CERTIFIED MAIL®

Doddridge County Office of Emergency Management
George Eidel, Floodplain Manager
105 Court Street, Suite 3
West Union, WV 26456

7016 2070 0000 3170 2976

HASLER

$006.75⁰
01/30/2019 ZIP 26456
012E14643162

US POSTAGE

1st 2.1.19

2-7

2-16

William L. Jones
Revocable Living Trust
2037 Indian Fork Rd.
New Milton, WV 26411

NIXIE 250 DE 1 0002/26/19

RETURN TO SENDER
UNCLAIMED
UNABLE TO FORWARD

UNC 26456>2012 BC: 26456201205 *1771-12663-26-26

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

19-540

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

William L. Jones
Revocable Living Trust
2037 Indian Fork Rd.
New Milton, WV 26411

9590 9402 4298 8190 0203 57

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Doddridge County Office of
Emergency Management/Floodplain Management
105 Court Street, Suite 3
304-873-1343
doddridgecountyfpm@gmail.com

January 30, 2019

Dear Sir or Ma'am,

You are receiving this letter because you have been identified as a land surface and/or mineral rights owner for property or adjacent property related to the proposed development/project identified by the following page.

No action is required of you. This letter is simply to inform you of the proposed development.

If you would like to comment on this proposed project, or would like additional information, you may contact the Doddridge County Floodplain Manager at the above address.

Respectfully yours,

George Eidel

George Eidel, CFM, OEM Director/Floodplain Manager

7016 2070 0000 3170 2969

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

DC Flood plain

Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .55

Total Postage and Fees $ 6.75

Sent To: I. L. Morris

Street and Apt. No., or PO Box No.: P. O. Box 397

City, State, ZIP+4®: Glenville, WV 26351 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV JAN 31 2019 USPS 26456-9998 Postmark Here

7016 2070 0000 3170 2976

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .55

Total Postage and Fees $ 6.75

Sent To: William L. Jones Revocable Living Trust

Street and Apt. No., or PO Box No.: 2037 Indian Fork Rd.

City, State, ZIP+4®: New Milton, WV 26411 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV JAN 31 2019 USPS 26456-9998 Postmark Here

7016 2070 0000 3170 2983

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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OFFICIAL USE

Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .55

Total Postage and Fees $ 6.75

Sent To: Marie E. Hyde & Richard A. Baker

Street and Apt. No., or PO Box No.: 11820 Redlands Blvd.

City, State, ZIP+4®: Moreno Valley, CA 92555 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV JAN 31 2019 USPS 26456-9998 Postmark Here

7016 2070 0000 3170 2990

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .55

Total Postage and Fees $ 6.75

Sent To: Jerry L. & Sharon L. Leggett

Street and Apt. No., or PO Box No.: 2806 Rube Leggett Rd.

City, State, ZIP+4®: New Milton, WV 26411 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV JAN 31 2019 USPS 26456-9998 Postmark Here

7016 2070 0000 3170 3003

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .55

Total Postage and Fees $ 6.75

Sent To: Jeffrey L. & Liney E. McKinney

Street and Apt. No., or PO Box No.: 2616 Rube Leggett Rd.

City, State, ZIP+4®: New Milton, WV 26411 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV JAN 31 2019 USPS 26456-9998 Postmark Here

7016 2070 0000 3170 3010

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee $ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .55

Total Postage and Fees $ 6.75

Sent To: Jean & Dakota R. Richards

Street and Apt. No., or PO Box No.: 2756 Rube Leggett Rd.

City, State, ZIP+4®: New Milton, WV 26411 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

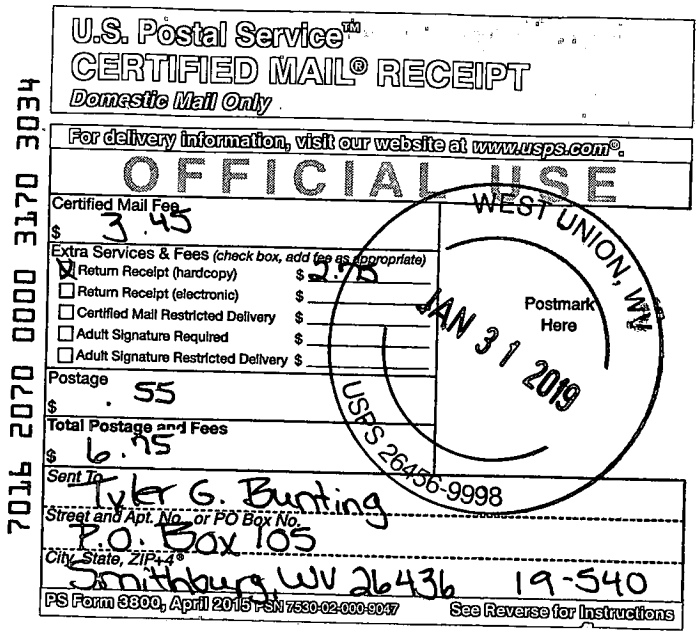
WEST UNION, WV JAN 31 2019 USPS 26456-9998 Postmark Here

Doddridge County Floodplain Permits

(Week of February 4, 2019)

Please take notice that on the **(25th)** of **(January), 2019, (Antero Resources)** filed an application for a Floodplain Permit **(#19-540)** to develop land located at or about **(South Fork of Hughes River Road); Coordinates: 39.177469 N, -80.755329 W.** The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance to WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by **(March 11, 2019)** (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, WV 26456. **This project is for road widening and repair to South Fork of Hughes River Road.**

GEORGE C. FIDEL, CFM
Doddridge County Floodplain Manager



U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

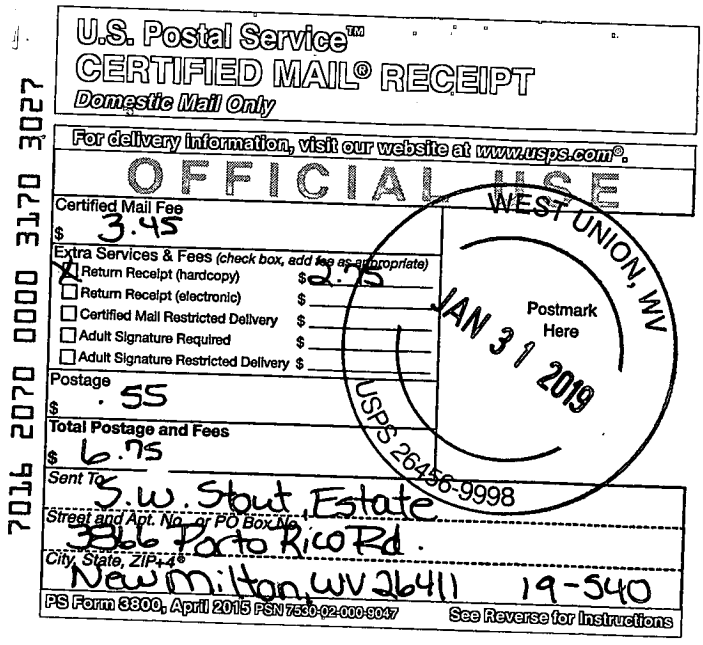
Certified Mail Fee $ 3.45
Extra Services & Fees (check box, add fee as appropriate)
☒ Return Receipt (hardcopy) $ 2.75
☐ Return Receipt (electronic) $
☐ Certified Mail Restricted Delivery $
☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $
Postage $ .55
Total Postage and Fees $ 6.75

Sent To: Tyler G. Bunting
Street and Apt. No., or PO Box No.: P.O. Box 105
City, State, ZIP+4®: Smithburg, WV 26436 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV
JAN 31 2019
USPS 26456-9998
Postmark Here

7016 2070 0000 3170 3034



U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee $ 3.45
Extra Services & Fees (check box, add fee as appropriate)
☒ Return Receipt (hardcopy) $ 2.75
☐ Return Receipt (electronic) $
☐ Certified Mail Restricted Delivery $
☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $
Postage $ .55
Total Postage and Fees $ 6.75

Sent To: S.W. Stout, Estate
Street and Apt. No., or PO Box No.: 386 Porto Rico Rd.
City, State, ZIP+4®: New Milton, WV 26411 19-540

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WEST UNION, WV
JAN 31 2019
USPS 26456-9998
Postmark Here

7016 2070 0000 3170 3027

CERTIFIED MAIL®

Doddridge County Office of Emergency Management
George Eidel, Floodplain Manager
105 Court Street, Suite 3
West Union, WV 26456

7016 2070 0000 3170 3027

HASLER

$006.75[0]
01/30/2019 ZIP 26456
012E14643162

US POSTAGE

2-1-19

NSN NISP

NSN

S. W. Stout, Estate
3866 Porto Rico Rd.
New Milton, WV 26411

NIXIE 250 DE 1 0002/10/19

RETURN TO SENDER
NO SUCH NUMBER
UNABLE TO FORWARD

NSN BC: 26456201205 *1771-01350-10-27
26456>2012

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT
OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

19-540

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

S. W. Stout, Estate
3866 Porto Rico Rd.
New Milton, WV 26411

9590 9402 4298 8190 0203 02

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Doddridge County Office of
Emergency Management/Floodplain Management
105 Court Street, Suite 3
304-873-1343
doddridgecountyfpm@gmail.com

January 30, 2019

Dear Sir or Ma'am,

You are receiving this letter because you have been identified as a land surface and/or mineral rights owner for property or adjacent property related to the proposed development/project identified by the following page.

No action is required of you. This letter is simply to inform you of the proposed development.

If you would like to comment on this proposed project, or would like additional information, you may contact the Doddridge County Floodplain Manager at the above address.

Respectfully yours,

George Eidel

George Eidel, CFM, OEM Director/Floodplain Manager

19-540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

arie E. Hyde & Richard A. Baker
11820 Redlands Blvd.
Moreno Valley, CA 92555

9590 9402 4298 8190 0203 40

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery 2-5-19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
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- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

19-540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

I. L. Morris
P.O. Box 397
Glenville, WV 26352

9590 9402 4298 8190 0203 64

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☒ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery 2-4-19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Doddridge County Floodplain Permits

(Week of February 4, 2019)

Please take notice that on the **(25th)** of **(January), 2019, (Antero Resources)** filed an application for a Floodplain Permit **(#19-540)** to develop land located at or about **(South Fork of Hughes River Road); Coordinates: 39.177469 N, -80.755329 W.** The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance to WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by **(March 11, 2019)** (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, WV 26456. **This project is for road widening and repair to South Fork of Hughes River Road.**

GEORGE C. FIDEL, CFM
Doddridge County Floodplain Manager

19-540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Tyler G. Bunting
P.O. Box 105
Smithburg, WV 26436

9590 9402 4298 8190 0202 96

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Lenora Bunting ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Lenora Bunting C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

19-540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Jerry L. & Sharon L. Leggett
2806 Rube Leggett Rd.
New Milton, WV 26411

9590 9402 4298 8190 0203 33

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jerry Leggett ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Jerry Leggett C. Date of Delivery 2.1.19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Floodplain Development Permit

Doddridge County, WV Floodplain Management

This permit gives approval for the development/ project listed that impacts the FEMA-designated floodplain and/or floodway of Doddridge County, WV, pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance. This permit must be posted at the site of work as to be clearly visible and must remain posted during entirety of development.

Permit: #19-540

Date Approved: March 11, 2019 **Expires: March 11, 2020**

Issued to: Antero Resources **POC: Sam Mikesell**

Company Address: 535 White Oaks Blvd. Bridgeport, WV 26330

Project Address: S. Fork Hughes River Road

Firm: 54017C0225C **Lat/Long: 39.177496N, -80.755329W**

Purpose of Development: Road Improvements

Issued by: George C. Eidel, CFM, OEM Director/Doddridge County FPM (*or designee*)

George C. Eidel

Date: March 11, 2019

For additional information regarding this permit, please contact Doddridge County Floodplain Manager at 304.873.2631, or via email at doddridgecountyfpm@gmail.com
118 East Court Street; West Union, WV 26456

19-540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- ☐ Attach this card to the back of the mailpiece, or on the front if space permits.

Dean & Dakota R. Richards
2756 Rube Leggett Rd.
New Milton, WV 26411

9590 9402 4298 8190 0203 19

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Dakota Reed ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Dakota Reed | C. Date of Delivery 2-4-19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
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- ☐ Registered Mail™
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- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

19-540

SENDER: COMPLETE THIS SECTION

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- Attach this card to the back of the mailpiece, or on the front if space permits.

Jeffrey L. & Liney E. McKinney
2616 Rube Leggett Rd.
New Milton, WV 26411

9590 9402 4298 8190 0203 26

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Jeff McKinney ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* JEFF McKINNEY | C. Date of Delivery 2-1-19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
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- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

COPY COPY COPY

KLEINFELDER OFFICE CHECKING
550 WEST C STREET SUITE 1200
SAN DIEGO, CA 92101

19-10/1250

10291

DATE 1/30/2019

PAY TO THE ORDER OF Doddridge County Commission

$ 500.00

Five - hundred 00/100 DOLLARS

Security Features Included. Details on back

usbank.

FOR South Fork of Hughes River Rd. Floodplain Permit

AUTHORIZED SIGNATURE

SAFEGUARD SECURE

"010291" 1:125000105: 157519869794"

THE FACE OF THIS DOCUMENT CONTAINS HEAT-SENSITIVE INK. TOUCH OR RUB RED IMAGE. IT WILL DISAPPEAR WITH HEAT.

COPY COPY COPY COPY COPY

FP # 19-540

FLOODPLAIN PERMIT #19-540

Antero Resources S. Fork Hughes River Rd. Road Improvements 39.177496N, -80.755329W

TASK	COMPLETE (DATE)	NOTES
CHECK RECEIVED		
US ARMY CORP. ENGINEERS (USACE)		
US FISH & WILDLIFE SERVICES (USFWS)		
WV DEPT. NATURAL RESOURCES (WVDNR)		
WV DEPT. ENVIROMENTAL PROTECTION (WVDEP)		
STATE HISTORIC & PRESERVATION OFFICE (SHPO)		
OFFICE of LAND & STREAM (OLS)		
DATE OF COMMISSION READING		
DATE AVAILABLE TO BE GRANTED	3/11/2019	
PERMIT GRANTED		
COMPLETE		

7016 2070 0000 3170 2969

7016 2070 0000 3170 2976

7016 2070 0000 3170 2983

7016 2070 0000 3170 2990

7016 2070 0000 3170 3003

7016 2070 0000 3170 3010

7016 2070 0000 3170 3027

7016 2070 0000 3170 3034

Doddridge County Floodplain Permits

(Week of February 4, 2019)

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GEORGE C. EIDEL, CFM
Doddridge County Floodplain Manager

KLEINFELDER
Bright People. Right Solutions.

1575 Corporate Woods Parkway
Suite 200
Uniontown, OH
44685
o| 330.899.1557
f | 330.899.1150

TRANSMITTAL

To:

Mr. George Eidel
Floodplain Manager
105 Court Street, Suite #3
West Union, WV 26456

Date: January 30, 2019

Reference No: 20191575.002A

cc: Project File

Document Control No.

Subject: Floodplain Permit Application Fee
Antero Resources Corporation
South Fork of Hughes River Rd Improvements
Doddridge County, West Virginia

☒ Attached ☐ Under separate cover

Via:
- ☐ Messenger/Courier
- ☐ First Class Mail
- ☒ FedEx
- ☐ United Parcel
- ☐ DHL
- ☐ Lone Star Overnight
- ☐ Freight
- ☐ Other

Transmitted:
- ☐ As Requested
- ☒ For Approval
- ☐ For Your Use
- ☐ For Review & Comment

Remarks:

Enclosed please find the $500 fee for South Fork of Hughes River Rd Improvements floodplain application.

The project budget is $830,000 for the 9.49 acres of road improvement. Only 5.48% of the project is located within the floodplain, bringing the project cost within a floodplain to $45,484. The project budget within the floodplain is under $100,000 bringing the floodplain permit fee to $500.

By: Benjamin Hargest
Civil Engineer

KLEINFELDER
Bright People. Right Solutions.

1575 Corporate Woods Parkway
Suite 200
Uniontown, OH
44685
o| 330.899.1557
f | 330.899.1150

TRANSMITTAL

To:

Mr. George Eidel
Floodplain Manager
105 Court Street, Suite #3
West Union, WV 26456

Date: January 23, 2019

Reference No: 20191575.002A

cc: Project File

Document Control No.

Subject: Floodplain Permit Application
Antero Resources Corporation
South Fork of Hughes River Rd Improvements
Doddridge County, West Virginia

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Remarks:

Enclosed please find the following documents to facilitate your review of the above referenced application:

Attachment A – Floodplain Application

Attachment B – Site Plans

Attachment C – Location Exhibits

The check for fee is to follow.

By: Benjamin Hargest
Civil Engineer

ATTACHMENT A
FLOODPLAIN APPLICATION

Road Widening + Repair

Permit# 19-540

Project Name: Hughes River Rd Improvement

Permittees Name: Antero Resources

JAN25 19 12:09PM

Doddridge County, WV

Floodplain Development Permit Application

This document is to be used for projects that impact/potentially impact the FEMA---designated floodplain and/or floodway of Doddridge County, WV pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance.

SECTION 1: GENERAL PROVISIONS (APPLICANT TO READ AND SIGN)

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. The permit will expire if no work is commenced within six months of issuance.
5. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
6. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
7. I THE APPLICANT CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

APPLICANT'S SIGNATURE Tracy B Daniel

DATE 1-24-2019

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Applicant Information:

Please provide all pertinent data.

Applicant Information		
Responsible Company Name: Antero Resources Corporation		
Corporate Mailing Address: 1615 Wynkoop St.		
City: Denver	**State:** CO	**Zip:** 80202
Corporate Point of Contact (POC):		
Corporate POC Title:		
Corporate POC Primary Phone:		
Corporate POC Primary Email:		
Corporate FEIN:	**Corporate DUNS:**	
Corporate Website: www.anteroresources.com		
Local Mailing Address: 535 White Oaks Blvd		
City: Bridgeport	**State:** WV	**Zip:** 26330
Local Project Manager (PM):		
Local PM Primary Phone:		
Local PM Secondary Phone:		
Local PM Primary Email:		
Person Filing Application: Sam Mikesell		
Applicant Title: Environmental Specialist		
Applicant Primary Phone: 303-357-6853		
Applicant Secondary Phone:		
Applicant Primary Email: smikesell@anteroresources.com		

Project Narrative:

Describe in detail the proposed development including project name/title, type of development, estimated start and completion timeline, and its potential impact on the floodplain. Use additional copies of this page as needed.

Project Narrative:
Antero Resources Corporation is proposing roadway widening and resurfacing of County Road
19/11 (South Fork of Hughes River Road) and County Road 40 (Cain Run) at multiple locations
along within Doddridge County.
The locations of the work will be at:
*The intersection of County Road 19/11 and County Road 19/6 (Harmony Road).
*The intersection of County Road 19/11 and County Road 23/2 (Big Run).
*Along County Road 19/11 approximately 0.70 miles West of the intersection of County Road
19/11 and County Road 40 (Cain Run).
*The intersection of County Road 40 and County Road 54/1 then going East approximately 0.75
miles.
The work will include the resurfacing of existing roadway, widening of roadway in some areas,
and the restoration of drainage ditches and curbs.

Proposed Development:

Please check all elements of the proposed project that apply.

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

	ACTIVITY		STRUCTURAL TYPE
[]	New Structure	[]	Residential (1 – 4 Family)
[]	Addition	[]	Residential (more than 4 Family)
[]	Alteration	[]	Non-residential (floodproofing)
[]	Relocation	[]	Combined Use (res. & com.)
[]	Demolition	[]	Replacement
[]	Manufactured/Mobil Home		

B. OTHER DEVELOPLMENT ACTIVITIES:

[X] Fill [] Mining [] Drilling [] Pipelining
[X] Grading
[] Excavation (except for STRUCTURAL DEVELOPMENT checked above)
[] Watercourse Alteration (including dredging and channel modification)
[X] Drainage Improvements (including culvert work)
[X] Road, Street, or Bridge Construction
[] Subdivision (including new expansion)
[] Individual Water or Sewer System
[] Other (please specify)

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 1 of 4

Site/Property Information:		
Legal Description: Cain Run		
Physical Address/911 Address: County Route 40		
Decimal Latitude/Longitude: 39.177496 -80.755329		
DMS Latitude/Longitude: 39° 10' 38.99" -80° 45' 19.18"		
District:	**Map:**	**Parcel:**
Land Book Description:		
Deed Book Reference:		
Tax Map Reference:		
Existing Buildings/Use of Property: County Road		

Floodplain Location Data: *(to be completed by Floodplain Manager or designee)*			
Community:	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long):		**Approximate Elevation:** **Estimated BFE:**	
Is the development in the floodway? ☐ **Yes** ☐ **No**		**Is the development in the floodplain?** ☐ **Yes** ☐ **No** **Zone:** _____	
Notes:			

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 2 of 4

Site/Property Information:		
Legal Description: South Fork of Hughes River		
Physical Address/911 Address: County Route 19/11		
Decimal Latitude/Longitude: 39.187522, -80.780108		
DMS Latitude/Longitude: 39° 11' 15.08", -80° 46' 48.39"		
District:	**Map:**	**Parcel:**
Land Book Description:		
Deed Book Reference:		
Tax Map Reference:		
Existing Buildings/Use of Property: County Road		

Floodplain Location Data: *(to be completed by Floodplain Manager or designee)*			
Community:	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long):		**Approximate Elevation:** **Estimated BFE:**	
Is the development in the floodway? ☐ **Yes** ☐ **No**		**Is the development in the floodplain?** ☐ **Yes** ☐ **No** **Zone:** _____	
Notes:			

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 3 **of** 4

Site/Property Information:		
Legal Description: South Fork of Hughes River		
Physical Address/911 Address: County Route 19/11		
Decimal Latitude/Longitude: 39.195570, -80.805148		
DMS Latitude/Longitude: 39° 11' 44.05", -80° 48' 18.53"		
District:	**Map:**	**Parcel:**
Land Book Description:		
Deed Book Reference:		
Tax Map Reference:		
Existing Buildings/Use of Property: County Road		

Floodplain Location Data: *(to be completed by Floodplain Manager or designee)*			
Community:	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long):		**Approximate Elevation:** **Estimated BFE:**	
Is the development in the floodway? ☐ **Yes** ☐ **No**		**Is the development in the floodplain?** ☐ **Yes** ☐ **No** **Zone:** _____	
Notes:			

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 4 of 4

Site/Property Information:		
Legal Description: South Fork of Hughes River		
Physical Address/911 Address: County Route 19/11		
Decimal Latitude/Longitude: 39.197165, -80.822966		
DMS Latitude/Longitude: 39° 11' 49.79", -80° 49' 22.68"		
District:	**Map:**	**Parcel:**
Land Book Description:		
Deed Book Reference:		
Tax Map Reference:		
Existing Buildings/Use of Property: County Road		

Floodplain Location Data: ***(to be completed by Floodplain Manager or designee)***			
Community:	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long):		**Approximate Elevation:** **Estimated BFE:**	
Is the development in the floodway? ☐ **Yes** ☐ **No**		**Is the development in the floodplain?** ☐ **Yes** ☐ **No** **Zone:** _____	
Notes:			

Property Owner Data:

Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 1

Property Owner Data:		
Name of Primary Owner (PO): Division of Highways District 4		
PO Address: P.O. Box 4220		
City: Clarksburg	**State:** WV	**Zip:** 26302-220
PO Primary Phone: 304-842-1517		
PO Secondary Phone:		
PO Primary Email:		

Surface Rights Owner Data:		
Name of Primary Owner (PO):		
PO Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Mineral Rights Owner Data: *(As Applicable)*		
Name of Primary Owner (PO):		
PO Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Contractor Data:

Please provide all pertinent data for contractors and sub---contractors that may be participating in this project. Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 1

Contractor/Sub-Contractor (C/SC) Information:		
C/SC Company Name:		
C/SC WV License Number:		
C/SC FEIN:	**C/SC DUNS:**	
Local C/SC Point of Contact (POC):		
Local C/SC POC Title:		
C/SC Mailing Address:		
City:	**State:**	**Zip-Code:**
Local C/SC Office Phone:		
Local C/SC POC Phone:		
Local C/SC POC E-Mail:		

Engineer Firm Information:		
Engineer Firm Name:		
Engineer WV License Number:		
Engineer Firm FEIN:	**Engineer Firm DUNS:**	
Engineer Firm Primary Point of Contact (POC):		
Engineer Firm Primary POC Title:		
Engineer Firm Mailing Address:		
City:	**State:**	**Zip-Code:**
Engineer Firm Office Phone:		
Engineer Firm Primary POC Phone:		
Engineer Firm Primary POC E-Mail:		

Adjacent and/or Affected Landowners Data

Please provide data for all adjacent and/or affected surface owners (both up and down stream) whose property may be impacted by proposed development as demonstrated by a floodplain study or survey. Use additional copies of this page as needed.

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO): Shown on Site Plans		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO):		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): Shown on Site Plans		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO):		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Site Plan

A Site Plan is an accurate and detailed map of the proposed development for this project. It shows the size, shape, location and special features of the project property, and the size and location of any development planned to the property, especially as that development will impact the floodplain and/or floodway. Site plans show what currently exists on the project property, and any changes or improvements you are proposing to make. **A certified and licensed engineering firm should complete site plans.**

A SITE PLAN MUST CONTAIN THE FOLLOWING INFORMATION:

1. Legal description of the parcel, north arrow and scale
2. All property lines and their dimensions
3. Names of adjacent roads, location of driveways
4. Location of sloughs, tributaries, streams, rivers, wetlands, ponds, and lakes, with setbacks indicated, and including FEMA floodplain data based on most updated FIRM.
5. Location, size, shape of all buildings, existing and proposed, with elevation of lowest floor indicated.
6. Location and dimensions of existing or proposed on-site sewage systems.
7. Location of all propane tanks, fuel tanks or other liquid storage tanks whether above ground or below ground level.
8. Location and dimensions of any proposed pipeline placement(s) into floodplain/floodway.
9. Location and dimensions of any roadway development into floodplain/floodway. *(Includes initial development access roads)*
10. Location and dimensions of any bridge and/or culvert development into floodplain/floodway.
11. Location and dimensions of any storage yard or facility into the floodplain/floodway.
12. Location of any existing utilities and/or proposed utility placement and/or displacement.
13. Location, dimensions and depth of any existing or proposed fill on site.
14. A survey showing the **existing ground elevations** of at least location on the building site. **ELEVATION NOTE**: All vertical datum will reference either NGVD 29 or NAVD 88. Assumed datum will not be acceptable unless the property is located in an area where vertical datum has not been published. For those areas where vertical datum has not been established, a site plan with contours, elevations using assumed datum, high water marks and existing water levels of sloughs, rivers, lakes or streams and proposed lowest floor elevation.

Applicant

Please read print name, sign and date below:

- I certify that I am authorized to submit this application for the primary project developer.
- I certify that the information included in this application is to the best of my knowledge true and complete.
- I certify that all required Federal, State, and local permits required by law and/or ordinance for the above described development of this project have will be properly attained, are current and valid, and must be presented prior to a Doddridge County Floodplain Permit being issued.
- I understand that if in the course of the development project additional permits become required that were not needed during the initial proposal, the primary developer must notify the Doddridge County Floodplain Manager within 48 hours of such need, and that a "Stop Work" order may be issued for all project work directly impacting the floodplain or floodway, until such time the required additional permits are acquired.
- I understand that once the floodplain permit is submitted, the application will be entered into official public record at the next regularly scheduled Doddridge County Commission meeting after the date of submittal.
- I understand that from the date of submittal of the fully completed permit application, the Doddridge County Floodplain Manager has ninety (90) days to make a determination to either grant or deny said permit application. During this approval period, the Doddridge County Floodplain Manager may, at his or her discretion, conduct a review and/or additional study of provided documentation by means of an independent engineering firm. All costs associated with said review and/or study must be reimbursed to the County before issuance of approved permit.
- I understand that during the approval period, the Doddridge County Floodplain Manager of designee may at his or her discretion conduct site visits and document conditions of proposed development pursuant to the permit application.
- I understand that once the Floodplain Permit is granted, the permit will be entered into official public record. Appeals to the permit may be made no later than twenty (20) days after said issuance. If a valid appeal is submitted, as determined by the Doddridge County Floodplain Manager, a "Stop Work" order will be issued for all project development directly involving the floodplain or floodway. A public hearing by the Doddridge County Appeals Board will be scheduled no less than ten (10) days after the next regularly scheduled Doddridge County Commission meeting.
- I understand that all decisions of the Doddridge County Appeals Board shall be final.
- **I understand issuance of a Floodplain Permit authorizes me to proceed with construction as proposed.**
- In signing this application, the primary developer hereby grants the Doddridge County Floodplain Manager or designee the right to enter onto the above---described location to inspect the development work proposed, in progress, and/or completed.
- I understand that if I do not follow exactly the site---plan submitted and approved by this permit that a "Stop Work" order may be issued by the Doddridge County Floodplain Manager and that I must stop all construction immediately until discrepancies of actual work vs. proposed work is resolved.

Applicant Signature: Troy B Daniel Date: 1-24-2019

Applicant Printed Name: Troy B Daniel, PE - Authorized Representative

PROPERTY OWNER	PARCEL ID NUMBER	E-911 ADDRESS	PROPERTY OWNER ADDRESS
MORRIS, I L (IKE)	09-07-0010-0002-0000	5193 HUGHES RIVER RD, NEW MILTON, WV 26411	PO BOX 397, GLENVILLE, WV 26352
BUNTING, TYLER GARRETT	09-07-0015-0001-0000	N/A	LENORA BUNTING, P O BOX 105, SMITHBURG, WV 26436
MCKINNEY, JEFFREY LYNN & LINEY ELAINE	09-07-0015-0001-0001	2605 RUBE LEGGETT RD, NEW MILTON, WV 26411	2616 RUBE LEGGETT RD, NEW MILTON, WV 26411
STOUT S W EST	09-07-011-0005-0000	3866 PORTO RICO RD, NEW MILTON, WV 26411	
LEGGETT JERRY L & SHARON L	09-07-0011-0007-0000, 09-07-0015-0001-0004	N/A	2806 RUBE LEGGETT RD, NEW MILTON, WV 26411
JONES WILLAIM L & REVOCABLE LIVING TRUST	09-07-0011-0008-0000	2826 RUBE LEGGETT RD, NEW MILTON, WV 26411	2037 INDIAN FORK RD, NEW MILTON, WV 26411
HYDE, MARIE E & RICHARD A BAKER	09-07-0015-0001-0005	2628 RUBE LEGGETT RD, NEW MILTON, WV 26411	11820 REDLANDS BLVD, MORENO VALLEY, CA 92555
RICHARDS, DEAN & DAKOTA REED	09-07-0015-0001-0002	2756 RUBE LEGGETT RD, NEW MILTON, WV 26411	2756 RUBE LEGGETT RD, NEW MILTON, WV 26411

ATTACHMENT C
LOCATION EXHIBITS

Location 1

This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

Map created on 1/14/2019

Flood Info Location

User Notes:

FEMA Effective Floodplain

- Floodway
- Flood Hazard Zone
- Advisory Zone A or Updated Zone AE

Disclaimer:

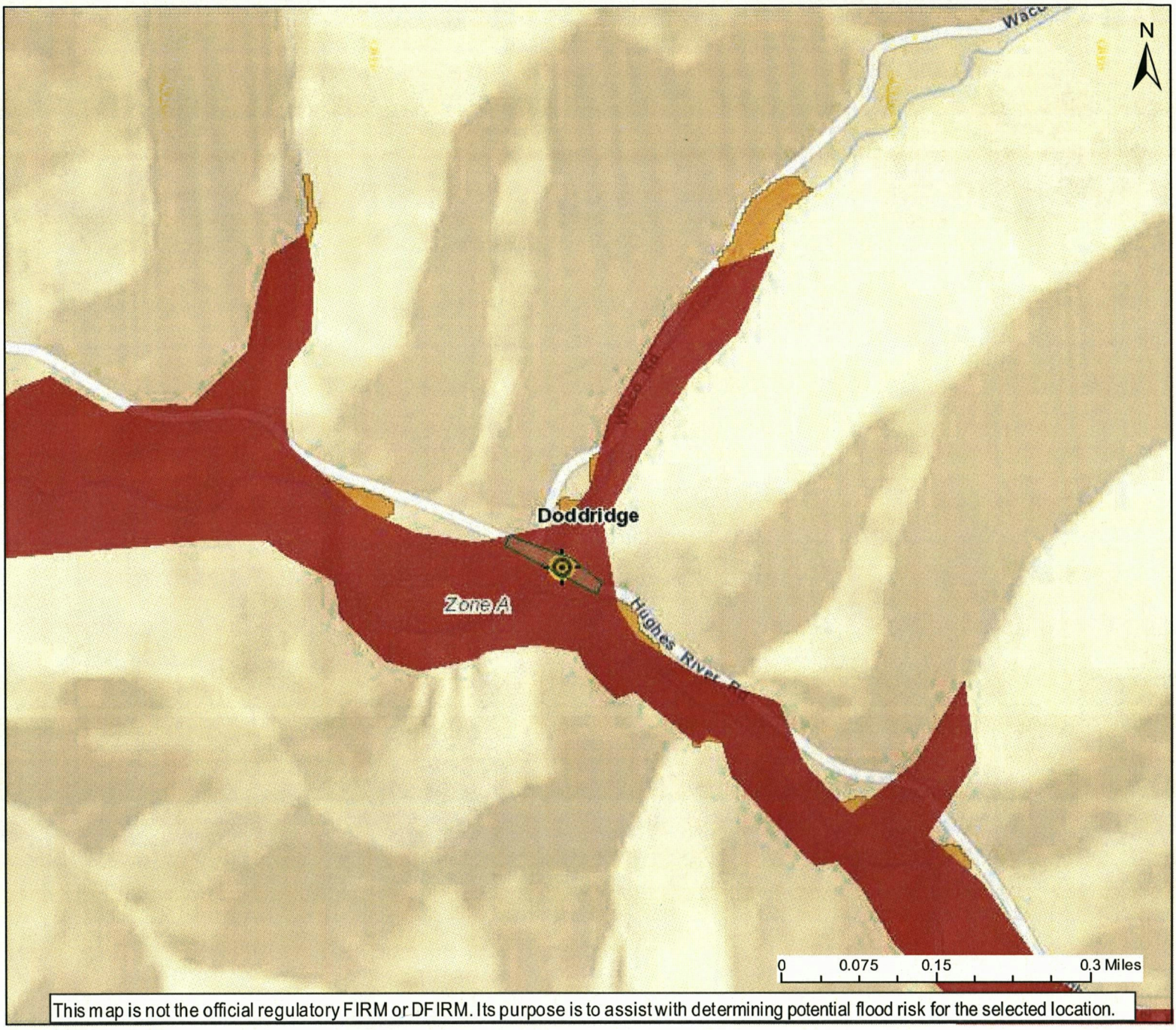
The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. **WV Flood Tool (*https://www.MapWV.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.**

Flood Hazard Area:

Location is **WITHIN** the FEMA 100-year floodplain.
Advisory Flood Heights available.

Flood Hazard Zone: A (Advisory A)
Stream: Unnamed Tributary 6 to South Fork
Watershed (HUC8): Little Kanawha (5030203)
FEMA Flood Map: 54017C0225C **EFF:** 10/4/2011
Elevation: About 846 ft (Source: SAMS 2003)
Community Name: Doddridge County
Community ID: 540024
Location (long, lat): (-80.822661, 39.197040)
Parcel ID: 09-07-0010-0002-0000
Address: multiple addresses

Location 2



Map created on 1/14/2019

Flood Info Location

User Notes:

FEMA Effective Floodplain

- Floodway
- Flood Hazard Zone
- Advisory Zone A or Updated Zone AE

Disclaimer:

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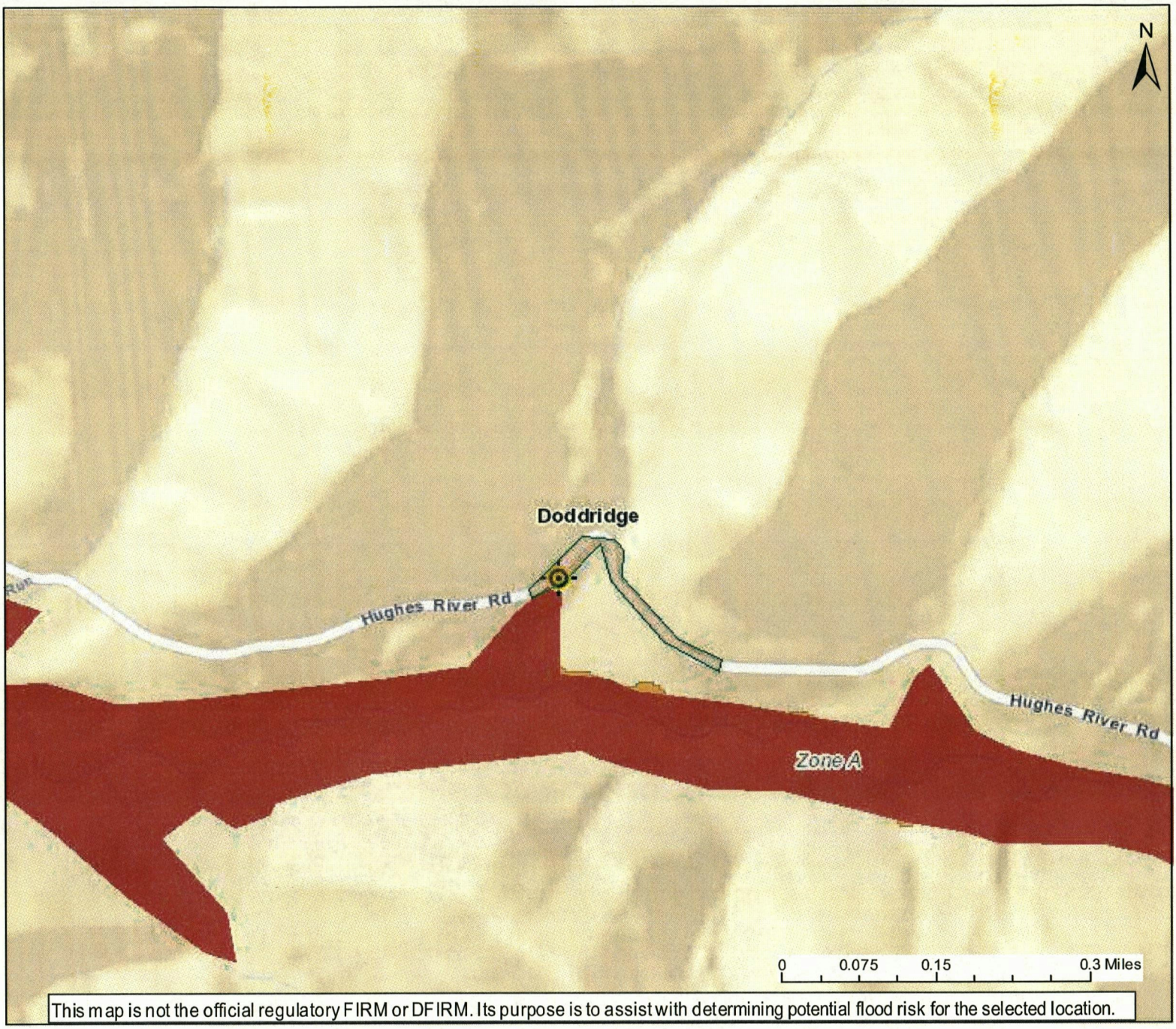
Flood Hazard Area:

Location is **WITHIN** the FEMA 100-year floodplain.
Advisory Flood Heights available.

Flood Hazard Zone: A (Advisory A)
Stream: South Fork Hughes River
Watershed (HUC8): Little Kanawha (5030203)
FEMA Flood Map: 54017C0225C **EFF:** 10/4/2011
Elevation: About 857 ft (Source: SAMS 2003)
Community Name: Doddridge County
Community ID: 540024
Location (long, lat): (-80.805164, 39.195543)
Parcel ID: 09-07-0010-0002-0000
Address: multiple addresses

Location 3



Map created on 1/14/2019

Flood Info Location

User Notes:

FEMA Effective Floodplain

- Floodway
- Flood Hazard Zone
- Advisory Zone A or Updated Zone AE

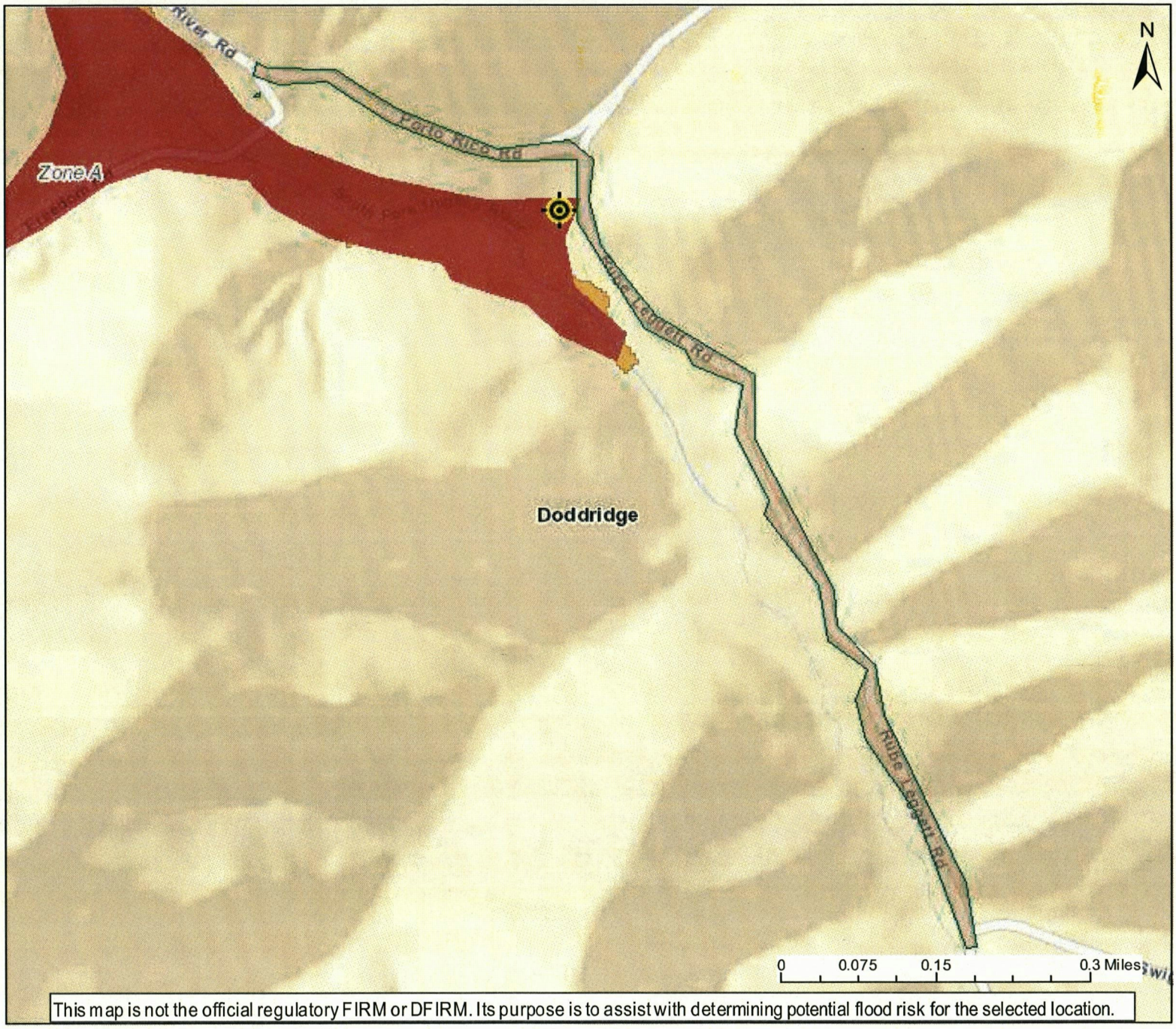
Disclaimer:

The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. **WV Flood Tool (*https://www.MapWV.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.**

Flood Hazard Area:
Location is **WITHIN** the FEMA 100-year floodplain.

Flood Hazard Zone: A
Stream: Dry Run
Watershed (HUC8): Little Kanawha (5030203)
FEMA Flood Map: 54017C0225C **EFF:** 10/4/2011
Elevation: About 919 ft (Source: SAMS 2003)
Community Name: Doddridge County
Community ID: 540024
Location (long, lat): (-80.782255, 39.188536)
Parcel ID: 09-07-0010-0002-0000
Address: multiple addresses

Location 4



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

Map created on 1/14/2019

Flood Info Location

User Notes:

FEMA Effective Floodplain

- Floodway
- Flood Hazard Zone
- Advisory Zone A or Updated Zone AE

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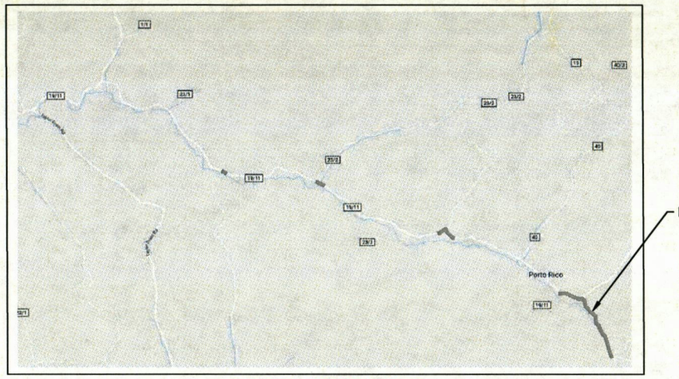
Flood Hazard Area:

Location is **WITHIN** the FEMA 100-year floodplain.

Flood Hazard Zone: A
Stream: South Fork Hughes River
Watershed (HUC8): Little Kanawha (5030203)
FEMA Flood Map: 54017C0225C **EFF:** 10/4/2011
Elevation: About 941 ft (Source: SAMS 2003)
Community Name: Doddridge County
Community ID: 540024
Location (long, lat): (-80.755937, 39.178042)
Parcel ID: 09-07-0010-0002-0000
Address: multiple addresses

Part of #19-540

PRELIMINARY PLANS FOR THE

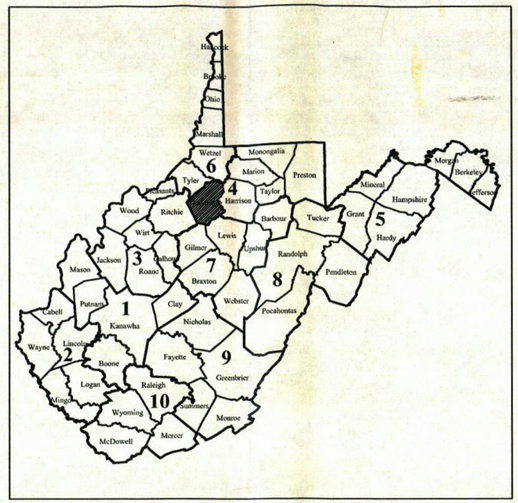


COUNTY HIGHWAY MAP
NOT TO SCALE

Antero Resources

SOUTH FORK OF HUGHES RIVER ROADWAY IMPROVEMENTS

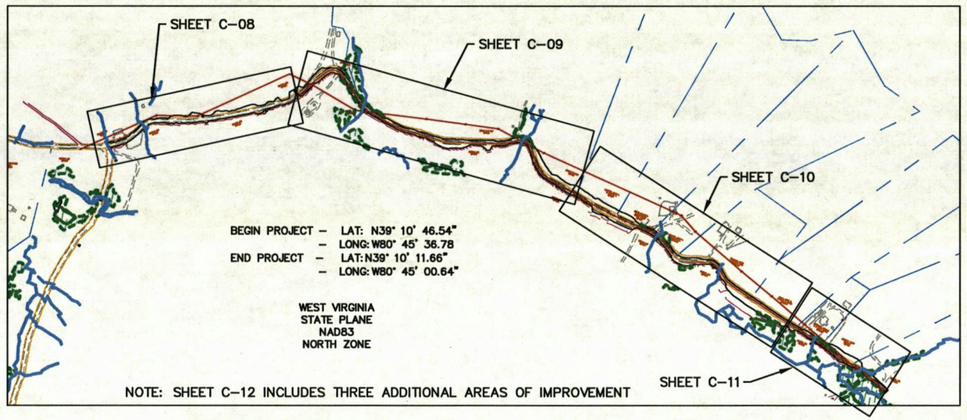
SERVES OXFORD 13
DODDRIDGE COUNTY, WEST VIRGINIA
JANUARY 2019



WEST VIRGINIA DOH DISTRICT MAP
NOT TO SCALE

SURFACE EASEMENT OUTSIDE RIGHT-OF-WAY					
OWNER	DISTRICT/ MAP/PID	TYPE OF EASEMENT	TOTAL EASEMENT (AC)	AREAS	
				STATION	STATION
HYDE, MARIE & RICHARD BAKER	7/15/1.5	TCE	0.01	30+50	33+50
JONES, WILLIAM	7/11/8	PROW	0.053	21+50	23+50
JONES, WILLIAM	7/11/8	TCE	0.048	21+50	23+50
JONES, WILLIAM	7/11/8	PDE	0.004	21+50	23+50
LEGGETT, JERRY & SHARON	7/11/7	PROW	0.139	19+00	21+50
LEGGETT, JERRY & SHARON	7/11/7	TCE	0.06	19+00	21+50
LEGGETT, JERRY & SHARON	7/15/1.4	PROW	0.001	23+50	25+50
LEGGETT, JERRY & SHARON	7/15/1.4	TCE	0.008	23+50	25+50
LEGGETT, JERRY & SHARON	7/15/1.4	PDE	0.007	23+50	25+50
MCKINNEY, JEFFREY	7/15/1.1	PROW	0.006	33+50	35+50
MCKINNEY, JEFFREY	7/15/1.1	TCE	0.031	33+50	35+50
MCKINNEY, JEFFREY	7/15/1.1	PDE	0.006	33+50	35+50
MORRIS, IKE	7/10/2	PROW	1.347	START	END
MORRIS, IKE	7/10/2	TCE	2.11	START	END
MORRIS, IKE	7/10/2	PDE	0.171	START	END
STOUT S W EST	7/11/5	PROW	0.164	4+50	19+00
STOUT S W EST	7/11/5	TCE	0.11	4+50	19+00
STOUT S W EST	7/11/5	PDE	0.013	4+50	19+00

DISTURBANCE AREA OUTSIDE RIGHT-OF-WAY				
DESCRIPTION	TOTAL AREA (SF)	TOTAL AREA (AC)	AREAS	
			STATION	STATION
PROJECT WIDE				
	384	0.009	301+00	301+50
	17957	0.412	302+00	312+00
	13440	0.309	301+00	312+00
	4567	0.105	0+00	2+00
	511	0.01	2+75	3+00
	25342	0.582	14+50	23+00
	12417	0.285	31+00	39+69
	4219	0.097	0+00	4+50
	65089	1.494	5+00	39+69



NOTE: SHEET C-12 INCLUDES THREE ADDITIONAL AREAS OF IMPROVEMENT

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COVER	C-01
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FLOODPLAIN CONDITIONS	
DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN A FLOODPLAIN?	YES
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR?	YES
FLOOD HAZARD ZONE?	NO
HEC-RAS STUDY COMPLETED?	NO
FLOODPLAIN SHOWN ON DRAWINGS?	YES
FIRM MAP NUMBER(S) FOR THIS SITE:	n/a
AREA OF RIGHT-OF-WAY IN FLOOD HAZARD AREA:	00.00 ACRES

THE GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED IN THE SITE NO MORE THAN TEN DAYS AND NO LESS THAN THREE DAYS IN ADVANCE OF EXCAVATION. WEST VIRGINIA STATE LAW REQUIRES 2 WORKING DAYS NOTICE (B24C-1-1 TO B24C-1-8 OF THE WEST VIRGINIA CODE).

