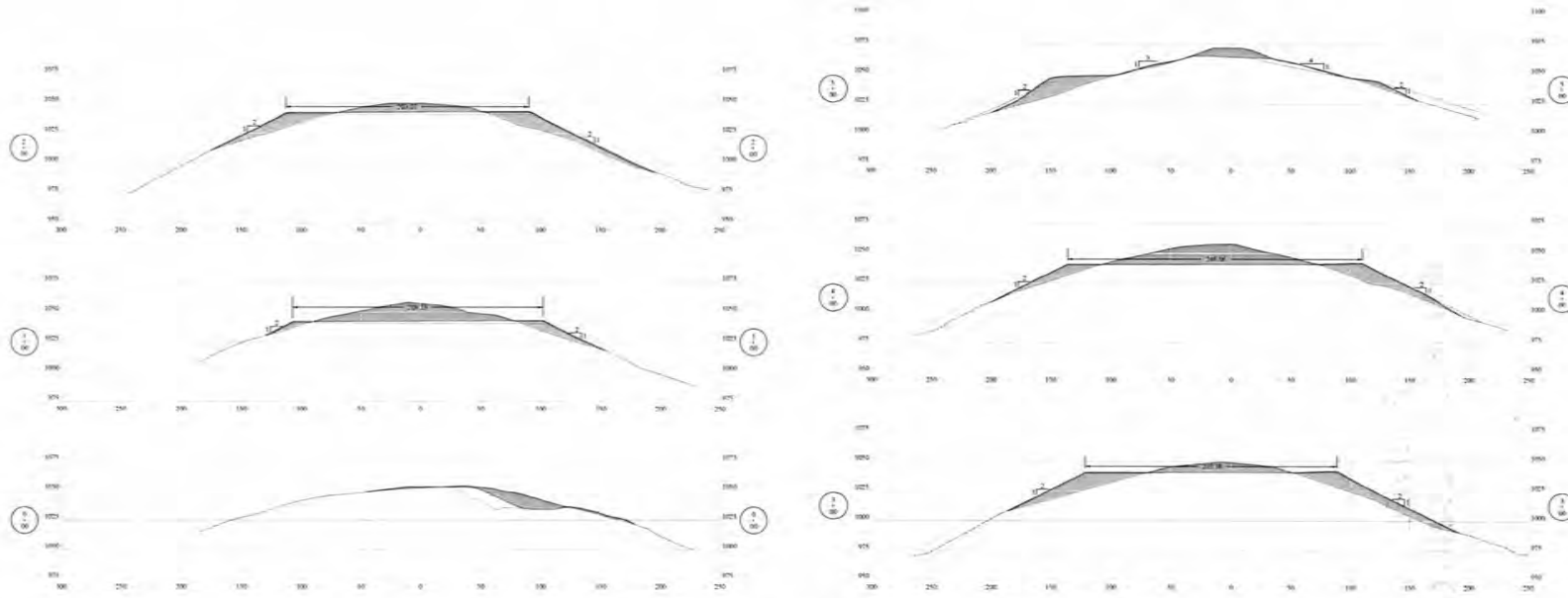
- Original Ground/Contour
- Original Ground 2' Contour
- Jackman 2' Contour
- Jackman 10' Contour
- Center of Station
- 30" Diameter Fiber Optic
- Shovel Hole Trace
- Wall Line Boundary
- Area of Station
- Existing Gas Line
- Existing Utility Pole Line
- 20' W. Right-of-Way
- 20' W. Right-of-Way
- 20' W. Right-of-Way
- Proposed Access Road
- Proposed Stream
- Optimized Stream

Date: 06/29/2016
Scale: As Shown
Designed By: JKS
File No:
Sheet 7 of 8

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



Well Pad Profile



Well Pad Cross Sections

Legend

- Well Pad
- Well Pad
- Original Ground
- Original
- As-Built



DATE

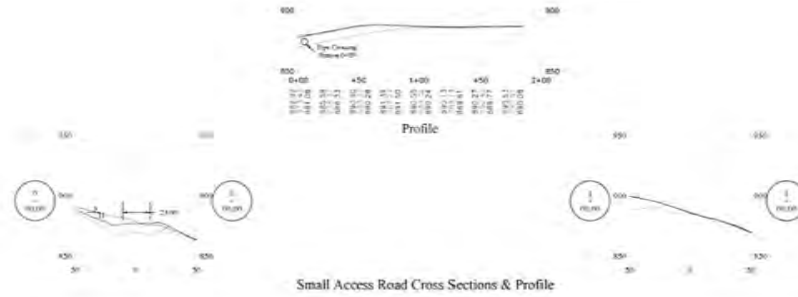
REVISION

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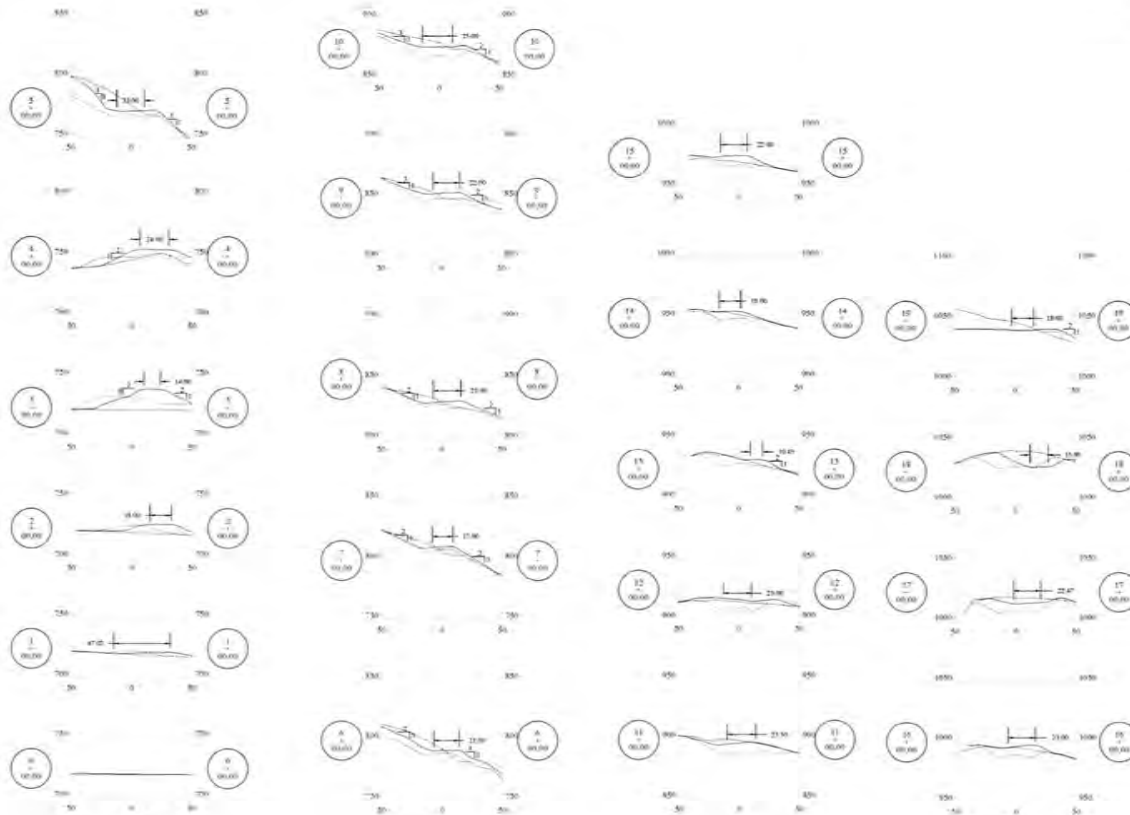
K+S surveys
 Surveying & Mapping
 1000 West 10th Street
 Suite 100
 Tyler, Texas 75701