CALL BEFORE YOU DIG IN WEST VIRGINIA
MISS UTILITY: 811 OR 1-800-245-4848

RESOURCE IMPACT TABLE

FEATURE LABEL	STATION	TYPE OF IMPACT	DRAINAGE (AC)	EX CULVERT SIZE (IN)	PROP. CULVERT SIZE (IN)	CONDITION	LENGTH OF CULVERT (FT)	OUTLET PROTETION IMPACT (FT)	DESCRIPTION OF IMPACT
C-01	301+00	FILL	1.5	18	18	BAD	N/A	20	OUTLET PROTECTION
C-02	304+00	FILL	1.5	18	18	BAD	50	20	CULVERT AND OUTLET PROTECTION
C-03	307+00	FILL	1	18	18	BAD	40	20	CULVERT AND OUTLET PROTECTION
C-04	310+00	FILL	1	24	18	BAD	35	20	CULVERT AND OUTLET PROTECTION
C-05	2+50	FILL	1.5	24	N/A	BAD	N/A	20	OUTLET PROTECTION
C-06	5+00	FILL	3.5	24	24	GOOD	N/A	20	OUTLET PROTECTION
C-07	14+50	FILL	3	24	24	GOOD	N/A	20	OUTLET PROTECTION
C-08a	23+75	FILL	1	15	18	BAD	55	20	CULVERT AND OUTLET PROTECTION
C-08B	24+00	FILL	1	12	18	BAD	30	20	CULVERT AND OUTLET PROTECTION
C-09	28+00	FILL	1	36	36	GOOD	N/A	20	OUTLET PROTECTION
C-10	35+00	FILL	1	12	18	BAD	35	20	CULVERT AND OUTLET PROTECTION
C-11	37+75	FILL	2	12	18	BAD	30	20	CULVERT AND OUTLET PROTECTION
C-12	38+25	FILL	2	N/A	18	N/A	40	20	CULVERT AND OUTLET PROTECTION
C-93+25	93+25	FILL	N/A	(2) 12"	N/A	GOOD	N/A	20	OUTLET PROTECTION
C-148+50	148+50	FILL	N/A	60"	N/A	GOOD	N/A	20	OUTLET PROTECTION
C-227+50	227+50	FILL	N/A	42"	N/A	GOOD	N/A	20	OUTLET PROTECTION

ENVIRONMENTAL NOTES

WETLAND DELINEATIONS WERE PERFORMED IN AUGUST & OCTOBER 2018 BY KLEINFELDER TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OR THE U.S. ARMY COPRS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP).

ATTACHMENT B
SITE PLANS

Antero Resources

APPROVED FOR PERMITS: BY: DATE:
APPROVED FOR BIDS: BY: DATE:
APPROVED FOR CONSTRUCTION: BY: DATE:

EARTHRES
ENGINEERING FOR SUCCESS

NO.	BY	DATE	DESCRIPTION
4	KRE	01/31/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	PRELIMINARY DESIGN FOR REVIEW

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-01

PLOT DATE/TIME: 1/31/2019 3:02 PM
CAD FILE: P:\PROJECTS\Antero Resources\131082.064 Hughes River Road\CAD\Drawings\Rev 0\131082.064 HUGHES_RIVER_ROAD_MASTER_PRELIM.dwg

GENERAL NOTES

PLANS
THESE PLANS PRESENT THE PROPOSED LINES, GRADES, AND DETAILS NECESSARY TO COMPLETE THE PROJECT. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS TO ACCOMPLISH THE WORK. THE CONTRACTOR IS TO USE BEST MANAGEMENT PRACTICES (BMP'S) AS REQUIRED BY FEDERAL, STATE, AND COUNTY AUTHORITIES.

GOVERNING SPECIFICATIONS AND STANDARD CONSTRUCTION DRAWINGS
THE GOVERNING SPECIFICATIONS FOR THIS PROJECT ARE THE (INSERT ENGINEER) SPECIFICATIONS THAT ARE INCLUDED WITHIN THESE PLANS. ANY ITEMS NOT COVERED IN THE (INSERT ENGINEER) SPECIFICATIONS SHALL BE COVERED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS, ROADS AND BRIDGES, ADOPTED 2010 AMENDED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, SUPPLEMENTAL SPECIFICATIONS, LATEST EDITION AND THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD DETAILS BOOKS, VOLUME I, DATED JANUARY 1, 2000 AND VOLUME II, DATED JANUARY 1, 1994. (WVDOH SPECIFICATIONS SHALL BE USED FOR TECHNICAL ASSISTANCE ONLY.)

EXISTING CONDITIONS
TOPOGRAPHIC FEATURES, CONTOURS, AND SURVEY REFERENCE STATIONS USED FOR THIS PROJECT ARE FROM (INSERT SURVEY COMPANY) FIELD SURVEY CONDUCTED IN (MONTH, YEAR). EXISTING ROADS, DRIVEWAYS, AND STRUCTURES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO LOCATE AND PROTECT EXISTING UTILITY SERVICES AND MAINS. ANY DISCREPANCIES BETWEEN THE PLANS AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE FIELD ENGINEER PRIOR TO CONSTRUCTION.

CONTRACTOR'S RESPONSIBILITY
FAILURE TO SPECIFICALLY MENTION ANY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PERFORM SUCH WORK. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS. THE CONTRACTOR IS RESPONSIBLE FOR TRANSITIONS TO DRIVEWAYS, DRAINAGE STRUCTURES AND OTHER ROADSIDE FEATURES. METAL TRENCH PLATES ARE REQUIRED FOR ALL JOBS INVOLVING CULVERT REPLACEMENT. TRENCH PLATES MUST BE PRESENT ON SITE AND READY FOR IMMEDIATE USE PRIOR TO ROADWAY EXCAVATION.

MATERIAL
ALL MATERIALS USED FOR THE PROJECT SHALL MEET WVDOH SPECIFICATIONS.

UTILITIES NOTIFICATION
AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE, AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN IN THE PLANS. THE OWNER OF THE UNDERGROUND UTILITY FACILITY SHALL, WITHIN FORTY-EIGHT (48) HOURS, EXCLUDING SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS, AFTER NOTICE IS RECEIVED, STAKE, MARK, OR OTHERWISE DESIGNATE THE LOCATION OF THE UNDERGROUND UTILITY FACILITIES IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO (2) DAYS AHEAD OF THE PLANNED CONSTRUCTION.

WORK LIMITS
THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION LOCATION ONLY. CONTRACTOR SHALL PROVIDE THE INSTALLATION AND OPERATION OF ALL WORK ZONE TRAFFIC CONTROL AND WORK ZONE TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS AT THE CONTRACTOR'S EXPENSE.

CONSTRICT ALL ACTIVITIES, EQUIPMENT STORAGE, AND STAGING TO WITHIN THE CONSTRUCTION LIMITS. UNLESS OTHERWISE IDENTIFIED IN THE PLANS OR PROPOSAL, THE CONSTRUCTION LIMITS ARE MAINTAINED WITHIN THE RIGHT OF WAY OR AS NOTED ON THE PLANS.

SUBMIT A WRITTEN REQUEST TO THE PROJECT ENGINEER TO USE ANY AREA OUTSIDE THESE LIMITS. THE DOCUMENT SUBMITTED MUST CLEARLY IDENTIFY THE AREA AND EXPLAIN THE PROPOSED USE AND RESTORATION OF THE AREA. USE OF THESE AREAS FOR DISPOSAL OF WASTE MATERIAL AND CONSTRUCTION DEBRIS, EXCAVATION OF BORROW MATERIAL AND PLACEMENT OF PORTABLE PLANTS IS PROHIBITED. THE REQUEST MUST BE APPROVED, IN WRITING, BEFORE THE CONTRACTOR HAS PERMISSION TO USE THE AREA.

SHOULDER AND DITCH WORK SHALL NOT BE PERFORMED BEYOND THESE LIMITS.

ANY ITEMS DAMAGED BEYOND THE CONSTRUCTION LIMITS AS DEFINED ABOVE WILL BE REPLACED IN KIND OR AS APPROVED BY THE PROJECT ENGINEER AT NO EXPENSE TO THE PROPERTY OWNER AND ANTERO RESOURCES.

ANY CONSTRUCTION EQUIPMENT THAT MAY DAMAGE ROAWAY INTEGRITY SHALL BE PROHIBITED FROM TRAVELING ON ROAD UNLESS PROPER PROTECTION (I.E. STEEL ROAD PLATES, PLYWOOD, ETC.) IS USED, OR WRITTEN APPROVAL IS OBTAINED FROM STATE, COUNTY, OR LOCAL AUTHORITY. ANY DAMAGE FROM FAILURE TO COMPLY WILL RESULT IN ROAD BEING RECONSTRUCTED AT CONTRACTOR'S EXPENSE.

PROTECTION OF RIGHT-OF-WAY LANDSCAPING
CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FEATURES SCHEDULED TO REMAIN AT NO EXPENSE TO ANTERO RESOURCES.

CONSTRUCTION NOISE
ACTIVITIES AND LAND USE ADJACENT TO THIS PROJECT MAY BE AFFECTED BY CONSTRUCTION NOISE. IN ORDER TO MINIMIZE ANY ADVERSE CONSTRUCTION NOISE IMPACTS, DO NOT OPERATE POWER-OPERATED CONSTRUCTION-TYPE DEVICES BETWEEN THE HOURS OF 11 PM AND 7 AM. IN ADDITION, DO NOT OPERATE AT ANY TIME ANY DEVICE IN SUCH A MANNER THAT THE NOISE CREATED SUBSTANTIALLY EXCEEDS THE NOISE CUSTOMARILY AND NECESSARILY ATTENDANT TO THE REASONABLE AND EFFICIENT PERFORMANCE OF SUCH EQUIPMENT.

WORK SCHEDULE / COORDINATION OF WORK
THE CONTRACTOR SHALL CONTACT EACH RESIDENCE AND BUSINESS LOCATED WITHIN THE PROJECT LIMITS TO ADVISE OF CONSTRUCTION SCHEDULE AND PARKING RESTRICTIONS NEEDED FOR CONSTRUCTION ACCESS. THE CONTRACTOR SHALL ALSO CONTACT LOCAL SCHOOLS AND EMERGENCY SERVICES TO COORDINATE ANY TIMES THAT CONSTRUCTION SHOULD NOT TAKE PLACE.

MAINTAINING TRAFFIC
TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES DURING NON-WORKING HOURS. THE LANE CLOSURE OF TWO-WAY TRAFFIC SHOULD BE AVOIDED, BUT IF NECESSARY, SHALL BE LIMITED TO NO LONGER THAN 30 MINUTES PER THE WEST VIRGINIA MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS (2006 EDITION). THE CLOSURE OF ONE LANE SHALL BE PERMITTED DURING PARTS OF THE PROJECT. HOWEVER, CLOSURE TIME SHALL BE LIMITED TO CONSTRUCTION REQUIRING CLOSURE. INGRESS AND EGRESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES. THE WEST VIRGINIA MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS, 2006 EDITION, SHALL BE ENFORCED DURING THE ENTIRE LIFE OF CONSTRUCTION.

TRAFFIC SIGNS AND SUPPORTS
SIGN AND SUPPORT INSTALLATION SHALL BE IN ACCORDANCE WITH THE WEST VIRGINIA MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS, 2006 EDITION.

CONSTRUCTION RIGHT-OF-WAY
THE TOTAL CONSTRUCTION RIGHT-OF-WAY WIDTH ON CR-XX IS XX-FT (XX-FT EACH WAY FROM CENTERLINE). THE RIGHT-OF-WAY FOR TR-XX IS XX-FT (XX-FT EACH WAY FROM CENTERLINE). THE RIGHT-OF-WAY FOR SR-XX IS XX-FT (XX-FT EACH WAY FROM CENTERLINE). THE CONTRACTOR SHALL STAY WITHIN THESE LIMITS FOR ALL WORK PERFORMED ON THIS PROJECT.

CLEAN UP

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE REMOVED ONCE 70% VEGETATIVE GROWTH IS ESTABLISHED OVER THE ENTIRE SITE.

MATERIAL DISPOSAL

MATERIAL WASTE SITE
THE MATERIAL WASTE SITE FOR THIS PROJECT IS LOCATED AT THE (INSERT WASTE SITE LOCATION).

MATERIAL DISPOSAL
CONTRACTOR SHALL DISPOSE OF ALL MATERIALS RESPONSIBLY.

MATERIAL FROM EXCAVATION, SHOULDER AND DITCH WORK, EARTH AND STONE REMOVED BELOW THE PAVEMENT REPLACEMENT AND PAVEMENT REPAIR AREAS ARE TO BE DISPOSED OF AT THE PROJECT WASTE SITE.

DURING THE EXCAVATION AND DITCHING PROCESS, SHOULD MATERIAL BE ENCOUNTERED THAT CONTAINS A SIGNIFICANT AMOUNT OR SIZE OF ORGANIC MATERIAL, TRASH, HYDROCARBONS AND/OR ANY OTHER MATERIALS THAT COULD PRESENT AN ENVIRONMENTAL RISK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER. THE ENGINEER WILL REVIEW AND DETERMINE WHETHER THE MATERIAL CAN BE SPOILED ON SITE OR DISPOSED OF AT AN APPROPRIATE LAND FILL FACILITY.

RECYCLING AND DISPOSAL
THE WASTE SITE SHALL BE REQUIRED TO MEET ALL LOCAL, STATE AND FEDERAL GUIDELINES AND REGULATIONS FOR DISPOSAL OF MATERIALS. THE WASTE SITE SHALL HAVE ALL EROSION CONTROL FEATURES REQUIRED BY THE REGULATIONS IN PLACE PRIOR TO WASTING ANY MATERIALS. ONCE ALL WORK IS COMPLETE THE WASTE SITE SHALL BE GRADED TO MEET THE GRADES OF THE SURROUNDING AREA AND THEN SEEDED AND MULCHED IN ACCORDANCE WITH THE SEED AND MULCH NOTES WITHIN THESE PLANS.

MATERIALS THAT ARE RECYCLABLE SUCH AS OLD CULVERT PIPES ARE TO BE TAKEN TO AN APPROVED RECYCLING LOCATION RATHER THAN BE BURIED IN THE WASTE SITE.

ALL COSTS FOR THE WASTE SITE, GRADING, EROSION CONTROL, SEEDING AND MULCHING, TRANSPORTATION AND RECYCLING COSTS ARE TO BE INCLUDED IN THE VARIOUS BID ITEMS THAT WILL HAVE TO BE RECYCLED OR DISPOSED OF.

PROJECT NOTES

SPECIAL ITEM: NIGHTTIME WORK
THIS ITEM HAS BEEN INCLUDED SHOULD NIGHTTIME WORK BE NECESSARY. THE BID PRICE FOR THIS ITEM SHALL INCLUDE ALL EXTRA COSTS INCURRED WITH WORKING DURING NIGHT TIME HOURS AND SHALL INCLUDE ALL ADDITIONAL COSTS NECESSARY FOR TEMPORARY LIGHT PLANTS, MATERIAL DELIVERY, SCHEDULING, ETC. TO PERFORM THE WORK. PAYMENT FOR THIS ITEM SHALL BE PAID PER DAY USED.

ITEM 201: SELECTIVE CLEARING AND THINNING
TREE TRIMMING IS TO BE PERFORMED AS SHOWN IN THE DETAIL. ALL TREES AND SHRUBS ALONG THE ROADWAY WHICH REQUIRE TRIMMING ARE CALLED OUT IN THE TABLE PROVIDED IN THE PLANS. TRIMMING TO THE RIGHT-OF-WAY LINE WILL ONLY BE REQUIRED WHERE THERE IS A SIGHT DISTANCE PROBLEM. NO TREE LARGER THAN 5" DIAMETER AT BREAST HEIGHT ARE TO BE CUT DOWN. ONLY TRIMMING OF THE BRANCHES IS PERMITTED. TREE TRIMMING WILL BE PAID FOR IN L.F. AS SHOWN IN THE DETAILS.

ITEM 207: UNCLASSIFIED EXCAVATION
UNCLASSIFIED EXCAVATION IS TO BE PERFORMED TO ALTER THE EXISTING GRADE TO MEET THE DESIGN ELEVATIONS SHOWN ON THE PLANS. ALL TOPSOIL REMOVED FROM THE AREA IS TO BE STOCKPILED AND THEN REPLACED AT A MAX DEPTH OF 6" OVER THE FINAL GRADED SLOPES TO PROVIDE ADEQUATE GRASS GROWTH. THE CONTRACTOR SHALL COMPACT ALL FILL MATERIALS TO NOT LESS THAN 95% OF MAXIMUM DRY DENSITY AND +/- 2% OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 TO PROVIDE STABILITY AND REDUCE SETTLEMENT.

ALL COSTS FOR WORK IN THESE LOCATIONS, INCLUDING CUTS, FILLS, REMOVAL, STOCKPILING AND REPLACEMENT OF TOPSOIL, SHOULDER AND DITCH GRADING AND FINAL COMPACTION OF THE ROADWAY SUBGRADE IS TO BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 207 IN THESE LOCATIONS. FINAL PAYMENT WILL BE THE TOTAL NUMBER OF CUBIC YARDS IN THE PLAN QUANTITY.

ITEM SPECIAL-521: XX" SOIL CEMENT @ XX% CEMENT
THIS ITEM HAS BEEN INCLUDED FOR ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY INCLUDING CEMENT TO PLACE A XX" SOIL CEMENT BASE WITH X% CEMENT AS SHOWN IN THE DETAILS AND TABLES SHOWN IN THESE PLANS. ALL COSTS FOR PULVERIZING, GRADING, PROVIDING AND PLACING CEMENT, MIXING, FINE GRADING AND CURE COAT ARE TO BE INCLUDED IN THE UNIT BID PRICE FOR FDR AND IS TO BE PAID FOR BY THE SY COMPLETE IN PLACE.

THE FDR IS TO BE PERFORMED BY USING TWO PULVERIZER PASSES. FIRST THE ROADWAY IS TO BE PULVERIZED, THEN SPREAD XX POUNDS PER SY OF CEMENT AND MIX WITH THE SECOND PASS.

ITEM 701: CEMENT
CEMENT IS TO BE APPLIED AT A RATE OF XX PSY. ALL CEMENT NEEDED FOR THE SOIL CEMENT IS TO BE INCLUDED IN UNIT BID PRICE FOR ITEM 701. ALL CEMENT USED FOR THIS PROJECT IS TO BE WVDOH APPROVED.

ITEM 707: CURE COAT
A CURE COAT IS TO BE PLACED ON THE NEW SOIL CEMENT SURFACE TO AID IN CURING AND IS TO BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 707, OR A WATER CURE OF FIVE DAYS MINIMUM IS REQUIRED.

ITEM 229: LINEAR GRADING (DAYLIGHTING SHOULDERS)
THIS DETAIL HAS BEEN INCLUDED IN THE CONTRACT FOR THE PURPOSE OF DAYLIGHTING THE EXISTING SHOULDERS AS SHOWN IN THE DETAILS. ALL COSTS FOR LINEAR GRADING AND DISPOSAL OF MATERIAL IS TO BE INCLUDED IN ITEM 229, LINEAR GRADING PAID BY L.F.

ITEM 229: DITCH CLEANOUT
THIS DETAIL HAS BEEN INCLUDED IN THE CONTRACT TO CLEAN OUT THE EXISTING DITCHES AS NEEDED ALONG THE PROJECT AND IN THE WIDENING AREAS (SEE QUANTITY TABLES FOR LOCATIONS). (ALL DITCHES CUT SHALL BE SEEDED AND MULCHED AS CALLED FOR IN THE PLANS.) ALL COSTS FOR DITCH CLEANOUT AND DISPOSAL OF MATERIAL IS TO BE INCLUDED IN THE COSTS FOR ITEM 229 DITCH CLEANOUT PAID BY L.F.

ITEM 401: HMA ASPHALT BASE COURSE
PLACE HMA BASE COURSE AS SHOWN IN THE TABLES AND DETAILS. ALL COSTS FOR MATERIALS, LABOR, AND EQUIPMENT IS TO BE INCLUDED IN THE COST FOR ITEM 401. THIS ITEM WILL BE PAID BY THE TON.

ITEM 307: AGGREGATE BASE COURSE, STONE
WVDOH ITEM 307 HAS BEEN INCLUDED AND IS TO BE PLACED AS SHOWN IN THE DETAILS AND QUANTITIES ARE OUTLINED IN THE TABLES PROVIDED IN THE PLANS. ALL STONE NEEDED FOR THIS ITEM WILL BE PROVIDED BY ANTERO AND THE CONTRACTOR WILL BE PAID FOR PLACEMENT BY THE TON.

PLACEMENT OF AGGREGATE SHALL BE WITH A PAVER OR SPREADER BOX. AGGREGATE SHALL BE WETTED TO AID IN COMPACTION.

ITEM 408: TACK COAT
THIS ITEM IS TO BE USED TO TACK COAT BETWEEN LAYERS OF ASPHALT. TACK IS TO BE APPLIED AT A RATE OF 0.03 GAL/SY WHEN APPLIED BETWEEN NEW PAVEMENT COURSES. WHEN APPLIED ON OLD PAVEMENT, TACK IS TO BE APPLIED AT A RATE OF 0.075 GAL/SY. THIS ITEM WILL BE PAID BY THE GALLON.

ITEM 401: HMA SCRATCH COURSE, TYPE X
PLACE HMA ASPHALT SCRATCH COURSE AS SHOWN IN THE TABLES AND DETAILS. ALL COSTS FOR MATERIALS, LABOR, AND EQUIPMENT IS TO BE INCLUDED IN THE COST FOR ITEM 401. THIS ITEM WILL BE PAID BY THE TON.

ITEM 401: HMA WEARING COURSE, TYPE X
PLACE HMA ASPHALT WEARING COURSE AS SHOWN IN THE DETAILS AND TABLES. ALL COSTS FOR MATERIALS, LABOR, AND EQUIPMENT IS TO BE INCLUDED IN THE COST FOR ITEM 401. THIS ITEM WILL BE PAID BY THE TON.

SAFETY EDGE
A SAFETY EDGE SHALL BE PLACED ON THE PAVER TO SHAPE THE OUTSIDE EDGE OF THE PAVEMENT TO BE A MAXIMUM OF 30° AS SHOWN IN THE DETAIL IN THE PLANS. ALL ASPHALT PLACED ON THIS JOB SHALL HAVE A SAFETY EDGE.

ITEM 218: RIP RAP
DUMPED ROCK IS TO BE PLACED AT THE OUTLET OF EACH NEW PIPE PLACED ON THIS PROJECT TO PREVENT EROSION OF THE OUTLET DITCH. DUMPED ROCK IS TO BE PLACED IN DEEP DITCHES, ADDITIONAL QUANTITY HAS BEEN ADDED AS A CONTINGENCY. ALL STONE NEEDED FOR THIS ITEM WILL BE PROVIDED BY ANTERO AND THE CONTRACTOR WILL BE PAID FOR PLACEMENT. FINAL PAY ITEM IS IN TON. (SEE DETAIL FOR DIMENSIONS.)

ITEM 218: GROUTED ROCK LINED CHANNEL
RIP RAP IS TO BE PLACED IN THE DITCH LINES AS SHOWN IN THE DETAILS ACCORDING TO THE PLAN AND TABLES TO PROVIDE EROSION PROTECTION. GROUT IS TO BE PLACED ACCORDING TO WVDOH ITEM 701.1. ALL COSTS FOR GROUT IS TO BE INCLUDED IN THE COST OF ROCK PLACEMENT. FINAL PAY ITEM IS TONS OF ROCK PLACED.

ITEM 606: UNDERDRAINS
A QUANTITY FOR UNDERDRAINS HAS BEEN INCLUDED IN THE PLANS FOR SUBSURFACE WATER REMOVAL FROM BELOW THE FULL DEPTH RECLAMATION, OR HILLSIDE CUT AREAS ON THE ROADWAY. SHOULD A SPRING OR SUBSURFACE WATER BE FOUND IN THESE AREAS AN UNDERDRAIN SHALL BE PLACED TO DRAIN THE WATER FROM UNDER THE ROADWAY OR CUT AREA TO THE CULVERT, DITCH, OR NATURAL DRAINAGE FEATURE. (SEE DETAILS IN PLANS.) ALL WORK FOR INSTALLATION OF THE UNDERDRAIN INCLUDING ALL MATERIALS, GEOTEXTILE (ITEM 207), AGGREGATE, PIPE, EQUIPMENT AND LABOR NECESSARY IS TO BE INCLUDED IN THE UNIT BID PRICE PER LINEAR FOOT FOR ITEM 606.

ITEM 608: FARM FIELD FENCE (WOVEN WIRE)
THIS ITEM HAS BEEN INCLUDED IN THE PLANS FOR REMOVAL AND REPLACEMENT OF FARM FIELD FENCE WHICH HAD TO BE REMOVED DUE TO THE ROADWAY WIDENING. SHOULD TEMPORARY FENCING BE NEEDED ADDITIONAL PAYMENT WILL BE MADE FOR THE TEMPORARY FENCE. ONCE THE FINAL CUT IS MADE AND SEEDED AND MULCHED THE FINAL FENCING WILL BE PLACED AND PAID FOR. ALL FENCE IS TO BE REPLACED WITH SIMILAR TYPE FENCING ACCEPTABLE TO THE LANDOWNER AND IS TO BE PAID FOR BY THE LINEAL FOOT NEEDED AS SHOWN IN THE PLANS.

ITEM 604: CORRUGATED PLASTIC PIPE (ADS TYPE N-12)
ALL PIPES REPLACED ON THIS PROJECT SHALL BE CORRUGATED DOUBLE WALL HDPE PIPE WITH A SMOOTH WALL INTERIOR. ALL PIPES INCLUDING DRIVEWAY PIPES SHALL BE BACKFILLED WITH FLOWABLE FILL WITH A MINIMUM OF 200 PSI FOR THE WIDTH OF THE ROADWAY INCLUDING SHOULDERS. THE PIPE IS TO BE ENCASED A MINIMUM OF 4" ON ALL SIDES UP TO WITHIN 12" OF THE ROADWAY SURFACE. ALL HDPE CULVERT PIPE WILL BE PROVIDED BY ANTERO. ALL COSTS FOR FLOWABLE FILL IS TO BE INCLUDED IN THE COST OF THE PIPE AND PAID FOR IN LF.

ITEM 240: CLEANING CULVERTS
THIS ITEM HAS BEEN INCLUDED IN THE PLANS TO BE USED FOR CLEANING DIRT AND DEBRIS OUT OF EXISTING CULVERTS.

CLEANING PROCEDURES EMPLOYED SHALL INSURE THAT THE REMOVAL AND DISPOSAL OF DIRT AND DEBRIS FROM THE CULVERT DOES NOT DAMAGE THE EXISTING CULVERT AND OR DAMAGE DOWNSTREAM PROPERTY. CLEANING METHODS SHALL PROTECT POLLUTION AND SEDIMENTATION FROM RECEIVING STREAMS OR WETLANDS. PAYMENT IS TO BE BY THE LINEAR FOOT OF CULVERT CLEANED.

ITEM 604: CORRUGATED PLASTIC ELBOWS (ADS, TYPE N12)
CORRUGATED PLASTIC ELBOWS HAVE BEEN INCLUDED IN AS A CONTINGENCY ITEM TO BE USED ON PIPE CULVERTS INLETS TO REDUCE THE DEEP DROP OFFS AT THE EDGE OF PAYMENT. A 22.5 DEGREE OR 45.0 DEGREE ELBOW SHALL BE USED ON AN AS NEEDED BASIS. ITEM IS TO BE PAID FOR PER EACH.

ITEM 636: MAINTENANCE OF TRAFFIC
TWO WAY TRAFFIC SHALL BE MAINTAINED DURING NON-WORKING HOURS. INGRESS AND EGRESS TO ALL DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES. TEMPORARY TWO WAY TRAFFIC ROAD CLOSURES SHALL NOT LAST LONGER THAN 20 MINUTES PER THE WEST VIRGINIA MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS (2006 EDITION).

ITEM 636: FLAGGERS
FLAGGERS SHALL BE USED AS NEEDED FOR TRAFFIC CONTROL IN WORK AREAS. FLAGGER AHEAD SIGNS SHALL BE USED AND COVERED OR REMOVED WHEN NO FLAGGER IS NEEDED.

ITEM 307: AGGREGATE BASE COURSE, STONE, CLASS 10
WVDOH ITEM 307 IS TO BE USED AS SHOULDER STONE ALONG THE EDGES OF THE ROADWAY. STONE IS TO BE PLACED AS SHOWN IN THE DETAILS AND QUANTITIES ARE OUTLINED IN THE TABLES PROVIDED IN THE PLANS. A CONTINGENCY QUANTITY OF 100 TONS HAS BEEN ADDED TO BE PLACED AS NEEDED FOR SHOULDER DROP OFF. ALL STONE FOR THE ITEM WILL BE PROVIDED BY ANTERO AND CONTRACTOR WILL BE PAID FOR PLACEMENT BY THE TON.

CONTACTS

MISS UTILITY
1-800-245-4848
http://www.wv811.com

NATIONAL RESPONSE CENTER FOR REPORTING CHEMICAL OR OIL SPILLS
1-800-424-8802

WEST VIRGINIA DIVISION OF HIGHWAYS
(DISTRICT #)
(STREET ADDRESS)
(CITY, STATE ZIP)
(PHONE #)

ANTERO RESOURCES
BRYAN RADABAUGH
ROADWAY ENGINEER MANAGER
740-760-1062
bradabaugh@anteroresources.com

STATE EMERGENCY SPILL NOTIFICATION
1-800-642-3074

AMBULANCE, FIRE, LAW ENFORCEMENT
911

(LOCAL SCHOOL DISTRICT BUS GARAGE)
(CONTACT PERSON)
(CONTACT TITLE)
(PHONE #)
(EMAIL)

EARTHRES GROUP INC
WILLIAM J HUDAK JR., PE
SENIOR PROJECT MANAGER
1-681-209-5211
whudak@earthres.com

Antero Resources

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4	KRT	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	11/14/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRT		

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-02

PLOT DATE/TIME: 1/21/2019 2:02 PM
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Table 1: Impacts to Jurisdictional Waters in the LOD (Fill Only)

Feature Label	OHWM Width (FT.)	OHWM Depth (IN.)	Temporary Fill (T) or Permanent Fill (P)	Length of Impact (FT.)	Area of Impact (SQ FT.)	Area of Impact (Acres)	Fill Quantity (CY)	Description of Impact	Comments
Streams									
KLF-STREAM01 (INT) - Crossing 1	3.0	18	T	15	304.9	0.0070	0.25	Erosion and Sediment (E&S) Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet Side of the Culvert
KLF-STREAM01 (INT) - Crossing 2	3.0	18	P	55	415.0	0.0095	26.00	Culvert Replacement and Outlet Protection. Proposed Culvert Diameter 18", Length 35'. Culvert C-10 (Station 35+00)	Workspace and E&S Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM02 (INT)	4.0	42	P	20	304.9	0.0070	1.50	Rip Rap Outlet Protection. Culvert C-09 (Station 28+00).	Workspace and E&S Perimeter Controls for Construction Activity.
KLF-STREAM03 (INT) - Crossing 1	4.5	36	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet Side of the Culvert
KLF-STREAM03 (INT) - Crossing 2	4.5	36	P	50	390.0	0.0090	22.00	Culvert Replacement and Outlet Protection. Proposed Culvert Diameter 18", Length 30' . Culvert C-08 (Station 24+00)	Workspace and E&S Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM04 (INT) - Crossing 1	4.0	36	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet Side of the Culvert
KLF-STREAM04 (INT) - Crossing 2	4.0	36	P	20	304.9	0.0070	1.25	Rip Rap Outlet Protection. Culvert C-07 (Station 14+50)	Workspace and E&S Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM05 (PER) - Crossing 1	6.0	30	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and Erosion and SedimentControls on the Inlet Side of the Culvert
KLF-STREAM05 (PER) - Crossing 2	6.0	30	P	20	304.9	0.0070	1.25	Rip Rap Outlet Protection. Culvert C-06 (Station 5+00)	Workspace and E&S Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM06 (EPH)	4.0	24	T	30	609.8	0.0140	0.50	E&S Perimeter Controls for Construction Activity. Clean Debris from Inlet	Workspace and E&S Controls on the Inlet and Outlet Sides of the Culvert
KLF-STREAM07 (EPH)	4.0	30	P	20	304.9	0.0070	44.25	Culvert Replacement and Outlet Protection. Proposed Culvert Diameter 18", Length 60'. Stream Starts at Culvert Outlet.	Workspace and Erosion & Sediment Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM08 (EPH)	4.0	24	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet Side of the Culvert
KLF-STREAM37 (PER) - Crossing 1	8.0	24	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet Side of the Culvert
KLF-STREAM37 (PER) - Crossing 2	8.0	24	P	30	609.8	0.0140	1.25	Rip Rap Outlet Protection. Culvert (Station 227+50)	Workspace and E&S Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM52 (PER) - Crossing 1	20.0	24	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet Side of the Culvert
KLF-STREAM52 (PER) - Crossing 2	20.0	24	P	20	304.9	0.0070	1.25	Rip Rap Outlet Protection. Culvert (Station 148+50)	Workspace and E&S Perimeter Controls for Construction Activity on the Outlet Side of the Culvert
KLF-STREAM120 (PER) - Crossing 1	5.0	12	T	15	304.9	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Workspace and E&S Controls on the Inlet of the Culvert
KLF-STREAM120 (PER) - Crossing 2	5.0	12	P	20	304.9	0.0070	1.25	Rip Rap Outlet Protection. E&S Perimeter Controls for Construction Activity	Culvert (Station 93+25). Workspace and E&S Controls on the Outlet of the Culvert
Oxford 13 PL KLF-STREAM61 (PER)	5.0	18	P	114	450.0	0.0110	30.00	New Culvert Instiatation and Outlet Protection. Culvert C-12 (Station 38+25) Realigning the the stream to follow the path of least resistance.	Workspace and E&S Perimeter Controls for Construction Activity

Wetlands									
KLF-WETLAND01 (PEM)	N/A	N/A	P	N/A	466.1	0.0107	10.50	Grading	E&S Perimeter Controls for Construction Activity. Temporary Material Storage
KLF-WETLAND02 (PEM)	N/A	N/A	P	N/A	213.4	0.0049	7.50	Grading	E&S Perimeter Controls for Construction Activity. Temporary Material Storage
KLF-WETLAND03 (PEM) - Crossing 1	N/A	N/A	T	N/A	150.0	0.0030	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
KLF-WETLAND03 (PEM) - Crossing 2	N/A	N/A	P	N/A	87.1	0.0020	4.00	Grading	Road Improvements
KLF-WETLAND04 (PEM)	N/A	N/A	P	N/A	135.0	0.0031	4.00	Grading	E&S Perimeter Controls for Construction Activity
KLF-WETLAND05 (PEM) - Crossing 1	N/A	N/A	T	N/A	360.0	0.0080	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
KLF-WETLAND05 (PEM) - Crossing 2	N/A	N/A	P	N/A	130.7	0.0030	7.00	Grading	Road Improvements
KLF-WETLAND06 (PEM) - Crossing 1	N/A	N/A	T	N/A	1000.0	0.0230	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
KLF-WETLAND06 (PEM) - Crossing 2	N/A	N/A	P	N/A	130.7	0.0030	1.30	Rip Rap Outlet Protection and Road Grading	Culvert C-05 (Station 2+50)
KLF-WETLAND07 (PEM) - Crossing 1	N/A	N/A	T	N/A	490.0	0.0110	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
KLF-WETLAND07 (PEM) - Crossing 2	N/A	N/A	P	N/A	261.4	0.0060	14.00	Grading	Road Improvements
KLF-WETLAND118 (PEM) - Crossing 1	N/A	N/A	T	N/A	1380.0	0.0320	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
KLF-WETLAND118 (PEM) - Crossing 2	N/A	N/A	P	N/A	1306.8	0.0300	60.00	Grading	Road Improvements
KLF-WETLAND119 (PEM) - Crossing 1	N/A	N/A	T	N/A	480.0	0.0110	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
KLF-WETLAND119 (PEM) - Crossing 2	N/A	N/A	P	N/A	174.2	0.0040	1.00	Grading	Road Improvements
KLF-WETLAND23 (PEM) - Crossing 1	N/A	N/A	T	N/A	766.7	0.0176	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
Oxford 13 PL KLF-WETLAND29 (PEM) - Crossing 1	N/A	N/A	T	N/A	430.0	0.0010	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
Oxford 13 PL KLF-WETLAND29 (PEM) - Crossing 2	N/A	N/A	P	N/A	130.7	0.0030	4.00	Culvert Installation Road Expansion	Road Improvements
Oxford 13 PL KLF-WETLAND41 (PSS) - Crossing 1	N/A	N/A	T	N/A	300.0	0.0070	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD. Temporary Material Storage
Oxford 13 PL KLF-WETLAND41 (PSS) - Crossing 2	N/A	N/A	P	N/A	261.4	0.0060	1.25	Rip Rap Outlet Protection	Culvert C-12 (Station 38+25)
Oxford 13 PL KLF-WETLAND41 (PFO) - Crossing 1	N/A	N/A	T	N/A	200.0	0.0050	0.25	E&S Perimeter Controls for Construction Activity	Areas that Fall Outside of Cut/Fill Lines but are within the LOD
Oxford 13 PL KLF-WETLAND41 (PFO) - Crossing 2	N/A	N/A	P	N/A	174.2	0.0040	1.25	Rip Rap Outlet Protection	Culvert C-11 (Station 37+75)

CAD FILE: F:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 01\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM.dwg PLOT DATE/TIME: 1/31/2019 2:02 PM

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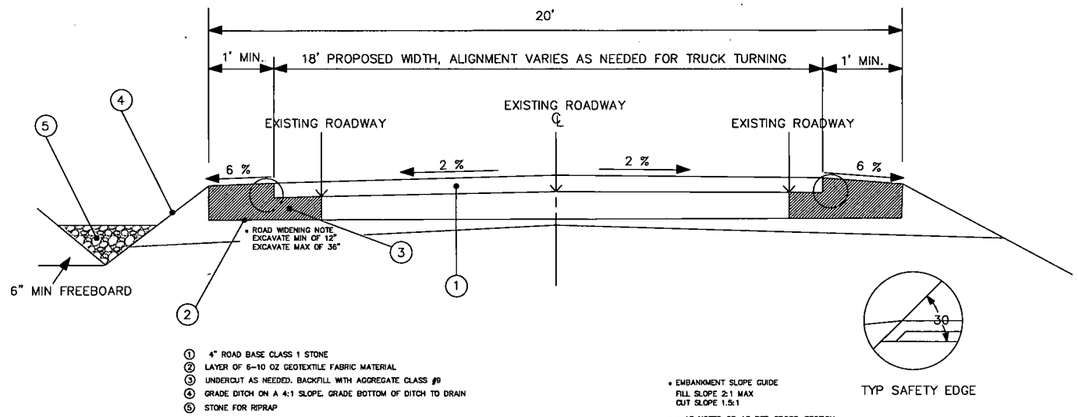
3	KRT	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	11/14/2018	INITIAL PRELIMINARY DESIGN
1	KRT	9/7	

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-03



① 4" ROAD BASE CLASS 1 STONE
② LAYER OF 6-10 OZ GEOTEXTILE FABRIC MATERIAL
③ UNDERCUT AS NEEDED. BACKFILL WITH AGGREGATE CLASS #9
④ GRADE DITCH ON A 4:1 SLOPE. GRADE BOTTOM OF DITCH TO DRAIN
⑤ STONE FOR RIPRAP

* EMBANKMENT SLOPE GUIDE
FILL SLOPE 2:1 MAX
CUT SLOPE 1.5:1

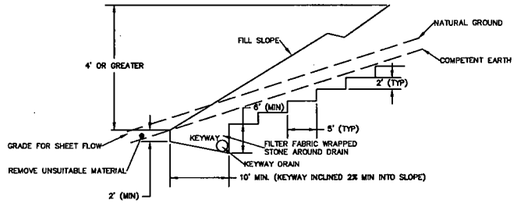
* * AS NOTED OR AS PER CROSS-SECTION

TYP SAFETY EDGE

ROAD WIDENING

NOT TO SCALE

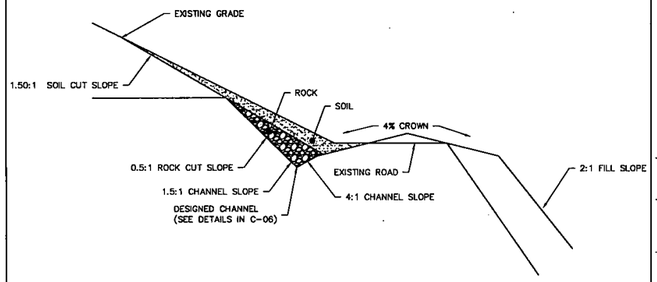
NOTES :
1. AMOUNT OF WIDENING ON EACH SIDE MAY VARY THRU THE PROJECT BECAUSE OF PHYSICAL RESTRICTIONS. DIMENSION RIGHT AND LEFT WILL VARY AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.
2. ADJUST FOR DEPTH AS NEEDED IN VICINITY OF CULVERTS TO AVOID DAMAGE TO PIPES.
3. ADD UNDERDRAINS AS NEEDED
4. DITCH FORESLOPES SHOULD BE 4:1
5. DITCHLINES ARE TO BE ESTABLISHED AT THE DISCRETION OF THE ENGINEER AND SHAPED TO CONFORM TO THE SHOULDER AND DITCH DETAIL. DITCHES ARE TO BE CLEANED AND GRADED TO ELIMINATE LOW SPOTS, PONDING AND FLAT AREAS TO PROVIDE POSITIVE DRAINAGE TO THE ROADWAY CULVERTS OR INLETS/OUTLETS.
6. SHOULDER STONE SHOULD BE CLASS 10 AGGREGATE



FILL BENCHING AND KEYWAY

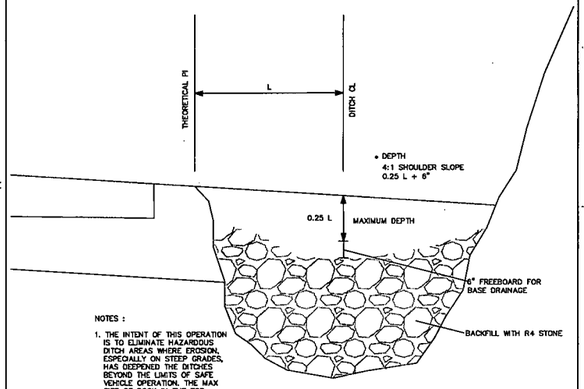
NOT TO SCALE

NOTES:
1. BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO, OR EXCEED 5:1, WHEN FILL HEIGHT EXCEEDS 4', OR WHEN RECOMMENDED BY ENGINEER
2. FILL MATERIAL SHALL BE PLACED, SPREAD AND COMPACTED IN LOOSE LIFTS NOT TO EXCEED 6-INCHES IN THICKNESS. LIFTS SHALL BE PLACED HORIZONTALLY WHERE PRACTICAL BASED ON FILL DEPTH AND EQUIPMENT USED.
3. GRADE BENCHES TO DRAIN



TYPICAL EXCAVATION CROSS SECTION

NOT TO SCALE



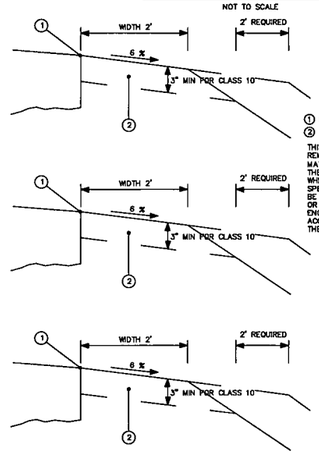
NOTES :
1. THE INTENT OF THIS OPERATION IS TO ELIMINATE HAZARDOUS DITCH AREAS WHERE EROSION, ESPECIALLY ON STEEP GRADES, HAS DEEPENED THE DITCHES BEYOND THE LIMITS OF SAFE VEHICLE OPERATION. THE MAX SIZE OF ROCK IN THE TOP LAYER SHOULD BE 4", HOWEVER LARGER ROCK WILL BE PERMITTED IN LOWER LAYERS AS APPROPRIATE FOR THE CONDITIONS.

CORRECTING DEEP DITCH DETAIL

NOT TO SCALE

SHOULDER RECONSTRUCTION

NOT TO SCALE



① FINISHED PAVEMENT ELEVATION
② AGGREGATE BASE COURSE, CLASS 10

THIS ITEM INCLUDES ANY NECCESARY REMOVAL OF EXISTING SHOULDER MATERIAL TO A MINIMUM OF 3" BELOW THE FINISHED PAVEMENT ELEVATION WHEN CLASS 10 AGGREGATE IS SPECIFIED. MATERIAL REMOVED SHALL BE REUSED WITHIN THE PROJECT LIMITS OR WASTED AS DIRECTED BY THE ENGINEER. SCARIFYING SHALL BE IN ACCORDANCE WITH SECTION 308.3.1 OF THE WVDOH SPECIFICATIONS

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2	KRT	11/20/2018	PRELIMINARY DESIGN FOR REVIEW
3	KRT	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
4	KRT	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-04

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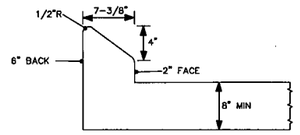
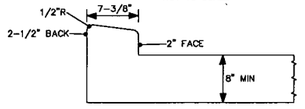


TYPE II CURB DETAIL

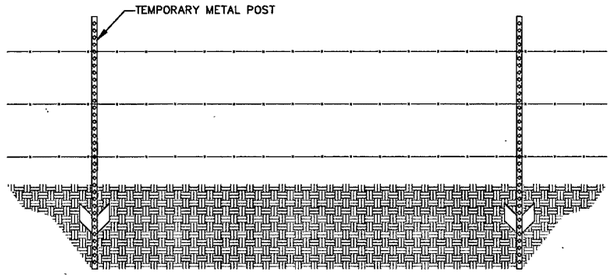
NOT TO SCALE



TYPE IV CURB
DRIVEWAY DETAIL

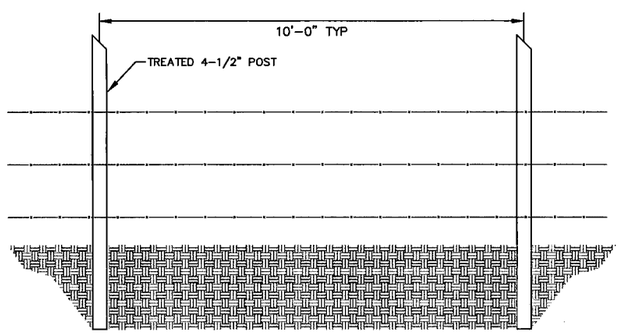
NOT TO SCALE

*PIPES WITHIN CURB/GUTTER NEED TYPE A OR B INLETS



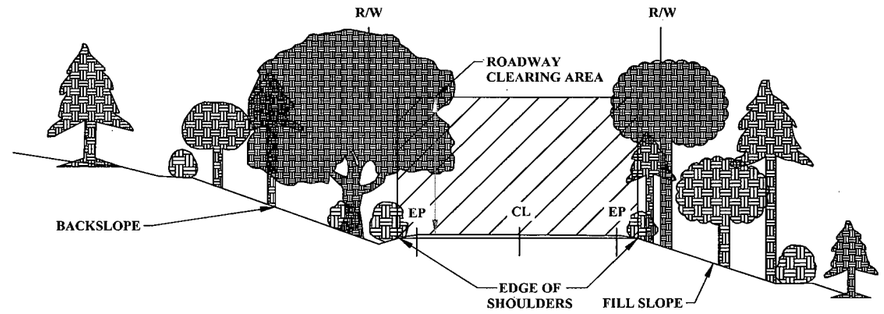
TEMPORARY BARBED WIRE FENCE

NOT TO SCALE



3 STRAND BARBED WIRE FENCE

NOT TO SCALE



CLEARING LIMITS TYPICAL

NOT TO SCALE

1. ALL TREES AND BRUSH WITHIN THE ROADWAY CLEARING AREA WILL BE REMOVED AS SHOWN IN DETAIL.
2. IN AREAS WHERE ADEQUATE SIGHT DISTANCE IS NOT MET, TREE TRIMMING MAY TAKE PLACE UP TO THE RIGHT-OF-WAY LIMITS. (SEE TABLE FOR LOCATIONS)
3. TREE AND BRUSH ARE TO BE TRIMMED BACK TO EITHER THE EDGE OF SHOULDERS OR RIGHT-OF-WAY (FOR SITE DISTANCE IMPRIVEMENT) ACCORDING TO TABLES BELOW.
4. ALL TRIMMED TREES AND BRANCHES SHALL BE CLEARED AND HAULED OFF-SITE IMMEDIATELY AFTER CLEARING/TRIMMING TO PREVENT TRAFFIC DISTURBANCES.

PLOT DATE/TIME: 1/21/2019 2:03 PM

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BY:	
APPROVED FOR CONSTRUCTION	DATE
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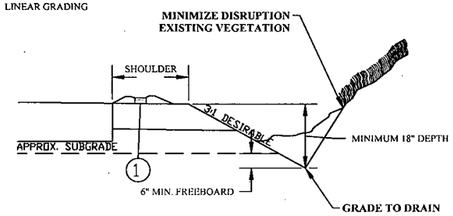
4	KKE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KKE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KKE	11/14/2018	INITIAL PRELIMINARY DESIGN
1			

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-05

LEGEND

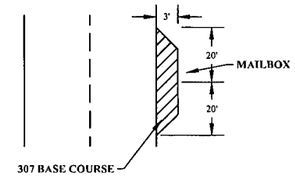
NO.	ITEM	DESCRIPTION
①	229	LINEAR GRADING



SHOULDER AND DITCHES
NOT TO SCALE

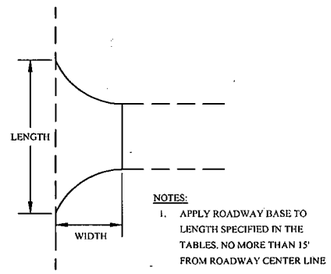
NOTES:
1. WIDTH SLOPE, AND MATERIAL AS SPECIFIED ON TYPICAL SECTIONS AND SHOULDER RECONSTRUCTION DETAIL.