Cross Sections - Well Pad
Jackman Drill Pad
 McElroy District,
 Tyler County, WV

Drawn: 05/19/2016
 Scale: As Shown
 Designed By: BK
 File No:
 Sheet 2 of 7



Small Access Road Cross Sections & Profile



Access Road Cross Sections

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Legend

- Original Centerline
- Change
- As-Built



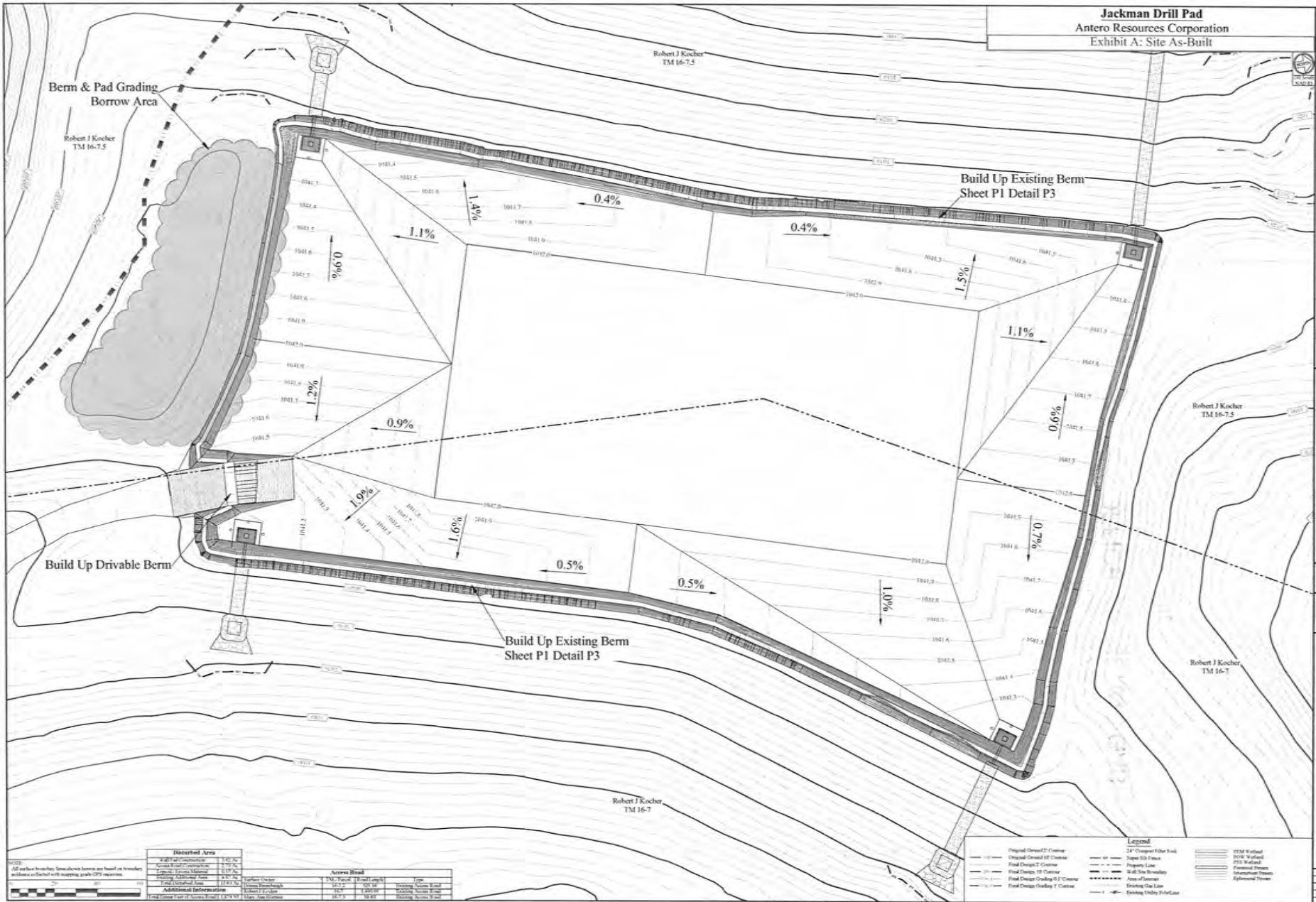
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Cross Sections - Access Road
Jackman Drill Pad
 Mollino District,
 Tyler County, WV

Date: 05/19/2016
 Scale: As Shown
 Designed by: JH
 File No:
 Sheet 9 of 9

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



NOTES:
1. All surface boundaries shown on this plan are based on boundary evidence as shown on the mapping grade GPS measures.

Disturbed Area	
Area of Disturbance	1.12 AC
Area of Reclamation	1.12 AC
Net Change in Area	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC
Disturbance to Wetlands	0.00 AC