*SEE QUANTITY TABLES AND PLANS FOR LOCATIONS



MAILBOX APPROACHES TYPICAL
NOT TO SCALE

ROAD NAME/NUMBER MAILBOX APPROACHES							
RT/LT	STA	LENGTH (FT)	WIDTH (FT)	TOTAL AREA (SY)	SCRATCH COURSE ASPHALT (TON)	WEARING COURSE ASPHALT (TON)	TACK COAT (GAL)
RT	23+00	40	3	120	N/A	N/A	N/A
LT	34+50	40	3	120	N/A	N/A	N/A



NOTES:
1. APPLY ROADWAY BASE TO LENGTH SPECIFIED IN THE TABLES. NO MORE THAN 15' FROM ROADWAY CENTER LINE

DRIVEWAY AND SIDE ROAD TREATMENT TYPICAL
NOT TO SCALE

DRIVEWAY SUMMARY										
STATION FROM	STATION TO	RT/LT	TYPE	LENGTH (FT)	WIDTH (FT)	TOTAL AREA (SY)	307 AGGREGATE (CY)	SCRATCH COURSE ASPHALT (TON)	WEARING COURSE ASPHALT (TON)	TACK COAT (GAL)
SOUTH FORK OF HUGHES RIVER ROAD										
2+50	3+00	RT	STONE	30	8	150	XX.X	XX.X	XX.X	XX.X
14+00	14+50	LT	STONE	40	10	250	XX.X	XX.X	XX.X	XX.X
22+50	23+00	RT	STONE	60	10	315	XX.X	XX.X	XX.X	XX.X
33+75	34+25	LT	STONE	30	10	250	XX.X	XX.X	XX.X	XX.X

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APPROVED FOR BIDS
BY: DATE:
APPROVED FOR CONSTRUCTION
BY: DATE:

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NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN
1			

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-06

PLOT DATE/TIME: 1/21/2019 2:03 PM
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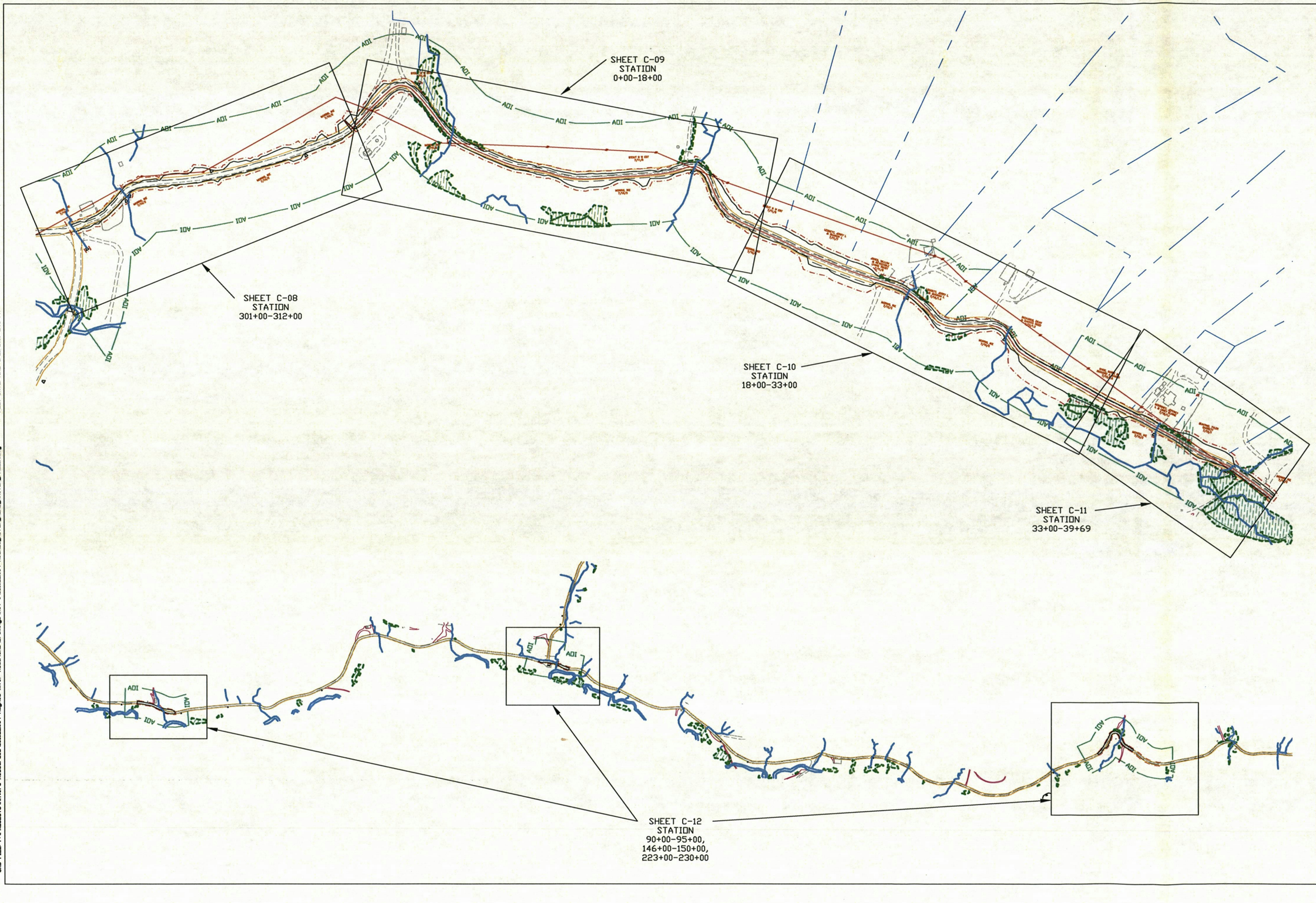

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APPROVED FOR BIDS
BY: DATE:

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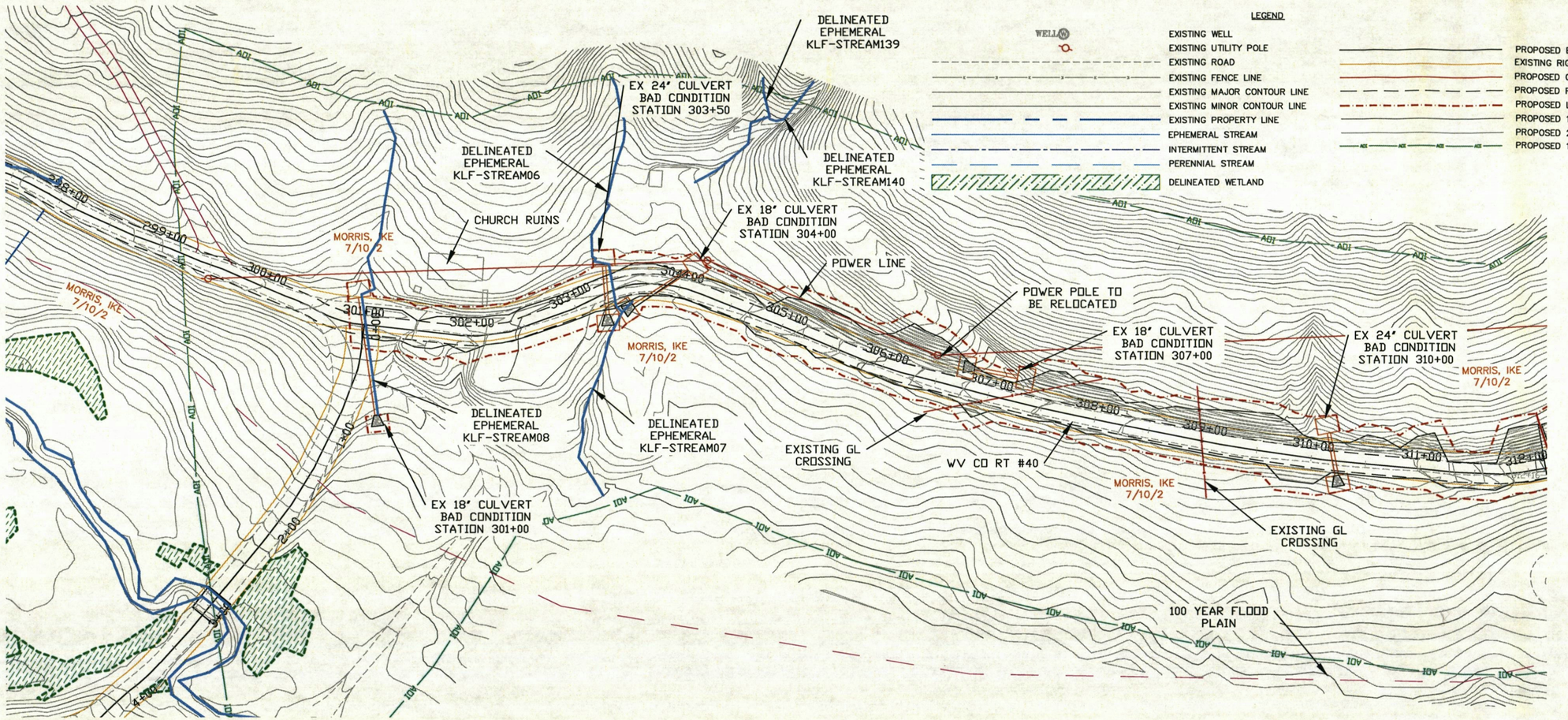
BY: DATE:

NO.	BY	DATE	DESCRIPTION
4	KRT	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	12/14/2018	INITIAL PRELIMINARY DESIGN
1			

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-07



Profile View of Hughes River Road

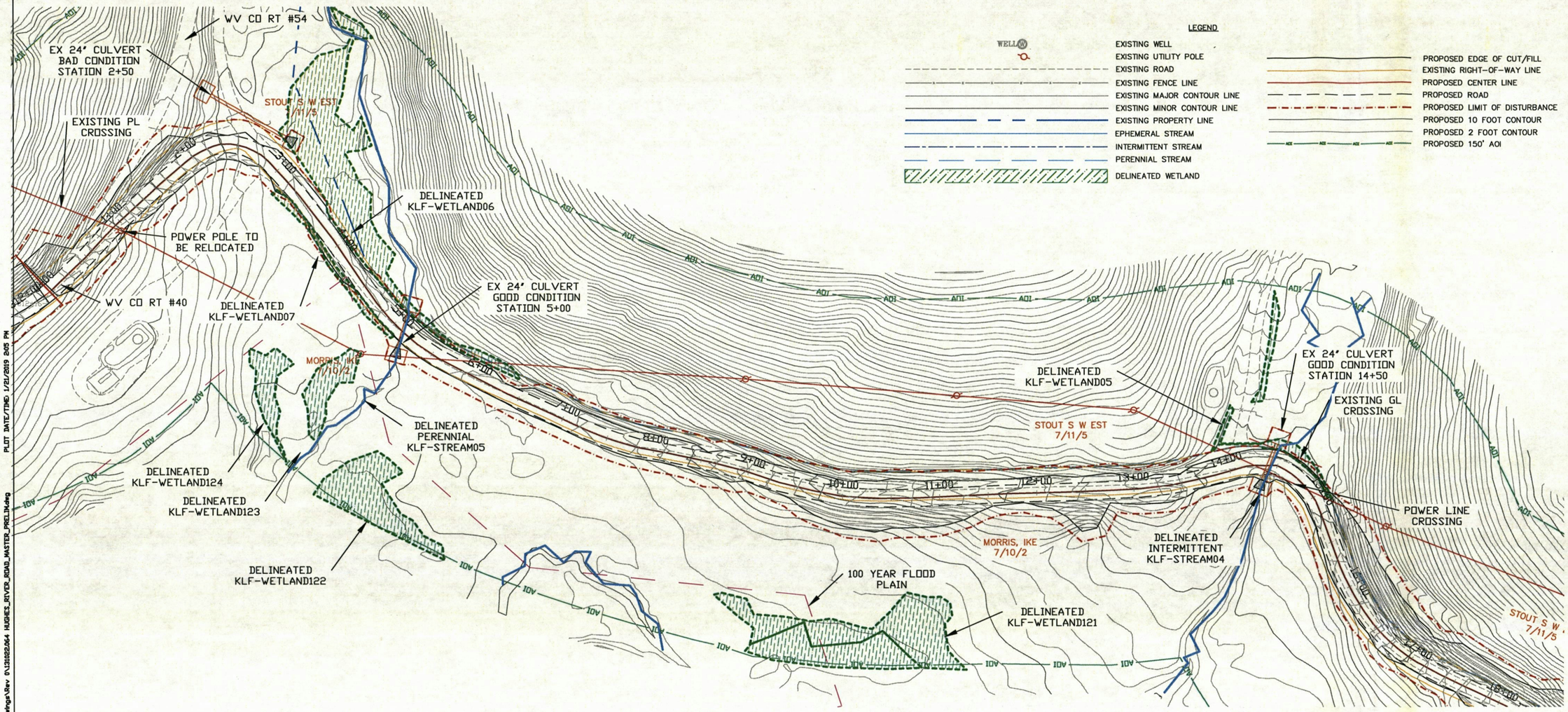
APPROVED FOR PERMITS	DATE
BY:	
APPROVED FOR BIDS	DATE
BY:	
APPROVED FOR CONSTRUCTION	DATE
BY:	

NO.	BY	DATE	DESCRIPTION
4	KRT	04/01/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/06/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRT	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-08

CAD FILE: P:\PROJECTS\Antero Resources\139022.064 Hughes River Road\CAD\Drawings\Rev 0\139022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM.dwg
PLOT DATE/TIME: 1/21/2019 3:04 PM



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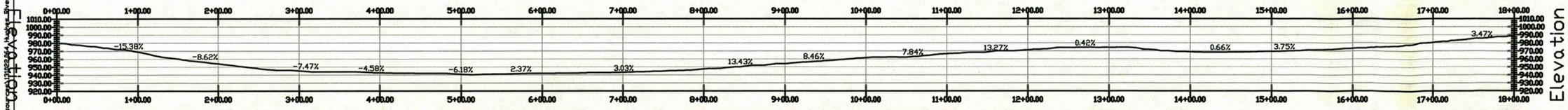

Profile View of OXFORD 13 ACCESS ROAD

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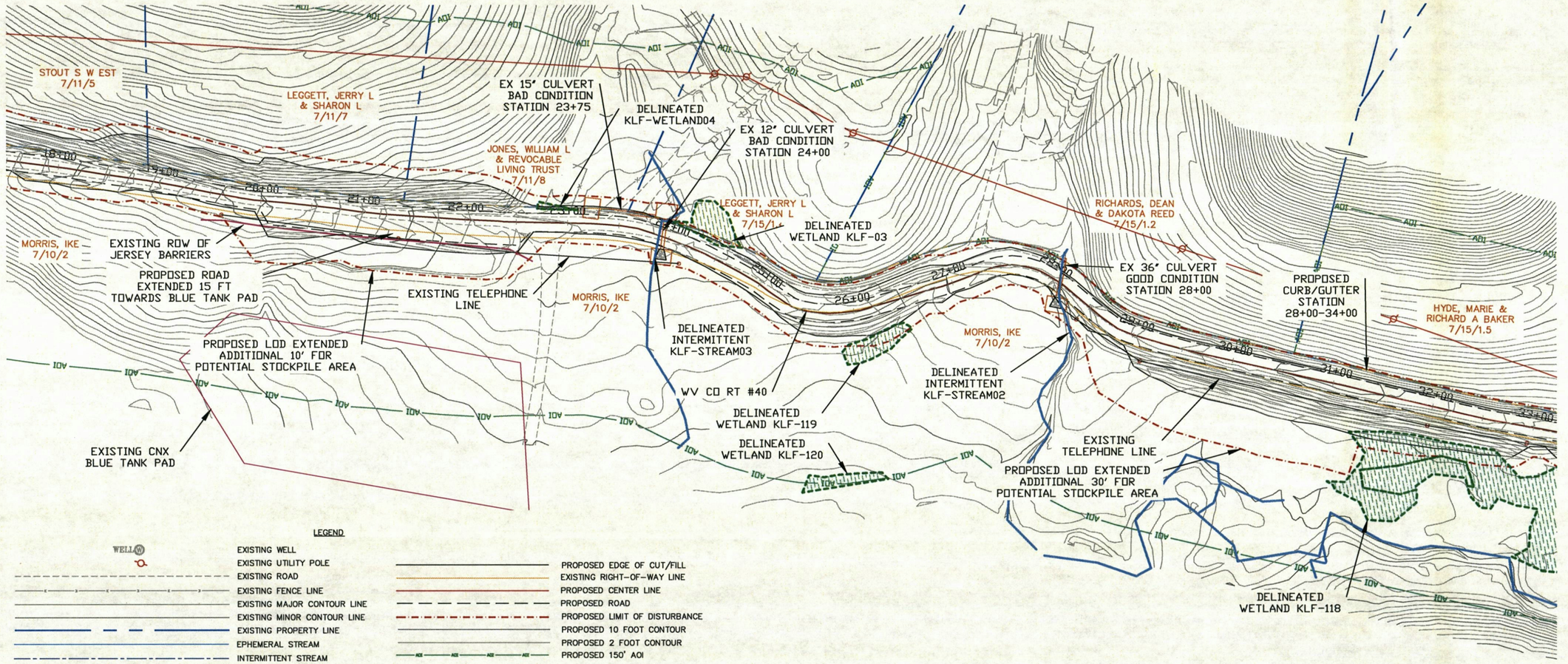
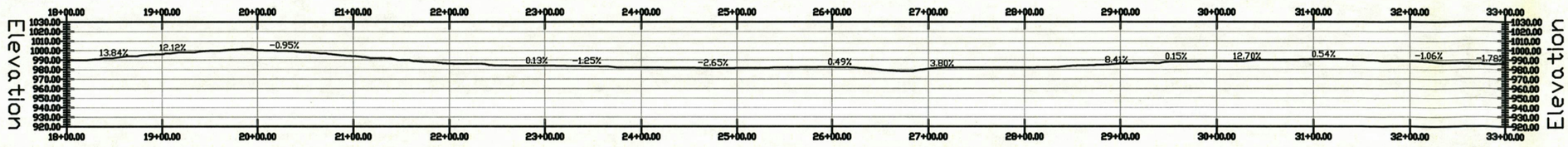
APPROVED FOR PERMITS	DATED
BY:	
APPROVED FOR BIDS	DATED
BY:	
APPROVED FOR CONSTRUCTION	DATED
BY:	

NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-09





Profile View of OXFORD 13 ACCESS ROAD

Antero Resources

EARTHRES ENGINEERING FOR SUCCESS

APPROVED FOR PERMITS	DATED
BY:	
APPROVED FOR BIDS	DATED
BY:	
APPROVED FOR CONSTRUCTION	DATED
BY:	

NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-10

CAD FILE: P:\PROJECTS\Antero Resources\13108264 Hughes River Road\CAD\Drawings\Rev 01\13108264 HUGHES_RIVER_ROAD_MASTER_PRELIM.dwg
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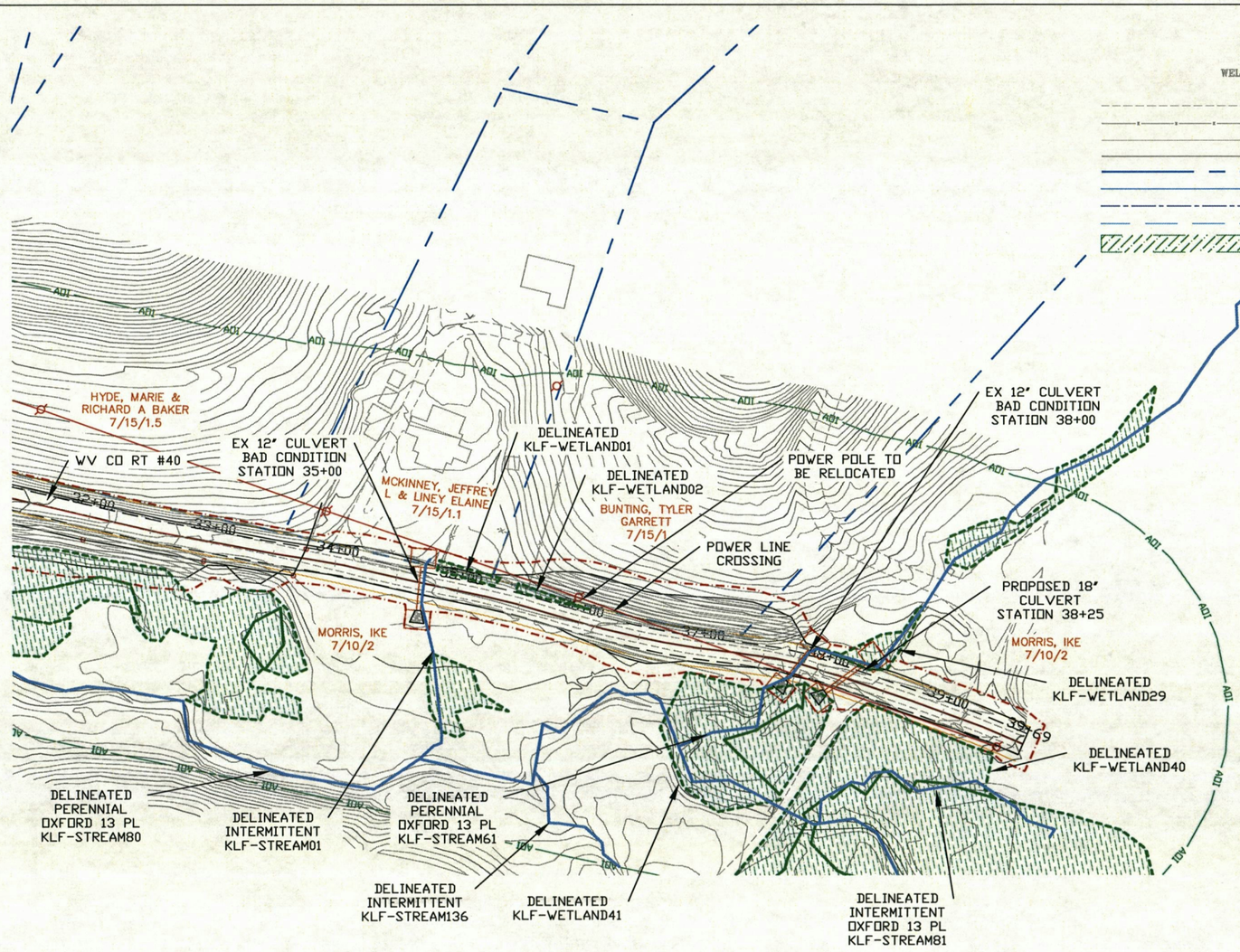

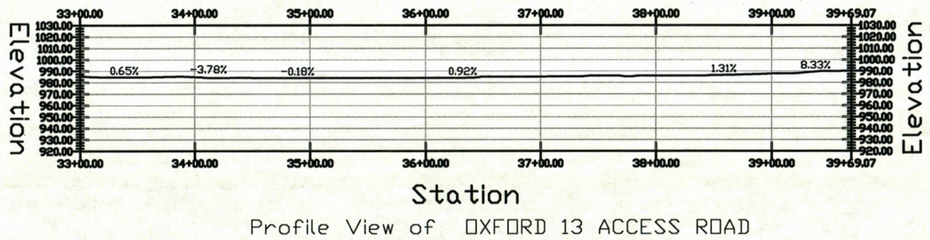

Profile View of OXFORD 13 ACCESS ROAD

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EARTHRES
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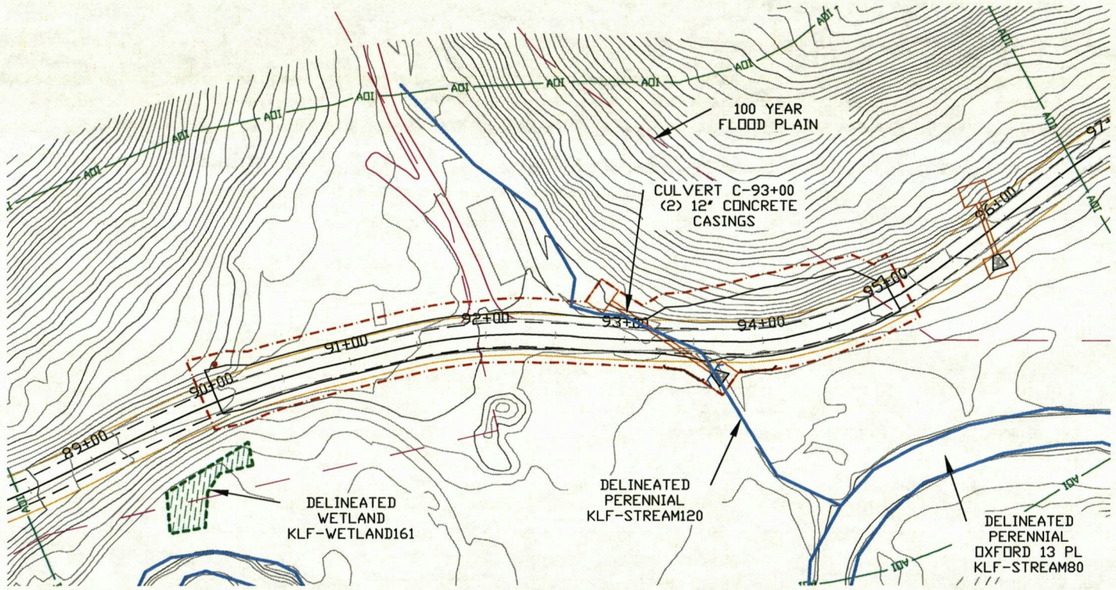
BY: DATED
APPROVED FOR BIDS: DATED
BY: DATED
APPROVED FOR CONSTRUCTION: DATED
BY: DATED

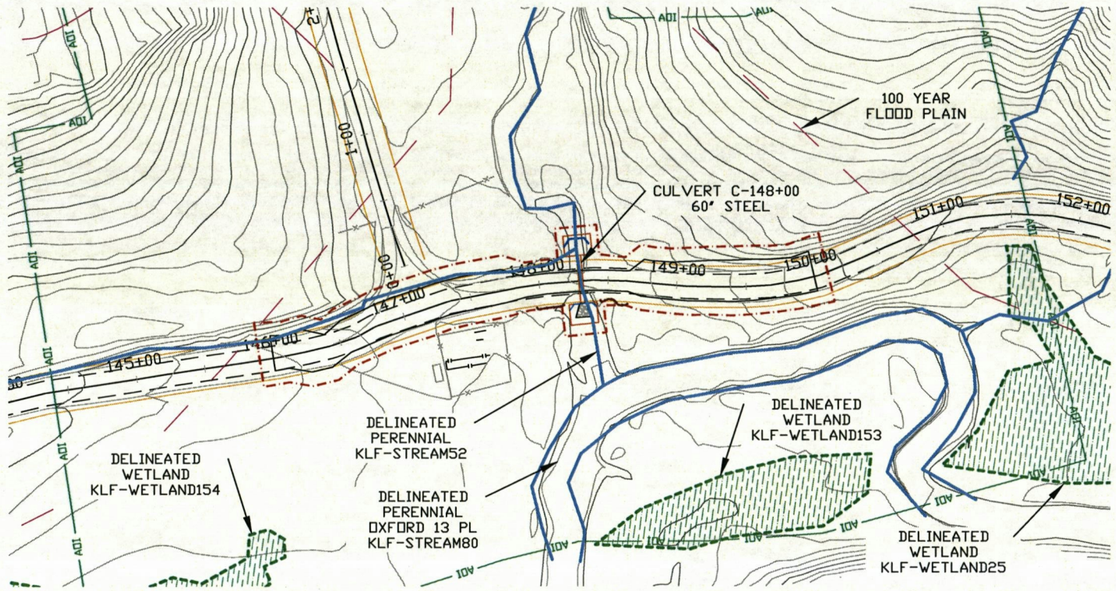
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

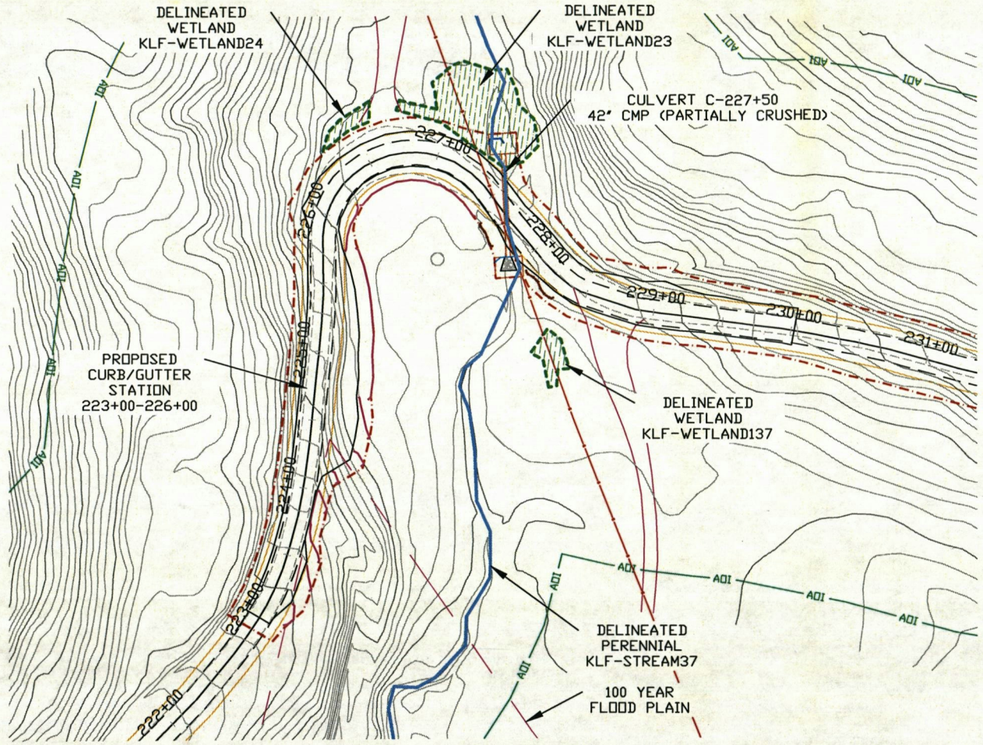
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

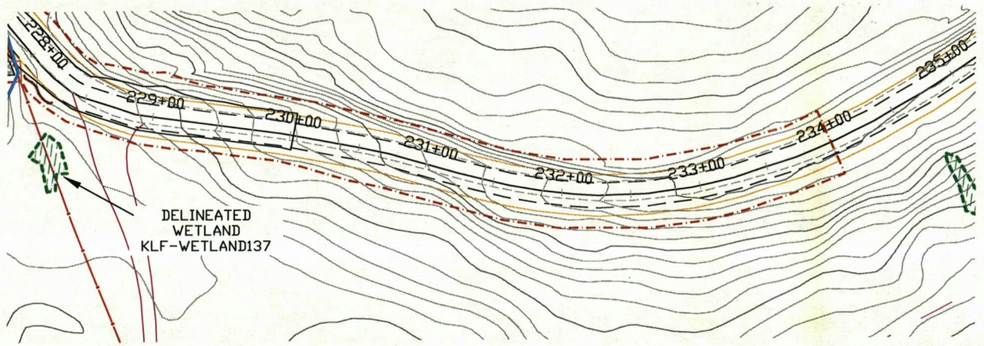
SHEET No.
C-11

CAD FILE: P:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 0\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM.dwg
PLOT DATE/TIME: 1/21/2019 2:06 PM









LEGEND

- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING ROAD
- EXISTING FENCE LINE
- EXISTING MAJOR CONTOUR LINE
- EXISTING MINOR CONTOUR LINE
- EXISTING PROPERTY LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED WETLAND
- PROPOSED EDGE OF CUT/FILL
- EXISTING RIGHT-OF-WAY LINE
- PROPOSED CENTER LINE
- PROPOSED ROAD
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED 10 FOOT CONTOUR
- PROPOSED 2 FOOT CONTOUR
- PROPOSED 150' AOI

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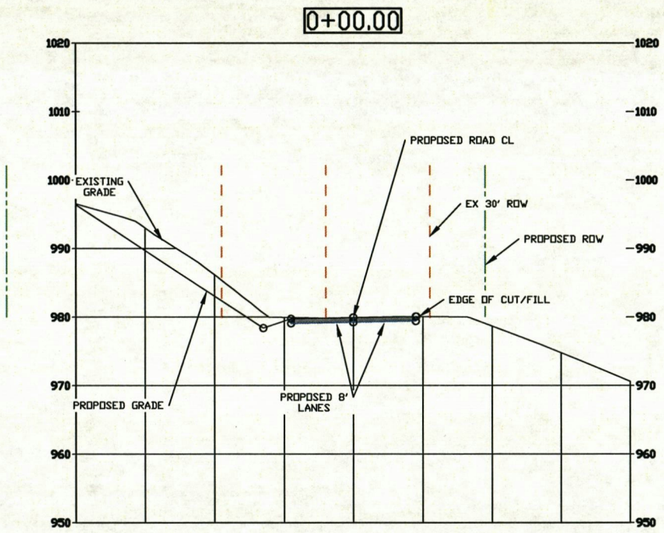
APPROVED FOR BIDS	DATE
BYH	
APPROVED FOR CONSTRUCTION	DATE
BYH	

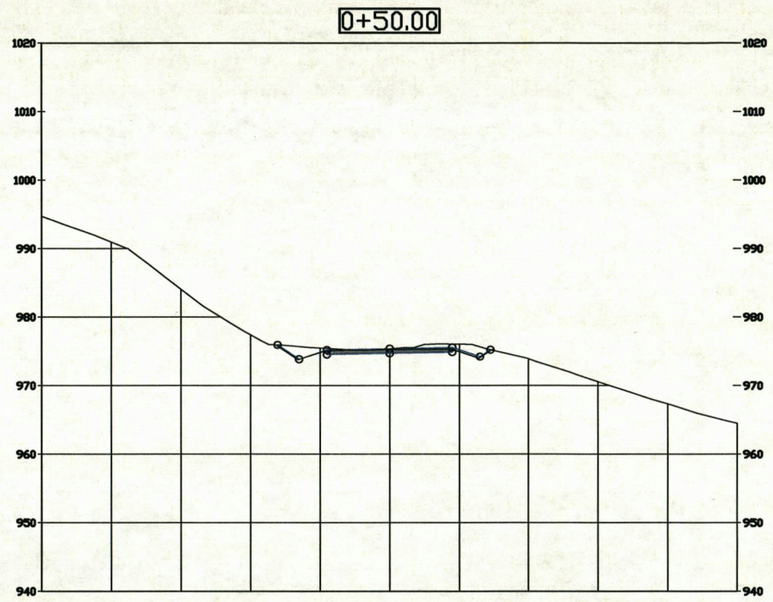
NO.	BY	DATE	DESCRIPTION
4	KRT	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	12/14/2018	INITIAL PRELIMINARY DESIGN

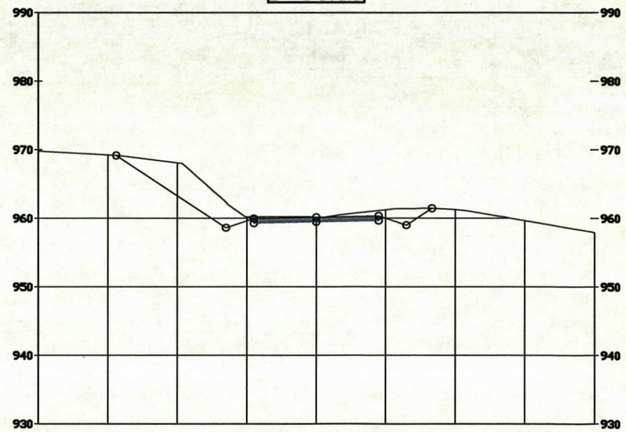
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-12

CAD FILE: F:\PROJECTS\Antero Resources\130822.064 Hughes River Road\CAD\Drawings\Rev 0\130822.064 HUGHES_RIVER_ROAD_MASTER_PRELIM.dwg PLOT DATE/TIME: 1/21/2019 2:07 PM







CAD FILE: P:\PROJECTS\Antero Resources\13108220.64 Hughes River Road\CAD\3D-settings\Rev 0\13108220.64 HUGHES_RIVER_ROAD_MASTER_PRELIM_cursections.dwg PLOT DATE/TIME: 1/21/2019 2:18 PM

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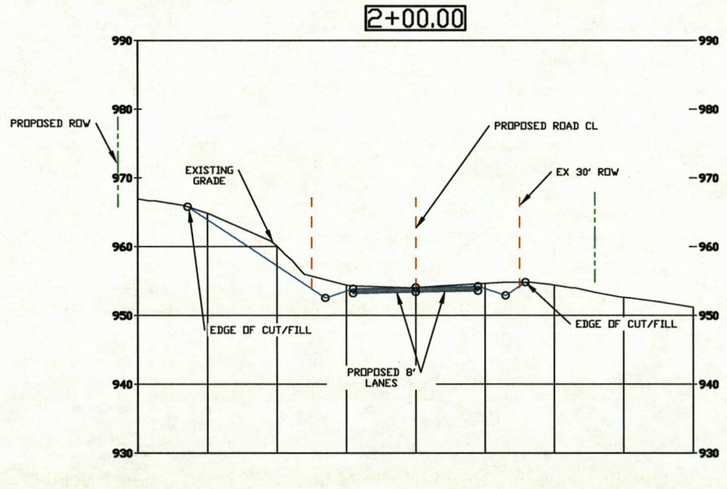
BY: DATE:
APPROVED FOR CONSTRUCTION
BY: DATE:

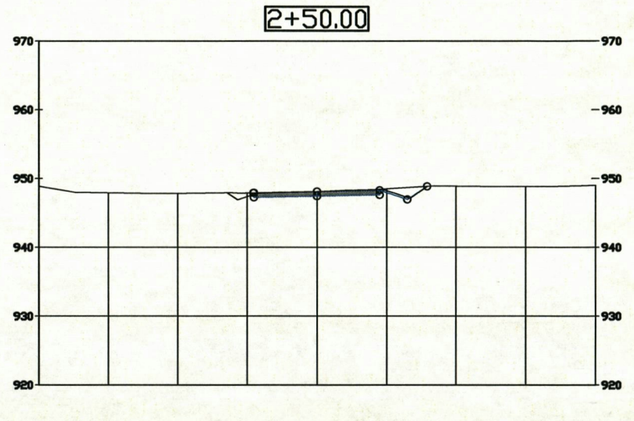
EARTHRES
ENGINEERING FOR SUCCESS

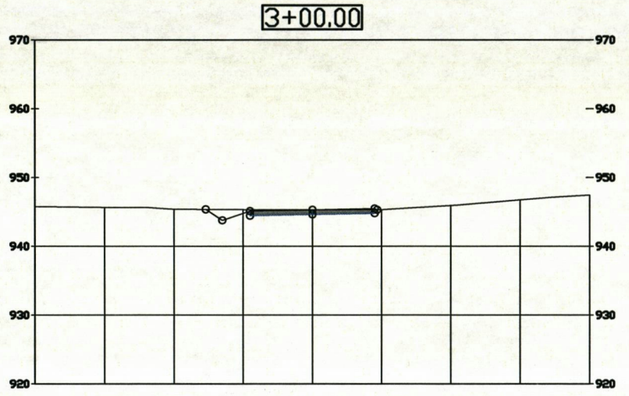
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

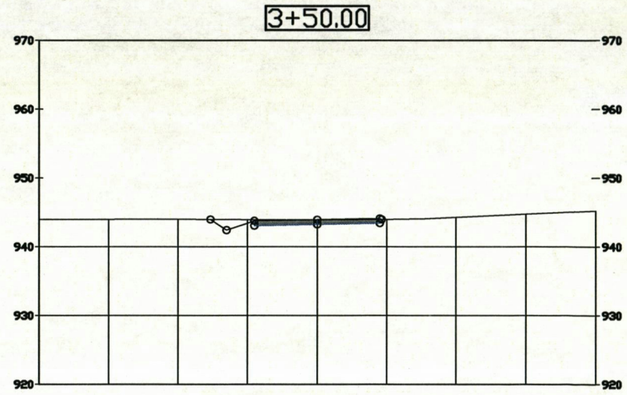
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-13









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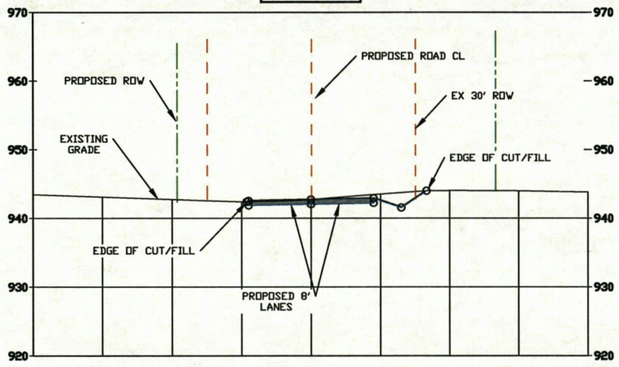
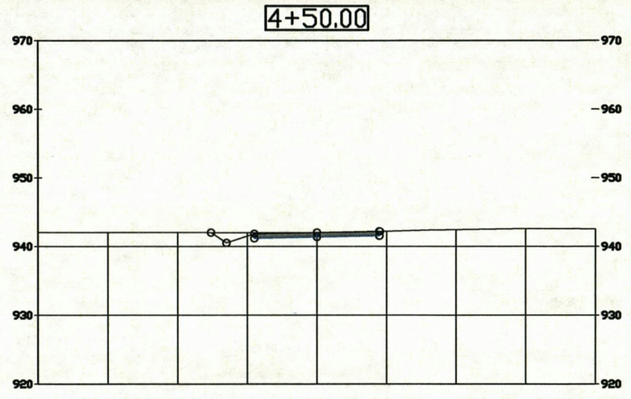
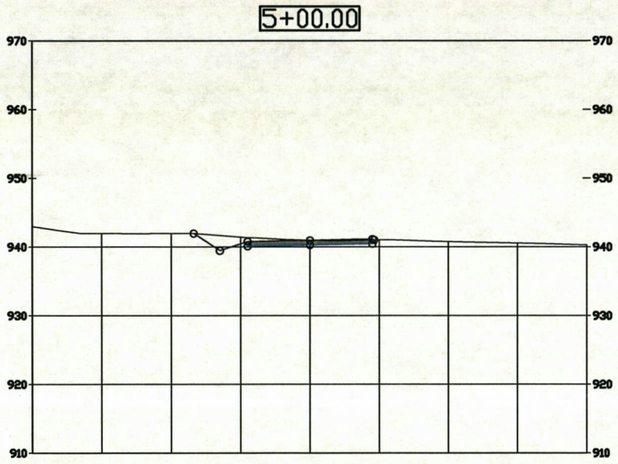
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

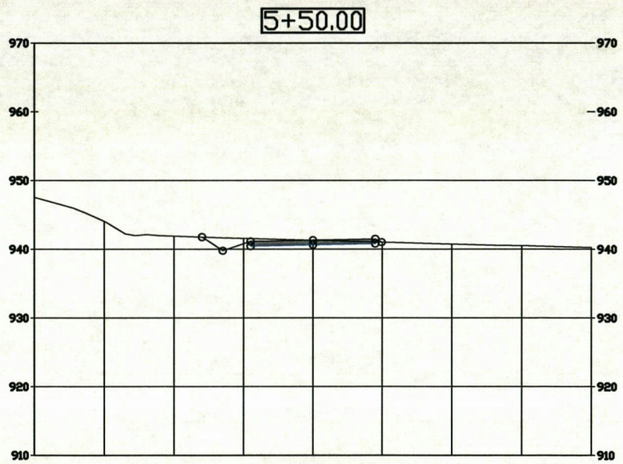
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-14









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APPROVED FOR CONSTRUCTION — BY: — DATE:

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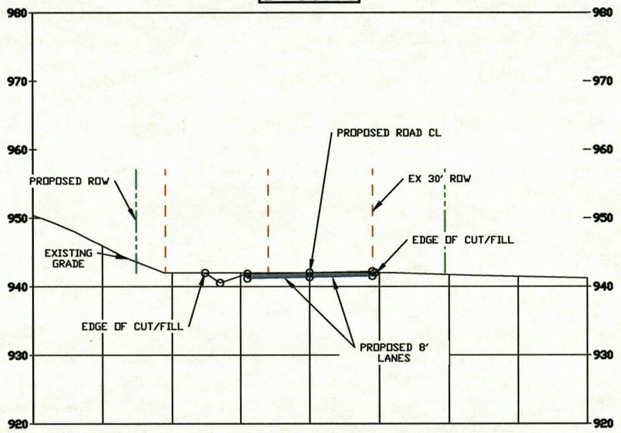
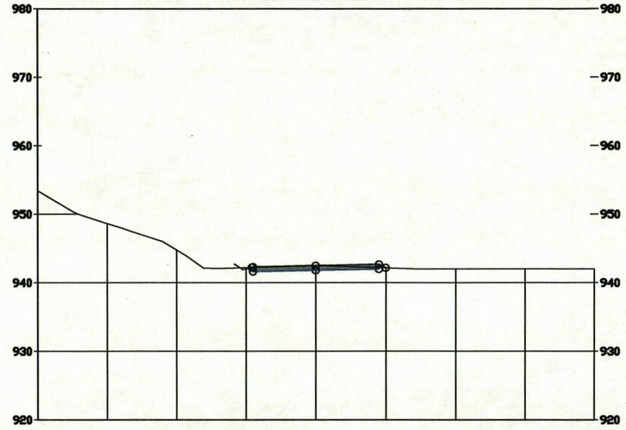
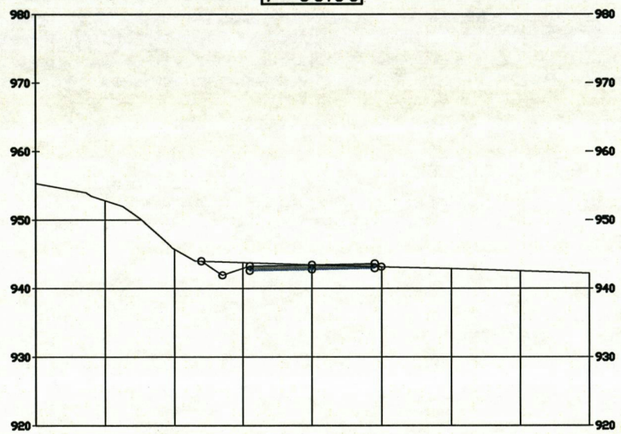
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

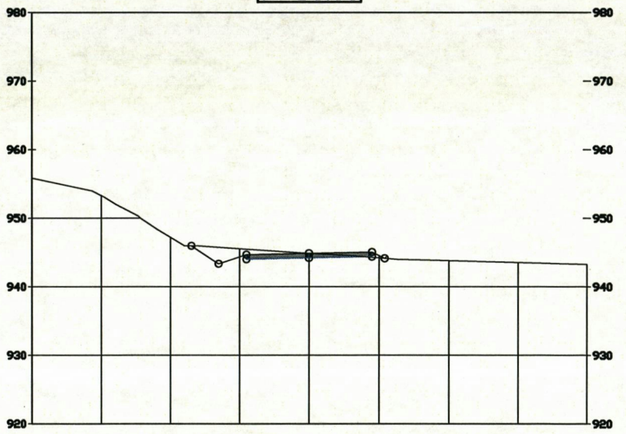
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-15









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APPROVED FOR CONSTRUCTION: BY: DATE:

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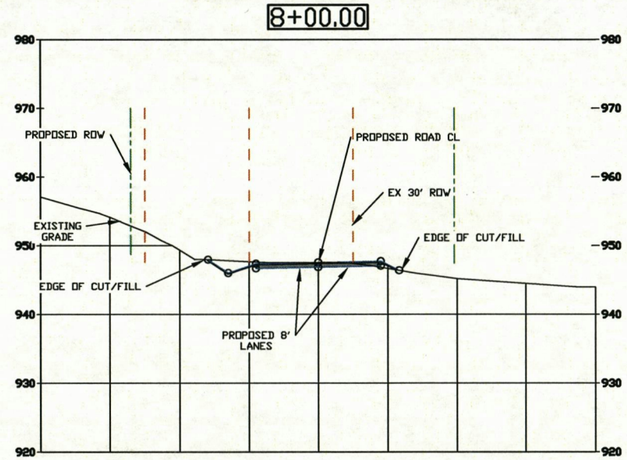
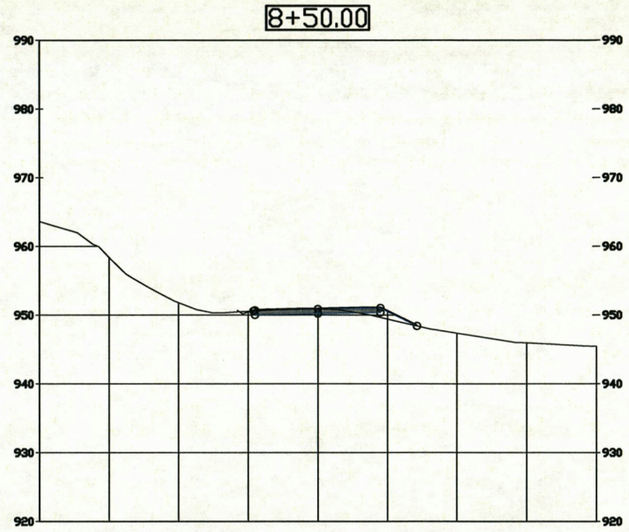
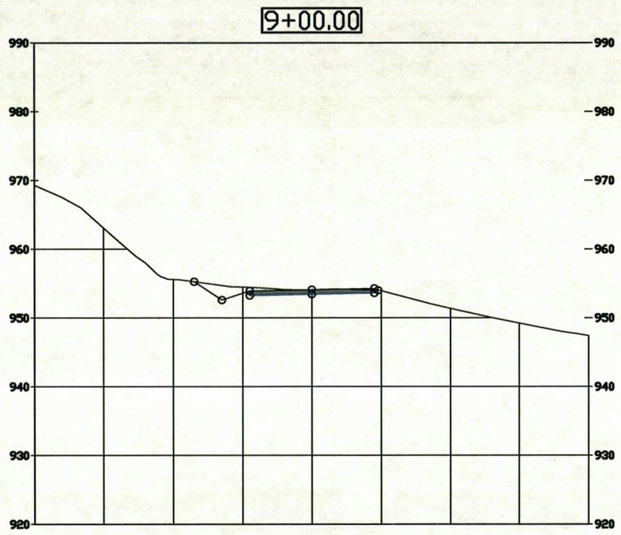
NO.	BY	DATE	DESCRIPTION
4	KRE	12/21/2018	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	12/14/2018	INITIAL PRELIMINARY DESIGN