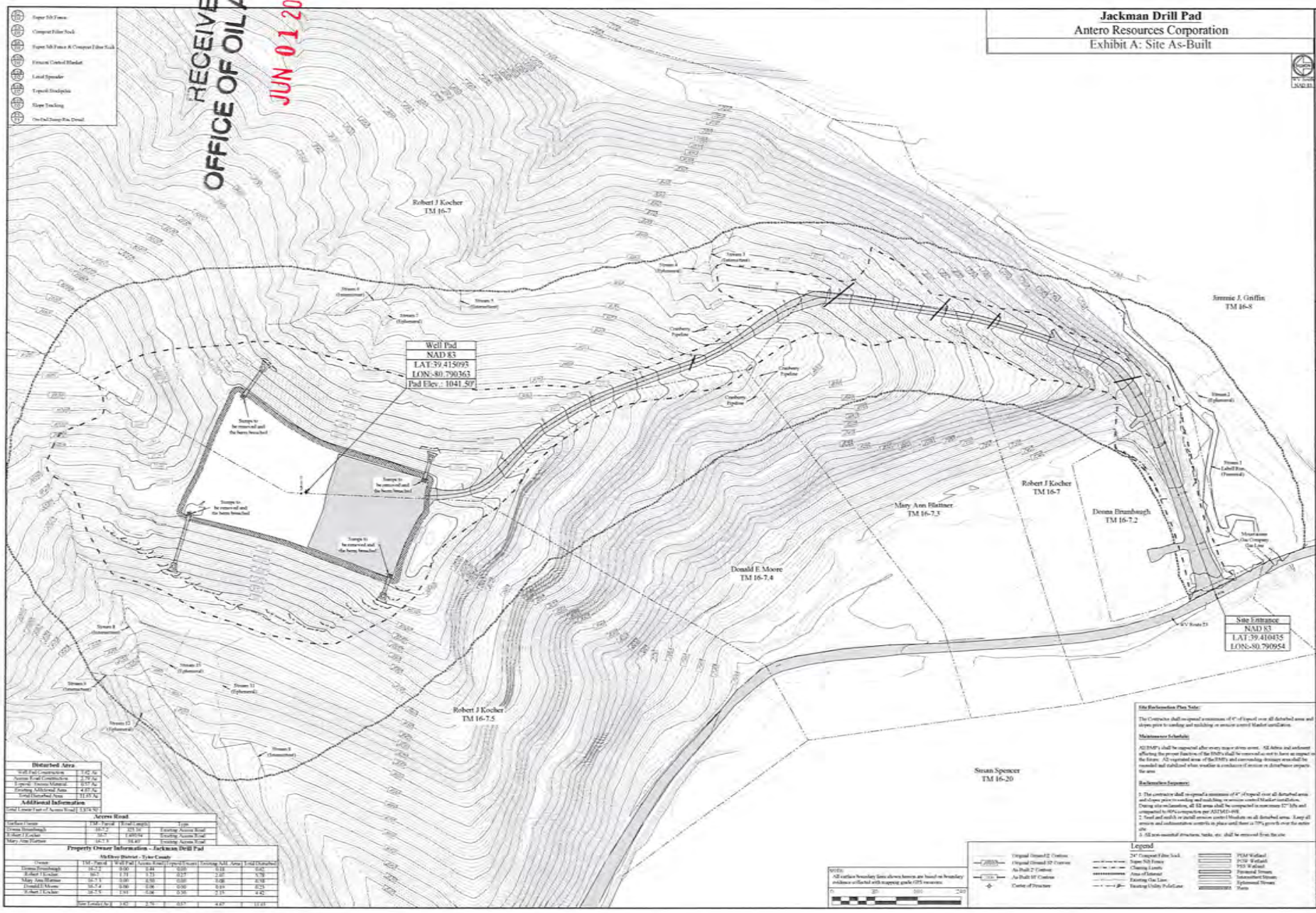
Asphalt Road			
Surface Course	1.50" Thick	18.00' Wide	1.50' Deep
Base Course	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep
Subgrade	4.00" Thick	18.00' Wide	4.00' Deep

Legend	
Proposed Gravel 2" Course	24" Crushed Filter Rock
Proposed Gravel 1.5" Course	Super 10 Course
Proposed Gravel 1" Course	Property Line
Proposed Gravel 0.75" Course	24" Site Boundary
Proposed Gravel 0.5" Course	Area of Interest
Proposed Gravel 0.25" Course	Existing Gas Line
	Existing Utility (Water/Electric)

Vertical text on the right side of the page, including the Antero Resources logo, project title 'Jackman Site', location 'Madison District, Tyler County, WV', and other administrative information.

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Jackman Drill Pad
 Antero Resources Corporation
 Exhibit A: Site As-Built



- Super 80 Fence
- Compact Filter Truck
- Super 80 Fence & Compact Filter Truck
- Private Control Barrier
- Local Spreader
- Topsoil Disposal
- Super Trucking
- One Day Dump Site Detail

Well Pad
 NAD 83
 LAT: 39.415093
 LON: -80.790363
 Pad Elev: 1041.50'

Site Entrance
 NAD 83
 LAT: 39.410435
 LON: -80.790954

Disturbed Area

Super 80 Fence	1.22	Ac
Super 80 Fence & Compact Filter Truck	2.70	Ac
Private Control Barrier	0.00	Ac
Local Spreader	4.81	Ac
Topsoil Disposal	0.00	Ac
Super Trucking	0.00	Ac
One Day Dump Site Detail	0.00	Ac
Total	8.73	Ac

Additional Information

Total Linear Feet of Access Road: 1,335.00'
 Access Road: 12' x 12' (10' x 12')
 Super 80 Fence: 1,220.00' (10' x 12')
 Super 80 Fence & Compact Filter Truck: 2,700.00' (10' x 12')
 Private Control Barrier: 0.00'
 Local Spreader: 4,810.00' (10' x 12')
 Topsoil Disposal: 0.00'
 Super Trucking: 0.00'
 One Day Dump Site Detail: 0.00'

Property Owner Information - Jackman Drill Pad

Owner	151' - 760' W	151' - 760' E	151' - 760' S	151' - 760' N	151' - 760' W	151' - 760' E	151' - 760' S	151' - 760' N
Donna Drumbrugh	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'
Robert J. Kocher	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'
Mary Ann Flatner	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'
Donald E. Moore	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'
Robert J. Kocher	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'
Total	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'	151' - 760'

The Reclamation Plan Note:

The Contractor shall regrade a minimum of 4" of topsoil over all disturbed areas and strip grass to seed and mulch in areas where further stabilization is required.

Maintenance Schedule:

AS BMP's shall be inspected after every major storm event. All debris and sediment affecting the proper function of the BMP's shall be removed as soon as it is observed in the storm. All required areas of the BMP's and surrounding drainage shall be inspected and stabilized when weather conditions or erosion or disturbance impacts the area.