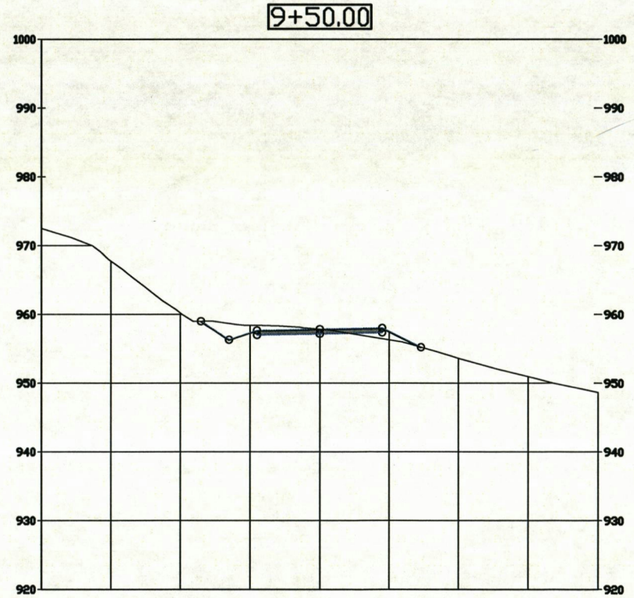
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-16









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APPROVED FOR BIDS — BY: — DATE:
APPROVED FOR CONSTRUCTION — BY: — DATE:

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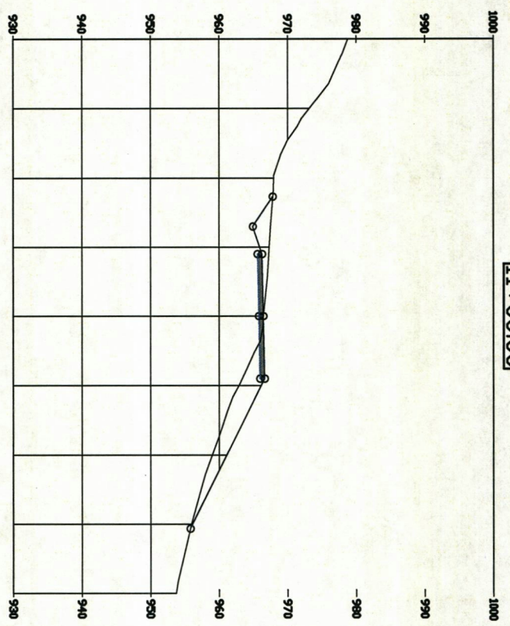
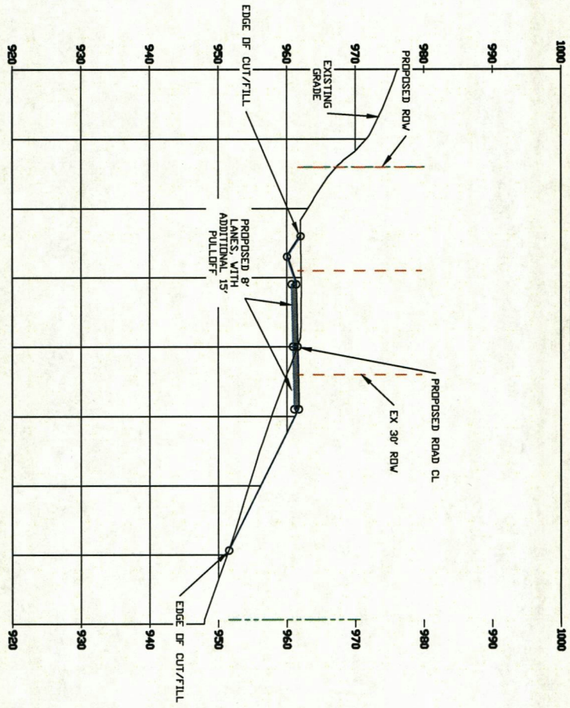
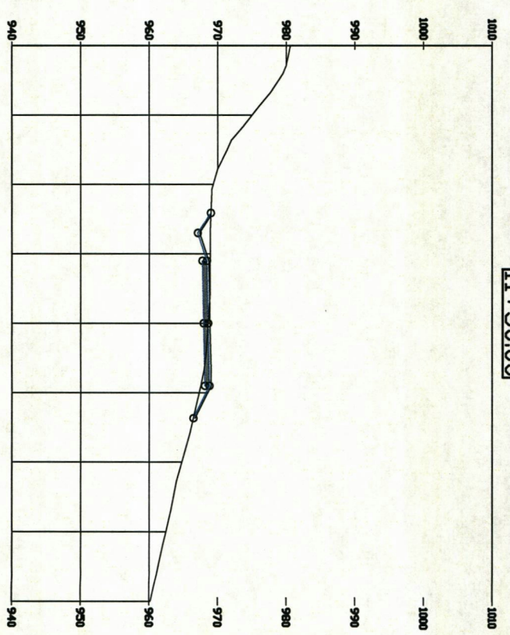
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

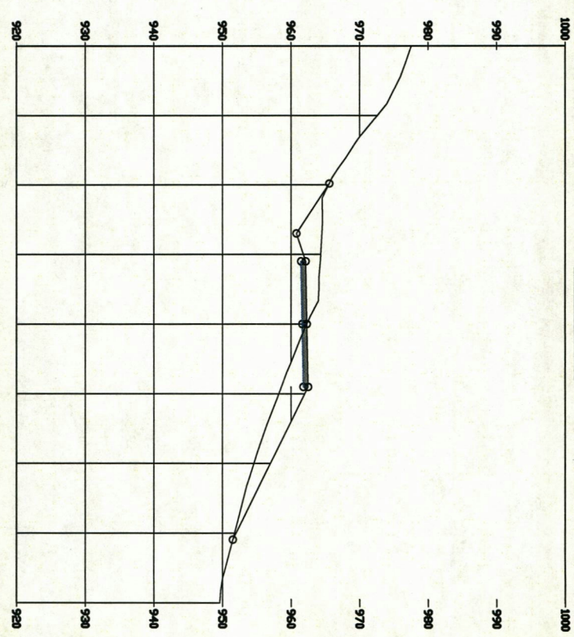
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-17









NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

EARTHRES
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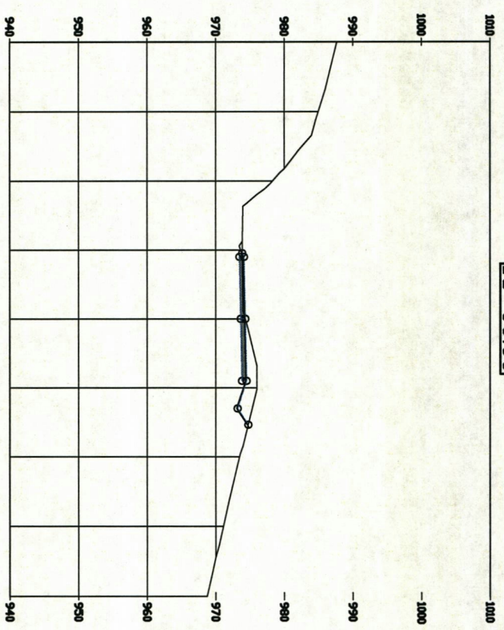
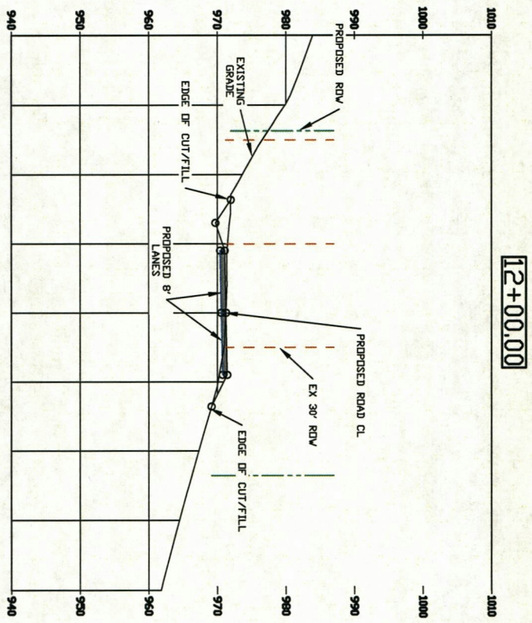
BY: DATE:
APPROVED FOR BIDS:
BY: DATE:
APPROVED FOR CONSTRUCTION:
BY: DATE:

Antero Resources

SHEET No.
C-18



13+00.00



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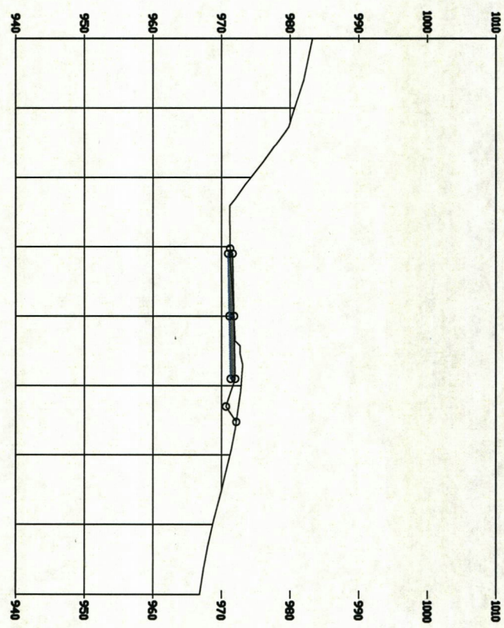

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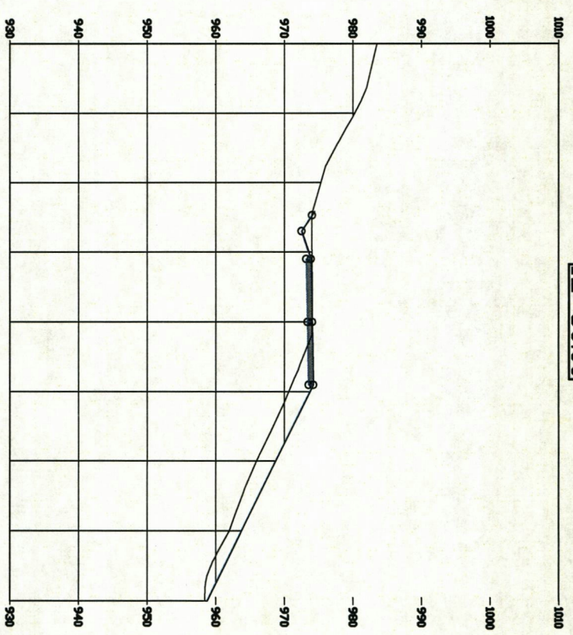

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ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No. C-19

NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

EARTHRES
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APPROVED FOR PERMITS:	
BY:	DATE:
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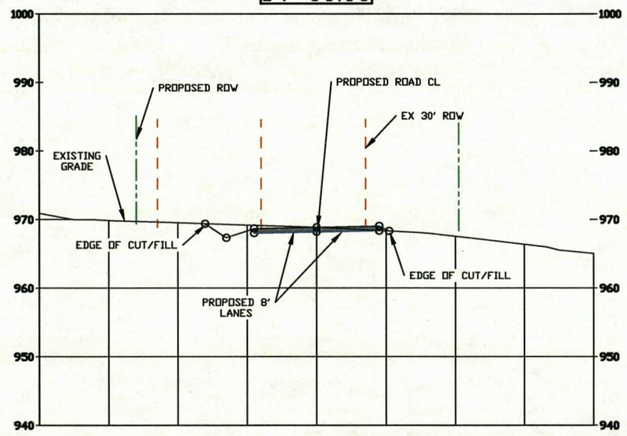
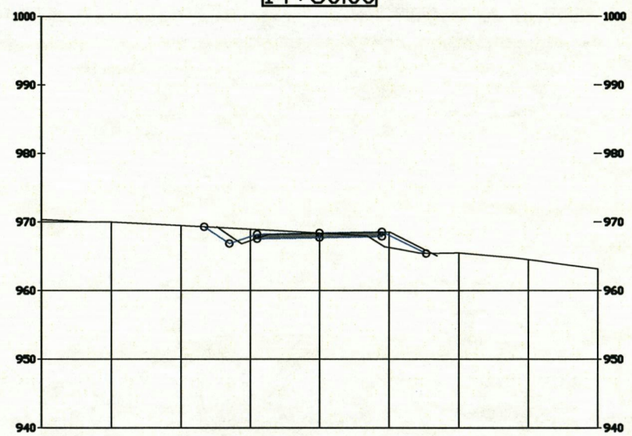
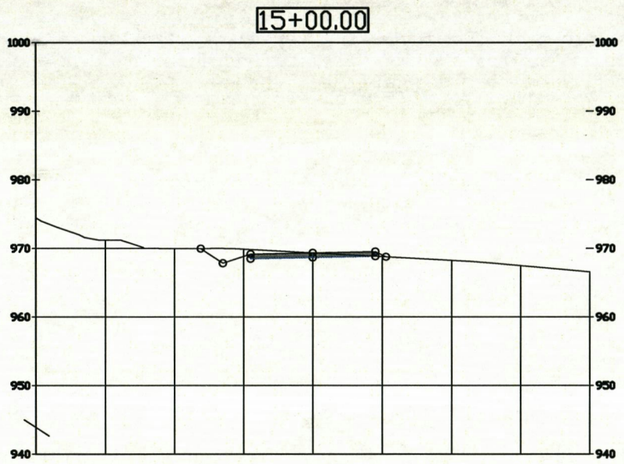
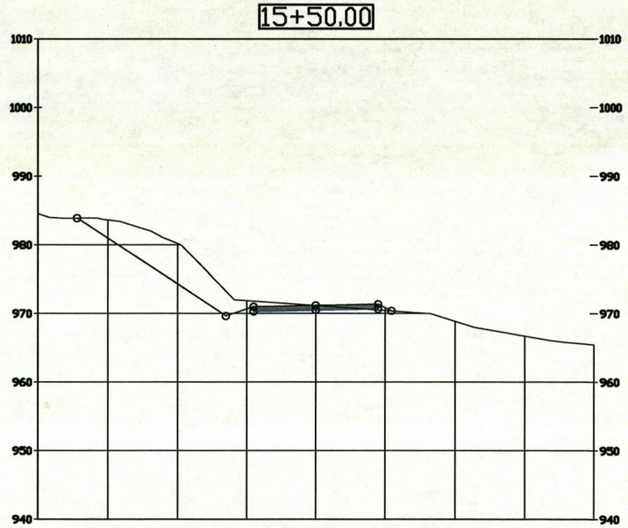
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources









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Antero Resources

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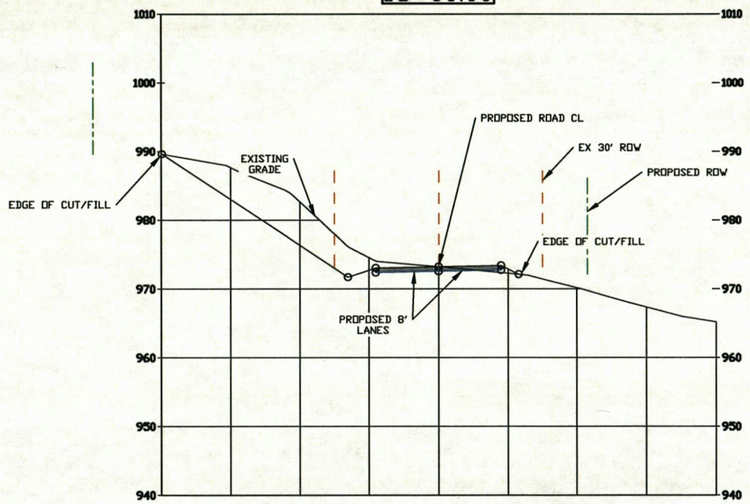
APPROVED FOR CONSTRUCTION: BY: DATE:

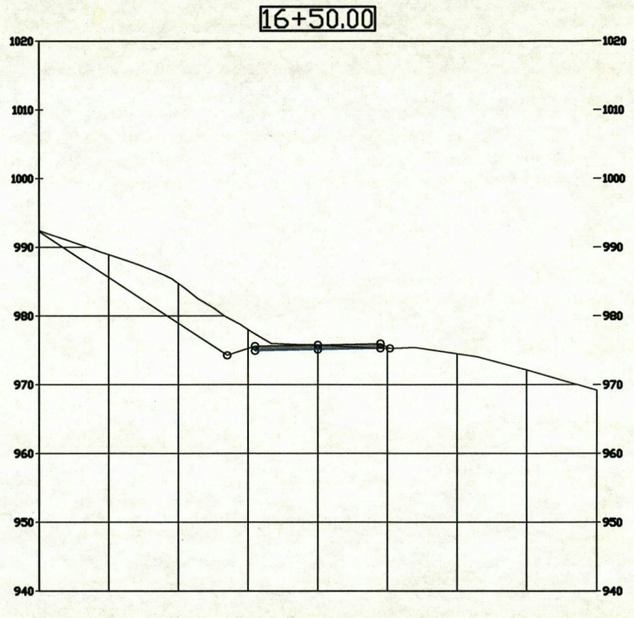
EARTHRES
ENGINEERING FOR SUCCESS

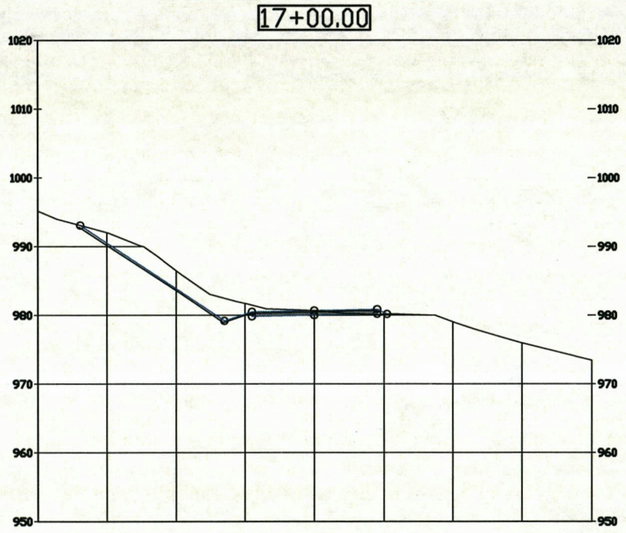
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

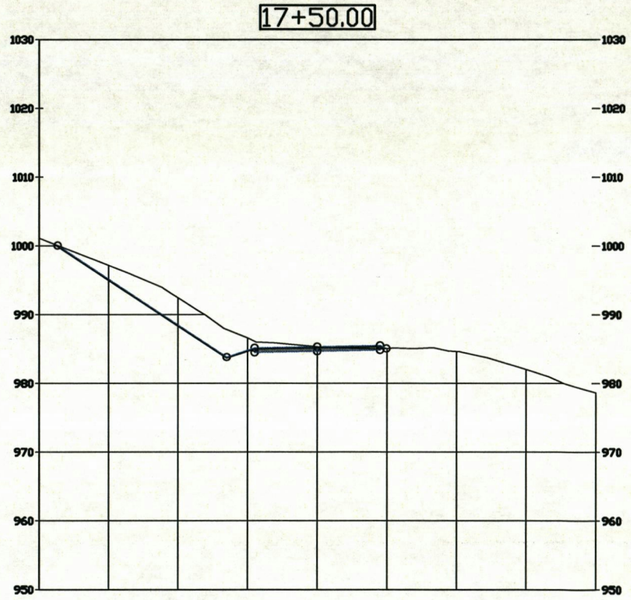
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-20









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APPROVED FOR CONSTRUCTION — BY: — DATE:

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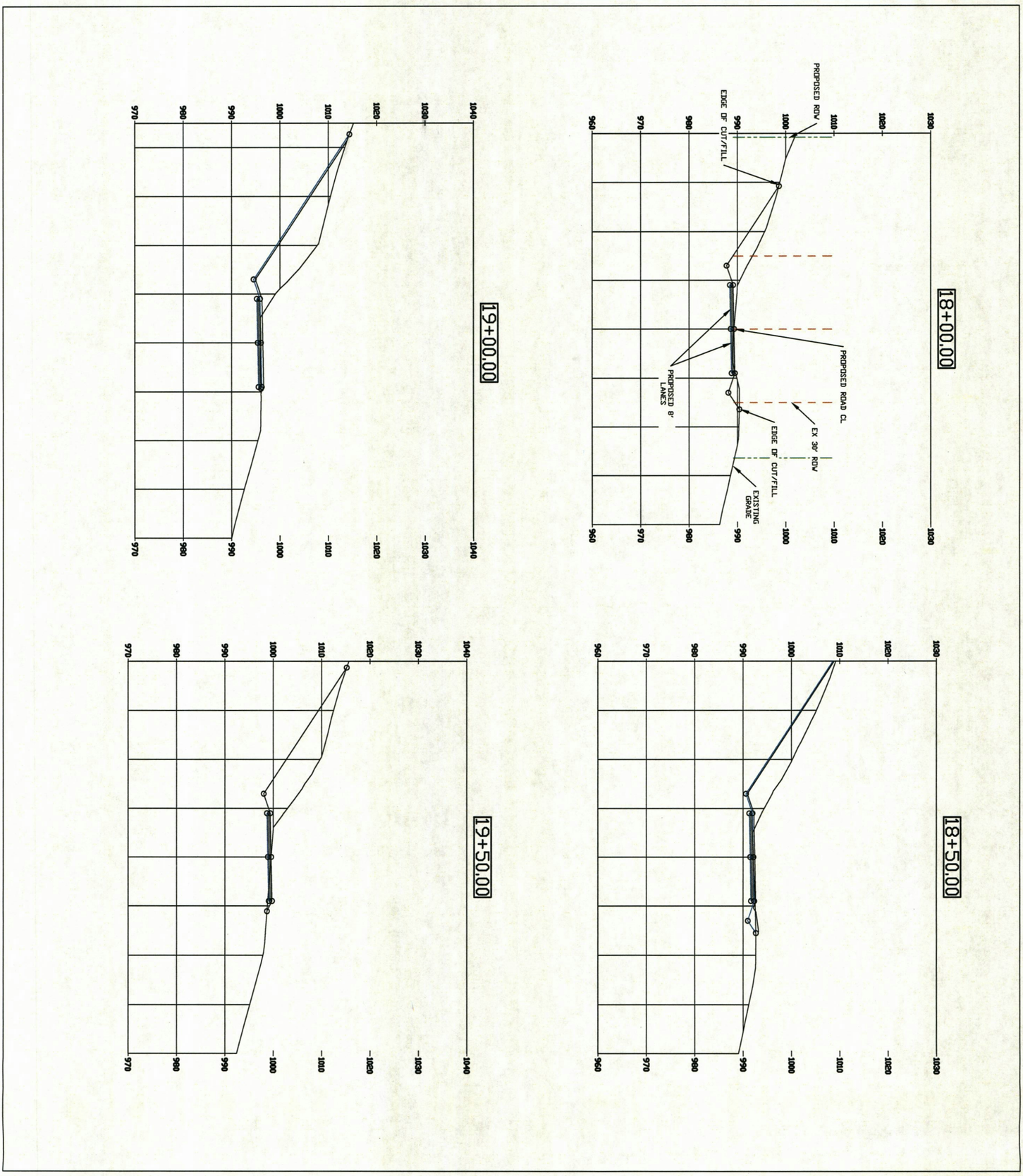
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-21



SHEET No. C-22	ANTERO RESOURCES SOUTH FORK OF HUGHES RIVER ROAD IMPROVEMENT PRELIMINARY DESIGN FOR WEST VIRGINIA		

NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/12/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

EARTHRES
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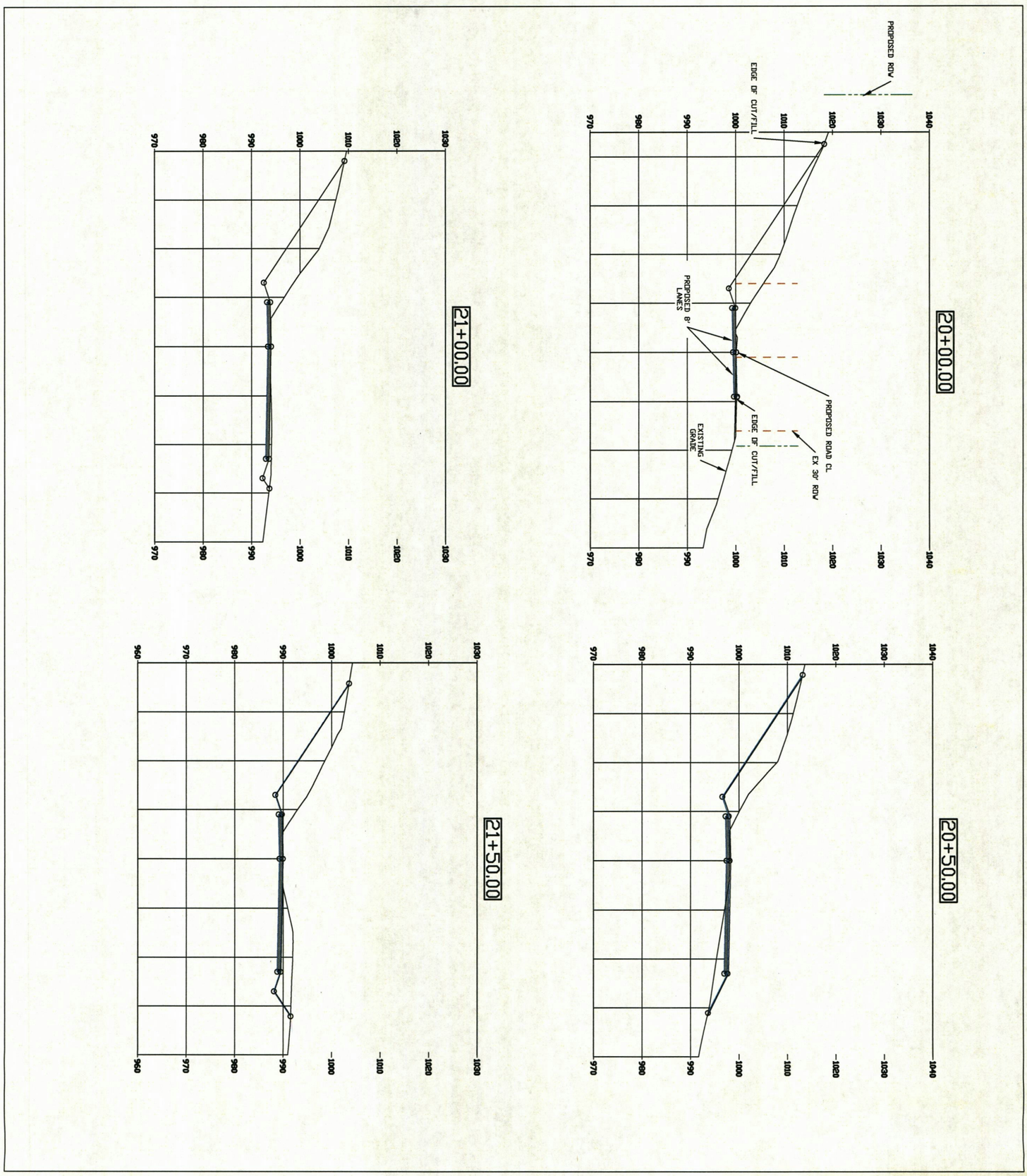
APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources



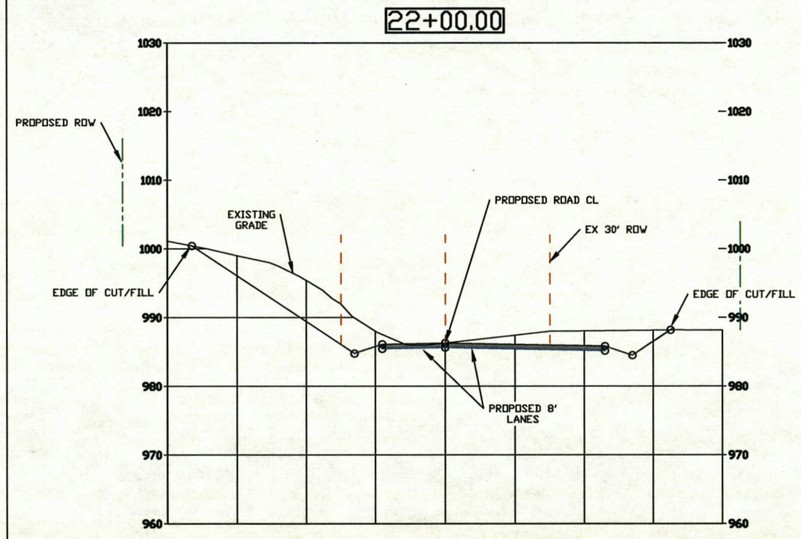
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

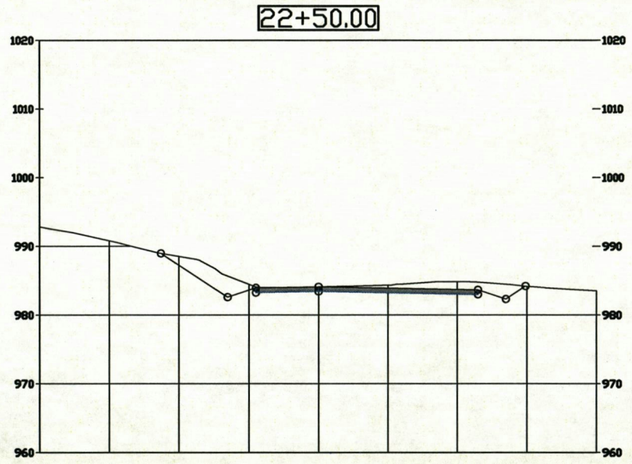
NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

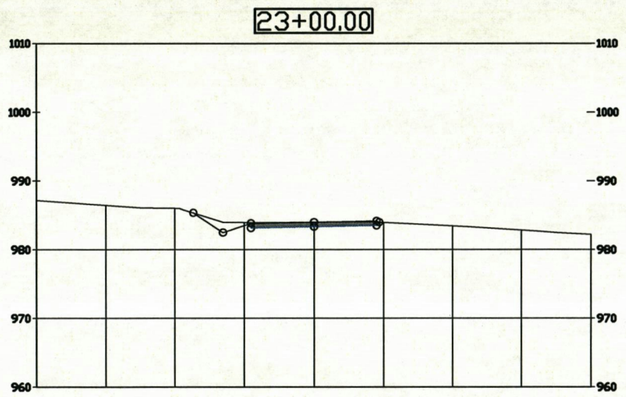
EARTHRES
ENGINEERING FOR SUCCESS™

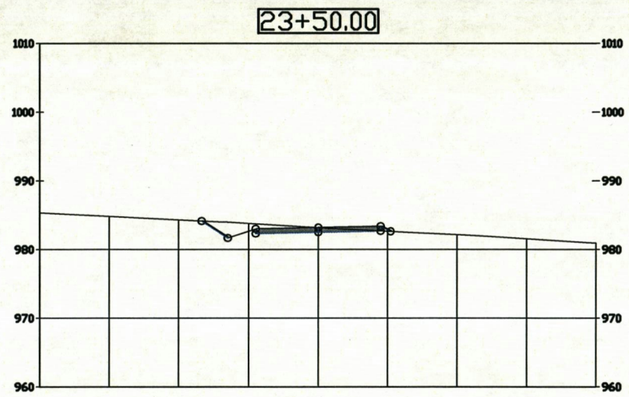
APPROVED FOR PERMITS:
BY: DATE:
APPROVED FOR BIDS:
BY: DATE:
APPROVED FOR CONSTRUCTION:
BY: DATE:

Antero Resources









Antero Resources

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BY: DATE:
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BY: DATE:
APPROVED FOR CONSTRUCTION
BY: DATE:

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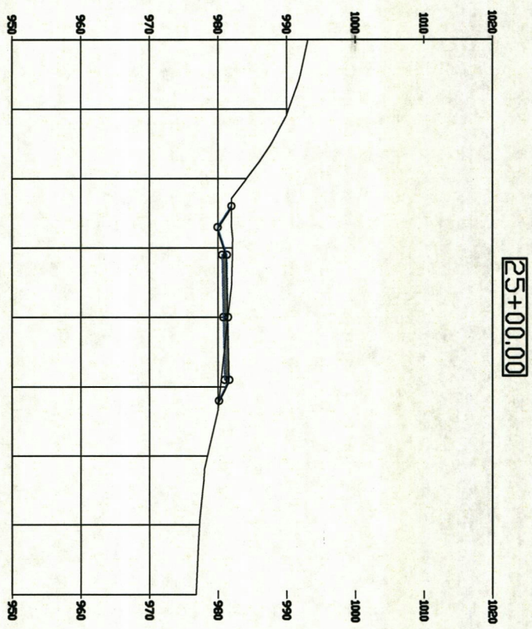
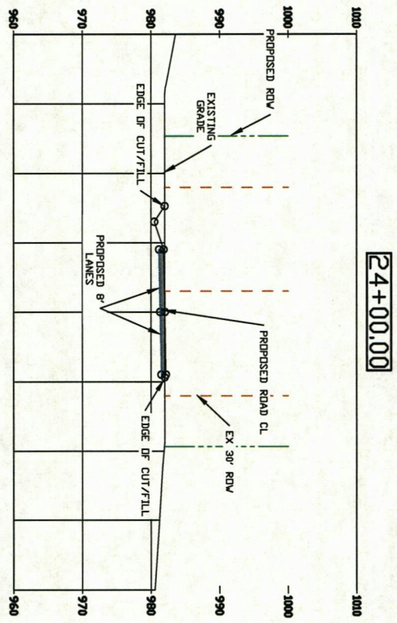
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

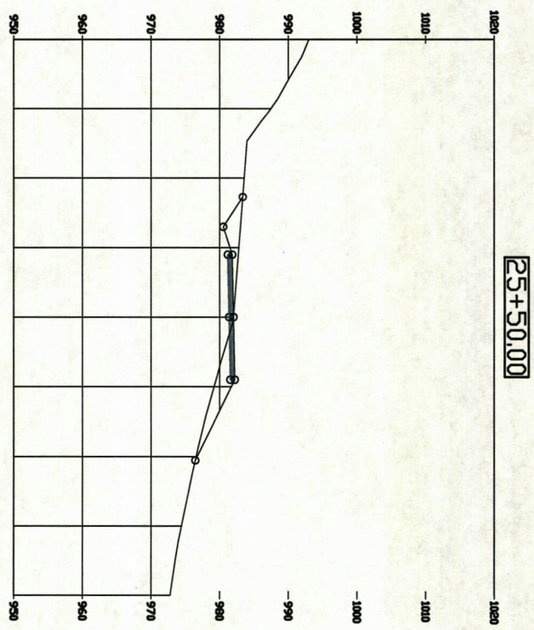
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

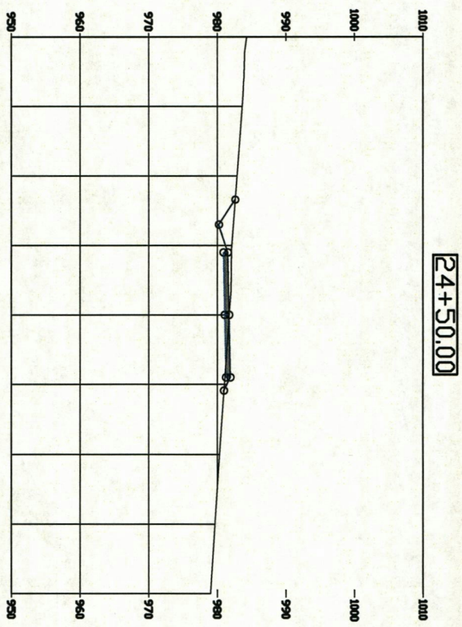
SHEET No.
C-24

CAD FILE: P:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 0\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_curbsections.dwg PLOT DATE/TIME: 1/21/2019 2:19 PM









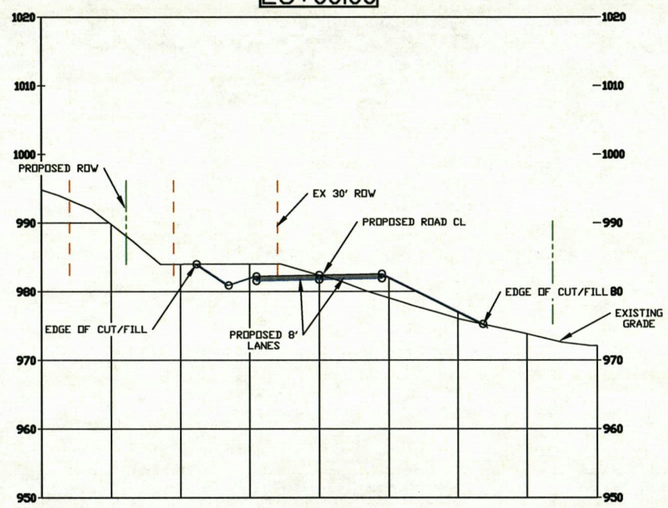
SHEET No.	ANTERO RESOURCES SOUTH FORK OF HUGHES RIVER ROAD IMPROVEMENT PRELIMINARY DESIGN FOR WEST VIRGINIA	NO.	BY	DATE	DESCRIPTION
C-25		4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
		3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
		1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

EARTHRES ENGINEERING FOR SUCCESS™

APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

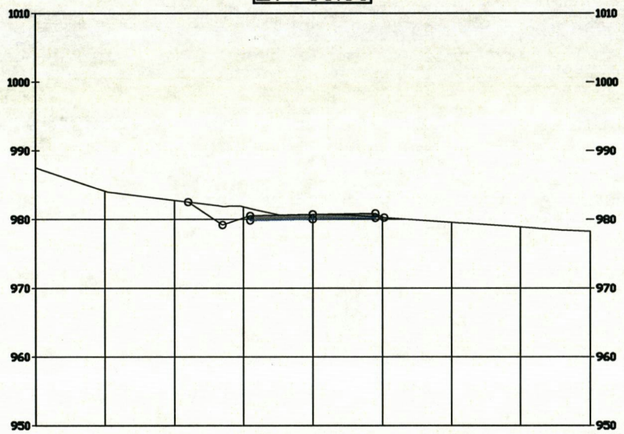
Antero Resources

26+00.00

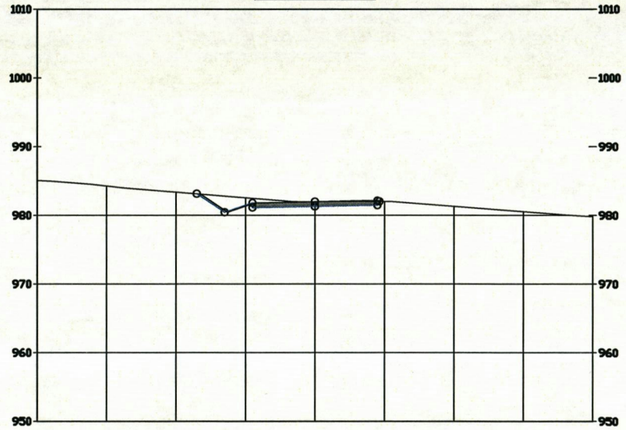


26+50.00

27+00.00



27+50.00



Antero Resources

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ENGINEERING FOR SUCCESS™

APPROVED FOR PERMITS	DATE:
BY:	
APPROVED FOR BIDS	DATE:
BY:	
APPROVED FOR CONSTRUCTION	DATE:
BY:	

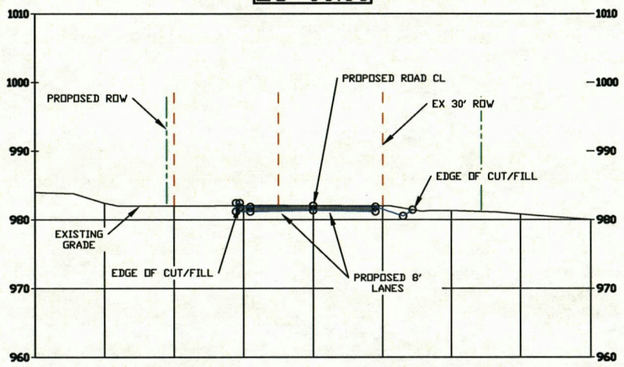
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

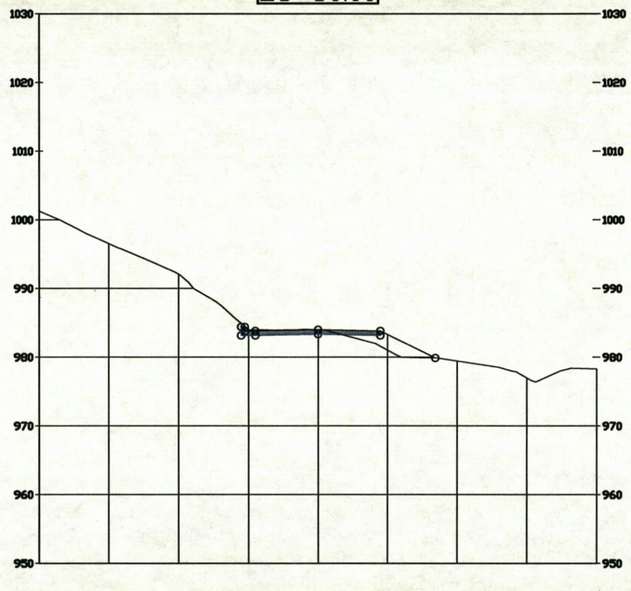
SHEET No.
C-26

CAD FILE: F:\PROJECTS\Antero Resources\131082064 Hughes River Road\CAD\Drawings\Rev 01\131082064 HUGHES_RIVER_ROAD_MASTER_PRELIM_cutsections.dwg PLOT DATE/TIME: 1/21/2019 2:30 PM

28+00.00



28+50.00



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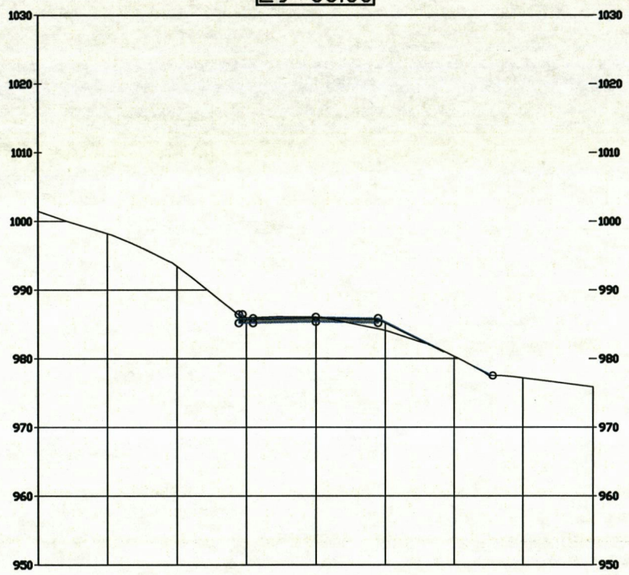

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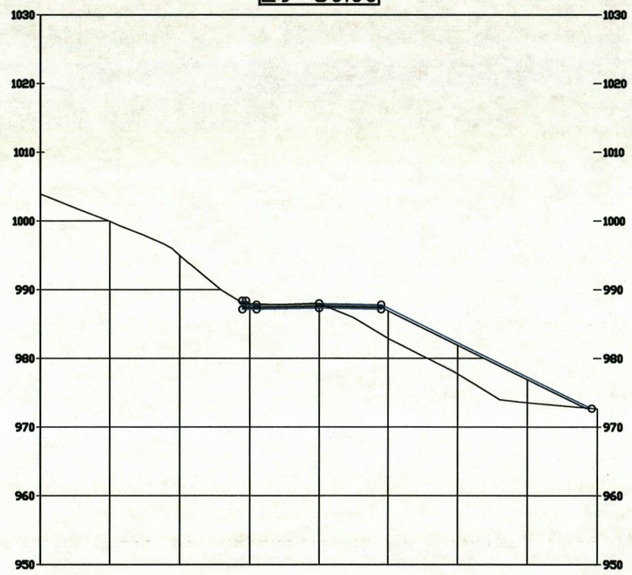

Antero Resources

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APPROVED FOR CONSTRUCTION: BY: DATE:

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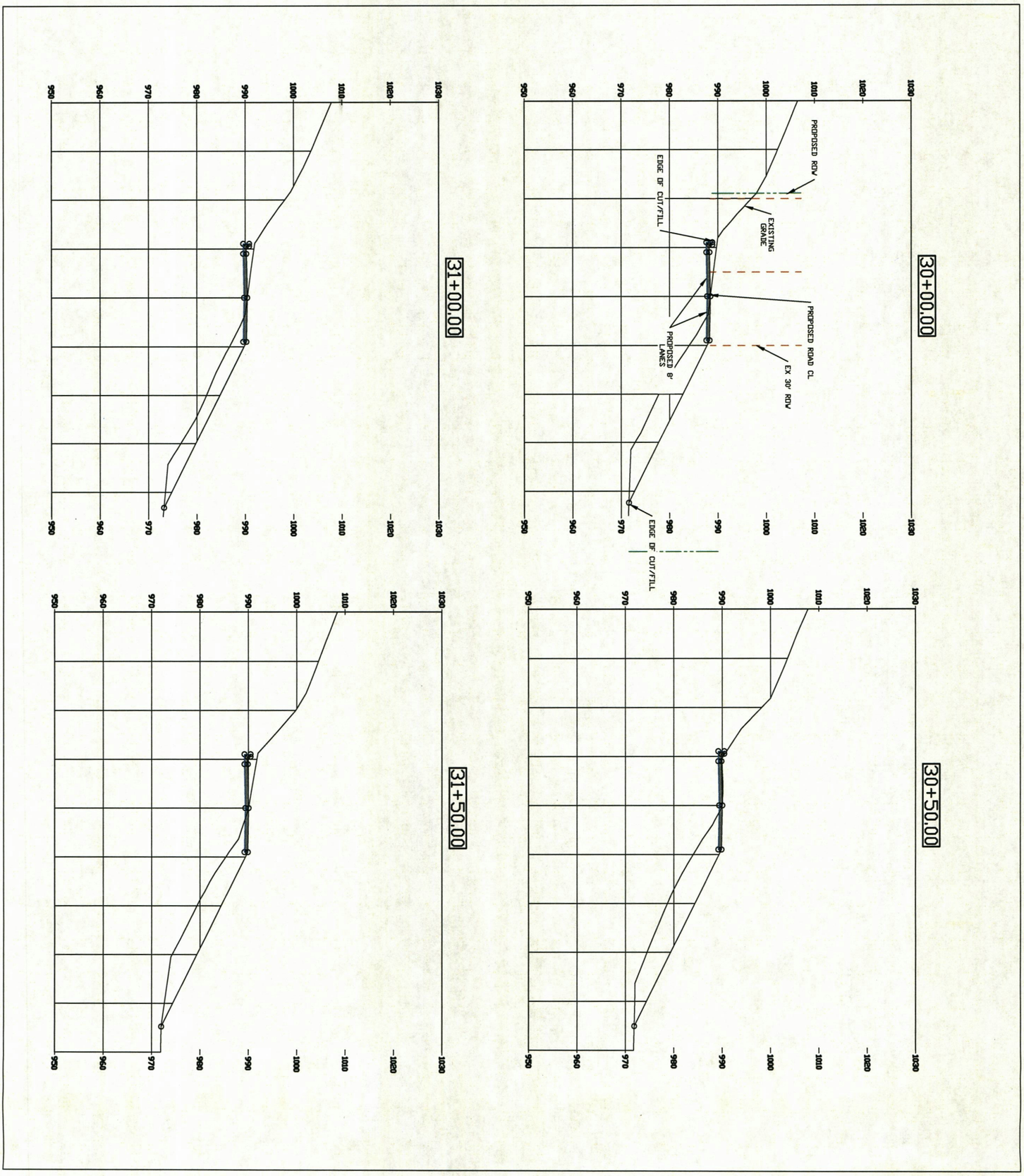
ENGINEERING FOR SUCCESS™

NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-27



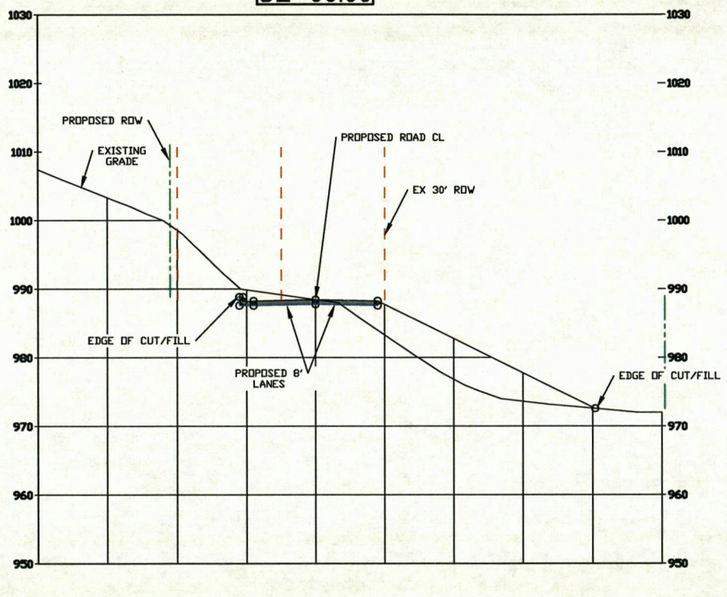
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

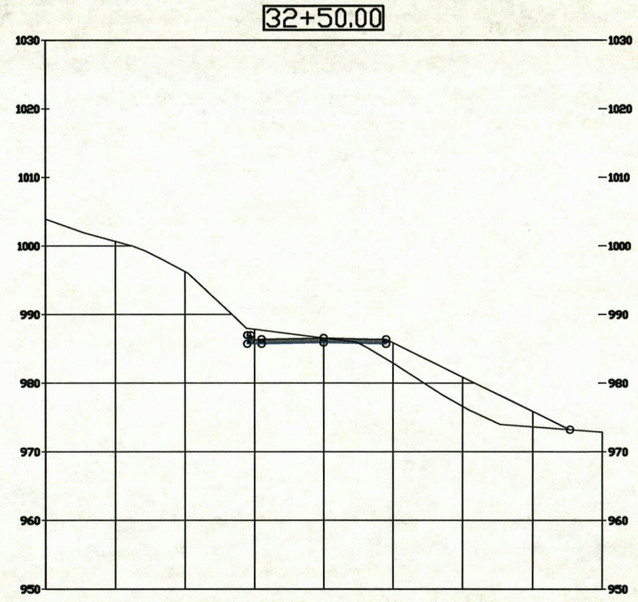
NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

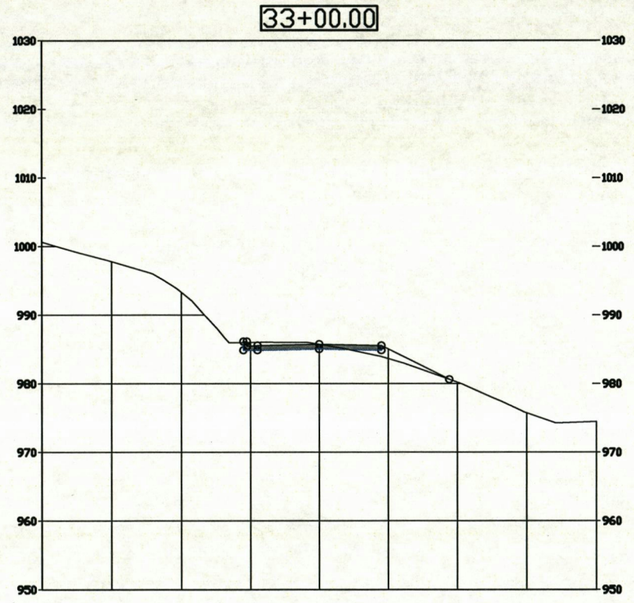
EARTHRES
ENGINEERING FOR SUCCESS™

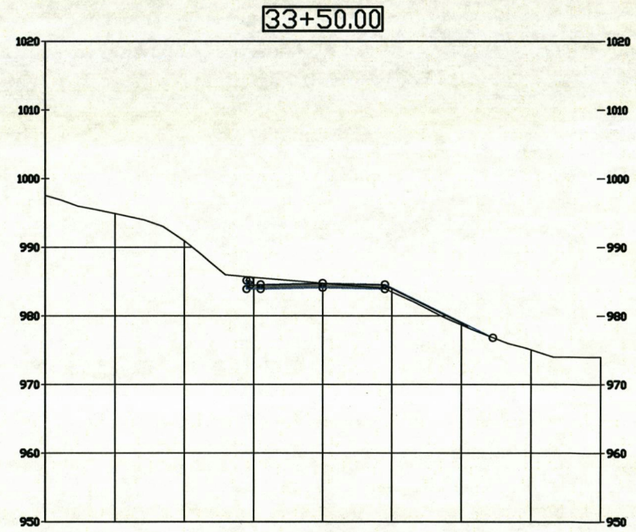
APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources









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Antero Resources

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EARTHRES
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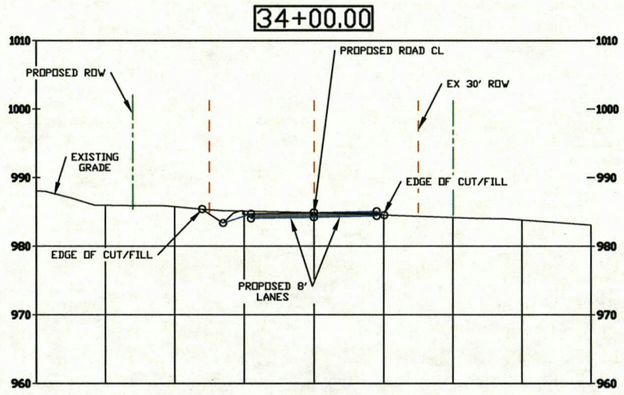
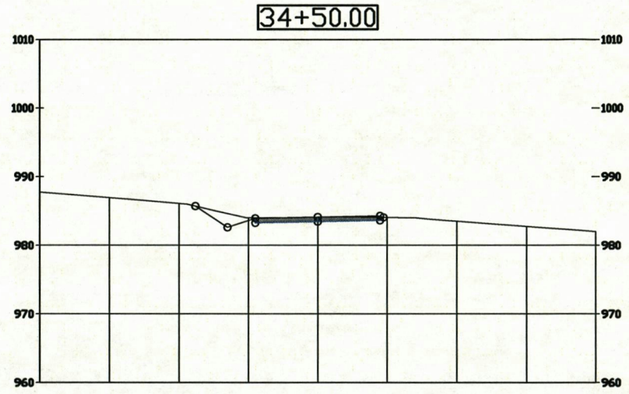
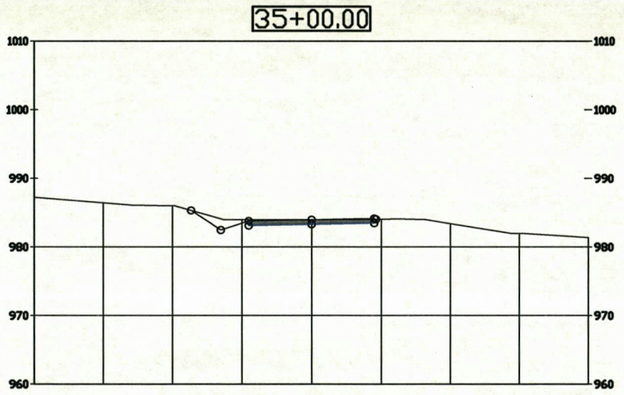
NO.	BY	DATE	DESCRIPTION
4	KRT	01/31/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRT	11/14/2018	INITIAL PRELIMINARY DESIGN

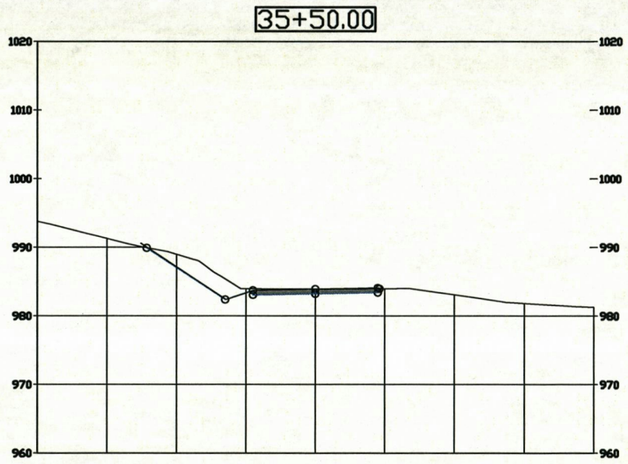
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-29









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Antero Resources

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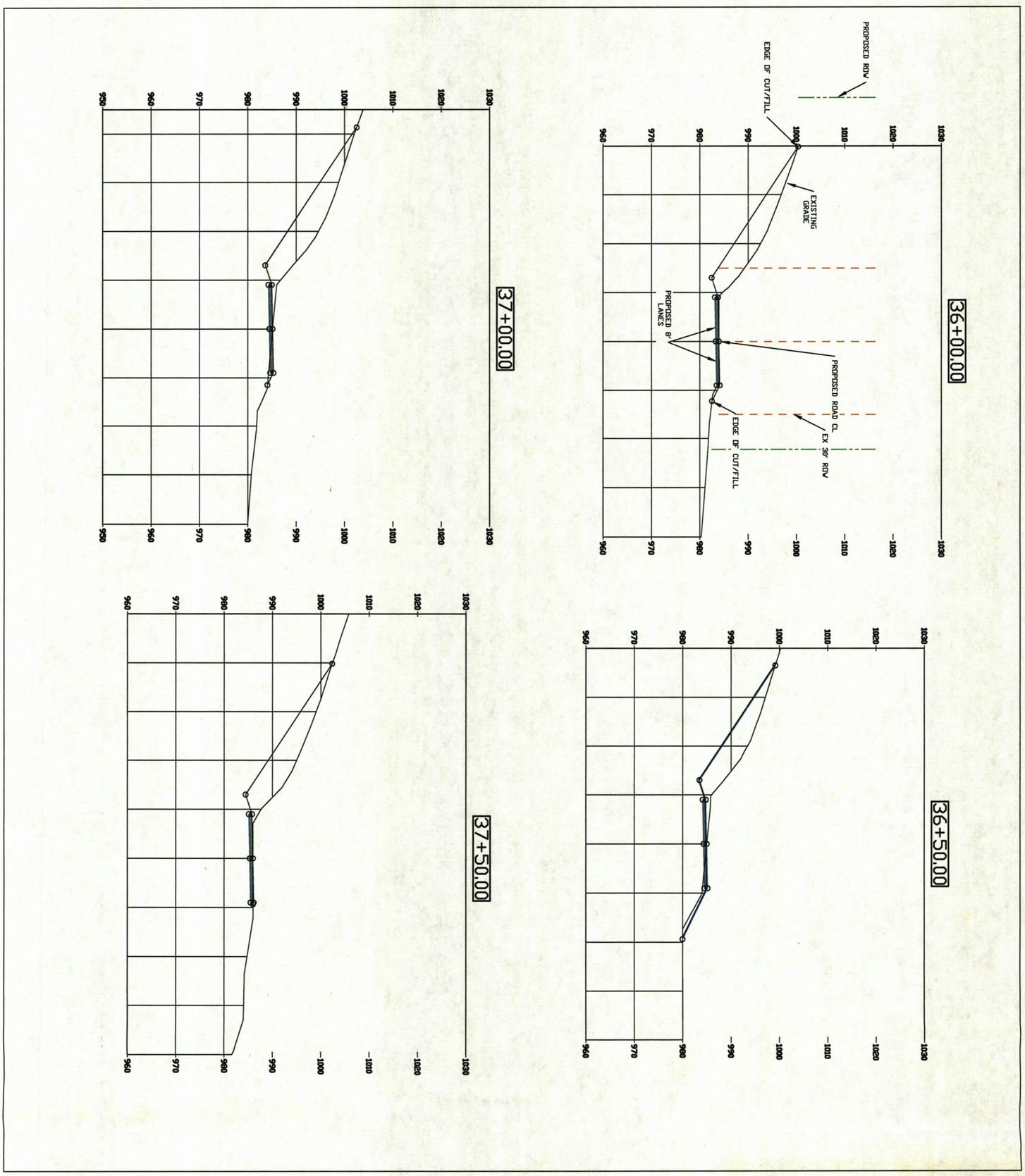
APPROVED FOR CONSTRUCTION: BY: DATE:

EARTHRES
ENGINEERING FOR SUCCESS™

NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-30



ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No. C-31

NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

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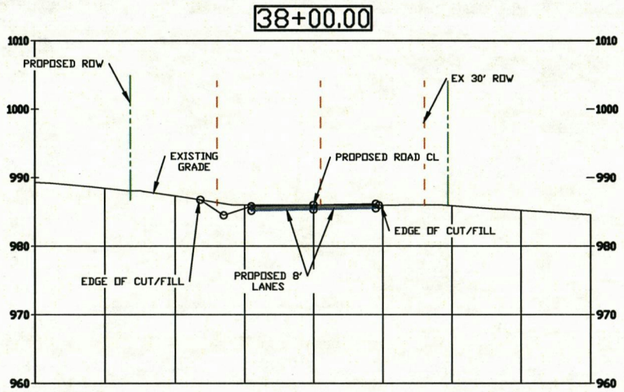
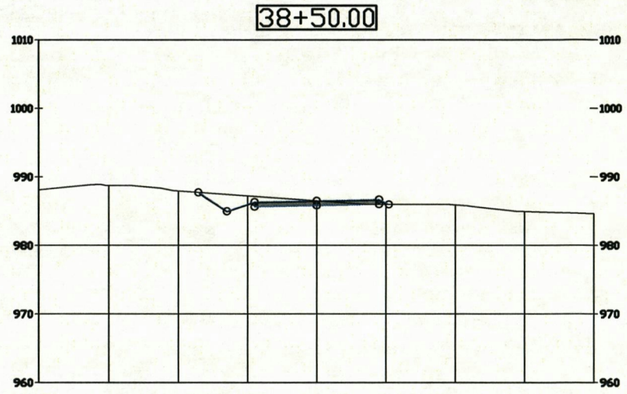
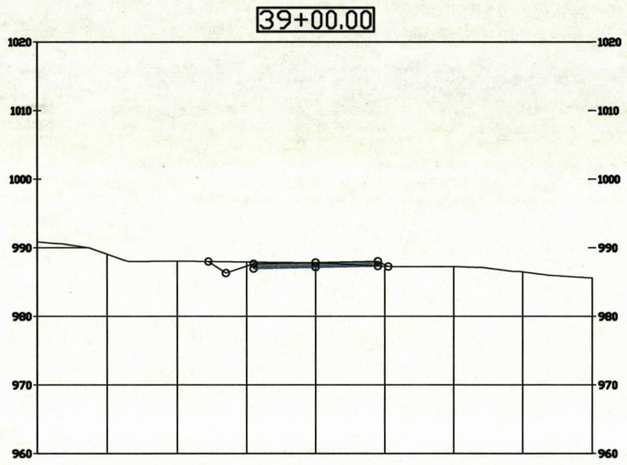
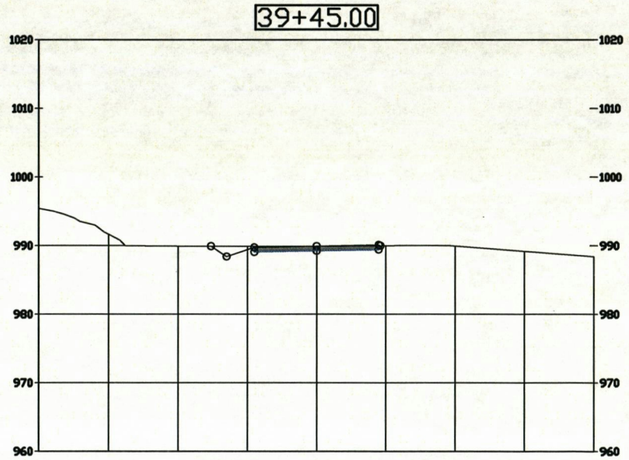
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources









CAD FILE: F:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 0\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_cutsections.dwg PLOT DATE/TIME: 1/21/2019 8:21 PM

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EARTHRES
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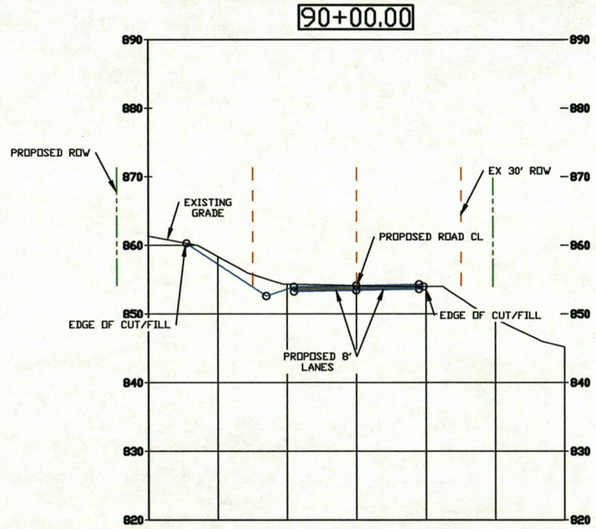
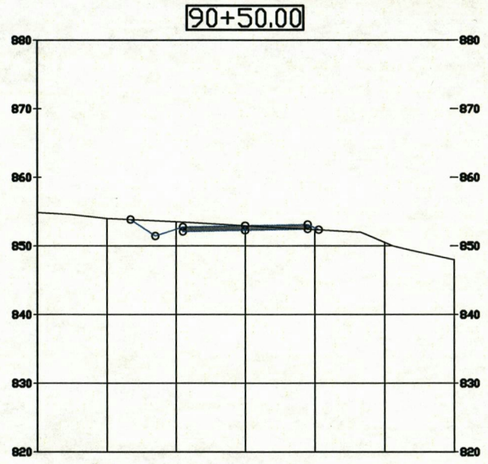
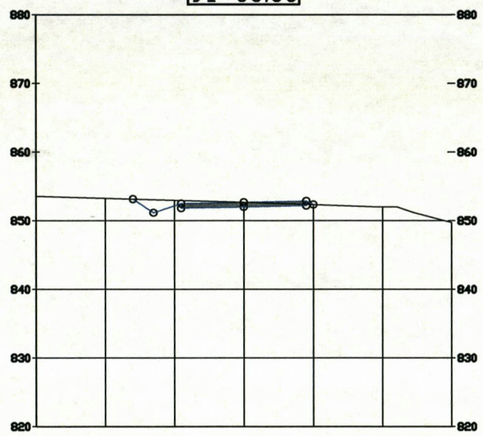
NO.	BY	DATE	DESCRIPTION
4	KRS	01/21/2019	PRELIMINARY SESSION FOR PERMITTING
3	KRS	12/20/2018	PRELIMINARY SESSION FOR REVIEW
2	KRS	11/14/2018	INITIAL PRELIMINARY SESSION

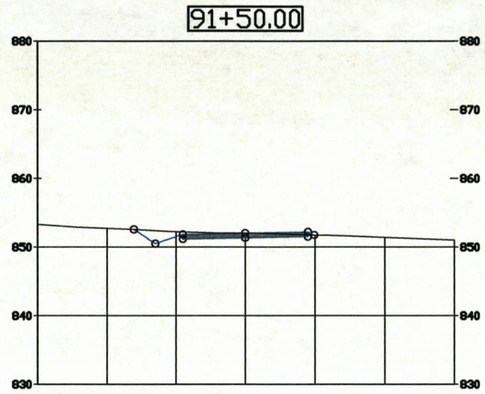
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-32









CAD FILE: F:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 01\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_cutsections.dwg PLOT DATE/TIME: 1/21/2019 8:21 PM

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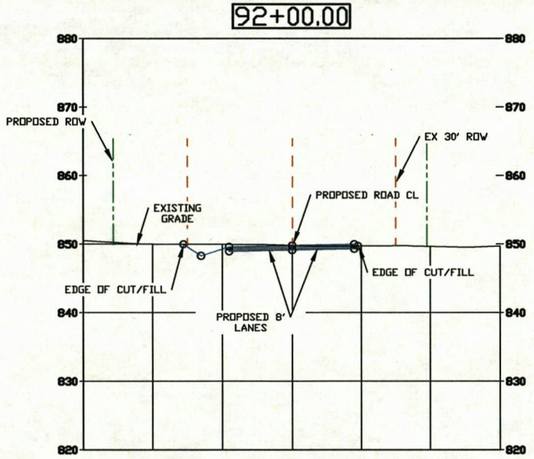
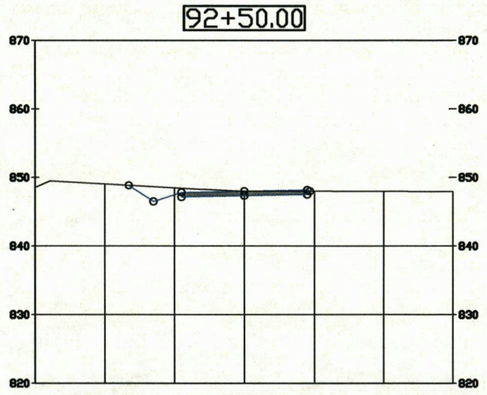
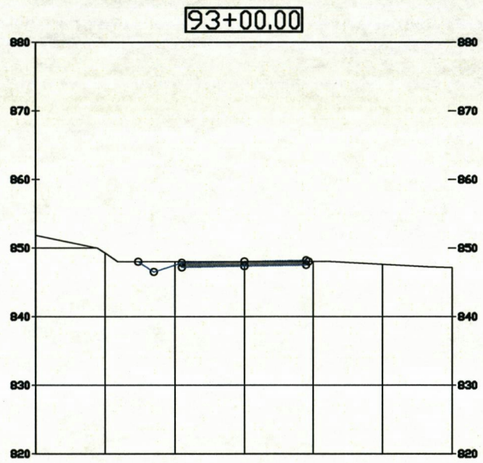
NO.	BY	DATE	DESCRIPTION
4	KKE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KKE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KKE	11/14/2018	INITIAL PRELIMINARY DESIGN

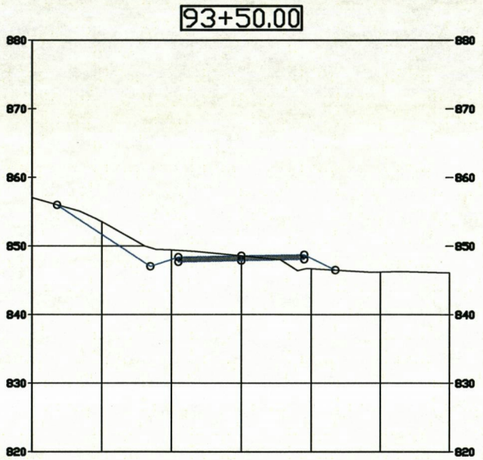
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-33









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NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-34

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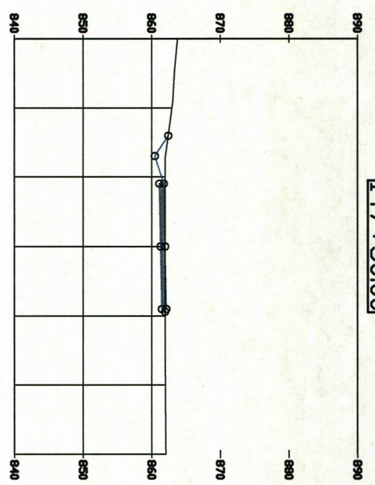
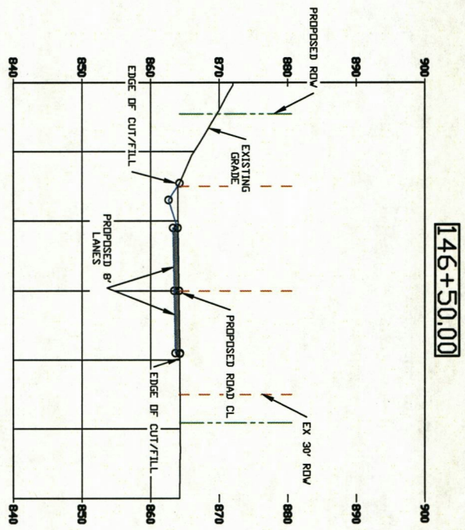
NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

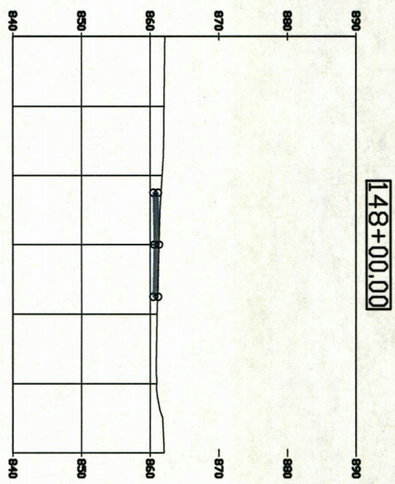
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

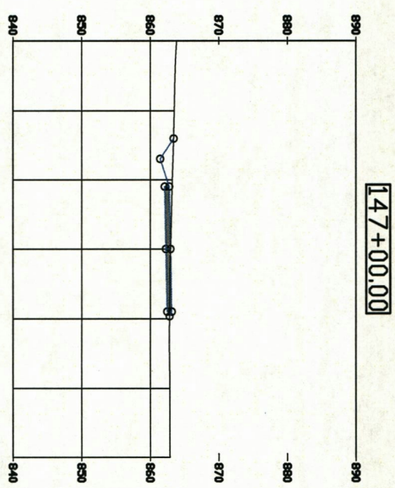
SHEET No.
C-35

CAD FILE: F:\PROJECTS\Antero Resources\131022064 Hughes River Road\CAD\Drawings\Rev 01\131022064 HUGHES_RIVER_ROAD_MASTER_PRELIM_cutsections.dwg
PLOT DATE/TIME: 1/21/2019 2:21 PM









4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

EARTHRES
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SHEET No. C-36

CAD FILE: F:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 0\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_curksections.dwg PLOT DATE/TIME: 1/21/2019 2:22 PM

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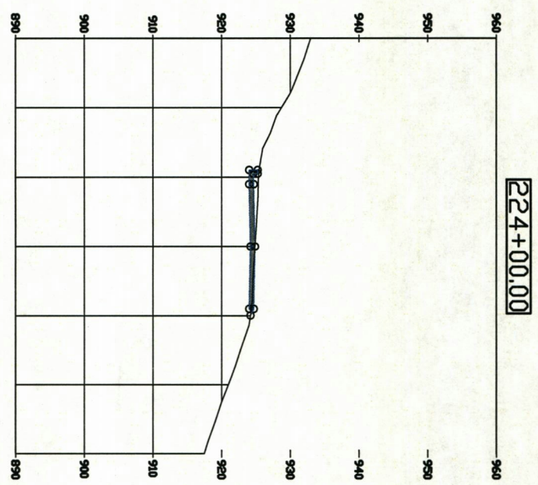
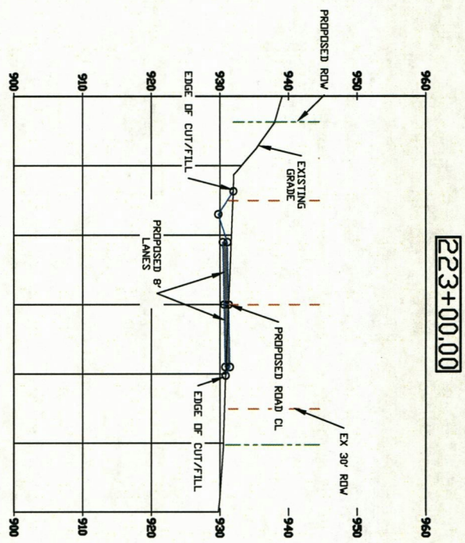
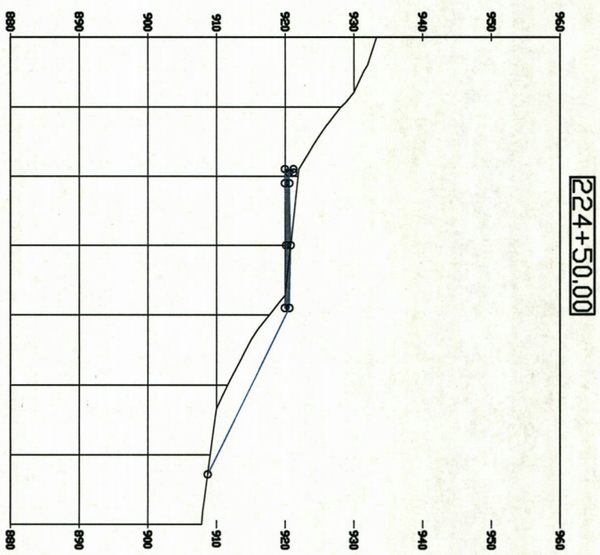
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

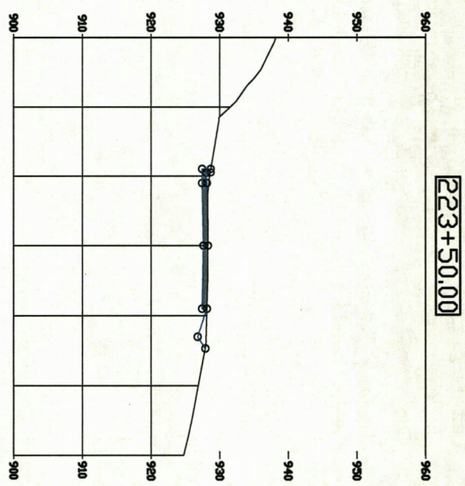
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-37







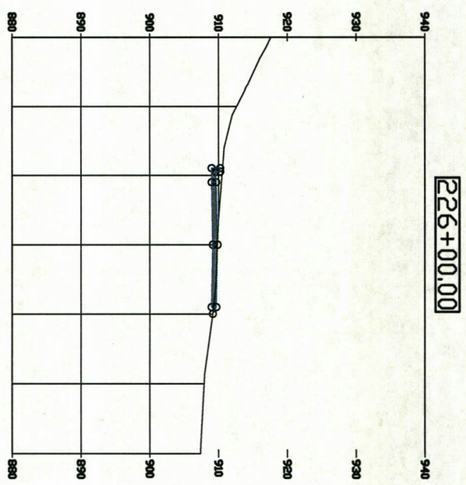


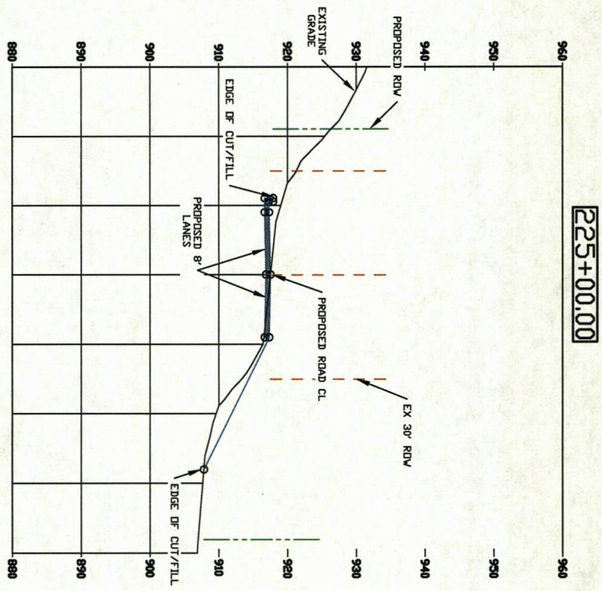
SHEET No.	ANTERO RESOURCES SOUTH FORK OF HUGHES RIVER ROAD IMPROVEMENT PRELIMINARY DESIGN FOR WEST VIRGINIA	NO.	BY	DATE	DESCRIPTION
C-38		3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
		1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

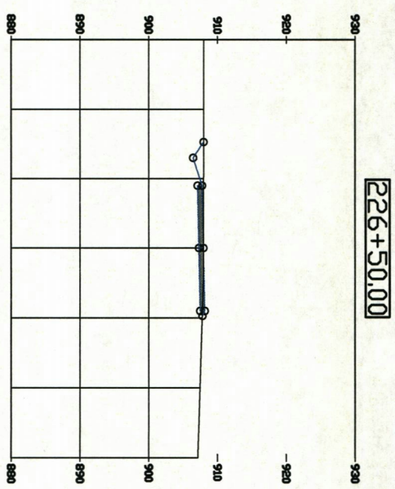
EARTHRES ENGINEERING FOR SUCCESS™

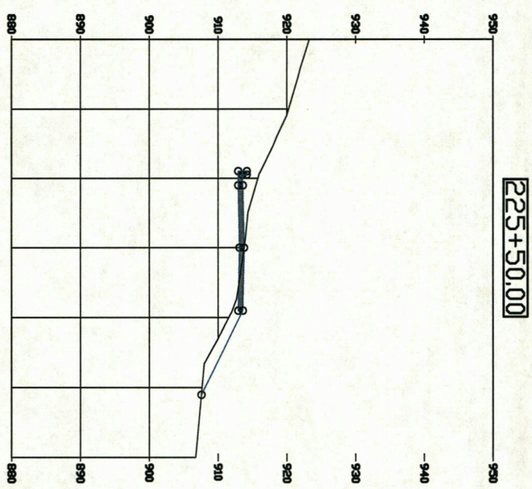
APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources









3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

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BY:	DATE:
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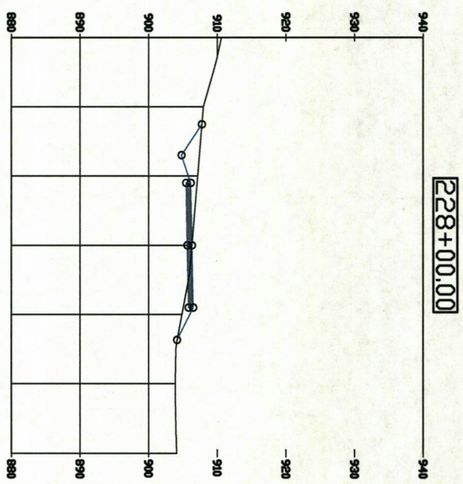
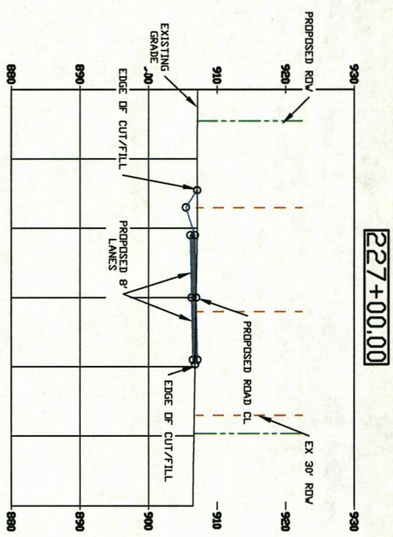
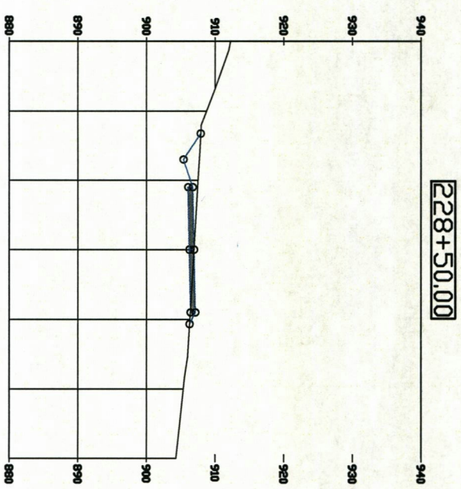
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

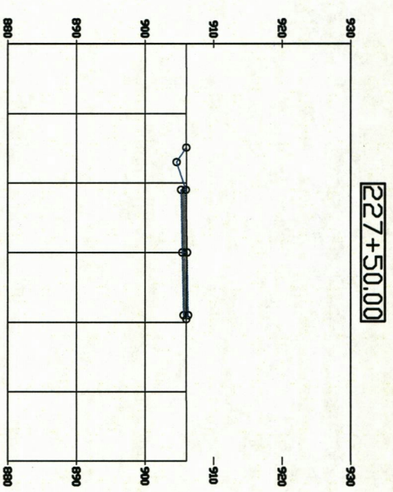
Antero Resources

SHEET No. C-39









3	KRI	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

EARTHRES
ENGINEERING FOR SUCCESS™

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BY: DATE:
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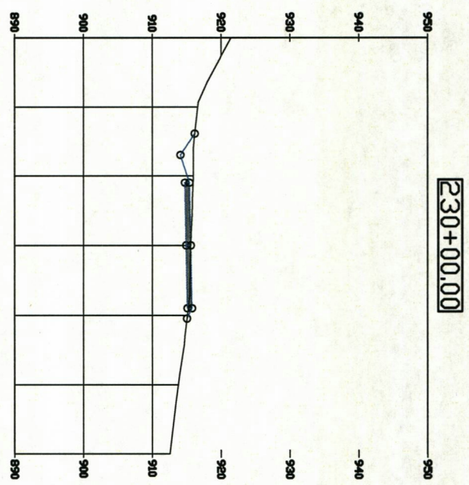
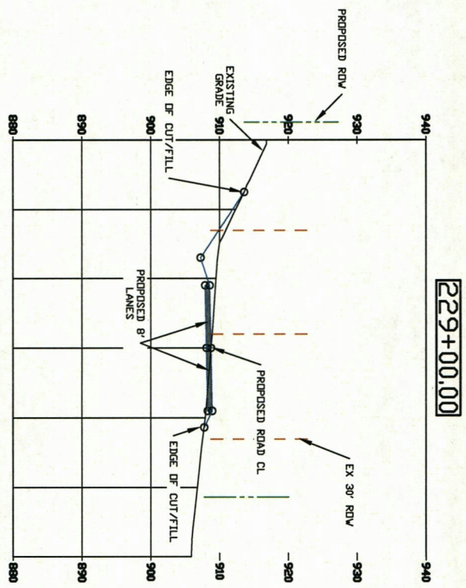
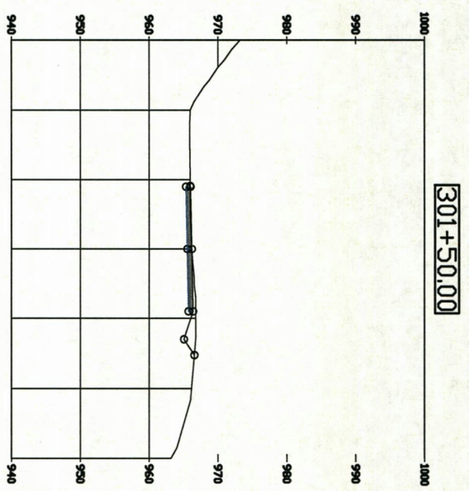
BY: DATE:
APPROVED FOR CONSTRUCTION:
BY: DATE:

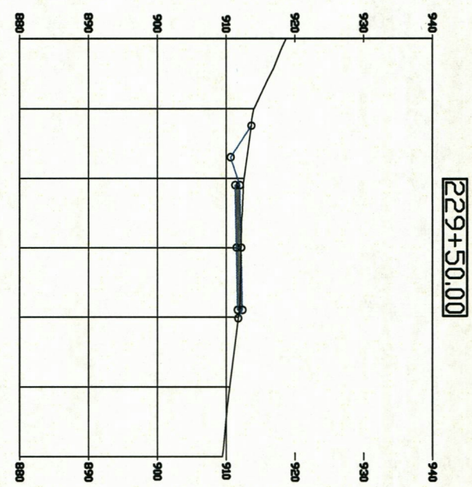
Antero Resources

SHEET No. C-40









3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

EARTHRES
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BY:	DATE:
APPROVED FOR BIDS:	
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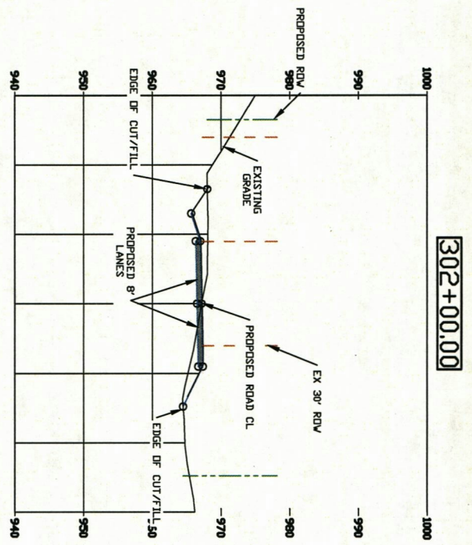
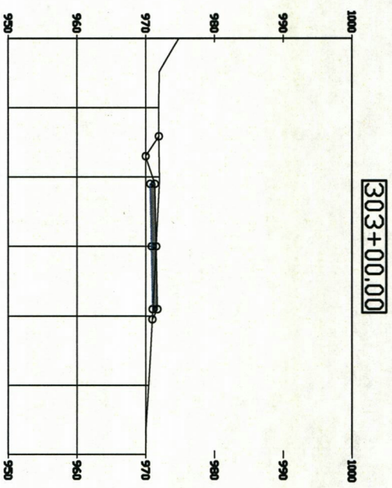
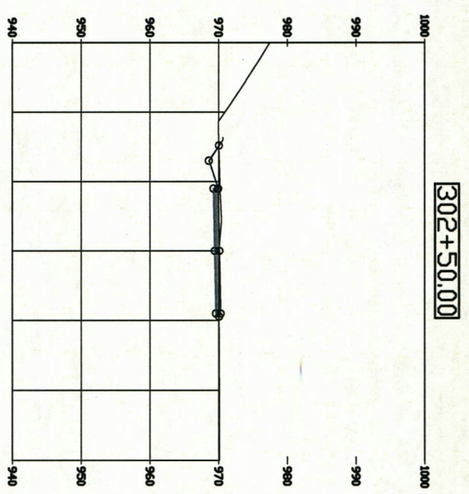
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

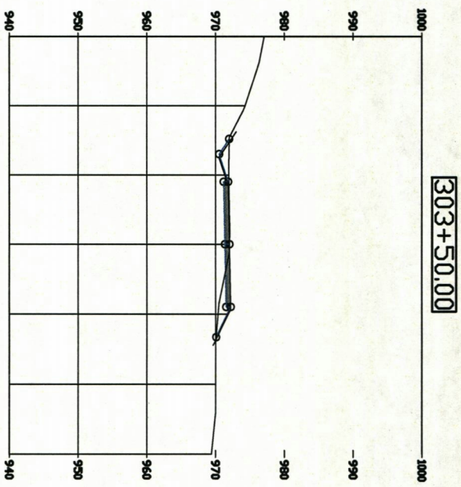
Antero Resources

SHEET No.
C-41









3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

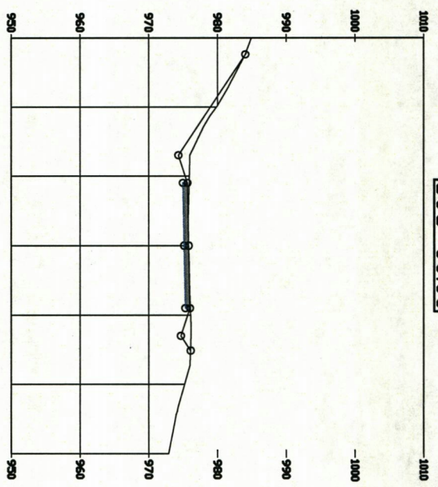
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

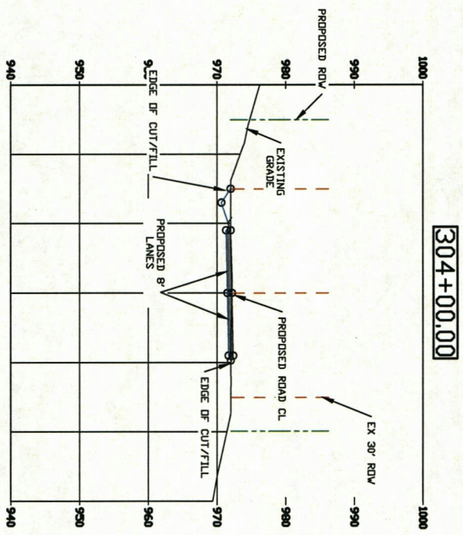
EARTHRES
ENGINEERING FOR SUCCESS™

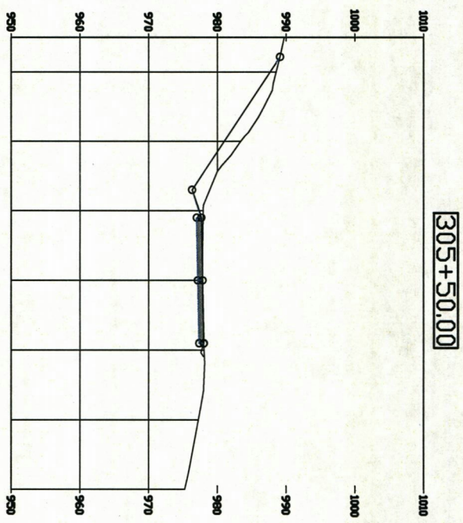
APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

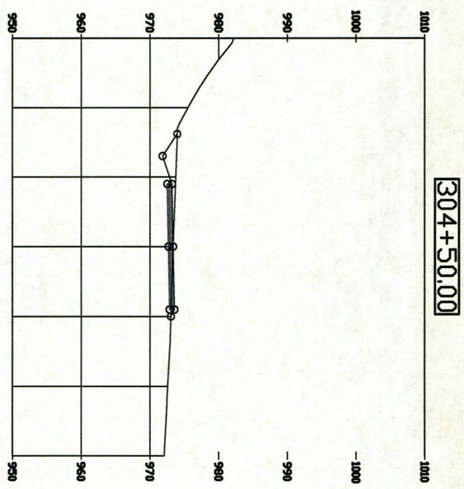
Antero Resources

SHEET No. C-42









3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

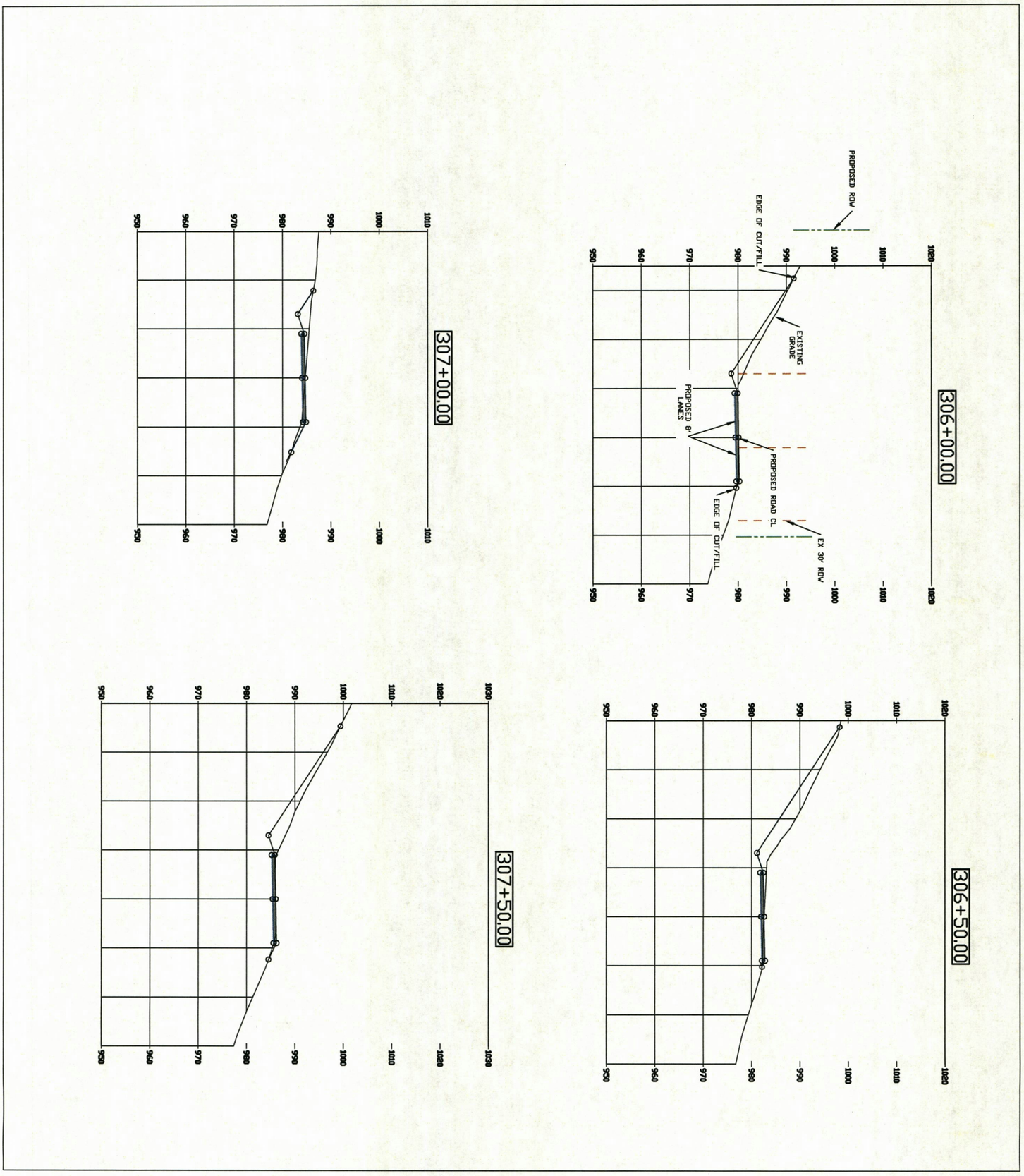
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

EARTHRES
ENGINEERING FOR SUCCESS™

APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources

SHEET No. C-43



ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

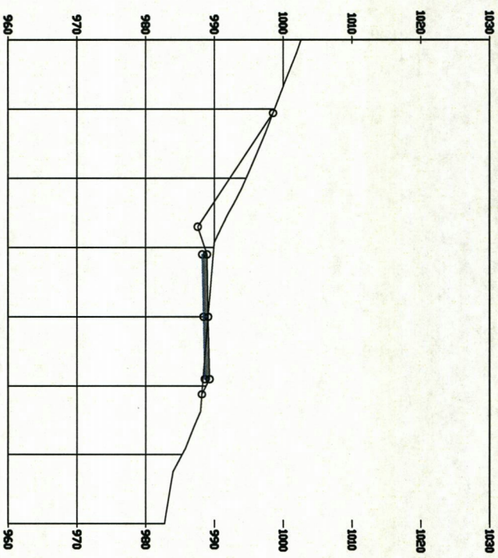
SHEET No. C-44

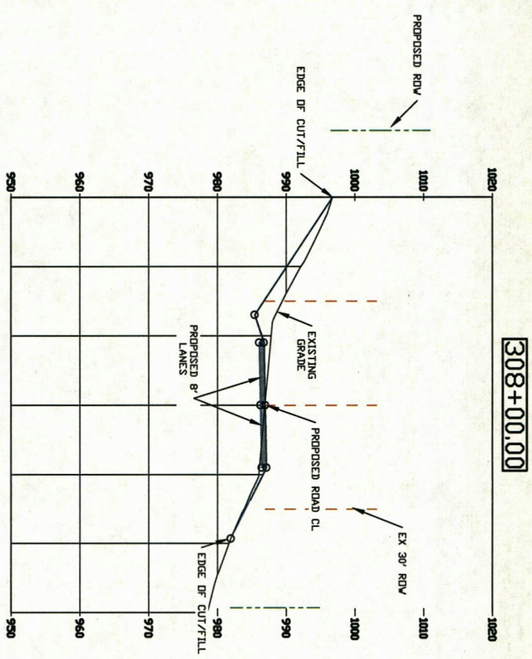
NO.	BY	DATE	DESCRIPTION
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

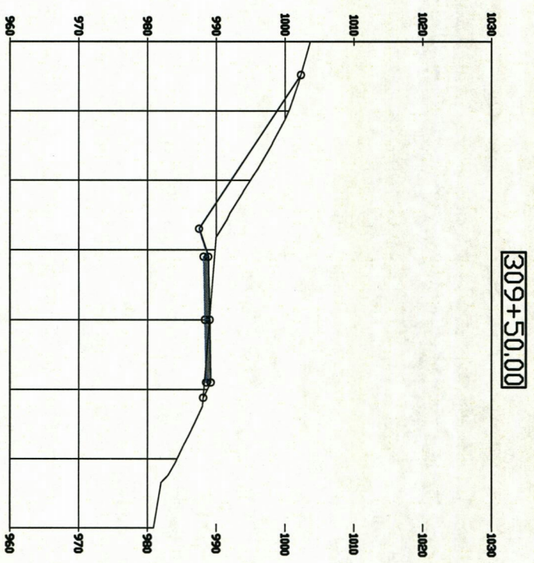
EARTHRES
ENGINEERING FOR SUCCESS™

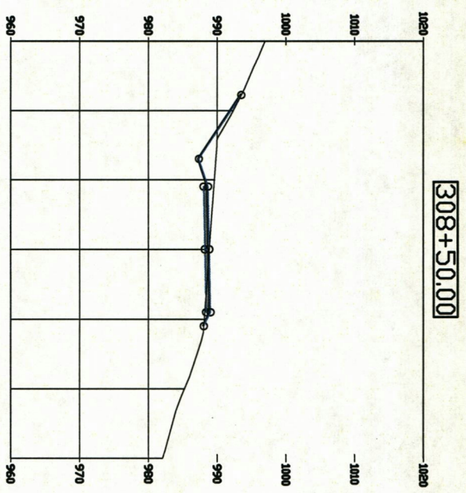
APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources