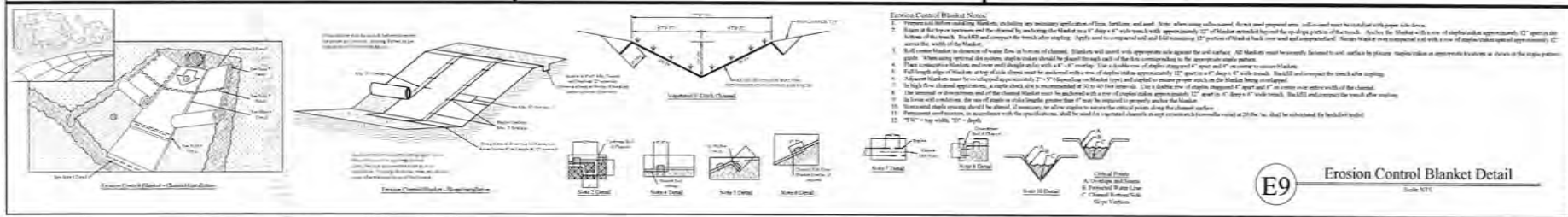
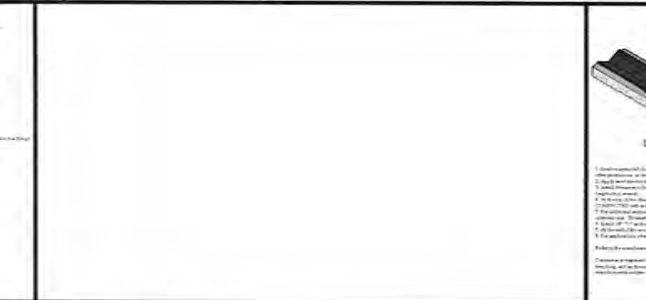
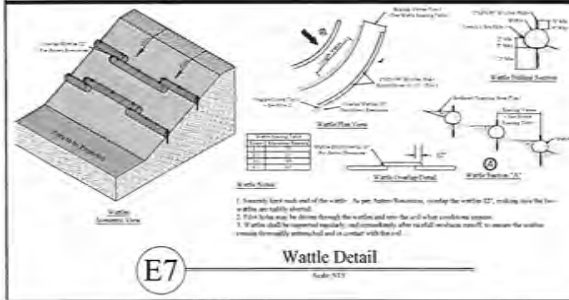
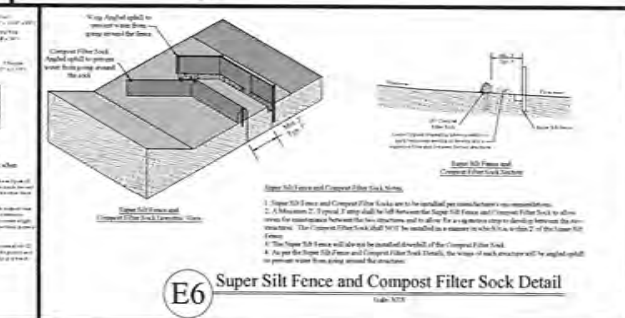
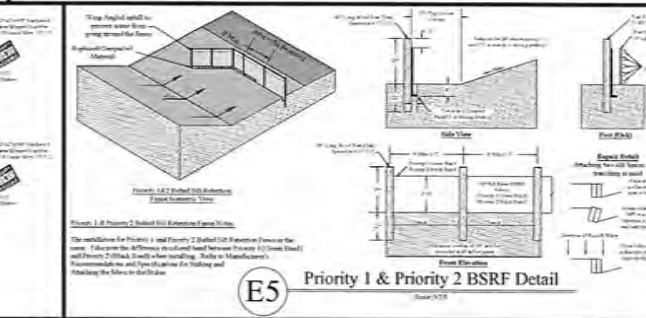
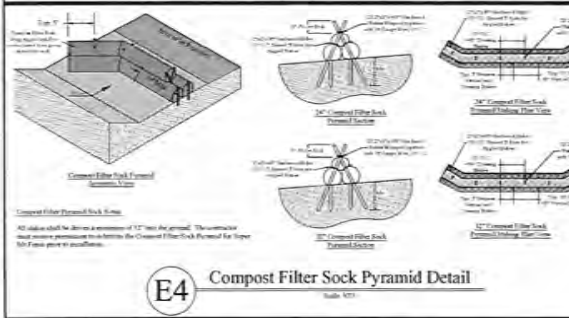
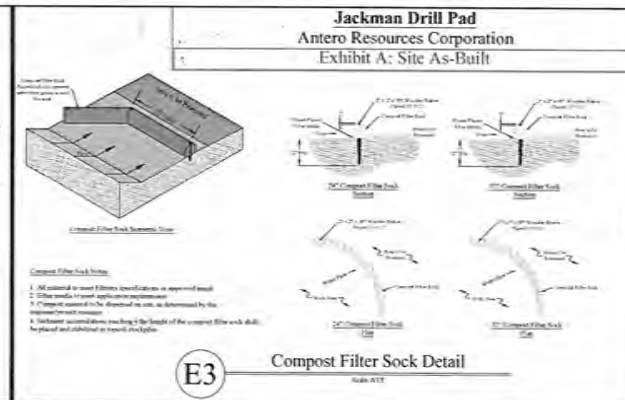
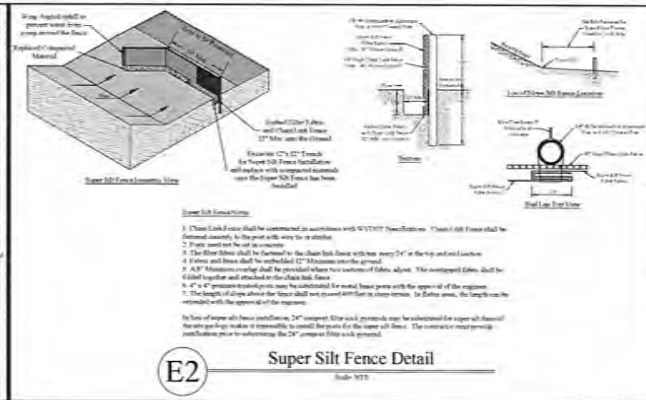
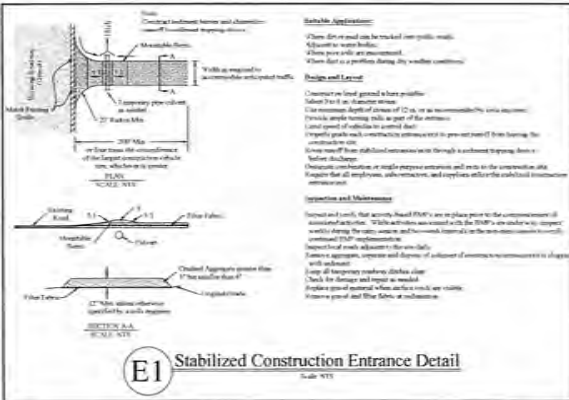
Reclamation Events:

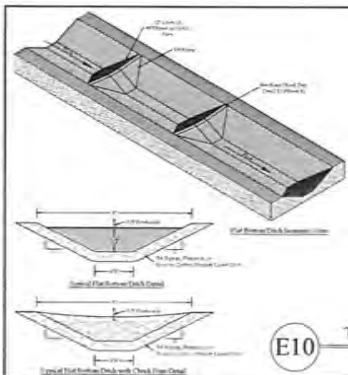
- The contractor shall regrade a minimum of 4" of topsoil over all disturbed areas and strip grass to seed and mulch in areas where further stabilization is required.
- During site reclamation, all SE areas shall be compacted to meet 95% and compacted to 95% compaction per ASTM D-1557.
- Seed and mulch in small erosion control structures on all disturbed areas. Keep all erosion and sedimentation controls in place until there is 70% grass cover over the entire site.
- All non-erectable structures, tanks, etc. shall be removed from the site.

- Legend**
- Original Class 22 Contour
 - Original Class 10 Contour
 - As Built 2' Contour
 - As Built 10' Contour
 - Center of Structure
 - Super 80 Fence
 - Compact Filter Truck
 - Private Control Barrier
 - Local Spreader
 - Topsoil Disposal
 - Super Trucking
 - One Day Dump Site Detail
 - P&H Material
 - P&H Material
 - P&H Material
 - P&H Material
 - P&H Material
 - P&H Material

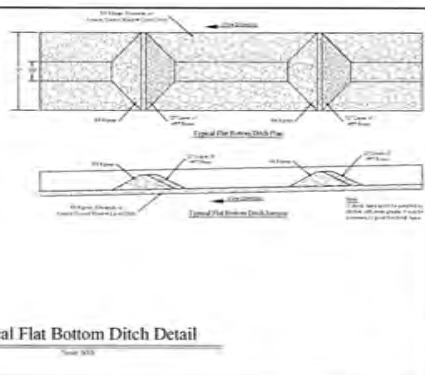


Antero Resources
 PREPARED FOR ANTERO RESOURCES CORPORATION
 K&S Surveying
 Site Reclamation Plan
 Jackman Drill Pad
 McElroy District,
 Tyler County, WV
 Date: 05/19/2016
 Scale: As Shown
 Drawn By: BC
 File No:
 Sheet 51 of 81

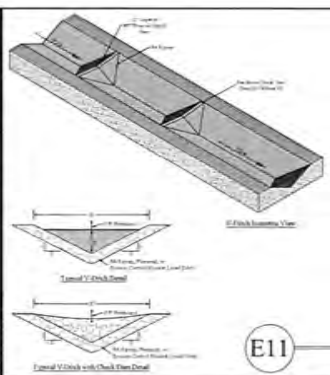




E10 Typical Flat Bottom Ditch Detail
Scale: N12



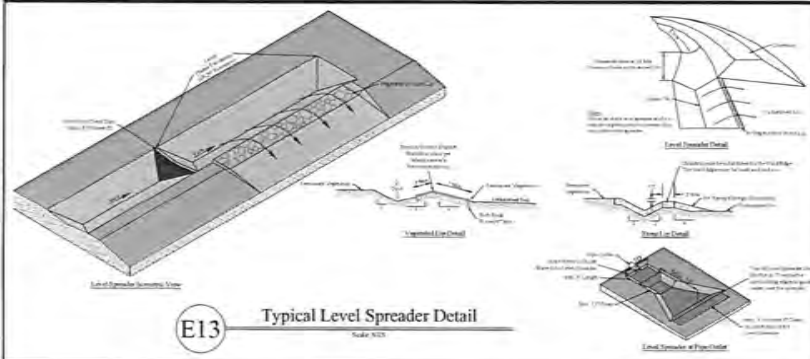
E11 Typical V-Ditch Detail
Scale: N12



E12 Stone Check Dam Detail
Scale: N12

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

Notes:
1. All dimensions are in feet unless otherwise noted.
2. All elevations are in feet above sea level unless otherwise noted.
3. All structures are to be constructed in accordance with the specifications and standards of the American Society of Civil Engineers (ASCE) and the American Institute of Steel Construction (AISC).
4. All materials shall be of the highest quality and shall be approved by the Engineer before use.
5. All work shall be completed in accordance with the schedule of values and shall be subject to inspection and approval by the Engineer.



E13 Typical Level Spreader Detail
Scale: N12

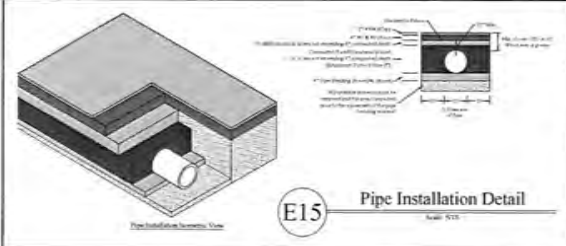
Outlet without Ditch

Outlet Size (inches)	Outlet Length (feet)	Outlet Width (feet)	Outlet Height (feet)	Outlet Slope (ft/ft)	Outlet Material
12	10	12	12	0.00	Concrete
18	15	18	18	0.00	Concrete
24	20	24	24	0.00	Concrete
30	25	30	30	0.00	Concrete
36	30	36	36	0.00	Concrete
42	35	42	42	0.00	Concrete
48	40	48	48	0.00	Concrete
54	45	54	54	0.00	Concrete
60	50	60	60	0.00	Concrete
66	55	66	66	0.00	Concrete
72	60	72	72	0.00	Concrete
78	65	78	78	0.00	Concrete
84	70	84	84	0.00	Concrete
90	75	90	90	0.00	Concrete
96	80	96	96	0.00	Concrete
102	85	102	102	0.00	Concrete
108	90	108	108	0.00	Concrete
114	95	114	114	0.00	Concrete
120	100	120	120	0.00	Concrete

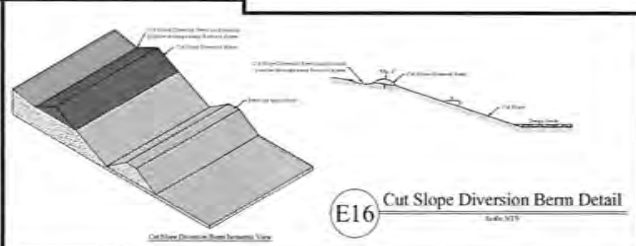
Outlet with Ditch

Outlet Size (inches)	Outlet Length (feet)	Outlet Width (feet)	Outlet Height (feet)	Outlet Slope (ft/ft)	Outlet Material
12	10	12	12	0.00	Concrete
18	15	18	18	0.00	Concrete
24	20	24	24	0.00	Concrete
30	25	30	30	0.00	Concrete
36	30	36	36	0.00	Concrete
42	35	42	42	0.00	Concrete
48	40	48	48	0.00	Concrete
54	45	54	54	0.00	Concrete
60	50	60	60	0.00	Concrete
66	55	66	66	0.00	Concrete
72	60	72	72	0.00	Concrete
78	65	78	78	0.00	Concrete
84	70	84	84	0.00	Concrete
90	75	90	90	0.00	Concrete
96	80	96	96	0.00	Concrete
102	85	102	102	0.00	Concrete
108	90	108	108	0.00	Concrete
114	95	114	114	0.00	Concrete
120	100	120	120	0.00	Concrete