3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN
NO.	BY	DATE	DESCRIPTION

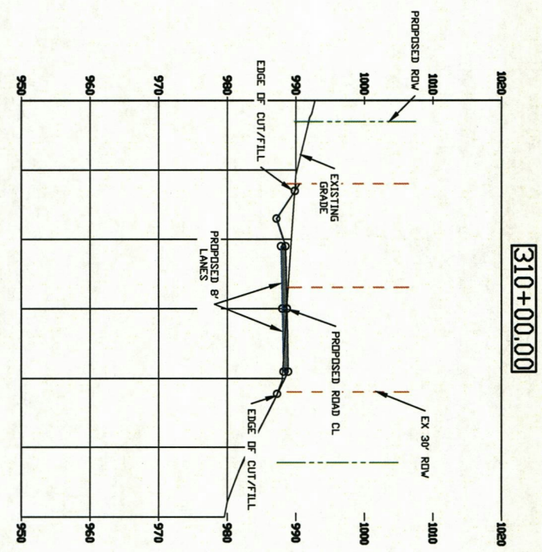
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

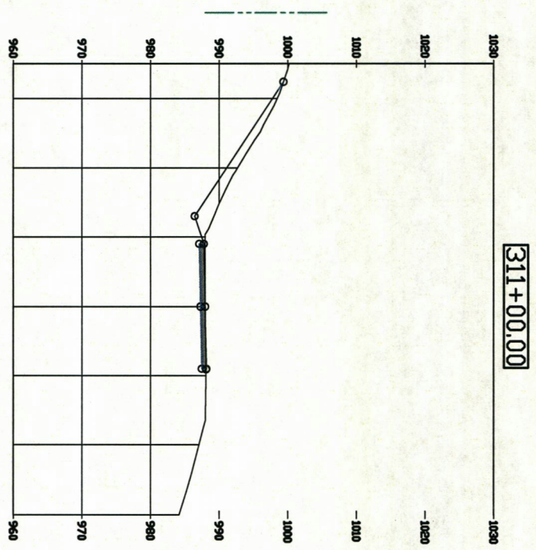
EARTHRES
ENGINEERING FOR SUCCESS™

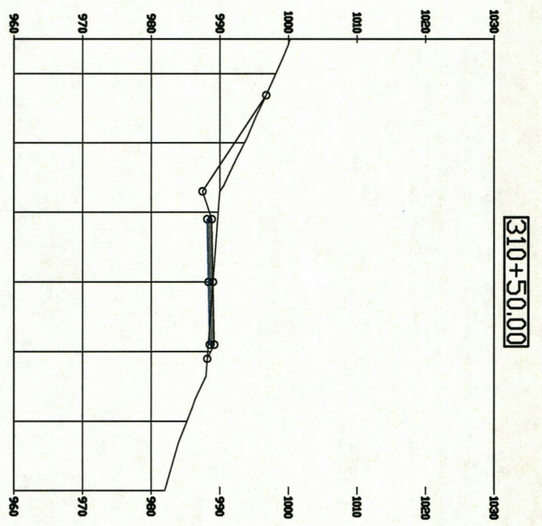
APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

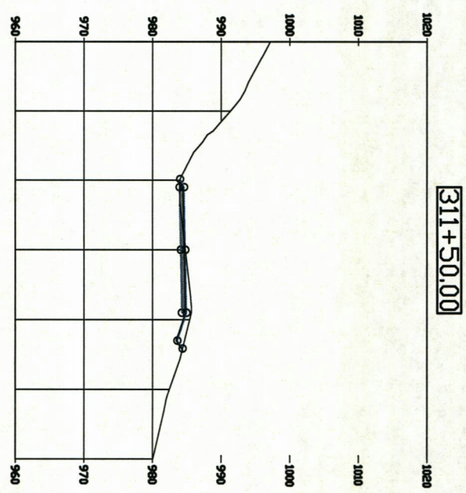
Antero Resources

SHEET No.
C-45









ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No. C-46

NO.	BY	DATE	DESCRIPTION
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

EARTHRES
ENGINEERING FOR SUCCESS™

APPROVED FOR PERMITS:	
BY:	DATE:
APPROVED FOR BIDS:	
BY:	DATE:
APPROVED FOR CONSTRUCTION:	
BY:	DATE:

Antero Resources

CAD FILE: P:\PROJECTS\Antero Resources\131082.064 Hughes River Road\CAD\Drawings\Rev 0\131082.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_cutsections.dwg PLOT DATE/TIME: 1/21/2019 2:23 PM

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APPROVED FOR BIDS: BY: DATE:
APPROVED FOR CONSTRUCTION: BY: DATE:

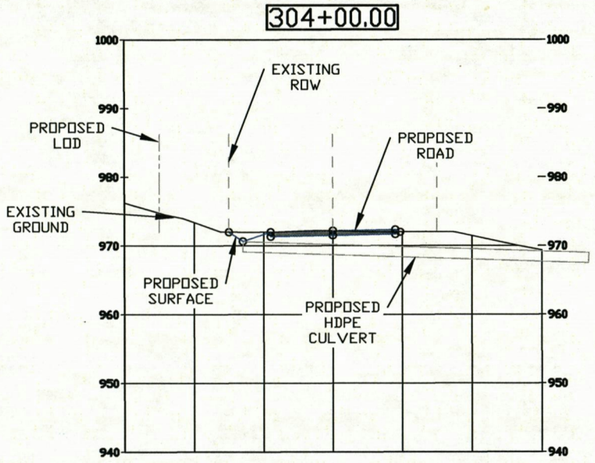
EARTHRES
ENGINEERING FOR SUCCESS™

NO.	BY	DATE	DESCRIPTION
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

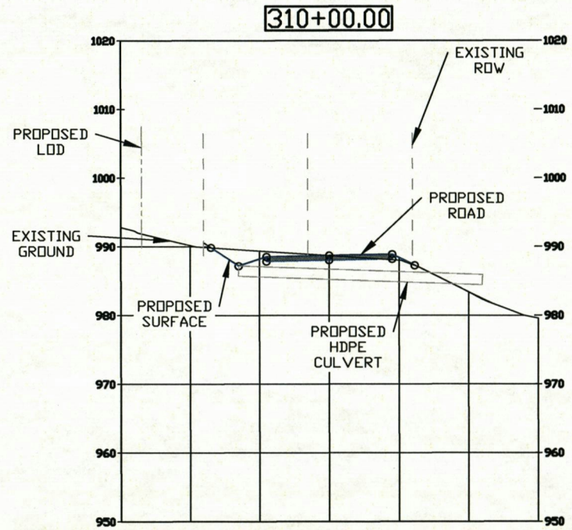
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-47

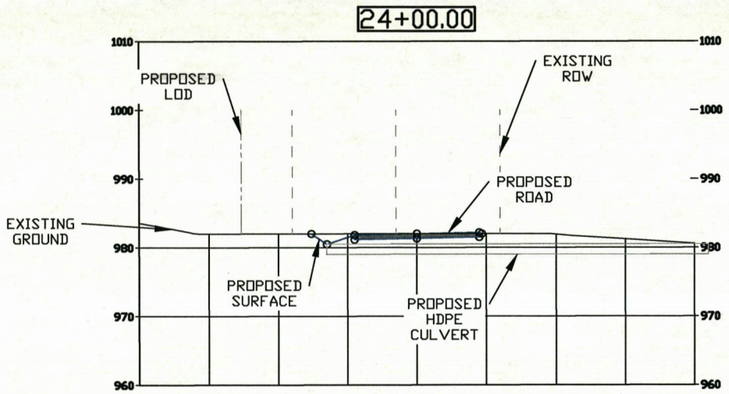
CULVERT SECTION NOTE
SEE C-49 FOR PROPOSED
CULVERT LENGTH AND DIAMETER



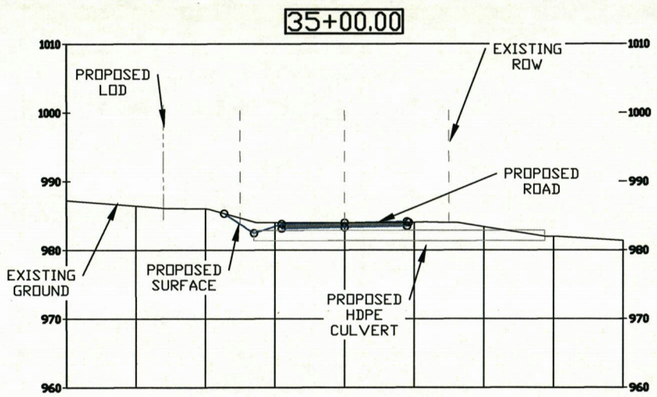
PROPOSED CULVERT
C-02



PROPOSED CULVERT
C-04



PROPOSED CULVERT
C-08B



PROPOSED CULVERT
C-10

Antero Resources

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APPROVED FOR BIDS — BY: — DATE:
APPROVED FOR CONSTRUCTION — BY: — DATE:

EARTHRES
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NO.	BY	DATE	DESCRIPTION
4	KEE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KEE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KEE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

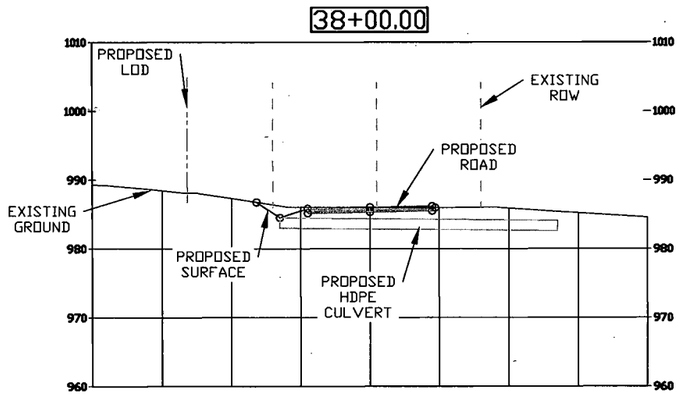
SHEET No.
C-48

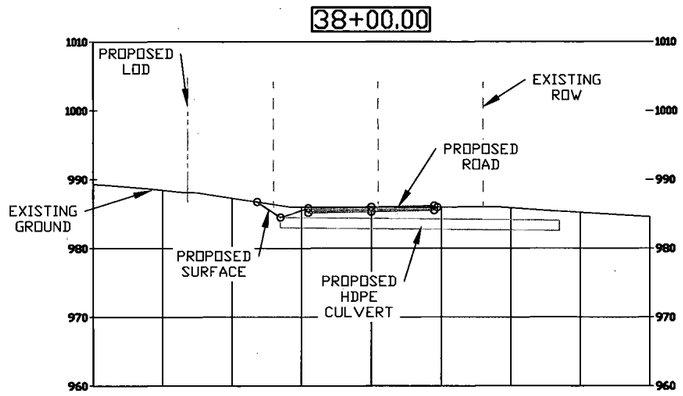
CAD FILE: P:\PROJECTS\Antero Resources\13108263\64 Hughes River Road\CAD\Drawings\Rev 01\13108263\64 HUGHES_RIVER_ROAD_MASTER_PRELIM_4045.dwg
PLOT DATE/TIME: 1/21/2019 2:09 PM

RESOURCE IMPACT TABLE

FEATURE LABEL	STATION	TYPE OF IMPACT	DRAINAGE (AC)	EX CULVERT SIZE (IN)	PROP. CULVERT SIZE (IN)	CONDITION	LENGTH OF CULVERT (FT)	OUTLET PROTETION IMPACT (FT)	DESCRIPTION OF IMPACT
C-01	301+00	FILL	1.5	18	18	BAD	N/A	20	OUTLET PROTECTION
C-02	304+00	FILL	1.5	18	18	BAD	50	20	CULVERT AND OUTLET PROTECTION
C-03	307+00	FILL	1	18	18	BAD	40	20	CULVERT AND OUTLET PROTECTION
C-04	310+00	FILL	1	24	18	BAD	35	20	CULVERT AND OUTLET PROTECTION
C-05	2+50	FILL	1.5	24	N/A	BAD	N/A	20	OUTLET PROTECTION
C-06	5+00	FILL	3.5	24	24	GOOD	N/A	20	OUTLET PROTECTION
C-07	14+50	FILL	3	24	24	GOOD	N/A	20	OUTLET PROTECTION
C-08a	23+75	FILL	1	15	18	BAD	55	20	CULVERT AND OUTLET PROTECTION
C-08B	24+00	FILL	1	12	18	BAD	30	20	CULVERT AND OUTLET PROTECTION
C-09	28+00	FILL	1	36	36	GOOD	N/A	20	OUTLET PROTECTION
C-10	35+00	FILL	1	12	18	BAD	35	20	CULVERT AND OUTLET PROTECTION
C-11	37+75	FILL	2	12	18	BAD	30	20	CULVERT AND OUTLET PROTECTION
C-12	38+25	FILL	2	N/A	18	N/A	40	20	CULVERT AND OUTLET PROTECTION
C-93+25	93+25	FILL	N/A	(2) 12"	N/A	GOOD	N/A	20	OUTLET PROTECTION
C-148+50	148+50	FILL	N/A	60"	N/A	GOOD	N/A	20	OUTLET PROTECTION
C-227+50	227+50	FILL	N/A	42"	N/A	GOOD	N/A	20	OUTLET PROTECTION

CULVERTS TO BE REPLACED
C-02 - INVERT ELEV INLET 969', INVERT ELEV OUTLET 967'
C-03 - SEE DRIVEWAY CULVERT DETAIL
C-04 - INVERT ELEV INLET 987', INVERT ELEV OUTLET 985'
C-08A - SEE DRIVEWAY CULVERT DETAIL
C-08B - INVERT ELEV INLET 979', INVERT ELEV OUTLET 978'
C-10 - INVERT ELEV INLET 980', INVERT ELEV OUTLET 979'
C-11 - INVERT ELEV INLET 984', INVERT ELEV OUTLET 983'
C-12 - INVERT ELEV INLET 984', INVERT ELEV OUTLET 983'





NOTE
BOTH C-11 AND C12 CULVERTS ARE INSTALLED AT AN ANGLE, EXISTING GROUND VARIES FROM CROSS SECTION AT OUTLET

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APPROVED FOR CONSTRUCTION: BY: DATE:

EARTHRES
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NO.	BY	DATE	DESCRIPTION
4	KKE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KKE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KKE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-49

CAD FILE: F:\PROJECTS\Antero Resources\132022.064 Hughes River Road\CAD\Drawings\Rev 0\132022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_40455.dwg
PLOT DATE/TIME: 1/21/2019 2:10 PM

SHEET No. C-50

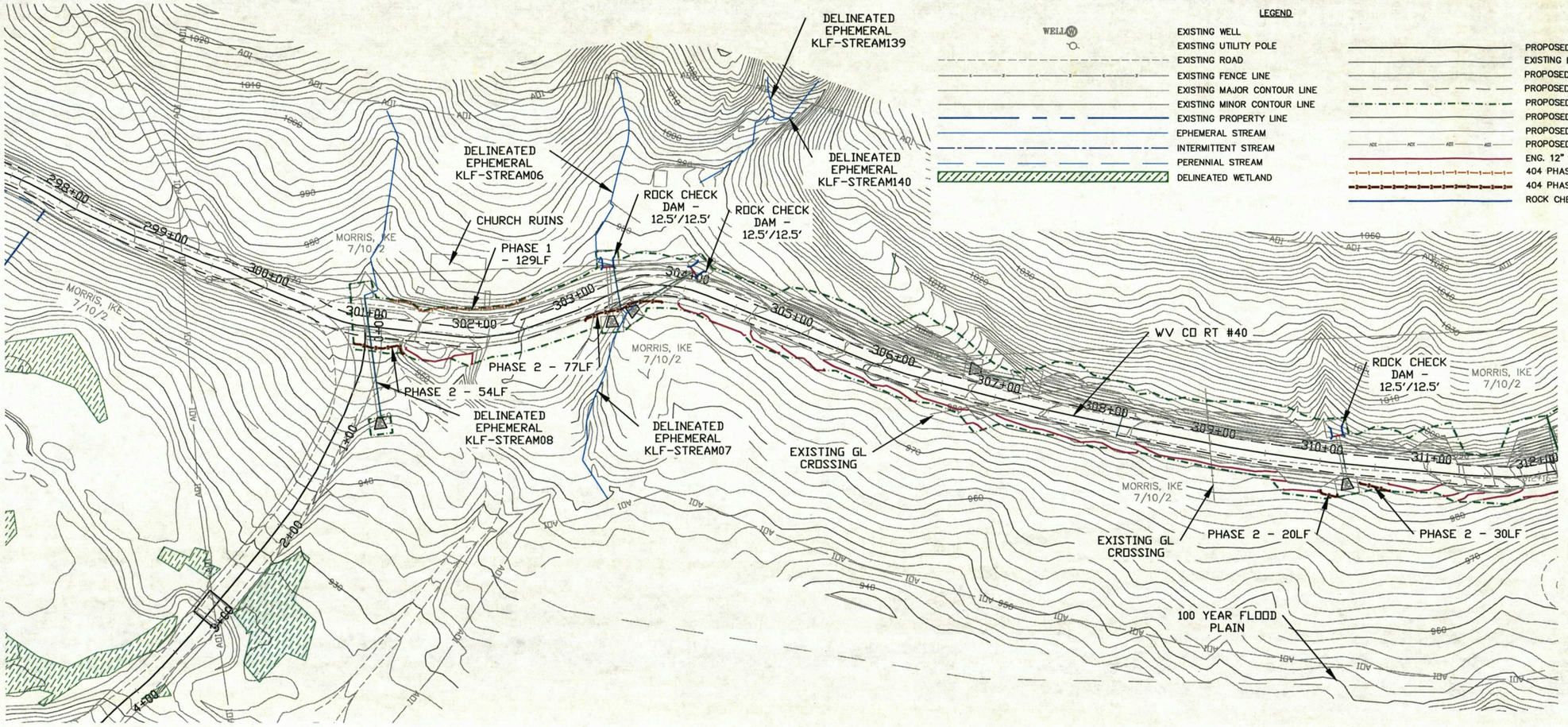
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

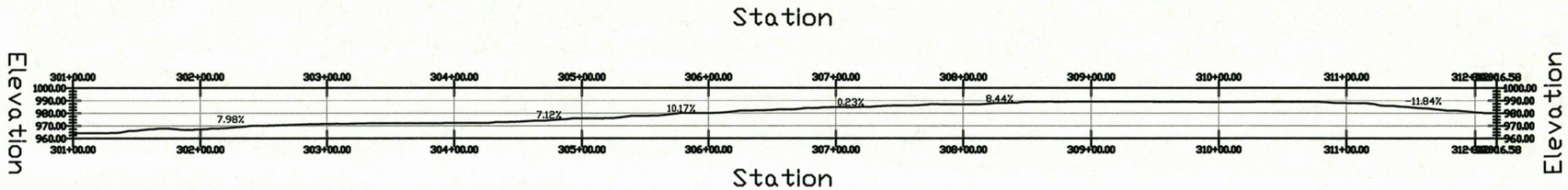
NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

EARTHRES
"ENGINEERING FOR SUCCESS"

APPROVED FOR PERMITS:
BY: DATE:
APPROVED FOR BIDS:
BY: DATE:
APPROVED FOR CONSTRUCTION:
BY: DATE:

Antero Resources





Profile View of Hughes River Road

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

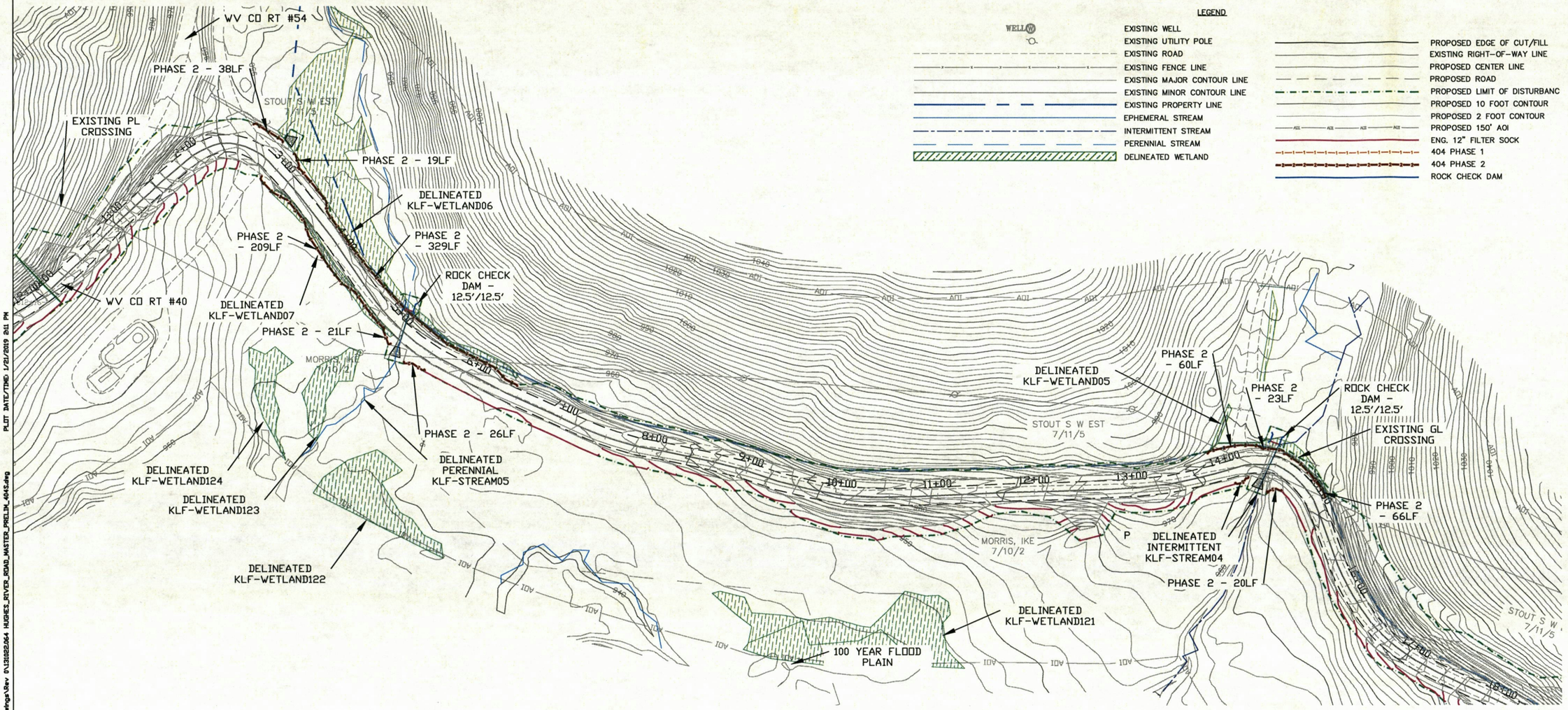
NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

APPROVED FOR PERMITS — BY: — DATE:
APPROVED FOR BIDS — BY: — DATE:
APPROVED FOR CONSTRUCTION — BY: — DATE:

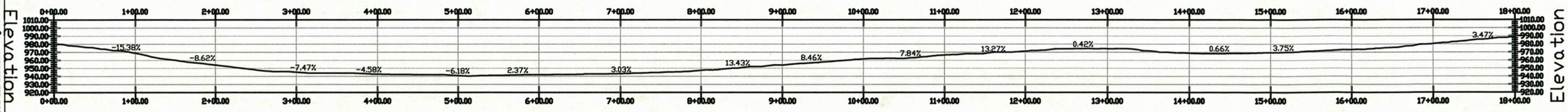
EARTHRES ENGINEERING FOR SUCCESS

Antero Resources

SHEET No.
C-51



Station



Profile View of OXFORD 13 ACCESS ROAD

Antero Resources

EARTHRES ENGINEERING FOR SUCCESS

APPROVED FOR PERMITS BY: DATE
APPROVED FOR BIDS BY: DATE
APPROVED FOR CONSTRUCTION BY: DATE

NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-52

CAD FILE: F:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 0\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_4045.dwg
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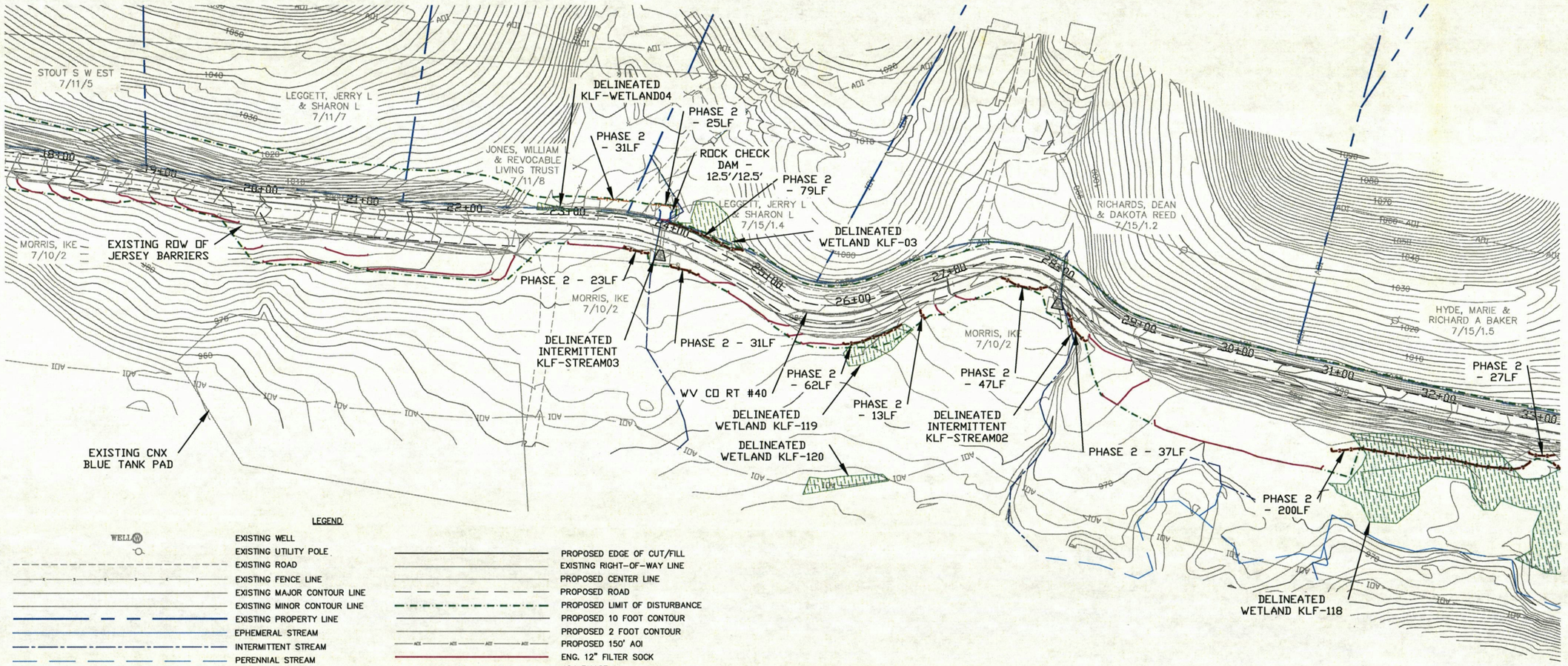
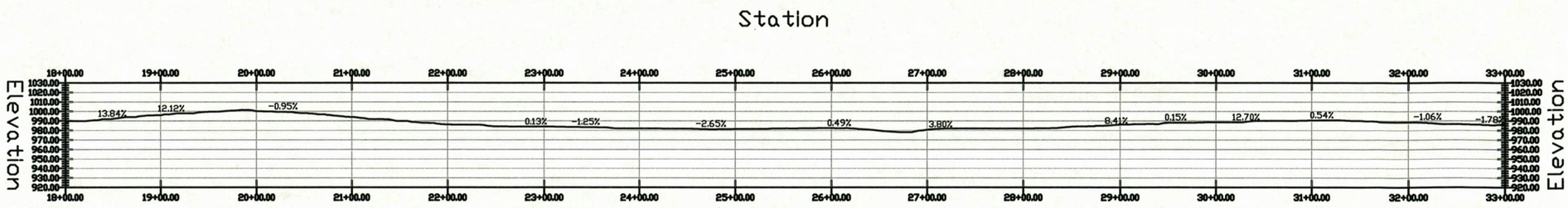


LEGEND

EXISTING WELL	PROPOSED EDGE OF CUT/FILL
EXISTING UTILITY POLE	EXISTING RIGHT-OF-WAY LINE
EXISTING ROAD	PROPOSED CENTER LINE
EXISTING FENCE LINE	PROPOSED ROAD
EXISTING MAJOR CONTOUR LINE	PROPOSED LIMIT OF DISTURBANCE
EXISTING MINOR CONTOUR LINE	PROPOSED 10 FOOT CONTOUR
EXISTING PROPERTY LINE	PROPOSED 2 FOOT CONTOUR
EPHEMERAL STREAM	PROPOSED 150' AOI
INTERMITTENT STREAM	ENG. 12" FILTER SOCK
PERENNIAL STREAM	404 PHASE 1
DELINEATED WETLAND	404 PHASE 2
	ROCK CHECK DAM



Profile View of OXFORD 13 ACCESS ROAD

Antero Resources

EARTHRES ENGINEERING FOR SUCCESS

APPROVED FOR PERMITS:	BY:	DATED:
APPROVED FOR BIDS:	BY:	DATED:
APPROVED FOR CONSTRUCTION:	BY:	DATED:

NO.	BY	DATE	DESCRIPTION
4	KRI	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	12/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-53

CAD FILE F:\PROJECTS\Antero Resources\131822.064 Hughes River Road\CAD\Drawings\Rev 01\131822.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_4045.dwg
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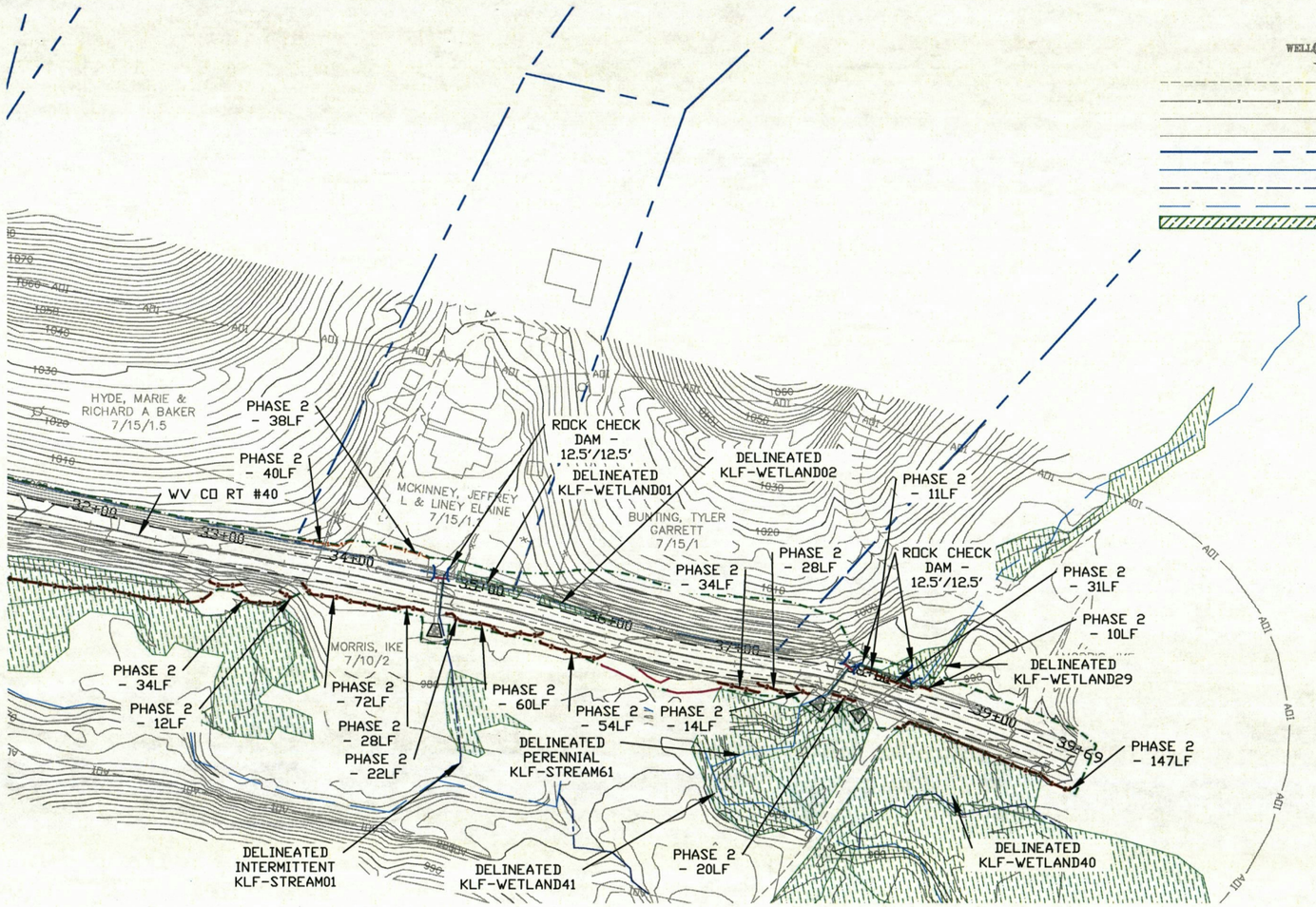

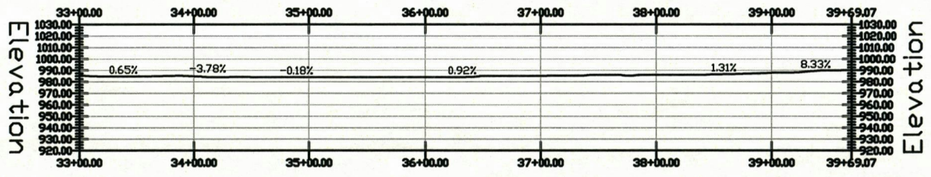

Profile View of OXFORD 13 ACCESS ROAD

NO.	BY	DATE	DESCRIPTION
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3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRI	11/14/2018	INITIAL PRELIMINARY DESIGN

APPROVED FOR PERMITS: BY: DATE:
APPROVED FOR BIDS: BY: DATE:
APPROVED FOR CONSTRUCTION: BY: DATE:

Antero Resources

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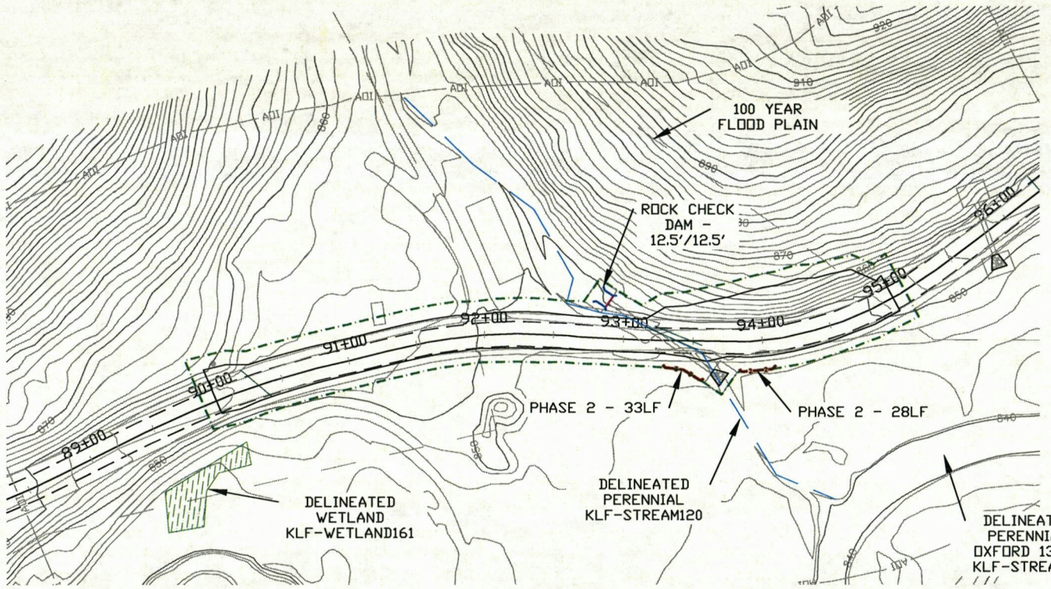
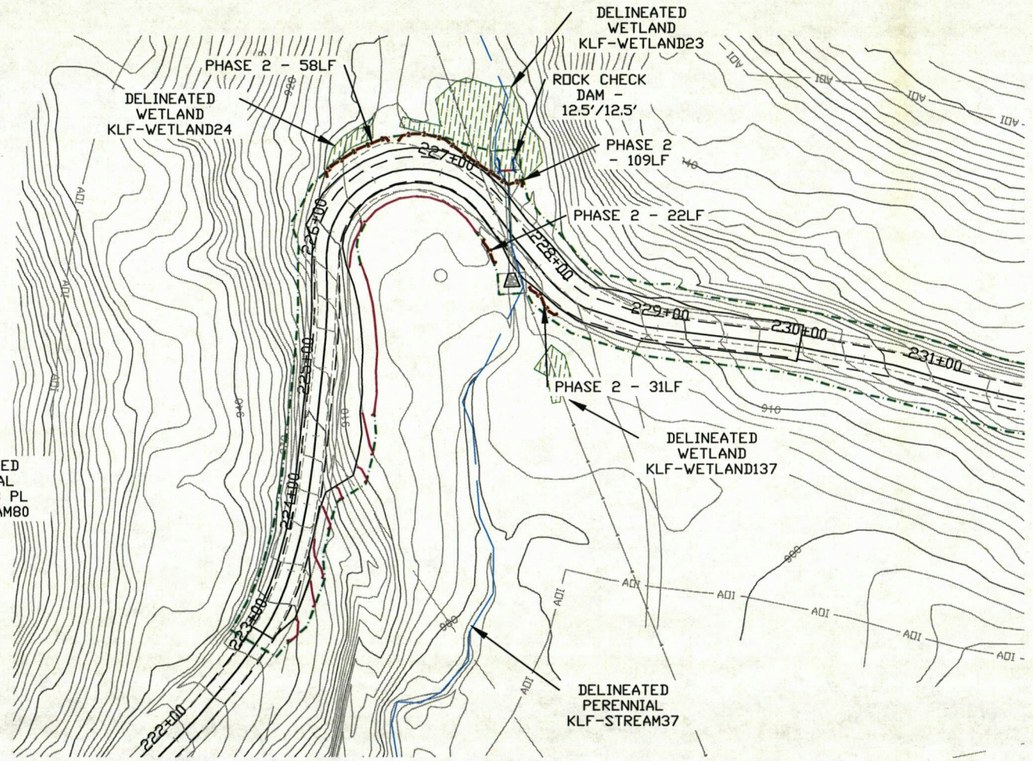
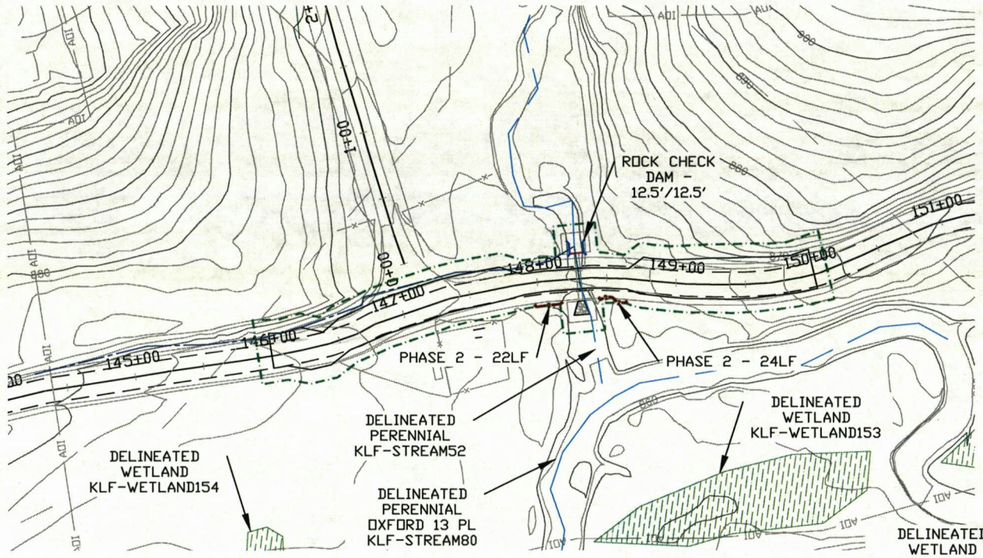
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

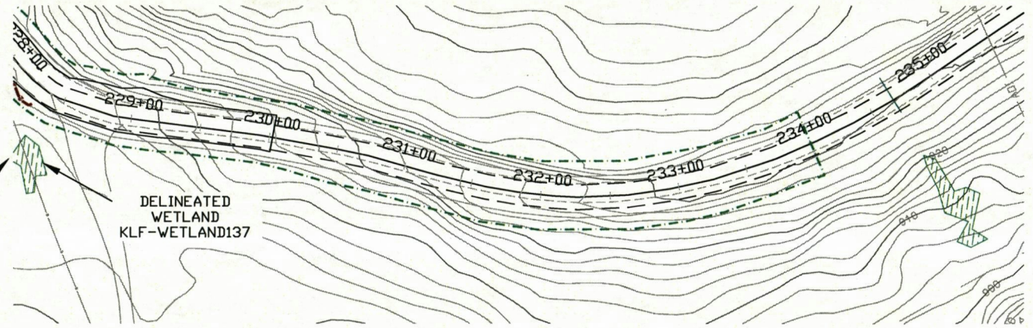
SHEET No.
C-54

CAD FILE: P:\PROJECTS\Antero Resources\13082564 Hughes River Road\CADD\Drawings\Rev 01\13082564_HUGHES_RIVER_ROAD_MASTER_PRELIM_404S.dwg PLOT DATE/TIME: 1/21/2019 2:13 PM









LEGEND

- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING ROAD
- EXISTING FENCE LINE
- EXISTING MAJOR CONTOUR LINE
- EXISTING MINOR CONTOUR LINE
- EXISTING PROPERTY LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED WETLAND
- PROPOSED EDGE OF CUT/FILL
- EXISTING RIGHT-OF-WAY LINE
- PROPOSED CENTER LINE
- PROPOSED ROAD
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED 10 FOOT CONTOUR
- PROPOSED 2 FOOT CONTOUR
- PROPOSED 150' AOI
- ENG. 12" FILTER SOCK
- 404 PHASE 1
- 404 PHASE 2
- ROCK CHECK DAM

Antero Resources

APPROVED FOR PERMITS — DATE:
BY:
APPROVED FOR BIDS — DATE:
BY:
APPROVED FOR CONSTRUCTION — DATE:
BY:

EARTHRES
ENGINEERING FOR SUCCESS

NO.	BY	DATE	DESCRIPTION
4	KRE	03/25/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRE	11/14/2018	INITIAL PRELIMINARY DESIGN

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-55

CAD FILE: F:\PROJECTS\Antero Resources\130822064 Hughes River Road\CAD\Drawings\Rev 0\130822064 HUGHES_RIVER_ROAD_MASTER_PRELIM_404S.dwg PLOT DATE/TIME: 1/21/2019 2:14 PM

EROSION CONTROL NOTES

1. EROSION AND SEDIMENT CONTROL NEEDS-404'S (ANTERO INSTALLED EROSION AND SEDIMENT CONTROLS) WILL BE INSTALLED BEFORE ANY WORK IS TO TAKE PLACE. THESE CONTROLS MAY VARY AND CONTRACTOR SHALL CONFIRM WITH ANTERO RESOURCES THAT ALL 404'S ARE IN PLACE AND FUNCTIONAL BEFORE THEY COMMENCE WITH CONSTRUCTION.

2. ALL PROPERTIES ADJACENT TO THE SITE OF SOIL-DISTURBING ACTIVITY SHALL BE PROTECTED TO THE MAXIMUM EXTENT PRACTICABLE, FORM SOIL EROSION AND SEDIMENT RUNOFF AND DRAINAGE, INCLUDING, BUT NOT LIMITED TO PRIVATE PROPERTIES, NATURAL AND ARTIFICIAL WATERWAYS, WETLANDS, STORM SEWERS AND PUBLIC LANDS.

3. CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL PRACTICES USED TO SATISFY THIS REQUIREMENT SHALL CONFORM, AS A MINIMUM, TO STATE OF WEST VIRGINIA STANDARDS AS SET FORTH IN THE MOST-CURRENT EDITION OF THE WEST VIRGINIA BEST MANAGEMENT PRACTICES MANUAL, DEFINED BY THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION.

4. (INSERT ENGINEER NAME) ANTICIPATES OBTAINING, WITH A REASONABLE DEGREE OF CERTAINTY EROSION AND SEDIMENT CONTROL PLAN APPROVALS IN ACCORDANCE WITH THESE RULES, AND ALL OTHER NECESSARY PERMITS AND OR APPROVALS FROM FEDERAL STATE, AND/OR COUNTY AGENCIES. IF REQUIREMENTS VARY, THE MOST STRINGENT REQUIREMENTS SHALL BE FOLLOWED.

5. EROSION AND SEDIMENT CONTROL PRACTICES AT THE SITE, AND AS IDENTIFIED IN THE ESC PLAN SHALL COMPLY WITH THE FOLLOWING:

5.1. AN APPROVED EROSION AND SEDIMENT CONTROL PLAN OR APPROVAL LETTER FROM THE WV DEP SHALL BE LOCATED ON SITE FOR REVIEW.

5.2. LIMITS TO CLEARING AND GRADING SHALL BE SHOWN ON ESC PLANS. LIMITS TO CLEARING AND GRADING SHALL BE CLEARLY MARKED ON SITE WITH SIGNAGE, FLAGGING, AND/OR FENCING ETC.

5.3. INSTALL EROSION AND SEDIMENT PERIMETER CONTROLS AS A FIRST ACTION OF CONSTRUCTION AS SPECIFIED BY CONSTRUCTION SEQUENCE. THIS SHALL INCLUDE AND IS NOT LIMITED TO PROTECTIVE BMP'S FOR STREAM CORRIDORS AND CROSSINGS, WETLANDS, SITE ENTRANCE, SEDIMENT TRAPS & BASINS, BARRIERS, AND DIVERSION DIKES.

5.4. CONCENTRATED STORM WATER RUNOFF SHALL PASS THROUGH A SEDIMENT CONTROL DEVICE BEFORE EXITING THE SITE BOUNDARIES. CONCENTRATED RUNOFF FROM BARE SOIL AREAS SHALL BE DIVERTED INTO A SETTLING POND OR SEDIMENT CONTROL STRUCTURE, OR OTHER APPROVED SEDIMENT BARRIER BEFORE LEAVING THE SITE.

5.5. EARTHEN STRUCTURES SUCH AS DAMS, BASINS, STREAM MODIFICATIONS AND WATER DIVERSIONS SHALL BE SEEDED AND MULCHED WITH IN SEVEN (7) DAYS OF THE COMPLETION OF INSTALLATION, DAMS SHALL CONFORM TO THE WEST VIRGINIA DAM SAFETY LAWS (WV CODE CHAPTER 22, ARTICLE 14, DAM CONTROL AND SAFETY ACT)

5.6. STABILIZATION OF CRITICAL AREAS WITHIN 50 FEET OF ANY STREAM OR WETLAND SHALL BE TEMPORARILY STABILIZED WITHIN TWO (2) DAYS OF DISTURBANCE IF AREA WILL REMAIN INACTIVE FOR SEVEN (7) DAYS OR LONGER. CONSTRUCTION VEHICLES SHALL AVOID STREAMS AND THE 50 FOOT BUFFER AREAS. IF AN ACTIVE DRAINAGE WAY MUST BE CROSSED BY CONSTRUCTION VEHICLES REPEATEDLY DURING CONSTRUCTION, A TEMPORARY STEAM CROSSING SHALL BE CONSTRUCTED ACCORDING TO THE SPECIFICATIONS IN THE WEST VIRGINIA BEST MANAGEMENT PRACTICES MANUAL. CONSTRUCTION OF BRIDGES, CULVERTS OR SEDIMENT CONTROL STRUCTURES SHALL NOT PLACE SOIL, DEBRIS AND OTHER FINE PARTICULATE MATERIAL INTO OR CLOSE TO THE WATER RESOURCE IN SUCH A MANNER THAT IT MAY SLOUGH, SLIP OR ERODE.

5.7. STORM SEWER INLETS SHALL BE PROTECTED SO THAT SEDIMENT-LADEN RUNOFF WILL NOT ENTER THE STORM SEWER SYSTEM WITHOUT FIRST BEING FILTERED AND/OR TREATED. SANITARY SEWER MANHOLES SHALL BE PROTECTED SO THAT NO STORM RUNOFF WILL ENTER THE SANITARY SEWER SYSTEM.

5.8. RE-VEGETATE SOIL. TEMPORARY SOIL STABILIZATION SHALL OCCUR WITHIN SEVEN (7) DAYS AFTER ROUGH GRADING IF THE AREA WILL REMAIN IDLE LONGER THAN TWENTY-ONE (21) DAYS. PERMANENT SOIL STABILIZATION SHALL BE INSTALLED WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. PERMANENT VEGETATION IS A GROUND COVER DENSE ENOUGH TO COVER 80% OF THE SOIL SURFACE AND MATURE ENOUGH TO SURVIVE WINTER WEATHER CONDITION.

5.9. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED TO PREVENT SOIL LOSS. STABILIZATION SHALL BE REQUIRED IF STOCKPILES ARE LOCATED WITHIN CRITICAL AREAS NEAR STREAMS OR WETLANDS, OR IF DETERMINED BY THE WV DEP THAT SEDIMENT FROM STOCKPILES WILL LEAVE THE SITE.

5.10. UNSTABLE SOILS PRONE TO SLIPPING OR SLOUGHING SHALL NOT BE CLEARED, GRADED, EXCAVATED, FILLED OR HAVE LOADS IMPOSED UPON THEM UNLESS THE WORK IS PLANNED BY A QUALIFIED PROFESSIONAL ENGINEER AND INSTALLED IN ACCORDANCE WITH THE ESC PLAN. CUT AND FILL SLOPES SHOULD BE DESIGNED TO MINIMIZE EROSION PROBLEMS. ADEQUATE SLOPE DESIGN INCLUDES USE OF ROUGH SOIL SURFACE ALONG THE FACE OF THE SLOPE; WATER DIVERSION ALONG THE TOP OF THE SLOPE AWAY FROM THE FACE; TERRACES TO REDUCE SLOPE LENGTH; DELIVERY OF CONCENTRATED STORM WATER FLOWS TO THE VASE OF THE SLOPE VIA ADEQUATE CHANNEL OR PIPE; AND DRAINAGE FOR WATER SEEPS IN THE SLOPE THAT ENDANGER SLOPE STABILITY.

5.11. SOIL SHALL BE REMOVED FROM PAVED SURFACES AND/OR PUBLIC ROADS AT THE END OF EACH DAY IN SUCH A MANNER THAT DOES NOT CREATE OFF-SITE SEDIMENTATION IN ORDER TO ENSURE SAFETY AND ABATE OFF-SITE SOIL LOSS. COLLECTED SEDIMENTS SHALL BE PLACED IN A STABLE LOCATION ON SITE OR TAKEN OFF-SITE TO A STABLE LOCATION.