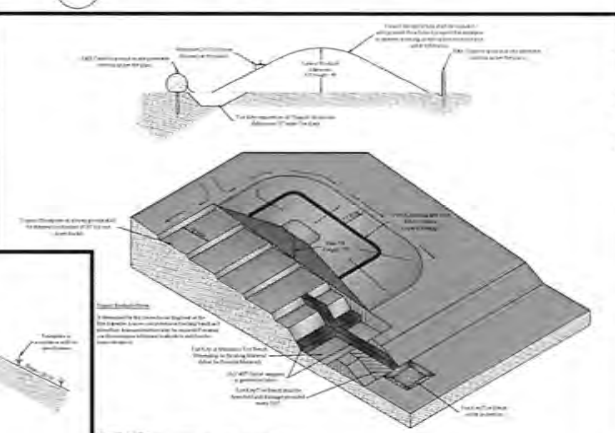
E14 Pipe Outlet Protection Detail
Scale: N12



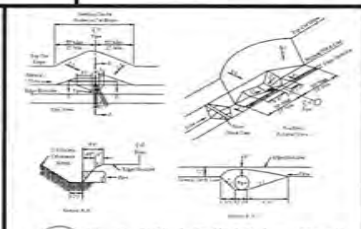
E15 Pipe Installation Detail
Scale: N12



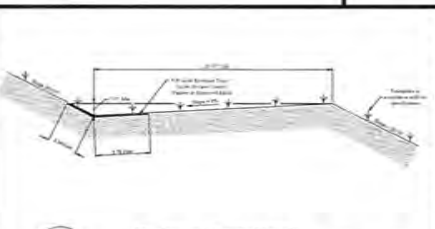
E16 Cut Slope Diversion Berm Detail
Scale: N12



E18 Slope Tracking Detail
Scale: N12



E19 Typical Ditch Relief Culvert Detail
Scale: N12



E20 Drainage Bench Detail
Scale: N12

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OFFICE OF OIL AND GAS

Topsoil Stockpile Detail
Scale: N12

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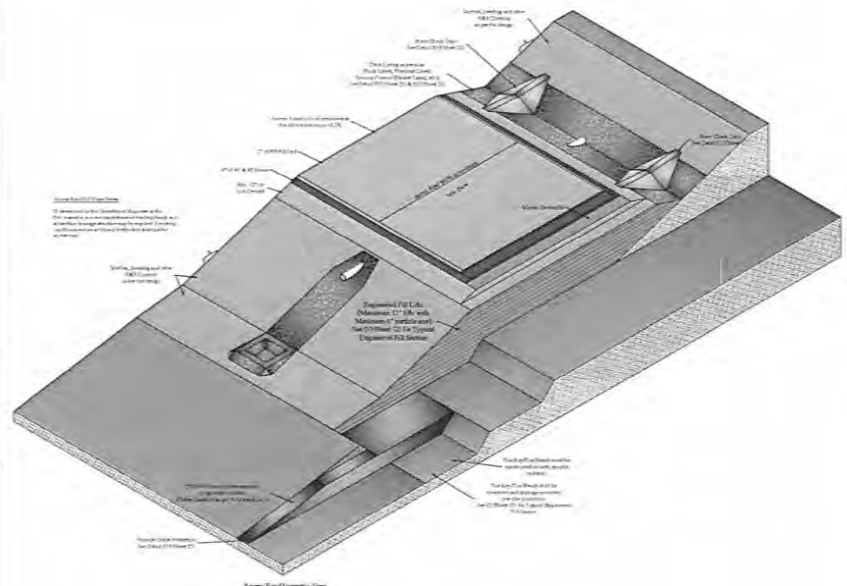
K+S Services

Environment and Sediment Control Details
Jackman Drill Pad
McClintock District
Tyler County, WV

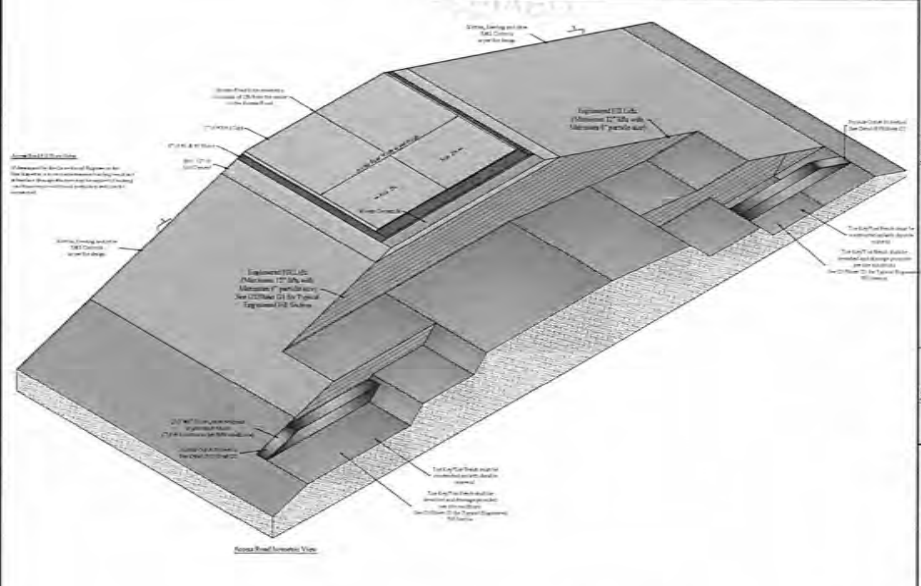
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Scale: As Shown
Designed By: BR
Proj. No.:
Sheet: E01 of E10

JUN 01 2016

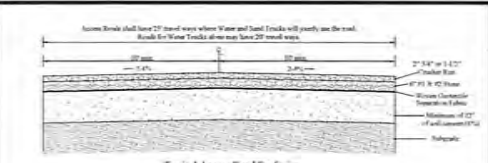
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



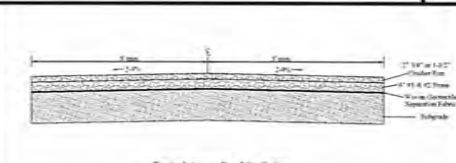
R1 Typical Access Road Cut Section Details
Scale: N12



R2 Typical Access Road Fill Section Details
Scale: N12



R3 Typical Access Road Surfacing Details
Scale: N12

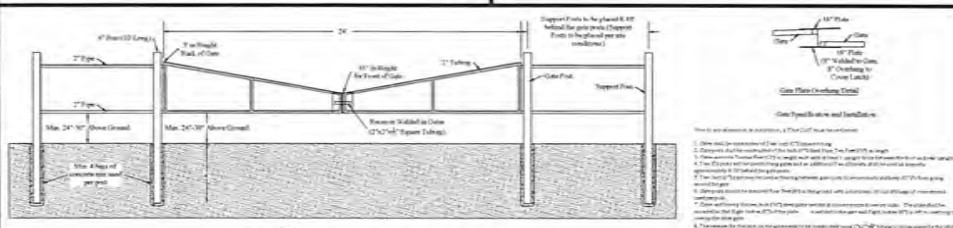


R4 Temporary/Adjacent Access Road Surfacing Details
Scale: N12



Color	Application	Color	Application
Yellow	Yellow Ribbons used to indicate top of Cut (C). Cut to be removed at time of Pad/Drill Site Removal by site design.	Blue & White Stripes	Blue & White Stripes used to indicate F12 Site Boundary (F12) and Clearing Lines.
Yellow & Orange	Yellow and Orange Ribbons used to indicate Grade at Top of Pad/Drill Site.	Orange & Black Stripes	Orange & Black Stripes used to indicate Vertical Cut (C) or Contour at edge of access road. Orange & Black Stripes used to indicate Vertical (F12) or Contour at edge of access road.
Orange	Orange Ribbons used to indicate top of F12 (F). F to be removed at time of Pad/Drill Site Removal by site design.	Pink & White Stripes	Pink & White Stripes used to indicate Stream and Treatment Channel Structures. Pink Stripes used to indicate Top Hole Location.
Pink	Pink Ribbons used to indicate Top Hole Location.	Orange & White Stripes	Orange & White Stripes used to indicate Top Hole Location. Equipment (E) to be applicable.
Pink & Black	Pink & Black Stripes used to indicate Vertical Cut (C) or Pad/Drill Site contour at edge of Pad/Drill Site. Pink & Black Stripes used to indicate Vertical (F12) or Pad/Drill Site contour at edge of Vertical Cut (C) to be removed at time of Pad/Drill Site Removal by site design.	Blue	Blue Ribbons used to indicate Contour of F12. Blue Ribbons used to indicate Contour of F12. Blue Ribbons used to indicate Contour of F12.

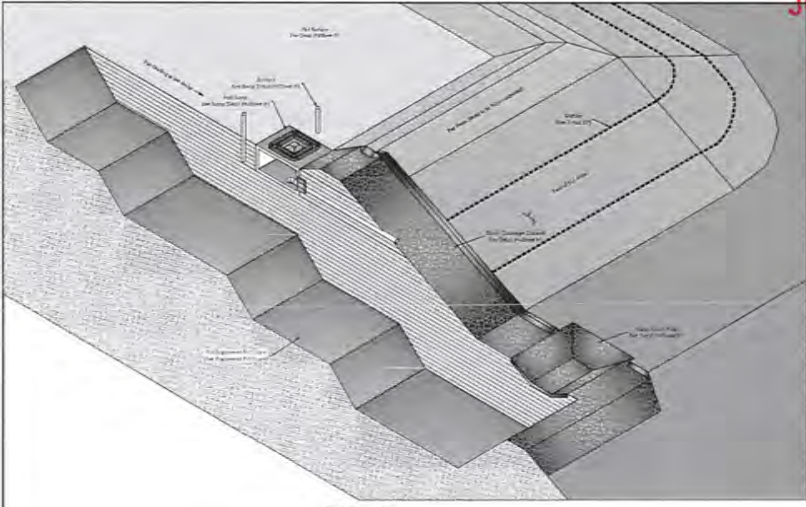
R6 Construction Staking Guide
Scale: N12



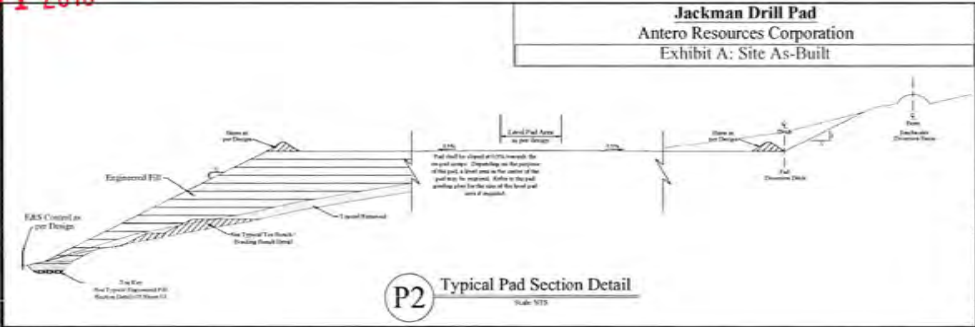
R5 Access Road Gate Detail
Scale: N12

JUN 01 2016

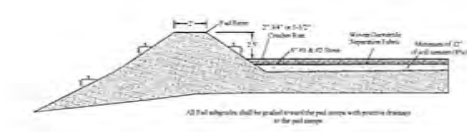
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



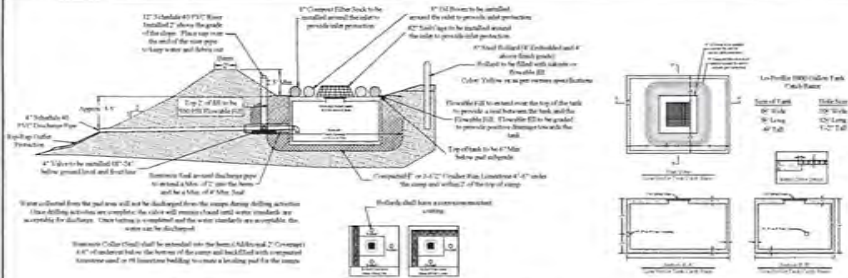
P1 Typical Pad Isometric View Detail
Scale: NTS



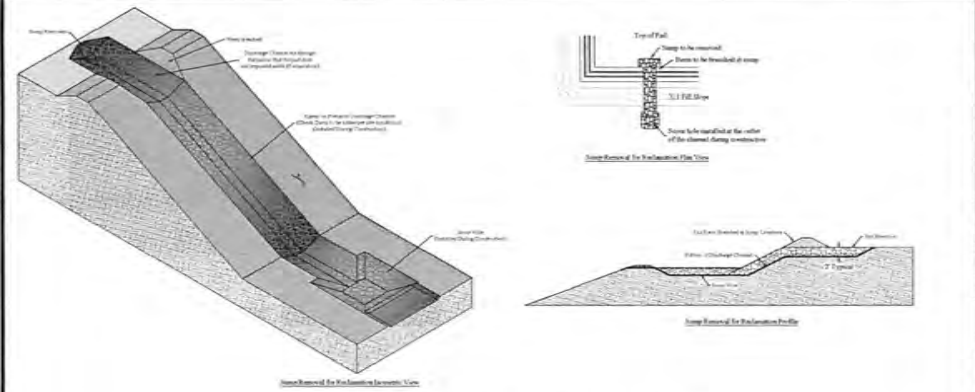
P2 Typical Pad Section Detail
Scale: NTS