5.12. STABILIZE DISTURBED OR MODIFIED DRAINAGE WAYS. REDUCE EROSION EFFECTS OF STOMR WATER BY USING AND/OR MAINTAINING GRASSED SWALES. INFILTRATED STRUCTURES, OR WATER DIVERSIONS.

5.13. SEDIMENT AND EROSION CONTROLS SHALL BE INSPECTED ONCE EVERY SEVEN (7) DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAINFALL EVENT. A WRITTEN LOG OF THESE INSPECTIONS AND IMPROVEMENTS TO CONTROLS SHALL BE KEPT ON SITE. THE INSPECTIONS SHALL INCLUDE THE DATE OF INSPECTION, NAME OF INSPECTOR, WEATHER CONDITIONS, OBSERVATIONS, ACTIONS TAKEN TO CORRECT AND PROBLEMS AND THE DATE CORRECTIVE ACTIONS WERE TAKEN.

5.14. TRENCHES FOR UNDERGROUND UTILITY LINES AND PIPES SHALL BE TEMPORARILY STABILIZED WITHIN SEVEN (7) DAYS IF THE ARE TO REMAIN INACTIVE FOR THIRTY (30) DAYS. TRENCH DEWATERING DEVICES SHALL DISCHARGE IN A MANNER THAT FILTERS SOIL-LADEN WATER BEFORE DISCHARGING IT TO A RECEIVING DRAINAGE DITCH OR POND. IF SEEDING, MULCHING, OR OTHER EROSION AND SEDIMENT CONTROL MEASURES WERE PREVIOUSLY INSTALLED, THESE PROTECTIVE MEASURES SHALL BE REINSTALLED.

5.15. DISTURBED AREAS WHICH WILL REMAIN UNWORKED FOR A PERIOD OF 21 DAYS OR MORE SHALL BE STABILIZED WITH SEEDING AND MULCHING OR OTHER APPROPRIATE MEANS WITHIN 7 DAYS.

5.16. SOLID, SANITARY AND TOXIC WASTE MUST BE DISPOSED OF IN A PROPER MANNER IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL, REGULATIONS. IT IS PROHIBITED TO BURN, BURY OR POUR OUT ONTO THE GROUND OR INTO THE STORM SEWER ANY SOLVENTS, PAINTS, STAINS, GASOLINE, DIESEL FUEL, USED MOTOR OIL, HYDRAULIC FLUID, ANTIFREEZE, CEMENT CURING COMPOUNDS AND OTHER SUCH TOXIC OR HAZARDOUS WASTES. STORAGE TANKS SHOULD BE LOCATED IN DIKED AREAS AWAY FROM ANY DRAINAGE CHANNELS. THE DIKED AREA SHOULD HOLD A VOLUME 110% OF THE LARGEST TANK.

5.17. OFF-SITE VEHICLE TRACKING SEDIMENT SHALL BE MINIMIZED. CONSTRUCTION VEHICLES ARE LIMITED TO THE CONSTRUCTION ACCESS ROAD(S) NOTED ON THE PLAN. OFFSITE SEDIMENT TRACKING SHALL BE CONTROLLED BY REGULARLY SCHEDULED SWEEPING OF OFFSITE ACCESS ROADS AND MAINTENANCE OF ROCK CONSTRUCTION ENTRANCE.

5.18. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST MEET THE STANDARDS AND SPECIFICATIONS OF THE WEST VIRGINIA BEST MANAGEMENT PRACTICES MANUAL (LATEST EDITION)

5.19. OTHER EROSION AND SEDIMENT CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS.

5.20. WINTERIZATION - ANY DISTURBED AREA THAT IS NOT GOING TO BE WORKED FOR 21 DAYS OR MORE MUST BE SEEDED AND MULCHED BY NOVEMBER 1 OR MUST HAVE A DORMANT SEEDING OR MULCH COVER APPLIED BETWEEN NOVEMBER 1 AND MARCH 1.

5.21. CONCRETE CEMENT IS TO BE TAKEN BACK TO PLANT FOR WASHOUT AND RECYCLING OR DESIGNATED AREAS ON SITE FOR CONCRETE WASHOUT ARE TO BE USED.

ADDITIONAL CONSTRUCTION SITE POLLUTION CONTROLS

1. CONSTRUCTION PERSONNEL, INCLUDING SUBCONTRACTORS WHO MAY USE OR HANDLE HAZARDOUS OR TOXIC MATERIALS, SHALL BE MADE AWARE OF THE FOLLOWING GENERAL GUIDELINES REGARDING DISPOSAL AND HANDLING OF HAZARDOUS AND CONSTRUCTION WASTES:

*PREVENT SPILLS	USE PRODUCTS UP
*FOLLOW LABEL DIRECTIONS FOR DISPOSAL	REMOVE LIDS FROM EMPTY BOTTLES AND CANS WHEN DISPOSING IN TRASH
*RECYCLE WASTES WHENEVER POSSIBLE	DONT POUR INTO WATERWAYS, STORM DRAINS OR ONTO THE GROUND
*DON'T BURY CHEMICALS OR CONTAINERS	DON'T POUR DOWN THE SINK, FLOOR DRAIN OR SEPTIC TANKS
*DON'T BURN CHEMICALS OR CONTAINERS	DON'T MIX CHEMICALS TOGETHER

2. CONTAINERS SHALL BE PROVIDED FOR THE PROPER COLLECTION OF ALL WASTE MATERIAL INCLUDING CONSTRUCTION DEBRIS, TRASH, PETROLEUM PRODUCTS AND ANY HAZARDOUS MATERIALS USED ON-SITE. CONTAINERS SHALL BE COVERED AND NOT LEAKING. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THAT MATERIAL. CONSTRUCTION DEMOLITION AND DEBRIS (CD&D) WASTE MUST BE DISPOSED OF AT AN WEST VIRGINIA DEP APPROVED CD&D LANDFILL.

3. NO CONSTRUCTION RELATED WASTE MATERIALS ARE TO BE BURIED ON-SITE. BY EXCEPTION, CLEAN FILL (BRICKS, HARDENED CONCRETE, SOIL) MAY BE UTILIZED IN IN A WAY WHICH DOES NOT ENCROACH UPON NATURAL WETLANDS, STREAMS OR FLOODPLAINS OR RESULT IN THE CONTAMINATION OF WATERS OF THE STATE.

4. HANDLING CONSTRUCTION CHEMICALS. MIXING, PUMPING, TRANSFERRING OR OTHER HANDLING OF CONSTRUCTION CHEMICALS SUCH AS FERTILIZER, LIME, ASPHALT, CONCRETE DRYING COMPOUNDS, AND ALL OTHER POTENTIALLY HAZARDOUS MATERIALS SHALL BE PERFORMED IN AN AREA AWAY FROM ANY WATERCOURSE, DITCH OR STORM DRAIN.

5. EQUIPMENT FUELING AND MAINTENANCE, OIL CHANGING, ETC., SHALL BE PERFORMED AWAY FROM WATERCOURSES, DITCHES OR STORM DRAINS, IN AN AREA DESIGNATED FOR THAT PURPOSE. THE DESIGNATED AREA SHALL BE EQUIPPED FOR RECYCLING OIL AND CATCHING SPILLS. SECONDARY CONTAINMENT SHALL BE PROVIDED FOR ALL FUEL OIL STORAGE TANKS. THESE AREAS MUST BE INSPECTED EVERY SEVEN DAYS AND WITHIN 24 HRS. OF A 0.5 INCH OR GREATER RAIN EVENT TO ENSURE THERE ARE NO EXPOSED MATERIALS WHICH WOULD CONTAMINATE STORM WATER. SITE OPERATORS MUST BE AWARE THAT SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) REQUIREMENTS MAY APPLY. AN SPCC PLAN IS REQUIRED FOR SITES WITH ONE SINGLE ABOVE GROUND TANK OF 660 GALLONS OR MORE, ACCUMULATIVE ABOVE GROUND STORAGE OF 1130 GALLONS OR MORE, OR 42,000 GALLONS OF UNDERGROUND STORAGE. CONTAMINATED SOILS MUST BE DISPOSED OF IN ACCORDANCE WITH ITEM 8.

6. CONCRETE WASH WATER SHALL NOT BE ALLOWED TO FLOW TO STREAMS, DITCHES, STORM DRAINS, OR ANY OTHER WATER CONVEYANCE. A SUMP OR PIT WITH NO POTENTIAL FOR DISCHARGE SHALL BE CONSTRUCTED IF NEEDED TO CONTAIN CONCRETE WASH WATER. FIELD TILE OR OTHER SUBSURFACE DRAINAGE STRUCTURES WITHIN 10 FT. OF THE SUMP SHALL BE CUT AND PLUGGED. FOR SMALL PROJECTS, TRUCK CHUTES MAY BE RINSED AWAY FROM ANY WATER CONVEYANCES.

7. SPILL REPORTING REQUIREMENTS: SPILLS ON PAVEMENT SHALL BE ABSORBED WITH SAWDUST OR KITTY LITTER AND DISPOSED OF WITH THE TRASH AT A LICENSED SANITARY LANDFILL. HAZARDOUS OR INDUSTRIAL WASTES SUCH AS MOST SOLVENTS, GASOLINE, OIL-BASED PAINTS, AND CEMENT CURING COMPOUNDS REQUIRE SPECIAL HANDLING. SPILLS SHALL BE REPORTED TO WEST VIRGINIA DEP (1-800-642-3074). SPILLS OF 25 GALLONS OR MORE OF PETROLEUM PRODUCTS SHALL BE REPORTED TO WEST VIRGINIA DEP, THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE WITH 30 MIN. OF THE DISCOVERY OF THE RELEASE. ALL SPILLS WHICH CONTACT WATERS OF THE STATE MUST BE REPORTED TO WEST VIRGINIA DEP.

8. CONTAMINATED SOILS. IF SUBSTANCES SUCH AS OIL, DIESEL FUEL, HYDRAULIC FLUID, ANTIFREEZE, ETC. ARE SPILLED, LEADED, OR RELEASED ONTO THE SOIL, THE SOIL SHOULD BE DUG UP AND DISPOSED OF AT LICENSED SANITARY LANDFILL OR OTHER APPROVED PETROLEUM CONTAMINATED SOIL REMEDIATION FACILITY. (NOT A CONSTRUCTION/ DEMOLITION DEBRIS LANDFILL). NOTE THAT STORM WATER RUN OFF ASSOCIATED WITH CONTAMINATED SOILS ARE NOT TO BE AUTHORIZED UNDER WEST VIRGINIA'S GENERAL STORM WATER PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

9. OPEN BURNING. NO MATERIALS CONTAINING RUBBER, GREASE, ASPHALT, OR PETROLEUM PRODUCTS, SUCH AS TIRES, AUTOPARTS, PLASTICS OR PLASTIC COATED WIRE MAY BE BURNED (WV 45CSR6). OPEN BURNING IS NOT ALLOWED IN RESTRICTED AREAS, WHICH ARE DEFINED AS: 1) WITHIN CORPORATION LIMITS; 2) WITHIN 1000 FEET OUTSIDE A MUNICIPAL CORPORATION HAVING A POPULATION OF 1000 TO 10,000; AND 3) A ONE MILE ZONE OUTSIDE OF A CORPORATION OF 10,000 OR MORE, OUTSIDE OF RESTRICTED AREAS, NO OPEN BURNING IS ALLOWED WITHIN A 1000 FEET OF AN INHABITED BUILDING ON ANOTHER PROPERTY. OPEN BURNING IS PERMISSIBLE IN A RESTRICTED AREA FOR: HEATING TAR, WELDING, SMUDGE POTS AND SIMILAR OCCUPATIONAL NEEDS, AND HEATING FOR WARMTH OR OUTDOOR BARBEQUES. OUTSIDE OF RESTRICTED AREAS, OPEN BURNING IS PERMISSIBLE FOR LANDSCAPE OR LAND-CLEARING WASTES (PLANT MATERIAL, WITH PRIOR WRITTEN PERMISSION FROM WEST VIRGINIA DEP), AND AGRICULTURAL WASTES, EXCLUDING BUILDINGS.

10. DUST CONTROL OR DUST SUPPRESSANTS SHALL BE USED TO PREVENT NUISANCE CONDITIONS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND N A MANNER, WHICH PREVENT A DISCHARGE TO WATERS OF THE STATE. SUFFICIENT DISTANCE MUST BE PROVIDED BETWEEN APPLICATIONS AND NEARBY BRIDGES, CATCH BASINS, AND OTHER WATERWAYS. APPLICATION (EXCLUDING WATER) MAY NOT OCCUR WHEN RAIN IS IMMINENT AS NOTED IN THE SHORT TERM FORECAST. USED OIL MAY NOT BE APPLIED FOR DUST CONTROL.

11. OTHER AIR PERMITTING REQUIREMENTS: CERTAIN ACTIVITIES ASSOCIATED WITH CONSTRUCTION WILL REQUIRE AIR PERMITS INCLUDING BUT NOT LIMITED TO: MOBILE CONCRETE BATCH PLANTS, MOBILE ASPHALT PLANTS, CONCRETE CRUSHERS, LARGE GENERATORS, ETC. THESE ACTIVITIES WILL REQUIRE SPECIFIC WEST VIRGINIA DEP AIR PERMITS FOR INSTALLATION AND OPERATION. OPERATORS MUST SEEK AUTHORIZATION FROM THE CORRESPONDING DISTRICT OF WEST VIRGINIA DEP. FOR DEMOLITION OF ALL COMMERCIAL SITES, A NOTIFICATION FOR RESTORATION AND DEMOLITION MUST BE SUBMITTED TO WEST VIRGINIA DEP TO DETERMINE IF ASBESTOS CORRECTIVE ACTIONS ARE REQUIRED.

12. PROCESS WASTE WATER/LEACHATE MANAGEMENT. WEST VIRGINIA DEP'S CONSTRUCTION GENERAL PERMIT ONLY ALLOWS THE DISCHARGE OF STORM WATER AND DOES NOT INCLUDE OTHER WASTE STREAMS/DISCHARGES SUCH AS VEHICLE AND/OR EQUIPMENT WASHING, ON-SITE SEPTIC LEACHATE CONCRETE WASH OUTS, WHICH ARE CONSIDERED PROCESS WASTEWATERS. ALL PROCESS WASTEWATERS MUST BE COLLECTED AND PROPERLY DISPOSED AT AN APPROVED DISPOSAL FACILITY. IN THE EVENT, LEACHATE OR SEPTAGE IS DISCHARGED; IT MUST BE ISOLATED FOR COLLECTION AND PROPER DISPOSAL AND CORRECTIVE ACTIONS TAKEN TO ELIMINATE THE SOURCE OF WASTE WATER.

EROSION & SEDIMENT CONTROL PLAN
SOUTH FORK OF HUGHES RIVER ROAD
PRELIMINARY PLAN

DODDRIDGE COUNTY, WEST VIRGINIA

JANUARY 2019

SITE INFO

SITE DESCRIPTION
EXISTING - CR-XX
- TR- XX

SCHEDULE OF MAJOR CONSTRUCTION
COMMENCEMENT _____
COMPLETION _____

DEVELOPER

ANTERO RESOURCES CORPORATION
535 WHITE OAKS BOULEVARD
BRIDGEPORT, WV 26330

ENGINEER

WILLIAM J HUDAK JR., PE
SENIOR PROJECT MANAGER
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NO.	BY	DATE	DESCRIPTION
4	KRE	01/25/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	PRELIMINARY DESIGN FOR REVIEW

APPROVED FOR PERMITS BY: _____ DATE: _____
APPROVED FOR BIDS BY: _____ DATE: _____
APPROVED FOR CONSTRUCTION BY: _____ DATE: _____

Antero Resources

EARTHRES ENGINEERING FOR SUCCESS

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-56

CAD FILE: P:\PROJECTS\Antero Resources\130222.064 Hughes River Road\CAD\Drawings\Rev 04\130222.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_404S.dwg PLOT DATE/TIME: 1/21/2019 2:14 PM

ADDITIONAL CONSTRUCTION SITE POLLUTION CONTROLS (FROM ODNR RAINWATER AND LAND DEVELOPMENT MANUAL)

1. CONSTRUCTION PERSONNEL, INCLUDING SUBCONTRACTORS WHO MAY USE OR HANDLE HAZARDOUS OR TOXIC MATERIALS, SHALL BE MADE AWARE OF THE FOLLOWING GENERAL GUIDELINES REGARDING DISPOSAL AND HANDLING OF HAZARDOUS AND CONSTRUCTION WASTES:
* PREVENT SPILLS
* USE PRODUCTS UP
* FOLLOW LABEL DIRECTIONS FOR DISPOSAL
* REMOVE LIDS FROM EMPTY BOTTLES AND CANS WHEN DISPOSING IN TRASH
* RECYCLE WASTES WHENEVER POSSIBLE
* DON'T POUR INTO WATERWAYS, STORM DRAINS OR ONTO THE GROUND
* DON'T POUR DOWN THE SINK, FLOOR DRAIN OR SEPTIC TANKS
* DON'T BURY CHEMICALS OR CONTAINERS
* DON'T BURN CHEMICALS OR CONTAINERS
* DON'T MIX CHEMICALS TOGETHER

2. CONTAINERS SHALL BE PROVIDED FOR THE PROPER COLLECTION OF ALL WASTE MATERIAL INCLUDING CONSTRUCTION DEBRIS, TRASH, PETROLEUM PRODUCTS AND ANY HAZARDOUS MATERIALS USED ON-SITE. CONTAINERS SHALL BE COVERED AND NOT LEAKING. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THAT MATERIAL. CONSTRUCTION DEMOLITION AND DEBRIS (CD&D) WASTE MUST BE DISPOSED OF AT AN OHIO EPA APPROVED CD&D LANDFILL.

3. NO CONSTRUCTION RELATED WASTE MATERIALS ARE TO BE BURIED ON-SITE. BY EXCEPTION, CLEAN FILL (BRICKS, HARDENED CONCRETE, SOIL) MAY BE UTILIZED IN A WAY WHICH DOES NOT ENCROACH UPON NATURAL WETLANDS, STREAMS OR FLOODPLAINS OR RESULT IN THE CONTAMINATION OF WATERS OF THE STATE.

4. HANDLING CONSTRUCTION CHEMICALS. MIXING, PUMPING, TRANSFERRING OR OTHER HANDLING OF CONSTRUCTION CHEMICALS SUCH AS FERTILIZER, LIME, ASPHALT, CONCRETE DRYING COMPOUNDS, AND ALL OTHER POTENTIALLY HAZARDOUS MATERIALS SHALL BE PERFORMED IN AN AREA AWAY FROM ANY WATERCOURSE, DITCH OR STORM DRAIN.

5. EQUIPMENT FUELING AND MAINTENANCE, OIL CHANGING, ETC., SHALL BE PERFORMED AWAY FROM WATERCOURSES, DITCHES OR STORM DRAINS, IN AN AREA DESIGNATED FOR THAT PURPOSE. THE DESIGNATED AREA SHALL BE EQUIPPED FOR RECYCLING OIL AND CATCHING SPILLS. SECONDARY CONTAINMENT SHALL BE PROVIDED FOR ALL FUEL OIL STORAGE TANKS. THESE AREAS MUST BE INSPECTED EVERY SEVEN DAYS AND WITHIN 24 HRS. OF A 0.5 INCH OR GREATER RAIN EVENT TO ENSURE THERE ARE NO EXPOSED MATERIALS WHICH WOULD CONTAMINATE STORM WATER. SITE OPERATORS MUST BE AWARE THAT SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) REQUIREMENTS MAY APPLY. AN SPCC PLAN IS REQUIRED FOR SITES WITH ONE SINGLE ABOVE GROUND TANK OF 660 GALLONS OR MORE, ACCUMULATIVE ABOVE GROUND STORAGE OF 1330 GALLONS OR MORE, OR 42,000 GALLONS OF UNDERGROUND STORAGE. CONTAMINATED SOILS MUST BE DISPOSED OF IN ACCORDANCE WITH ITEM 8.

6. CONCRETE WASH WATER SHALL NOT BE ALLOWED TO FLOW TO STREAMS, DITCHES, STORM DRAINS, OR ANY OTHER WATER CONVEYANCE. A SUMP OR PIT WITH NO POTENTIAL FOR DISCHARGE SHALL BE CONSTRUCTED IF NEEDED TO CONTAIN CONCRETE WASH WATER. FIELD TILE OR OTHER SUBSURFACE DRAINAGE STRUCTURES WITHIN 10 FT. OF THE SUMP SHALL BE CUT AND PLUGGED. FOR SMALL PROJECTS, TRUCK CHUTES MAY BE RINSED AWAY FROM ANY WATER CONVEYANCES.

7. SPILL REPORTING REQUIREMENTS: SPILLS ON PAVEMENT SHALL BE ABSORBED WITH SAWDUST OR KITTY LITTER AND DISPOSED OF WITH THE TRASH AT A LICENSED SANITARY LANDFILL. HAZARDOUS OR INDUSTRIAL WASTES SUCH AS MOST SOLVENTS, GASOLINE, OIL-BASED PAINTS, AND CEMENT CURING COMPOUNDS REQUIRE SPECIAL HANDLING. SPILLS SHALL BE REPORTED TO OHIO EPA (1-800-282- 9378). SPILLS OF 25 GALLONS OR MORE OF PETROLEUM PRODUCTS SHALL BE REPORTED TO OHIO EPA, THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE WITHIN 30 MIN. OF THE DISCOVERY OF THE RELEASE. ALL SPILLS WHICH CONTACT WATERS OF THE STATE MUST BE REPORTED TO OHIO EPA.

8. CONTAMINATED SOILS. IF SUBSTANCES SUCH AS OIL, DIESEL FUEL, HYDRAULIC FLUID, ANTIFREEZE, ETC. ARE SPILLED, LEAKED, OR RELEASED ONTO THE SOIL. THE SOIL SHOULD BE DUG UP AND DISPOSED OF AT LICENSED SANITARY LANDFILL OR OTHER APPROVED PETROLEUM CONTAMINATED SOIL REMEDIATION FACILITY. (NOT A CONSTRUCTION/DEMOLITION DEBRIS LANDFILL). NOTE THAT STORM WATER RUN OFF ASSOCIATED WITH CONTAMINATED SOILS ARE NOT BE AUTHORIZED UNDER OHIO EPA'S GENERAL STORM WATER PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

9. OPEN BURNING. NO MATERIALS CONTAINING RUBBER, GREASE, ASPHALT, OR PETROLEUM PRODUCTS, SUCH AS TIRES, AUTOPARTS, PLASTICS OR PLASTIC COATED WIRE MAY BE BURNED (OAC 3745-19). OPEN BURNING IS NOT ALLOWED IN RESTRICTED AREAS, WHICH ARE DEFINED AS: 1) WITHIN CORPORATION LIMITS; 2) WITHIN 1000 FEET OUTSIDE A MUNICIPAL CORPORATION HAVING A POPULATION OF 1000 TO 10,000; AND 3) A ONE MILE ZONE OUTSIDE OF A CORPORATION OF 10,000 OR MORE. OUTSIDE OF RESTRICTED AREAS, NO OPEN BURNING IS ALLOWED WITHIN A 1000 FEET OF AN INHABITED BUILDING ON ANOTHER PROPERTY. OPEN BURNING IS PERMISSIBLE IN A RESTRICTED AREA FOR: HEATING TAR, WELDING, SMUDGE POTS AND SIMILAR OCCUPATIONAL NEEDS, AND HEATING FOR WARMTH OR OUTDOOR BARBEQUES. OUTSIDE OF RESTRICTED AREAS, OPEN BURNING IS PERMISSIBLE FOR LANDSCAPE OR LAND-CLEARING WASTES (PLANT MATERIAL, WITH PRIOR WRITTEN PERMISSION FROM OHIO EPA). AND AGRICULTURAL WASTES, EXCLUDING BUILDINGS.

10. DUST CONTROL OR DUST SUPPRESSANTS SHALL BE USED TO PREVENT NUISANCE CONDITIONS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND IN A MANNER, WHICH PREVENT A DISCHARGE TO WATERS OF THE STATE. SUFFICIENT DISTANCE MUST BE PROVIDED BETWEEN APPLICATIONS AND NEARBY BRIDGES, CATCH BASINS, AND OTHER WATERWAYS. APPLICATION (EXCLUDING WATER) MAY NOT OCCUR WHEN RAIN IS IMMINENT AS NOTED IN THE SHORT TERM FORECAST. USED OIL MAY NOT BE APPLIED FOR DUST CONTROL.

11. PROCESS WASTE WATER/LEACHATE MANAGEMENT. OHIO EPA'S CONSTRUCTION GENERAL PERMIT ONLY ALLOWS THE DISCHARGE OF STORM WATER AND DOES NOT INCLUDE OTHER WASTE STREAMS/DISCHARGES SUCH AS VEHICLE AND/OR EQUIPMENT WASHING, ON-SITE SEPTIC LEACHATE, CONCRETE WASH OUTS, WHICH ARE CONSIDERED PROCESS WASTEWATERS. ALL PROCESS WASTEWATERS MUST BE COLLECTED AND PROPERLY DISPOSED AT AN APPROVED DISPOSAL FACILITY. IN THE EVENT, LEACHATE OR SEPTAGE IS DISCHARGED, IT MUST BE ISOLATED FOR COLLECTION AND PROPER DISPOSAL AND CORRECTIVE ACTIONS TAKEN TO ELIMINATE THE SOURCE OF WASTE WATER.

DUST CONTROL

1. VEGETATIVE COVER AND/MULCH – APPLY TEMPORARY OR PERMANENT SEEDING AND MULCH TO AREAS THAT WILL REMAIN IDLE FOR OVER 21 DAYS. SAVING EXISTING TREES AND LARGE SHRUBS WILL ALSO REDUCE SOIL AND AIR MOVEMENT ACROSS DISTURBED AREAS. SEE TEMPORARY SEEDING; PERMANENT SEEDING; MULCHING PRACTICES; AND TREE AND NATURAL AREA PROTECTION PRACTICES.

2. WATERING – SPRAY SITE WITH WATER UNTIL THE SURFACE IS WET BEFORE AND DURING GRADING AND REPEAT AS NEEDED, ESPECIALLY ON HAUL ROADS AND OTHER HEAVY TRAFFIC ROUTES. WATERING SHALL BE DONE AT A RATE THAT PREVENTS DUST BUT DOES NOT CAUSE SOIL EROSION. WETTING AGENTS SHALL BE UTILIZED ACCORDING TO MANUFACTURERS INSTRUCTIONS.

3. SPRAY-ON ADHESIVES – APPLY ADHESIVE ACCORDING TO THE FOLLOWING TABLE OR MANUFACTURERS'F INSTRUCTIONS.

ADHESIVES FOR DUST CONTROL

ADHESIVE	WATER DILUTION (ADHESIVE:WATER)	NOZZLE TYPE	APPLICATION RATE GAL./AC.
LATEX EMULSION	12.5:1	FINE	235
RESIN IN WATER ACRYLIC EMULSION (NO-TRAFFIC)	4:1	FINE	300
ACRYLIC EMULSION (NO-TRAFFIC)	7:1	COARSE	450
ACRYLIC EMULSION (TRAFFIC)	3.5:1	COARSE	350

4. STONE – GRADED ROADWAYS AND OTHER SUITABLE AREAS WILL BE STABILIZED USING CRUSHED STONE OR COARSE GRAVEL AS SOON AS PRACTICABLE AFTER REACHING AN INTERIM OR FINAL GRADE. CRUSHED STONE OR COARSE GRAVEL CAN BE USED AS A PERMANENT COVER TO
PROVIDE CONTROL OF SOIL EMISSIONS. 5. BARRIERS – EXISTING WINDBREAK VEGETATION SHALL BE MARKED AND PRESERVED. SNOW FENCING OR OTHER SUITABLE BARRIER MAY BE PLACED PERPENDICULAR TO PREVAILING AIR CURRENTS AT INTERVALS OF ABOUT 15 TIMES THE BARRIER HEIGHT TO CONTROL AIR CURRENTS AND BLOWING SOIL.

6. CALCIUM CHLORIDE - THIS CHEMICAL MAY BE APPLIED BY MECHANICAL SPREADER AS LOOSE, DRY GRANULES OR FLAKES AT A RATE THAT KEEPS THE SURFACE MOIST BUT NOT SO HIGH AS TO
CAUSE WATER POLLUTION OR PLANT DAMAGE. APPLICATION RATES SHOULD BE STRICTLY IN ACCORDANCE WITH SUPPLIERS'F SPECIFIED RATES.

7. OPERATION AND MAINTENANCE - WHEN TEMPORARY DUST CONTROL MEASURES ARE USED; REPETITIVE TREATMENT SHOULD BE APPLIED AS NEEDED TO ACCOMPLISH CONTROL. STREET CLEANING - PAVED AREAS THAT HAVE ACCUMULATED SEDIMENT FROM CONSTRUCTION SHOULD BE CLEANED DAILY, OR AS NEEDED, UTILIZING A STREET SWEEPER OR BUCKET -TYPE ENDLOADER
OR SCRAPER.

GRADE TREATMENT

CUT SLOPES-GREATER THAN 3:1 SLOPES
1. STAIR-STEP GRADING MAY BE CARRIED OUT ON ANY MATERIAL SOFT ENOUGH TO BE RIPPED WITH A BULLDOZER. THE RATIO OF THE HORIZONTAL DISTANCE TO THE VERTICAL CUT DISTANCE SHALL BE FLATTER THAN 1:1 AND THE HORIZONTAL PORTION OF THE "GSTEP"H SHALL SLOPE TOWARD THE VERTICAL WALL. INDIVIDUAL VERTICAL CUTS SHALL NOT BE MORE THAN 24 INCHES ON SOFT SOIL MATERIALS AND NOT MORE THAN 36 INCHES IN ROCKY MATERIALS.

2. GROOVING MAY BE MADE WITH ANY APPROPRIATE IMPLEMENT WHICH CAN BE SAFELY OPERATED ON THE SLOPE AND WHICH WILL NOT CAUSE UNDUE COMPACTION. SUGGESTED IMPLEMENTS
INCLUDE DISCS, TILLERS, SPRING HARROWS, AND THE TEETH ON A FRONT-END LOADER BUCKET. SUCH GROOVES SHALL NOT BE LESS THAN 3 INCHES DEEP NOR FURTHER THAN 15 INCHES APART.

FILL SLOPES-GREATER THAN 3:1 SLOPES
FILL SLOPES STEEPER THAN 3:1 SHALL BE GROOVED OR ALLOWED TO REMAIN ROUGH AS THEY ARE CONSTRUCTED UTILIZING METHOD (1) OR (2) BELOW.

1. GROOVING MAY BE MADE WITH ANY APPROPRIATE IMPLEMENT WHICH CAN BE SAFELY OPERATED ON THE SLOPE AND WHICH WILL NOT CAUSE UNDUE COMPACTION SUCH AS DISCS, TILLERS, SPRING
HARROWS, AND THE TEETH ON A FRONT-END LOADER BUCKET. GROOVES LEFT SHALL NOT BE LESS THAN 3 INCHES DEEP NOR FURTHER THAN 15 INCHES APART.

2. AS LIFTS OF THE FILL ARE CONSTRUCTED, SOIL AND ROCK MATERIALS MAY BE ALLOWED TO FALL NATURALLY ONTO THE SLOPE SURFACE. AT NO TIME SHALL SLOPES BE BLADED OR SCRAPED TO PRODUCE A SMOOTH, HARD SURFACE.

CUTS, FILLS, AND GRADED AREAS WHICH WILL BE MOWED
1. MOWED SLOPES SHOULD NOT BE STEEPER THAN 3:1 AND SHALL AVOID EXCESSIVE ROUGHNESS. THESE AREAS MAY BE ROUGHENED WITH SHALLOW GROOVES SUCH AS THOSE. WHICH REMAIN AFTER
TILLING, DISCING, HARROWING, RAKING. OR USE OF A CULTIPACKERSEEDER. THE FINAL PASS OF ANY SUCH TILLAGE IMPLEMENT SHALL BE ON THE CONTOUR (PERPENDICULAR TO THE SLOPE).

2. GROOVES FORMED BY IMPLEMENTS SHALL BE NOT LESS THAN 1 INCH DEEP AND NOT FURTHER THAN 12 INCHES APART. FILL SLOPES THAT ARE LEFT ROUGH DURING CONSTRUCTION MAY BE SMOOTHED WITH A CHAIN HARROW OR SIMILAR IMPLEMENT TO FACILITATE MOWING.

ROUGHENING WITH TRACKED MACHINERY
1. AVOID TRACKING CLAYEY SOILS IF POSSIBLE, DUE TO THEIR POTENTIAL FOR COMPACTION. CONVERSELY SANDY SOILS WILL HAVE LOW POTENTIAL FOR COMPACTION.

2. OPERATE TRACKED MACHINERY UP AND DOWN THE SLOPE TO LEAVE HORIZONTAL DEPRESSIONS IN THE SOIL. AS FEW PASSES OF THE MACHINERY,SHOULD BE MADE AS POSSIBLE TO MINIMIZE COMPACTION.

TOPSOILING

SALVAGING AND STOCKPILING
1. DETERMINE THE DEPTH AND SUITABILITY OF TOPSOIL AT THE SITE. (FOR HELP, CONTACT YOUR LOCAL SWCD OFFICE TO OBTAIN A COUNTY SOIL SURVEY REPORT).

2. PRIOR TO STRIPPING TOPSOIL, INSTALL APPROPRIATE DOWNSLOPE EROSION AND SEDIMENTATION CONTROLS SUCH AS SEDIMENT TRAPS AND BASINS.

3. REMOVE THE SOIL MATERIAL NO DEEPER THAN WHAT THE COUNTY SOIL SURVEY DESCRIBES AS "SURFACE SOIL."H (IE. A OR AP HORIZON).

4. CONSTRUCT STOCKPILES IN ACCESSIBLE LOCATIONS THAT DO NOT INTERFERE WITH NATURAL DRAINAGE. INSTALL APPROPRIATE SEDIMENT CONTROLS TO TRAP SEDIMENT SUCH AS SILT FENCE IMMEDIATELY ADJACENT TO THE STOCKPILE OR SEDIMENT TRAPS OR BASINS DOWNSTREAM OF THE STOCKPILE. STOCKPILE SIDE SLOPES SHALL NOT EXCEED A RATIO OF 3:1.

5. IF TOPSOIL IS STORED FOR MORE THAN 21 DAYS, IT SHALL BE TEMPORARY SEEDED, OR COVERED WITH A TARP.

SPREADING THE TOPSOIL
1. PRIOR TO APPLYING TOPSOIL, THE TOPSOIL SHALL BE PULVERIZED.

2. TO ENSURE BONDING, GRADE THE SUBSOIL AND ROUGHEN THE TOP 3-4 IN. BY DISKING.

3. DO NOT APPLY WHEN SITE IS WET, MUDDY, OR FROZEN, BECAUSE IT MAKES SPREADING DIFFICULT, CAUSES COMPACTION PROBLEMS, AND INHIBITS BONDING WITH SUBSOIL.

4. APPLY TOPSOIL EVENLY TO A DEPTH OF AT LEAST 4 INCHES BUT NOT MORE THAN 6 INCHES AND COMPACT SLIGHTLY TO IMPROVE CONTACT WITH SUBSOIL.

5. AFTER SPREADING, GRADE AND STABILIZE WITH SEEDING OR APPROPRIATE VEGETATION.

SPECIFICATIONS FOR MULCHING

1. MULCH AND OTHER APPROPRIATE VEGETATIVE PRACTICES SHALL BE APPLIED TO DISTURBED AREAS WITHIN 7 DAYS OF GRADING IF THE AREA IS TO REMAIN DORMANT (UNDISTURBED) FOR MORE THAN 21 DAYS OR ON AREAS AND PORTIONS OF THE SITE WHICH CAN BE BROUGHT TO FINAL GRADE.

2. MULCH SHALL CONSIST OF ONE OF THE FOLLOWING:
* STRAW - STRAW SHALL BE UNROTTED SMALL GRAIN STRAW APPLIED AT THE RATE OF 2 TONS/AC. OR 90 LB./1,000 SQ. FT. (TWO TO THREE BALES). THE STRAW MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICALLY SO THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQ.FT. SECTIONS AND PLACE TWO 45-LB. BALES OF STRAW IN EACH SECTION.
* HYDROSEEDERS - WOOD CELLULOSE FIBER SHOULD BE USED AT 2,000 LB./AC. OR 46 LB./1,000 SQ. FT.
* OTHER - ACCEPTABLE MULCHES INCLUDE MULCH MATTINGS AND ROLLED EROSION CONTROL PRODUCTS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD MULCH/CHIPS APPLIED AT 10-20 TONS/AC.

3. MULCH ANCHORING - MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR RUNOFF. THE FOLLOWING ARE ACCEPTABLE METHODS FOR ANCHORING MULCH.
* MECHANICAL - USE A DISK, CRIMPER, OR SIMILAR TYPE TOOL SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT BE LEFT GENERALLY LONGER THAN 6 INCHES.
* MULCH NETTINGS - USE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, FOLLOWING ALL PLACEMENT AND ANCHORING REQUIREMENTS. USE IN AREAS OF WATER CONCENTRATION AND STEEP SLOPES TO HOLD MULCH IN PLACE.
* SYNTHETIC BINDERS - FOR STRAW MULCH, SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TACK OR EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER. ALL APPLICATIONS OF SYTHETIC BINDERS MUST BE CONDUCTED IN SUCH A MANNER WHERE THERE IS NO CONTACT WITH WATERS OF THE STATE.
* WOOD CELLULOSE FIBER - WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. THE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 LB./ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LB./100 GAL. OF WOOD CELLULOSE FIBER.

TEMPORARY SEEDING

1 . STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS AND SEDIMENT TRAPS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION SITE.

2. TEMPORARY SEED SHALL BE APPLIED BETWEEN CONSTRUCTION OPERATIONS ON SOIL THAT WILL NOT BE GRADED OR REWORKED FOR 21 DAYS OR GREATER. THESE IDLE AREAS SHALL BE SEEDED WITHIN 7 DAYS AFTER GRADING.

3. THE SEEDBED SHOULD BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION. TEMPORARY SEEDING SHOULD NOT BE POSTPONED IF IDEAL SEEDBED PREPARATION IS NOT POSSIBLE.

4. SOIL AMENDMENTS-TEMPORARY VEGETATION SEEDING RATES SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION, WHICH MAY REQUIRE THE USE OF SOIL AMENDMENTS. BASE RATES FOR LIME AND FERTILIZER SHALL BE USED.

5. SEEDING METHOD-SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SPREADER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. WHEN FEASIBLE, SEED THAT HAS BEEN BROADCAST SHALL BE COVERED BY RAKING OR DRAGGING AND THEN LIGHTLY TAMPED INTO PLACE USING A ROLLER OR CULTIPACKER. IF HYDROSEEDING IS USED, THE SEED AND FERTILIZER WILL BE MIXED ON-SITE AND THE SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.

MULCHING TEMPORARY SEEDING
1. APPLICATIONS OF TEMPORARY SEEDING SHALL INCLUDE MULCH, WHICH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDINGS MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE, VERY FLAT SOIL CONDITIONS MAY NOT NEED MULCH TO ACHIEVE ADEQUATE STABILIZATION.

2. MATERIALS:
- STRAW-IF STRAW IS USED, IT SHALL BE UNROLLED SMALL-GRAIN STRAW APPLIED AT A RATE OF 2 TONS PER ACRE OR 90 LBS./1,000 SQ. FT. (2-3 BALES)
- HYDROSEEDERS-IF WOOD CELLULOSE FIBER IS USED, IT SHALL BE USED AT 2000 LBS./AC. OR 46 LB./1,000-SQ.-FT.
- OTHER-OTHER ACCEPTABLE MULCHES INCLUDE MULCH MATTINGS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD CHIPS APPLIED AT 6 TON/AC.

3. STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER. ANCHORING METHODS:
- MECHANICAL-A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT LEFT TO A LENGTH OF APPROXIMATELY 6 INCHES.
- MULCH NETTING-NETTING SHALL BE USED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS. NETTING MAY BE NECESSARY TO HOLD MULCH IN PLACE IN AREAS OF CONCENTRATED RUNOFF AND ON CRITICAL SLOPES.
- SYNTHETIC BINDERS-SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TRACK OR EQUIVALENT MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER.
- WOOD CELLULOSE FIBER-WOOD CELLULOSE FIBER BINDER SHALL BE APPLIED AT A NET DRY WT. OF 750 LB./AC. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LB./100 GAL.

Antero Resources

EARTHRES ENGINEERING FOR SUCCESS

NO.	BY	DATE	DESCRIPTION
4	KRT	01/25/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	12/04/2018	PRELIMINARY DESIGN FOR REVIEW
1	KRT	11/14/2018	PRELIMINARY DESIGN FOR REVIEW

APPROVED FOR PERMITS BY: DATE
APPROVED FOR BIDS BY: DATE
APPROVED FOR CONSTRUCTION BY: DATE

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-57

PLOT DATE/TIME: 1/25/2019 2:14 PM
CAD FILE: P:\PROJECTS\Antero Resources\130822864 Hughes River Road\CAD\Drawings\Rev 0\130822864 HUGHES_RIVER_ROAD_MASTER_PRELIM_4045.dwg

SPECIFICATIONS FOR PERMANENT SEEDING

SITE PREPARATION
1. SUBSOILER, PLOW, OR OTHER IMPLEMENT SHALL BE USED TO REDUCE SOIL COMPACTION AND ALLOW MAXIMUM INFILTRATION. (MAXIMIZING INFILTRATION WILL HELP CONTROL BOTH RUNOFF RATE AND WATER QUALITY.) SUBSOILING SHOULD BE DONE WHEN THE SOIL MOISTURE IS LOW ENOUGH TO ALLOW THE SOIL TO CRACK OR FRACTURE. SUBSOILING SHALL NOT BE DONE ON SLIP-PRONE AREAS WHERE SOIL PREPARATION SHOULD BE LIMITED TO WHAT IS NECESSARY FOR ESTABLISHING VEGETATION.

2. THE SITE SHALL BE GRADED AS NEEDED TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION AND SEEDING.

3. TOPSOIL SHALL BE APPLIED WHERE NEEDED TO ESTABLISH VEGETATION.

SEEDBED PREPARATION
1. LIME-AGRICULTURAL GROUND LIMESTONE SHALL BE APPLIED TO ACID SOIL AS RECOMMENDED BY A SOIL TEST. IN LIEU OF A SOIL TEST, LIME SHALL BE APPLIED AT THE RATE OF 150 POUNDS PER 1,000-SQ. FT. OR 3 TONS PER ACRE.

2. FERTILIZER-FERTILIZER SHALL BE APPLIED AS RECOMMENDED BY A SOIL TEST. IN PLACE OF A SOIL TEST, FERTILIZER SHALL BE APPLIED AT A RATE OF 12 POUNDS PER 1,000-SQ. FT. OR 500 POUNDS PER ACRE OF A 10-20-20 OR EQUIVALENT.

3. THE LIME AND FERTILIZER SHALL BE WORKED INTO THE SOIL WITH A DISK HARROW, SPRING-TOOTH HARROW, OR OTHER SUITABLE FIELD IMPLEMENT TO A DEPTH OF 3 INCHES. ON SLOPING LAND, THE SOIL SHALL BE WORKED ON THE CONTOUR.

SEEDING DATES AND SOIL CONDITIONS
SEEDING SHOULD BE DONE MARCH 1 TO APRIL 15 OR AUGUST 1 TO OCTOBER 1. IF SEEDING OCCURS APRIL 15 - AUGUST 1, AND OCTOBER 1 - MARCH 1, INCREASE SEEDING RATES BY 50%. TILLAGE FOR SEEDBED PREPARATION SHOULD BE DONE WHEN THE SOIL IS DRY ENOUGH TO CRUMBLE AND NOT FORM RIBBONS WHEN COMPRESSED BY HAND. FOR WINTER SEEDING, SEE THE FOLLOWING SECTION ON DORMANT SEEDING.

DORMANT SEEDINGS
1. SEEDINGS CAN BE MADE FROM DECEMBER 1 THROUGH MARCH 1. DURING THIS PERIOD, THE SEEDS ARE LIKELY TO GERMINATE BUT MAY NOT BE ABLE TO SURVIVE THE WINTER.

2. THE FOLLOWING METHODS MAY BE USED FOR "DORMANT SEEDING":
- FROM DECEMBER 1 THROUGH MARCH 1, PREPARE THE SEEDBED, ADD THE REQUIRED AMOUNTS OF LIME AND FERTILIZER, THEN MULCH AND ANCHOR. INCREASE SEEDING RATES BY 50%.

MULCHING
1. MULCH MATERIAL SHALL BE APPLIED IMMEDIATELY AFTER SEEDING. DORMANT SEEDING SHALL BE MULCHED. 100% OF THE GROUND SURFACE SHALL BE COVERED WITH AN APPROVED MATERIAL.

2. MATERIALS
- STRAW-IF STRAW IS USED IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT THE RATE OF 2-3 TONS PER ACRE OR 135 POUNDS (THREE TO FOUR BALES) PER 1,000-SQ. FT. THE MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICALLY APPLIED SO THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000-SQ.FT. SECTIONS AND SPREAD THREE 45-LB. BALES OF STRAW IN EACH SECTION.
- HYDROSEEDERS-LF WOOD CELLULOSE FIBER IS USED, IT SHALL BE APPLIED AT 1,500 LB./AC. OR 35 LB/1,000 SQ. FT.
- OTHER-OTHER ACCEPTABLE MULCHES INCLUDE ROLLED EROSION CONTROL MATTINGS OR BLANKETS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD CHIPS APPLIED AT 6 TONS PER ACRE.

3. STRAW AND MULCH ANCHORING METHODS
STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER.
- MECHANICAL-A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT, GENERALLY, BE LEFT LONGER THAN 6 INCHES.
- MULCH NETTING-NETTING SHALL BE USED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. NETTING MAY BE NECESSARY TO HOLD MULCH IN PLACE IN AREAS OF CONCENTRATED RUNOFF AND ON CRITICAL SLOPES.
- ASPHALT EMULSION-ASPHALT SHALL BE APPLIED AS RECOMMENDED BY THE MANUFACTURER OR AT THE RATE OF 160 GALLONS PER ACRE.

- SYNTHETIC BINDERS-SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TACK OR EQUIVALENT MAY BE USED AT RATES SPECIFIED BY THE MANUFACTURER.
- WOOD CELLULOSE FIBER-WOOD CELLULOSE FIBER SHALL BE APPLIED AT A NET DRY WEIGHT OF 1,500 POUNDS PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER WITH THE MIXTURE CONTAINING A MAXIMUM OF 50 POUNDS CELLULOSE PER 100 GALLONS OF WATER.

IRRIGATION
PERMANENT SEEDING SHALL INCLUDE IRRIGATION TO ESTABLISH VEGETATION DURING DRY WEATHER OR ON ADVERSE SITE CONDITIONS, WHICH REQUIRE ADEQUATE MOISTURE FOR SEED GERMINATION AND PLANT GROWTH.

IRRIGATION RATES SHALL BE MONITORED TO PREVENT EROSION AND DAMAGE TO SEEDED AREAS FROM EXCESSIVE RUNOFF.

TOPSOILING

SALVAGING AND STOCKPILING:

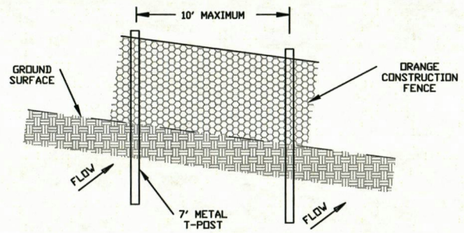
1. DETERMINE THE DEPTH AND SUITABILITY OF TOPSOIL AT THE SITE. (FOR HELP, CONTACT YOUR NRCS OFFICE TO OBTAIN A COUNTY SOIL SURVEY REPORT).
2. PRIOR TO STRIPPING TOPSOIL, INSTALL APPROPRIATE DOWNSLOPE EROSION AND SEDIMENTATION CONTROLS SUCH AS SEDIMENT TRAPS AND BASINS.
3. REMOVE THE SOIL MATERIAL NO DEEPER THAN WHAT THE COUNTY SOIL SURVEY DESCRIBES AS "SURFACE SOIL" (IE. A OR AP HORIZON).
4. CONSTRUCT STOCKPILES IN ACCESSIBLE LOCATIONS THAT DO NOT INTERFERE WITH NATURAL DRAINAGE. INSTALL APPROPRIATE SEDIMENT CONTROLS TO TRAP SEDIMENT SUCH AS SILT FENCE IMMEDIATELY ADJACENT TO THE STOCKPILE OR SEDIMENT TRAPS OR BASINS DOWNSTREAM OF THE STOCKPILE. STOCKPILE SIDE SLOPES SHALL NOT EXCEED A RATION OF 2:1.
5. IF TOPSOIL IS STORED FOR MORE THAN 21 DAYS, IT SHOULD BE TEMPORARY SEEDED, OR COVERED WITH A TARP.

SPREADING THE TOPSOIL

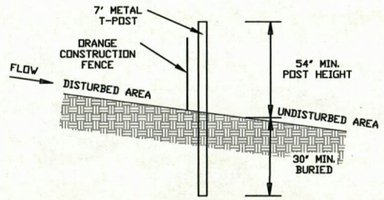
1. PRIOR TO APPLYING TOPSOIL, THE TOPSOIL SHOULD BE PULVERIZED.
2. TO ENSURE BONDING, GRADE THE SUBSOIL AND ROUGHEN THE TOP 3-4 IN. BY DISKING.
3. DO NOT APPLY WHEN SITE IS WET, MUDDY, OR FROZEN, BECAUSE IT MAKES SPREADING DIFFICULT, CAUSES COMPACTION PROBLEMS, AND INHIBITS BONDING WITH SUBSOIL.
4. APPLY TOPSOIL EVENLY TO A DEPTH OF AT LEAST 4 INCHES AND COMPACT SLIGHTLY TO IMPROVE CONTACT WITH SUBSOIL.
5. AFTER SPREADING, GRADE AND STABILIZE WITH SEEDING OR APPROPRIATE VEGETATION.

PHASE 1 - ORANGE CONSTRUCTION FENCE

N.T.S.



PERSPECTIVE VIEW

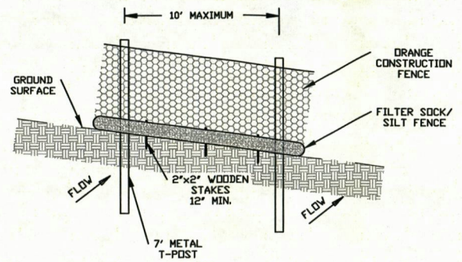


SECTION VIEW

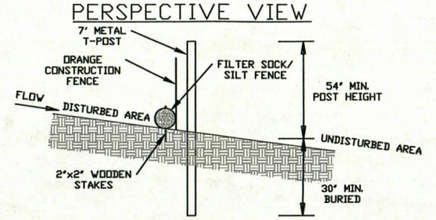
NOTES:
1. ALL MATERIAL SHOULD BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

PHASE 2 - ORANGE CONSTRUCTION FENCE & SILT FENCE/FILTER SOCK

N.T.S.