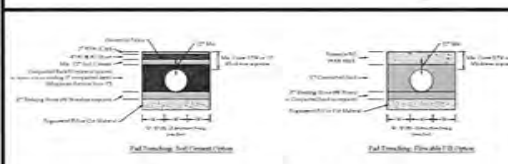
P3 Pad Surfacing Detail
Scale: NTS



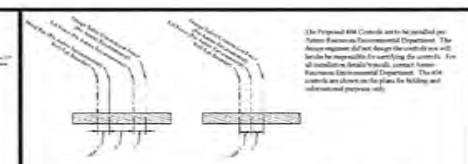
P4 On-Pad Sump Detail
Scale: NTS



P5 On-Pad Sump Reclamation Detail
Scale: NTS



P6 Typical Pad Trenching Detail
Scale: NTS



P7 Typical 404 Control Installation Details
Scale: NTS

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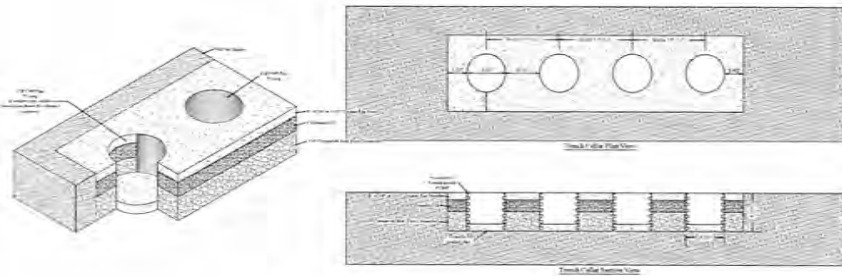
McHenry District
Tyler County, WV

Jackman Drill Pad

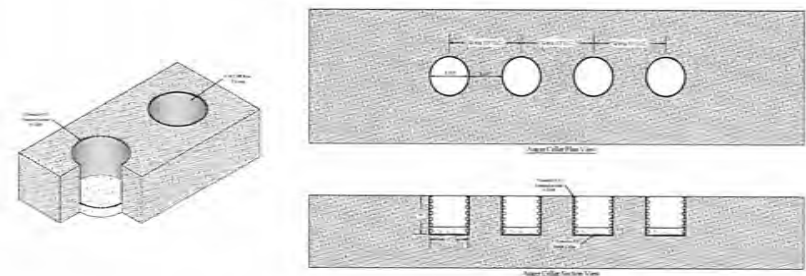
Typical Pad Details

Date: 05/19/2016
Scale: As Shown
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Sheet #1 of #1

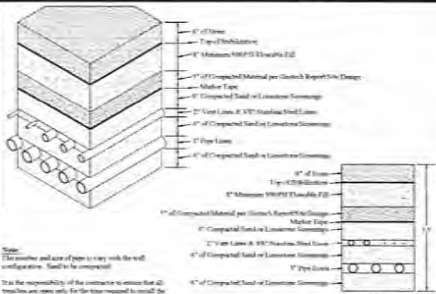
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As Built



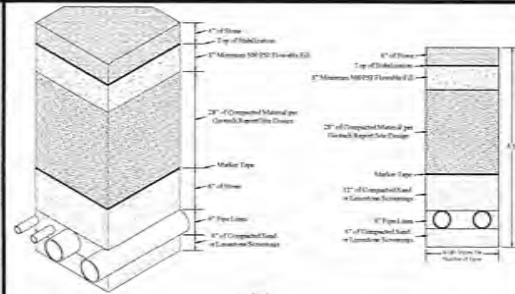
M1 Typical Trenched Cellar Detail
Scale: N12



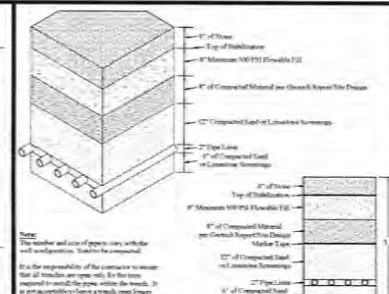
M2 Typical Augered Cellar Detail
Scale: N12



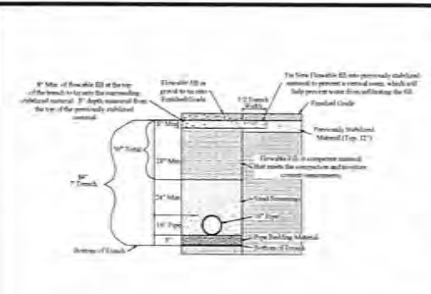
M3 Typical Well Line Detail
Scale: N12



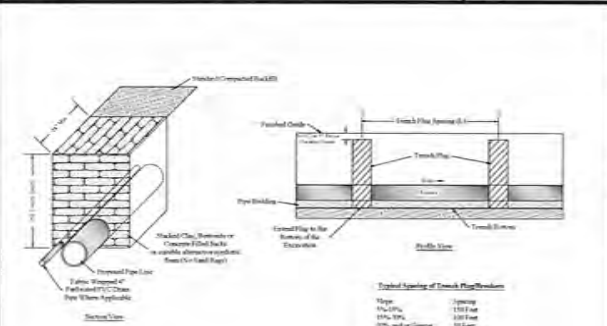
M4 Typical Sales Line Detail
Scale: N12



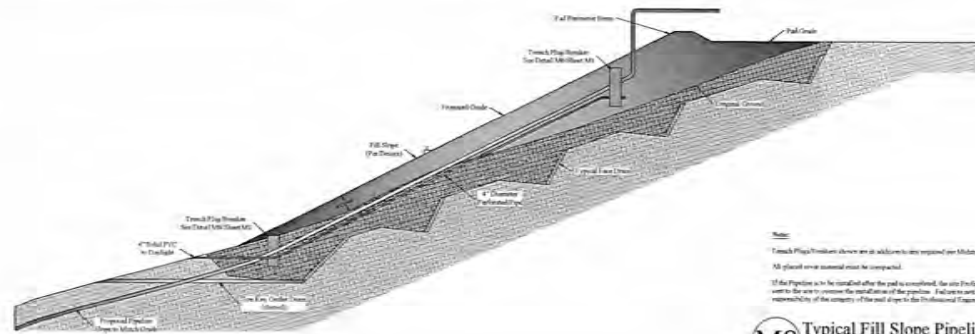
M5 Typical Tank Line Detail
Scale: N12



M6 Typical Line Through Pad Detail
Scale: N12



M7 Typical Impervious Trench Plug/Breaker
Scale: N12



M8 Typical Fill Slope Pipeline Installation Section
Scale: N12