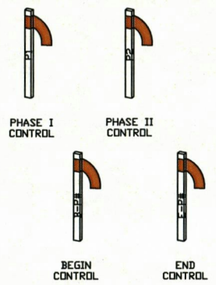


PERSPECTIVE VIEW



SECTION VIEW

NOTES:
1. ALL MATERIAL SHOULD BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
2. SILT FENCE MAY BE SUBSTITUTED FOR FILTER SOCK AT THE DISCRETION OF THE ON-SITE ENVIRONMENTAL FIELD COORDINATOR.



GENERAL GUIDELINES FOR INSTALLATION:
1. ALL FEATURES WHICH ARE INSIDE OR IMMEDIATELY ADJACENT TO THE WORK AREA/LOD SHALL BE PROTECTED
2. HEADWATERS OF ANY STREAM(S) INSIDE THE LOD SHOULD BE HORSESHOED WITH THE PROTECTION EXTENDING DOWN TO THE LOD AND FLARED OUT A MINIMUM OF 50'
3. ALL WETLANDS NOT SLATED FOR IMPACT INSIDE THE LOD SHOULD BE COMPLETELY WRAPPED WITH PROTECTION
4. ALL STREAMS WHICH BEGIN OUTSIDE THE LOD OR ARE PARALLEL TO THE LOD WILL HAVE PROTECTIONS ANYTHIME THE FEATURE IS WITHIN 100 FEET OF THE LOD AND CONSTRUCTION ACTIVITY.
5. ALL WETLANDS WITHIN CLOSE PROXIMITY TO THE LOD SHOULD HAVE PROTECTIONS INSTALLED ALONG THE LOD TO PROTECT THE FEATURE.
6. NO IMPACTS ARE AUTHORIZED TO ANY FEATURES OUTSIDE THE LOD.
7. PROTECTIONS SHOULD BE PROVIDED FOR ANY AND ALL SPECIAL SITUATIONS (I.E. NEARBY CEMETERIES, HOUSES, TREE(S) TO BE SAVED, WATER WELL, ETC.)

Antero Resources

APPROVED FOR PERMITS BY: DATE:
APPROVED FOR BIDS BY: DATE:
APPROVED FOR CONSTRUCTION BY: DATE:

EARTHRES ENGINEERING FOR SUCCESS™

NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRE	12/26/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRE	11/14/2018	PRELIMINARY DESIGN FOR REVIEW

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-58

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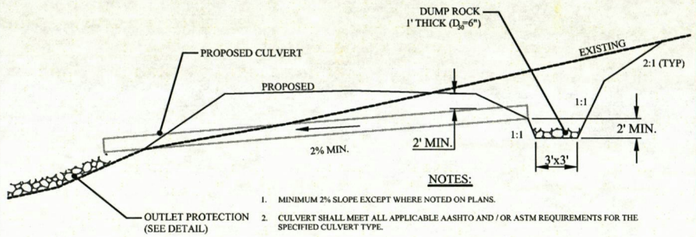
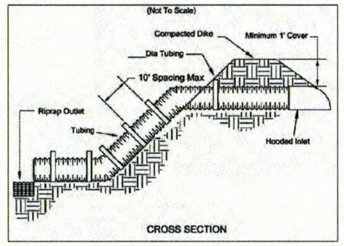


NOTES:

1. MINIMUM 2% SLOPE EXCEPT WHERE NOTED ON PLANS.
2. CULVERT SHALL MEET ALL APPLICABLE AASHTO AND / OR ASTM REQUIREMENTS FOR THE SPECIFIED CULVERT TYPE.

PROPOSED CULVERT INSTALLATION DETAIL
NOT TO SCALE

1. THE SLOPE DRAIN SHALL BE CONSTRUCTED ON A MINIMUM SLOPE OF 3 PERCENT.
2. ALL POINTS ALONG THE TOP OF THE DIKE/EARTHFILL FOR THE STORAGE AREA SHALL BE AT LEAST ONE (1) FOOT HIGHER THAN THE TOP OF THE INLET PIPE.
3. THE PIPE DRAIN MAY BE CONSTRUCTED OF CORRUGATED METAL OR PVC PIPE. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT. FLEXIBLE TUBING MAY BE USED, PROVIDED RIGID PIPE IS USE FOR THE INLET, THE FLEXIBLE TUBING IS OF THE SAME DIAMETER AS THE INLET, AND PIPE CONNECTIONS ARE MADE WITH METAL STRAPPING OR WATERTIGHT CONNECTING COLLARS. THE FLEXIBLE PIPE SHALL BE CONSTRUCTED WITH HOLD DOWN APPARATUS SPACED ON TEN (10) FOOT CENTERS FOR ANCHORING THE PIPE.
4. THE ENTRANCE TO THE PIPE SHALL BE A HOODED TYPE.
5. THE SOIL AROUND AND/OR UNDER THE PIPE SHALL BE PLACED IN 4-INCH LAYERS AND HAND COMPACTED TO THE TOP OF THE EARTH DIKE.
6. A RIPRAP APRON SHALL BE INSTALLED AT THE PIPE OUTLET WHERE CLEAN WATER IS DISCHARGED INTO A STABILIZED AREA OR DRAINAGEWAY.



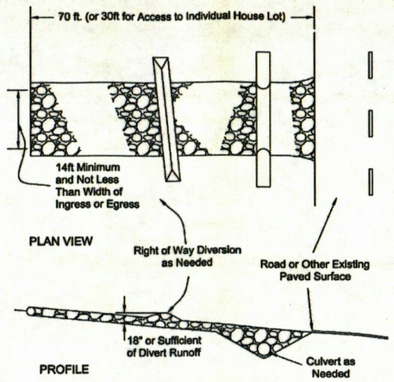
SLOPE DRAIN
NOT TO SCALE

1. STONE SIZE - AASHTO # 2 (1.5-2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOTS).
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST 10 INCHES FOR HEAVY DUTY USE.
4. WIDTH - THE ENTRANCE SHALL BE AT LEAST 14 FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE -A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:

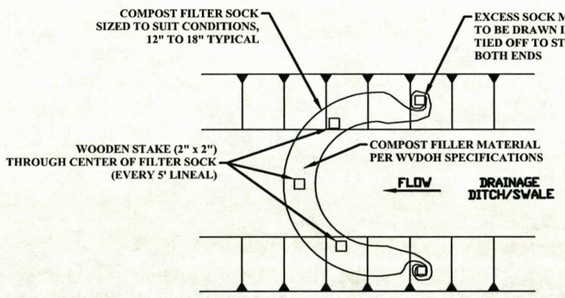
GEOTEXTILE SPECIFICATION FOR CONSTRUCTION ENTRANCE	
MINIMUM TENSILE STRENGTH	200 LBS.
MINIMUM PUNCTURE STRENGTH	80 PSI.
MINIMUM TEAR STRENGTH	50 LBS.
MINIMUM BURST STRENGTH	320 PSI.
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS<0.6 mm
PERMITTIVITY	1x10-3 cm/sec.

6. TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICABLE BEFORE MAJOR GRADING ACTIVITIES.
7. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
8. WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
9. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
10. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
11. REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

(Not To Scale)



CONSTRUCTION ENTRANCE
NOT TO SCALE

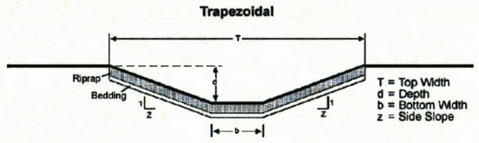


NOTES:

1. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

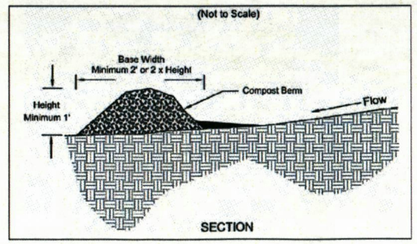
COMPOST FILTER SOCK DITCH CHECK
NOT TO SCALE

1. SUBGRADE FOR THE FILTER AND RIPRAP SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES AS SHOWN ON THE PLAN. THE SUBGRADE SHALL BE CLEARED OF ALL TREES, STUMPS, ROOTS, SOD, LOOSE ROCK, OR OTHER MATERIAL.
2. RIPRAP SHALL CONFORM TO THE GRADING LIMITS AS SHOWN ON THE PLAN.
3. NO ABRUPT DEVIATIONS FROM THE DESIGN GRADE OR HORIZONTAL ALIGNMENT SHALL BE PERMITTED.
4. GEOTEXTILE SHALL BE SECURELY ANCHORED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
5. GEOTEXTILE SHALL BE LAID WITH THE LONG DIMENSION PARALLEL TO THE DIRECTION OF FLOW AND SHALL BE LAID LOOSELY BUT WITHOUT WRINKLES AND CREASES. WHERE JOINTS ARE NECESSARY, STRIPS SHALL BE PLACED TO PROVIDE A 12-IN. MINIMUM OVERLAP, WITH THE UPSTREAM STRIP OVERLAPPING THE DOWNSTREAM STRIP.
6. GRAVEL BEDDING SHALL BE AASHTO NO. 67'FS OR 57'FS UNLESS SHOWN DIFFERENTLY ON THE DRAWINGS.
7. RIPRAP MAY BE PLACED BY EQUIPMENT BUT SHALL BE PLACED IN A MANNER TO PREVENT SLIPPAGE OR DAMAGE TO THE GEOTEXTILE. RIPRAP SHALL BE PLACED BY A METHOD THAT DOES NOT CAUSE SEGREGATION OF SIZES. EXTENSIVE PUSHING WITH A DOZER CAUSES SEGREGATION AND SHALL BE AVOIDED BY DELIVERING RIPRAP NEAR ITS FINAL LOCATION WITHIN THE CHANNEL.
8. CONSTRUCTION SHALL BE SEQUENCED SO THAT RIPRAP CHANNEL PROTECTION IS PLACED AND FUNCTIONAL WITHOUT DELAYS WHEN THE CHANNEL BECOMES OPERATIONAL.
9. ALL DISTURBED AREAS WILL BE VEGETATED AS SOON AS PRACTICAL.

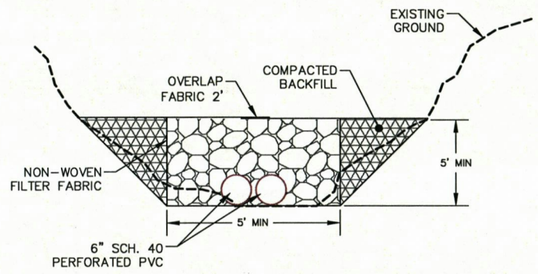


ROCK LINED CHANNEL
NOT TO SCALE

1. MATERIALS – COMPOST USED FOR FILTER BERMS SHALL BE WEED, PATHOGEN AND INSECT FREE AND FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH. THEY SHALL BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER AND CONSIST OF A PARTICLES RANGING FROM 1/4" TO 3".
2. INSTALLATION – FILTER BERMS WILL BE PLACED ON A LEVEL LINE ACROSS SLOPES, GENERALLY PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA. ON SLOPES APPROACHING 2:1, ADDITIONAL BERMS SHALL BE PROVIDED AT THE TOP AND AS NEEDED MID-SLOPE. FILTER BERMS ARE NOT TO BE USED IN CONCENTRATED FLOW SITUATIONS OR IN RUNOFF CHANNELS.
3. MAINTENANCE – INSPECT FILTER BERMS AFTER EACH SIGNIFICANT RAIN, MAINTAINING THE BERMS IN A FUNCTIONAL CONDITION AT ALL TIMES. REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE FILTER BERMS WHEN THEY REACH 1/3 OF THE EXPOSED HEIGHT OF THE PRACTICE. WHERE THE FILTER BERM DETERIORATES OR FAILS IT WILL BE, IT WILL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE ALTERNATIVE.
4. REMOVAL – FILTER BERMS NO LONGER NEEDED WILL BE DISPERSED ON SITE IN A MANNER THAT WILL FACILITATE SEEDING.



FILTER BERM
NOT TO SCALE



NOTES:

1. CORE DRAIN SHALL PLACED IN ALL LOCATIONS WERE EXISTING STREAMS ARE TO BE FILLED.
2. ALL ROCK PLACED IN CORE DRAIN MUST BE DURABLE ROCK AND NOT BE PRONE TO DEGRADE OR BREAK DOWN IN WATER.
3. GEOTEXTILE FABRIC SHALL MEET WVDOH SPECIFICATION FOR ENGINEERING FABRIC FOR SUBSURFACE DRAINAGE.
4. ALL ROCK SHALL RANGE FROM 6-IN TO 12-IN IN ALL DIMENSIONS.
5. ALL DRAINAGE WAYS AND SEEP AREAS SHALL HAVE A ROCK CORE DRAIN WITH A 5' MIN BOTTOM WIDTH AND 5' MIN DEPTH. THESE DRAINS SHALL BE CONVEYED AND TIED INTO THE MAIN ROCK CORE DRAIN.
6. NO EXCAVATION SHALL BE MADE THROUGH THE TOE KEY AND DRAIN. THE ROCK CORE DRAIN SHALL BE PLACED ON TOP OF THE KEYWAY.
7. TIE BONDING BENCH DRAINS IN TO ROCK CORE DRAIN WHERE APPLICABLE.

ROCK CORE DRAIN DETAIL
NOT TO SCALE

Antero Resources

APPROVED FOR PERMITS: BY: DATE:
APPROVED FOR BIDS: BY: DATE:
APPROVED FOR CONSTRUCTION: BY: DATE:

EARTHRES
ENGINEERING FOR SUCCESS™

NO.	BY	DATE	DESCRIPTION
4	KRT	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	11/14/2018	PRELIMINARY DESIGN FOR REVIEW
1			

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-59

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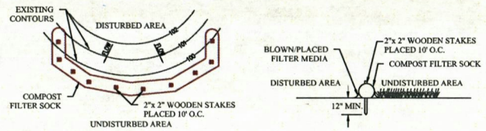
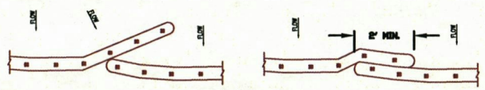


PLAN VIEW SECTION VIEW



END-TO-END SOCK JOINING

COMPOST SHALL MEET THE FOLLOWING STANDARDS:

ORGANIC MATTER CONTENT	80% - 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5 - 8.0
MOISTURE CONTENT	35% - 55%
PARTICLE SIZE	98% PASS THROUGH 1" SCREEN
SOLUBBLE SALT CONCENTRATION	5.0 dS MAXIMUM

COMPOST FILTER SOCK TO BE INSTALLED IN ACCORDANCE WITH FILTREXX MANUFACTURER SPECIFICATIONS, OR AN APPROVED EQUAL.

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8' UP SLOPE AT 45° TO THE MAIN SOCK. ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY DIAMETER SOCK SHALL NOT EXCEED THAT SHOWN ON BELOW TABLE.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

SOCKS SHALL BE INSPECTED AS DESCRIBED IN THE MAINTENANCE AND INSPECTION NOTES IN THE EROSION AND SEDIMENT CONTROL NOTES OF THESE PLANS. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS, PHOTODEGRADABLE SOCKS AFTER 1YR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, ALL STAKES SHALL BE REMOVED. DEGRADABLE FILTER SOCK MAY BE LEFT IN PLACE AND VEGETATED - THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT PRIOR TO SEEDING. THE MESH FROM ALL POLYPROPYLENE FILTER SOCKS SHALL BE REMOVED - THE MULCH SHALL BE SPREAD AS A SOIL SUPPLEMENT PRIOR TO SEEDING.

REPRODUCED FROM *FILTREXX LOW IMPACT DESIGN MANUAL* PAGE 324.

Slope Percent	Maximum Slope Length Above Sediment Control in Feet (Meters) *				
	8-IN (200-mm) Sediment Control	12-IN (300-mm) Sediment Control	18-IN (450-mm) Sediment Control	24-IN (600-mm) Sediment Control	32-IN (800-mm) Sediment Control
	6.5-IN (160-mm) **	9.5-IN (240-mm) **	14.5-IN (360-mm) **	19-IN (480-mm) **	26-IN (650-mm) **
2 (or less)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

* Based on a failure point of 36-IN (0.9-m) super silt fence (wire reinforced) at 1000-FT (303-m) of slope, watershed width equivalent to receiving length of sediment control device, 1-IN/24-HR (25-mm/24-HR) rain event.

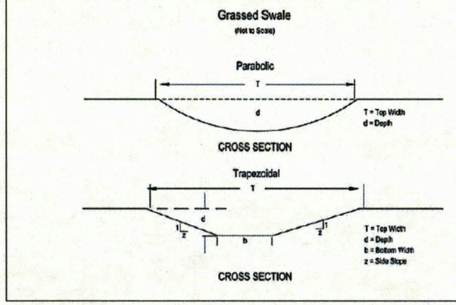
** Effective height of Sediment Control after installation and with constant head from runoff as determined by Ohio State University.

RESTRICTIONS
(1) COMPOST FILTER SOCK WILL NOT BE PLACED IN ANY AREA OF CONCENTRATED FLOWS SUCH AS SWALES, DITCHES, CHANNELS, ETC.
(2) COMPOST FILTER SOCK WILL NOT BE USED IN AREA WHERE ROCK OR ROCKY SOILS PREVENT THE FULL AND UNIFORM ANCHORING OF THE COMPOST FILTER SOCK.
(3) COMPOST FILTER SOCK WILL NOT BE PLACED ACROSS THE ENTRANCES TO PIPES OR CULVERTS AND WILL NOT BE WRAPPED AROUND THE PRINCIPAL SPILLWAY STRUCTURES OF SEDIMENT TRAPS OR BASINS.

INSTALLATION
(1) COMPOST FILTER SOCK WILL BE INSTALLED WITH LITTLE, IF ANY DISTURBANCE TO THE DOWNSLOPE SIDE OF THE COMPOST FILTER SOCK.

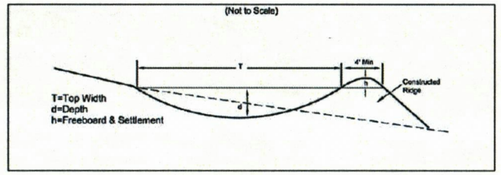
COMPOST FILTER SOCK
NOT TO SCALE

1. ALL TREES, BRUSH, STUMPS, AND OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE SITE.
2. THE CHANNEL SHALL BE EXCAVATED AND SHAPED TO THE PROPER GRADE AND CROSS SECTION.
3. FILL MATERIAL USED IN THE CONSTRUCTION OF THE CHANNEL SHALL BE WELL COMPACTED IN UNIFORM LAYERS NOT EXCEEDING 9 INCHES USING THE WHEEL TREADS OR TRACKS OF THE CONSTRUCTION EQUIPMENT TO PREVENT UNEQUAL SETTLEMENT.
4. EXCESS EARTH SHALL BE GRADED OR DISPOSED OF SO THAT IT WILL NOT RESTRICT FLOW TO THE CHANNEL OR INTERFERE WITH ITS FUNCTIONING.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE SPECIFICATIONS FOR PERMANENT SEEDING, VEGETATIVE PRACTICES, SODDING AND MATTING.
6. CONSTRUCTION SHALL BE SEQUENCED SO THAT NEWLY CONSTRUCTED CHANNELS ARE STABILIZED PRIOR TO BECOMING OPERATIONAL. TO AID IN THE ESTABLISHMENT OF VEGETATION, SURFACE WATER MAY BE PREVENTED FROM ENTERING THE NEWLY CONSTRUCTED CHANNEL THROUGH THE ESTABLISHMENT PERIOD.
7. GULLIES THAT MAY FORM IN THE CHANNEL OR OTHER EROSION DAMAGE THAT OCCURS BEFORE THE GRASS LINING BECOMES ESTABLISHED SHALL BE REPAIRED WITHOUT DELAY.



GRASSED SWALE
NOT TO SCALE

1. ALL TREES, BRUSH, STUMPS, AND OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE WORK SITE.
2. THE DIVERSION SHALL BE EXCAVATED AND SHAPED TO THE PROPER GRADE AND CROSS SECTION.
3. FILL MATERIAL USED IN THE CONSTRUCTION OF THE CHANNEL SHALL BE WELL COMPACTED IN UNIFORM LAYERS NOT EXCEEDING 9 INCHES USING THE WHEEL TREADS OR TRACKS OF THE CONSTRUCTION EQUIPMENT TO PREVENT UNEQUAL SETTLEMENT.
4. EXCESS EARTH SHALL BE GRADED OR DISPOSED OF SO THAT IT WILL NOT RESTRICT FLOW TO THE CHANNEL OR INTERFERE WITH ITS FUNCTIONING.
5. FERTILIZING, SEEDING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPLICABLE VEGETATIVE SPECIFICATIONS.
6. CONSTRUCTION SHALL BE SEQUENCED SO THAT THE NEWLY CONSTRUCTED CHANNEL IS STABILIZED PRIOR TO BECOMING OPERATIONAL. TO AID IN THE ESTABLISHMENT OF VEGETATION, SURFACE WATER MAY BE PREVENTED FROM ENTERING THE NEWLY CONSTRUCTED CHANNEL THROUGH THE ESTABLISHMENT PERIOD.
7. GULLIES THAT MAY FORM IN THE CHANNEL OR OTHER EROSION DAMAGE THAT OCCURS BEFORE THE GRASS LINING BECOMES ESTABLISHED SHALL BE REPAIRED WITHOUT DELAY.



DIVERSION DITCH
NOT TO SCALE

1. DRAINAGE AREA SHOULD NOT EXCEED 10 ACRES. LARGER AREAS REQUIRE A MORE EXTENSIVE DESIGN.
2. THE CHANNEL CROSS SECTION MAY BE PARABOLIC OR TRAPEZOIDAL. DISK THE BASE OF THE DIKE BEFORE PLACING FILL. BUILD THE DIKE 10% HIGHER THAN DESIGNED FOR SETTLEMENT. THE DIKE SHALL BE COMPACTED BY TRAVERSING WITH TRACKED EARTH-MOVING EQUIPMENT.
3. THE MINIMUM CROSS SECTION OF THE LEVEE OR DIKE WILL BE AS FOLLOWS: (MINIMUM DESIGN FREEBOARD SHALL BE 0.3 FOOT.) WHERE CONSTRUCTION TRAFFIC WILL CROSS, THE TOP WIDTH MAY BE MADE WIDER AND THE SIDE SLOPES FLATTER THAN SPECIFIED ABOVE.

TABLE 5.3.2

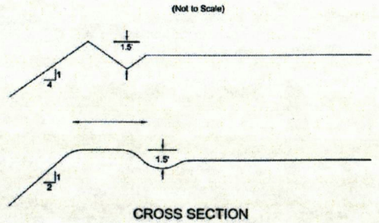
DIKE TOP WIDTH (FT.)	HEIGHT (FT.)	SIDE SLOPES	SHAPE
0	1.5	4:1	TRAPEZOIDAL
4	1.5	2:1	PARABOLIC

4. THE GRADE MAY BE VARIABLE DEPENDING UPON THE TOPOGRAPHY, BUT MUST HAVE A POSITIVE DRAINAGE TO THE OUTLET AND BE STABILIZED TO BE NON-EROSIVE.

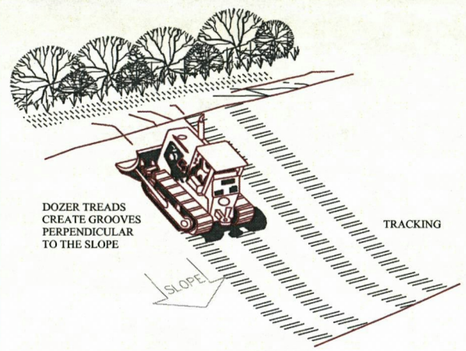
TABLE 5.3.3

TEMPORARY DIVERSION STABILIZATION TREATEMENT			
DIVERSION SLOPE	<2 AC.	2-5 AC.	5-10 AC.
0-3%	SEED & STRAW	SEED & STRAW	SEED & STRAW
3-5%	SEED & STRAW	SEED & STRAW	MATTING
5-8%	SEED & STRAW	MATTING	MATTING
8-20%	SEED & STRAW	MATTING	ENGINEERED

5. DIVERSIONS WITH STEEPER SLOPES OR GREATER DRAINAGE AREAS ARE BEYOND THE SCOPE OF THIS STANDARD AND MUST BE DESIGNED FOR STABILITY.
6. SEED, STRAW AND MAILING USED SHALL MEET THE SPECIFICATIONS FOR TEMPORARY SEEDING, MULCHING AND MATTING.
7. OUTLET RUNOFF ONTO A STABILIZED AREA, INTO A PROPERLY DESIGNED WATERWAY, GRADE STABILIZATION STRUCTURE, OR SEDIMENT TRAPPING FACILITY.
8. DIVERSIONS SHALL BE SEEDED AND MULCHED IN ACCORDANCE WITH THE REQUIREMENTS IN PRACTICE STANDARDS TEMPORARY SEEDING (OR PERMANENT SEEDING) AND MULCHING AS SOON AS THEY ARE CONSTRUCTED OR OTHER SUITABLE STABILIZATION IN ORDER TO PRESERVE DIKE HEIGHT AND REDUCE MAINTENANCE.

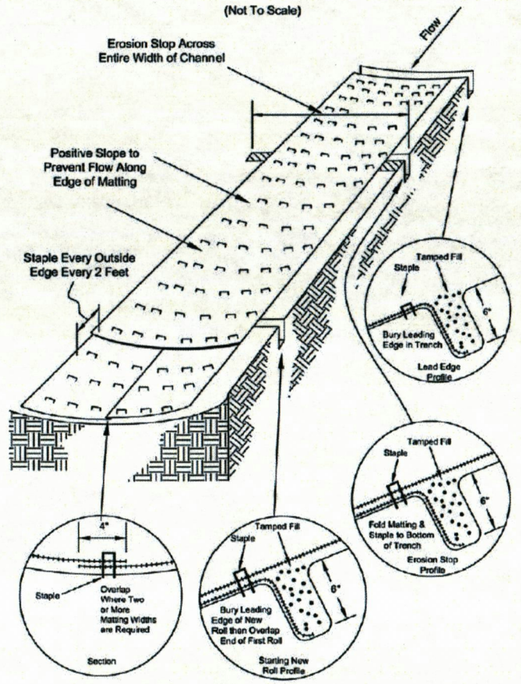


TEMPORARY DIVERSION
NOT TO SCALE



TRACKING A CONSTRUCTED SLOPE
NOT TO SCALE

1. CHANNEL SOIL PREPARATION - GRADE AND COMPACT AREA OF INSTALLATION, PREPARING SEEDBED BY LOOSENING 2-IN TO 3-IN OF TOPSOIL ABOVE FINAL GRADE. INCORPORATE AMENDMENTS SUCH AS LIME AND FERTILIZER INTO SOIL. REMOVE ALL ROCKS, CLODS, VEGETATION OR OTHER DEBRIS SO THAT INSTALLED TURF REINFORCEMENT MATTING (TRM) WILL HAVE DIRECT CONTACT WITH THE SOIL SURFACE.
2. CHANNEL SEEDING - APPLY SEED TO SOIL SURFACE PRIOR TO INSTALLATION. ALL CHECK SLOTS, ANCHOR TRENCHES, AND OTHER DISTURBED AREAS MUST BE RE-SEEDED. REFER TO THE PERMANENT SEEDING SPECIFICATION FOR SEEDING RECOMMENDATIONS.
3. EXCAVATE INITIAL ANCHOR TRENCH (12-IN x 6-IN) ACROSS THE LOWER END OF THE PROJECT AREA.
4. EXCAVATE INTERMITTENT CHECK SLOTS (6-IN x 6-IN) ACROSS THE CHANNEL AT 30-FT C-C INTERVALS ALONG THE CHANNEL.
5. EXCAVATE LONGITUDINAL CHANNEL ANCHOR SLOTS (4-IN x 4-IN) ALONG BOTH SIDES OF THE CHANNEL TO BURY THE EDGES. WHENEVER POSSIBLE EXTEND THE TRM 2-FT TO 3-FT ABOVE THE CREST OF CHANNEL SIDE SLOPES.
6. INSTALL TRM IN INITIAL ANCHOR TRENCH (DOWNSTREAM) ANCHOR EVERY 12-IN, BACKFILL, AND COMPACT SOIL.
7. ROLL OUT TRM BEGINNING IN THE CENTER OF THE CHANNEL TOWARD THE INTERMITTENT CHECK SLOT. DO NOT PULL TAUGHT. UNROLL ADJACENT ROLLS UPSTREAM WITH A 3-IN MINIMUM OVERLAP (ANCHOR EVERY 18-IN) AND UP EACH CHANNEL SIDE SLOPE.
8. AT TOP OF CHANNEL SIDE SLOPES, INSTALL TRM IN THE LONGITUDINAL ANCHOR SLOTS, ANCHOR EVERY 18-IN.
9. INSTALL TRM IN INTERMITTENT CHECK SLOTS. LAY INTO TRENCH AND SECURE WITH ANCHORS EVERY 12-IN, BACKFILL WITH SOIL AND COMPACT.
10. OVERLAP ROLL ENDS A MINIMUM OF 12-IN WITH UPSTREAM TRM ON TOP FOR A SHINGLING EFFECT. BEGIN ALL NEW ROLLS IN AN INTERMITTENT CHECK SLOT, DOUBLE ANCHORED EVERY 12-IN.
11. INSTALL UPSTREAM END IN A TERMINAL ANCHOR TRENCH (12-IN x 6-IN); ANCHOR EVERY 12-IN, BACKFILL AND COMPACT.
12. COMPLETE ANCHORING THROUGHOUT CHANNEL AT 2.5 PER SQUARE YARD USING SUITABLE GROUND ANCHORING DEVICES (U SHAPED WIRE STAPLES, METAL GEOTEXTILE PINS, PLASTIC STAKES, AND TRIANGULAR WOODEN STAKES). ANCHORS SHOULD BE OF SUFFICIENT LENGTH TO RESIST PULLOUT. LONGER ANCHORS MAY BE REQUIRED IN LOOSE SANDY OR GRAVELLY SOILS.



TURF REINFORCEMENT MATTING
NOT TO SCALE

Antero Resources

EARTHRES ENGINEERING FOR SUCCESS™

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4	KRI	01/31/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRI	12/28/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRI	11/14/2018	PRELIMINARY DESIGN FOR REVIEW

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-60

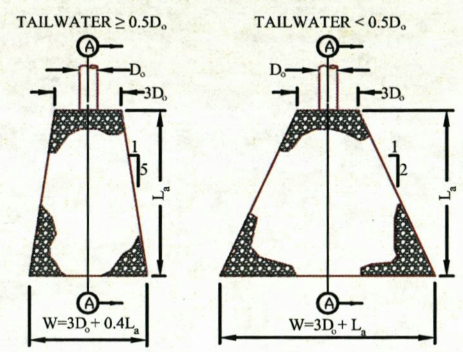
PLOT DATE/TIME: 1/31/2019 2:15 PM

CAD FILE: F:\PROJECTS\Antero Resources\138822.064 Hughes River Road\CAD\Drawings\Rev 0\138822.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_404S.dwg

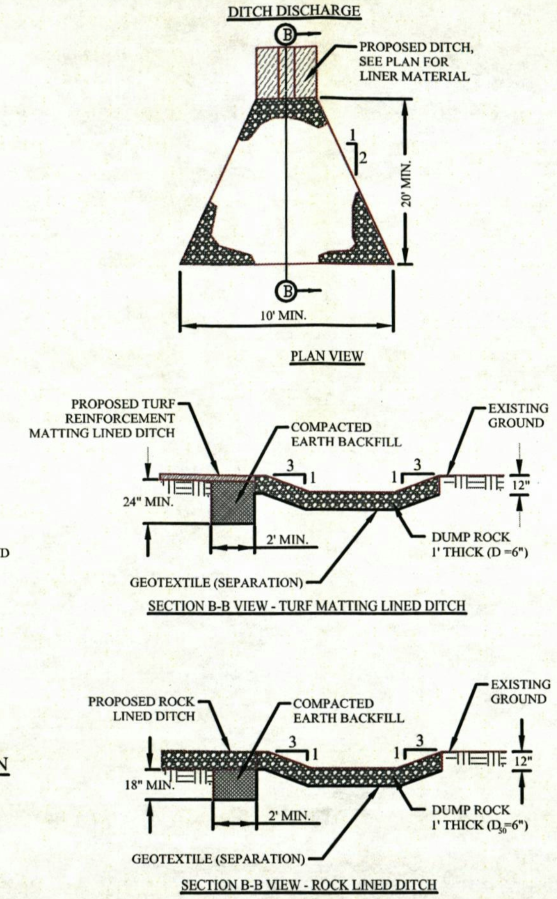
NOTES (APPLICABLE TO CULVERT AND DITCH DISCHARGE):

1. SUBGRADE FOR THE FILTER OR BEDDING AND RIPRAP SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES AS SHOWN ON THE PLAN. THE SUBGRADE SHALL BE CLEARED OF ALL TREES, STUMPS, ROOTS, SOD, LOOSE ROCK, OR OTHER MATERIAL.
2. RIPRAP SHALL CONFORM TO THE GRADING LIMITS AS SHOWN ON THE PLAN.
3. GEOTEXTILE SHALL BE SECURELY ANCHORED ACCORDING TO MANUFACTURERS' RECOMMENDATIONS.
4. GEOTEXTILE SHALL BE LAID WITH THE LONG DIMENSION PARALLEL TO THE DIRECTION OF FLOW AND SHALL BE LAID LOOSELY BUT WITHOUT WRINKLES AND CREASES. WHERE JOINTS ARE NECESSARY, STRIPS SHALL BE PLACED TO PROVIDE A 12-IN. MINIMUM OVERLAP, WITH THE UPSTREAM STRIP OVERLAPPING THE DOWNSTREAM STRIP.
5. GRAVEL BEDDING SHALL BE AASHTO NO. 67 OR 57 UNLESS SHOWN DIFFERENTLY ON THE DRAWINGS.
6. RIPRAP MAY BE PLACED BY EQUIPMENT BUT SHALL BE PLACED IN A MANNER TO PREVENT SLIPPAGE OR DAMAGE TO THE GEOTEXTILE.
7. RIPRAP SHALL BE PLACED BY A METHOD THAT DOES NOT CAUSE SEGREGATION OF SIZES. EXTENSIVE PUSHING WITH A DOZER CAUSES SEGREGATION AND SHALL BE AVOIDED BY DELIVERING RIPRAP NEAR ITS FINAL LOCATION WITHIN THE CHANNEL.
8. CONSTRUCTION SHALL BE SEQUENCED SO THAT OUTLET PROTECTION IS PLACED AND FUNCTIONAL WHEN THE STORM DRAIN, CULVERT, OR OPEN CHANNEL ABOVE IT BECOMES OPERATIONAL.
9. ALL DISTURBED AREAS WILL BE VEGETATED AS SOON AS PRACTICAL.
10. CONTRACTOR SHALL USE TAILWATER < 0.5D UNLESS OTHERWISE SPECIFIED ON PLANS.
11. CULVERT SLOPE MAY BE FIELD ADJUSTED WITH ENGINEER'S APPROVAL. (SLOPE SHALL NOT BE LESS THAN THE MINIMUM SLOPE SHOWN IN PROPOSED CULVERT DETAIL OR NOTED ON PLANS.)
12. THE WATER OUTFALL HEIGHT SHALL NOT EXCEED TWO (2) FEET.
13. LENGTH OF OUTLET PROTECTION SHALL EXTEND BEYOND THE TOE OF ANY FILL SLOPE SO AS TO DISCHARGE ONTO UNDISTURBED GROUND.

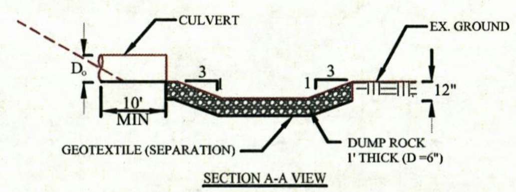
CULVERT DISCHARGE



DITCH DISCHARGE



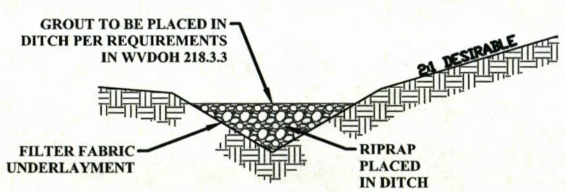
PLAN VIEW



ROCK OUTLET PROTECTION

NOT TO SCALE

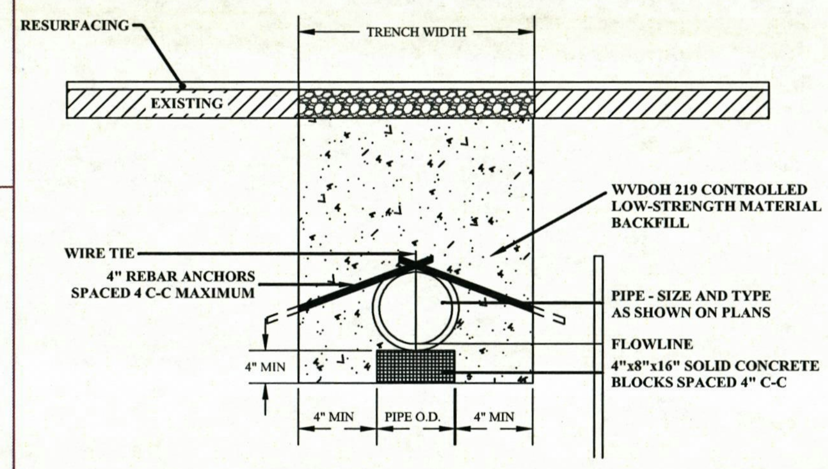
ROCK OUTLET PROTECTION										
CULVERT/ DITCH #	STA	RT/LT	CULVERT SIZE (IN)	CULVERT TYPE	LENGTH (FT)	WIDTH (FT)	ROCK SIZE	DEPTH (FT)	RIP RAP QTY (TON)	BEDDING QTY (TON)
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X
X	X+XX	RT/LT	XX	X	XX	X	X	X.X	X.X	X.X

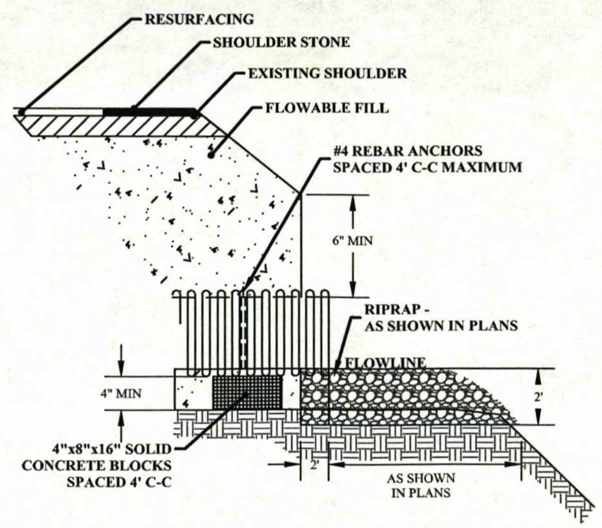


GROUTED RIPRAP CHANNEL DETAIL

NOT TO SCALE

GROUTED RIP RAP DITCH							
RIP RAP SIZE	STA		RT/LT	LENGTH (FT)	WIDTH (FT)	DEPTH (FT)	RIP RAP QTY (TON)
	FROM	TO					
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X
X	X+XX	X+XX	RT/LT	XX	X	X.X	X.X





CULVERT PIPE INSTALLATION

NOT TO SCALE

1. IF FDR PRIOR TO NEW PIPE PLACEMENT, THEN PLACE FLOWABLE FILL UP TO TOP OF FDR, AND OVERLAY WITH NEW PAVEMENT OR STONE.
2. IF PIPE REPLACEMENT FIRST, THEN PLACE FLOWABLE FILL UP TO BOTTOM OF EXISTING PAVEMENT AND FILL WITH WVDOH ITEM 307 STONE UP TO EXISTING ROADWAY SURFACE.

Antero Resources

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ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-61

CAD FILE: F:\PROJECTS\Antero Resources\131022.064 Hughes River Road\CAD\Drawings\Rev 0\131022.064 HUGHES_RIVER_ROAD_MASTER_PRELIM_404S.dwg PLOT DATE/TIME: 1/21/2019 2:15 PM

ROCK CHECK DAMS			
STATION RIGHT	STATION LEFT	STATION RIGHT	STATION LEFT
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
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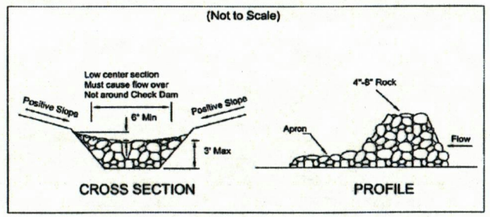
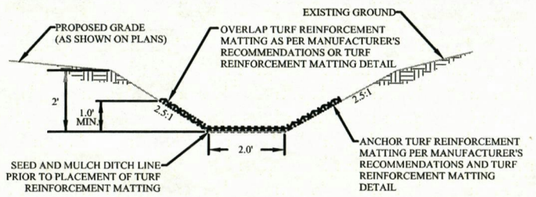
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX
X+XX	X+XX	X+XX	X+XX

1. THE CHECK DAM SHALL BE CONSTRUCTED OF 4-8 INCH DIAMETER STONE, PLACED SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL. RIP-RAP STONE IS ACCEPTABLE, BUT SHOULD BE UNDERLAIN WITH A GRAVEL FILTER CONSISTING OF AASHTO NO. 3 OR 4 OR SUITABLE FILTER FABRIC.
2. MAXIMUM HEIGHT OF CHECK DAM SHALL NOT EXCEED 3.0 FEET.
3. THE MIDPOINT OF THE ROCK CHECK DAM SHALL BE A MINIMUM OF 6 INCHES LOWER THAN THE SIDES IN ORDER TO DIRECT ACROSS THE CENTER AND AWAY FROM THE CHANNEL SIDES.
4. THE BASE OF THE CHECK DAM SHALL BE ENTRENCHED APPROXIMATELY 6 INCHES.
5. SPACING OF CHECK DAMS SHALL BE IN A MANNER SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.
6. A SPLASH APRON SHALL BE CONSTRUCTED WHERE CHECK DAMS ARE EXPECTED TO BE IN USE FOR AN EXTENDED PERIOD OF TIME, A STONE APRON SHALL BE CONSTRUCTED IMMEDIATELY DOWNSTREAM OF THE CHECK DAM TO PREVENT FLOWS FROM UNDERCUTTING THE STRUCTURE. THE APRON SHOULD BE 6 IN. THICK AND ITS LENGTH TWO TIMES THE HEIGHT OF THE DAM.
7. STONE PLACEMENT SHALL BE PERFORMED EITHER BY HAND OR MECHANICALLY AS LONG AS THE CENTER OF CHECK DAM IS LOWER THAN THE SIDES AND EXTENDS ACROSS ENTIRE CHANNEL.
8. SIDE SLOPES SHALL BE A MINIMUM OF 2:1.

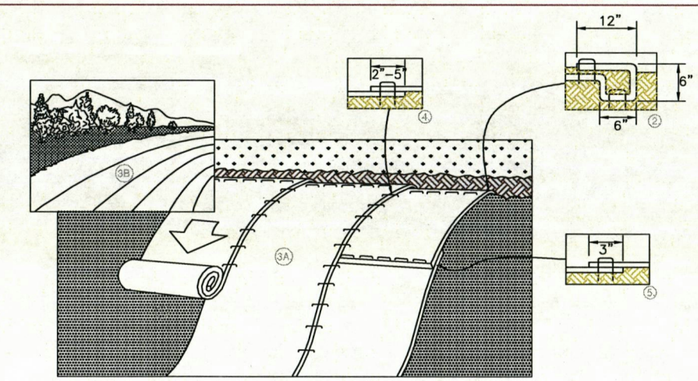


ROCK CHECK DAM
NOT TO SCALE



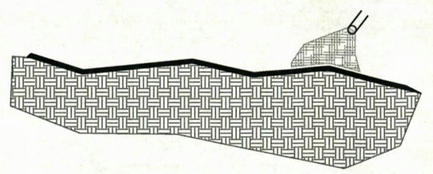
NOTE - INSTALL WHERE DITCHLINE SLOPES ARE LESS THAN 8%

TURF REINFORCEMENT MATTING LINED DITCH TYPICAL SECTION
NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" - 5" OVERLAP DEPENDING ON BLANKET TYPE.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
6. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

HYDRAULICALLY APPLIED EROSION CONTROL BLANKET
NOT TO SCALE



NOTES

SPECIFICATIONS: HIGH PERFORMANCE-FLEXIBLE GROWTH MEDIUM
THIS SECTION SPECIFIES A HYDRAULICALLY-APPLIED, 100% BIODEGRADABLE, HIGH PERFORMANCE-FLEXIBLE GROWTH MEDIUM (HP-FGM) THAT IS MANUFACTURED IN THE UNITED STATES AND IS COMPOSED OF 100% RECYCLED THERMALLY REFINED (WITHIN A PRESSURE VESSEL) WOOD FIBERS, CRIMPED INTERLOCKING MAN-MADE BIODEGRADABLE FIBERS, MICRO-PORE GRANULES, NATURALLY DERIVED CROSSLINKED BIOPOLYMERS AND WATER ABSORBENTS. THE HP-FGM IS PHYTOSANITIZED, FREE FROM PLASTIC NETTING, REQUIRES NO CURING PERIOD AND UPON APPLICATION FORMS INTIMATE BOND WITH THE SOIL SURFACE TO CREATE A CONTINUOUS, POROUS, ABSORBENT AND FLEXIBLE EROSION RESISTANT BLANKET THAT ALLOWS FOR RAPID GERMINATION AND ACCELERATED PLANT GROWTH. ALL COMPONENTS OF THE GM SHALL BE PRE-PACKAGED BY THE MANUFACTURER TO ASSURE BOTH MATERIAL PERFORMANCE AND COMPLIANCE WITH THE FOLLOWING VALUES. NO CHEMICAL ADDITIVES WITH THE EXCEPTION OF FERTILIZER, LIMING AND BIOSTIMULANT MATERIALS SHOULD BE ADDED TO THIS PRODUCT.

1. THERMALLY PROCESSED (WITHIN A PRESSURE VESSEL) WOOD FIBER - 80% ± 3%
   HEATED TO A TEMPERATURE GREATER THAN 380 DEGREES FAHRENHEIT (193 DEGREES CELSIUS) FOR 5 MINUTES
   AT A PRESSURE GREATER THAN 50 PSI (345kPa)
   CROSSLINKED BIOPOLYMERS AND WATER ABSORBENTS - 10% ± 1%
   CRIMPED, MAN-MADE BIODEGRADABLE INTERLOCKING FIBERS -5% ± 1%
   MICRO-PORE GRANULES - 5% ± 1%

INSTALLATION
STRICTLY COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS. USE APPROVED HYDRO-SPRAYING MACHINES WITH FAN TYPE NOZZLE (50-DEGREE TIP). TO ACHIEVE OPTIMUM SOIL SURFACE COVERAGE, APPLY HP-FGM FROM OPPOSING DIRECTIONS TO SOIL SURFACE. ROUGH SURFACES (ROCKY TERRAIN, CAT TRACKS AND RIPPED SOILS) MAY REQUIRE HIGHER APPLICATION RATES TO ACHIEVE 100% COVER. SLOPE INTERRUPTION DEVICES OR WATER DIVERSION TECHNIQUES ARE RECOMMENDED WHEN SLOPE LENGTHS EXCEED 100 FEET (30 M). MAXIMUM SLOPE LENGTHS IS FOR PRODUCT APPLICATIONS ON 3H:1V SLOPE. FOR APPLICATION ON STEEPER SLOPES, SLOPE INTERRUPTION LENGTHS MAY NEED TO BE DECREASED BASED ON ACTUAL SITE CONDITIONS. NOT RECOMMENDED FOR CHANNELS OR AREAS WITH CONCENTRATED WATER FLOW. NO CHEMICAL ADDITIVES WITH THE EXCEPTION OF FERTILIZER, LIMING AND BIOSTIMULANT MATERIALS SHOULD BE ADDED TO THIS PRODUCT: TO ENSURE PROPER APPLICATION RATES, MEASURE AND STAKE AREA. FOR MAXIMUM PERFORMANCE, APPLY HP-FGM IN A TWO-STEP PROCESS AS FOLLOWS:

1. STEP ONE: APPLY PRESCRIPTIVE AGRONOMIC FORMULATIONS OF LIME AND FERTILIZER ALONG WITH 50% OF SEED WITH A SMALL AMOUNT OF HP-FGM FOR VISUAL METERING.
2. STEP TWO: MIX BALANCE OF SEED AND APPLY HP-FGM AT A RATE OF 50LB PER 125 GALLONS (23 KG/475 LITERS) OF WATER OVER FRESHLY SEEDED SURFACES. CONFIRM LOADING RATES WITH EQUIPMENT MANUFACTURER. DO NOT LEAVE SEEDED SURFACES UNPROTECTED, ESPECIALLY IF PRECIPITATION IS IMMINENT.
3. STEP THREE: SEE THE APPLICATION GUIDE IN THE APPENDIX OF THE PROJECT SPECIFICATIONS OR AT www.acfenvironmental.com

APPLICATION RATES
THESE APPLICATION RATES ARE FOR STANDARD CONDITIONS. DESIGNERS MAY WISH TO REDUCE RATES TO ENCOURAGE FASTER VEGETATION ESTABLISHMENTS OR MAY NEED TO IN CREASE APPLICATION RATES ON ROUGH SURFACES. CONSULT APPLICATION AND LOADING CHARTS TO DETERMINE NUMBER OF BAGS TO BE ADDED FOR DESIRED AREA AND APPLICATION RATE.

SLOPE GRADIENT / CONDITION	ENGLISH
<= 4H TO 1V	2,500 LB/AC
> 4H TO 1V AND < = 3H TO 1V	3,000 LB/AC
> = 3H TO 1V AND < = 2H TO 1V	3,500 LB/AC
> 2H TO 1V AND < = 1H TO 1V	4,000 LB/AC
> 1H TO 1V	4,500 LB/AC
BELOW ECB OR TRM	1,500 LB/AC
AS INFILL FOR TRM	3,500 LB/AC

NOTE: USED AS AN ALTERNATIVE FOR EROSION CONTROL MAT, HOWEVER EROSION CONTROL MAT IS STILL REQUIRED IN AREAS OF CONCENTRATED FLOW AND DITCHLINES. ALSO, A MINIMUM 3500 POUNDS PER ACRE COVERAGE OF FLEXTERRA HP-FGM IS REQUIRED IN ORDER TO REPLACE EROSION MATTING ON SIDE SLOPES.

HYDRAULICALLY APPLIED
EROSION CONTROL BLANKET
NOT TO SCALE

Antero Resources

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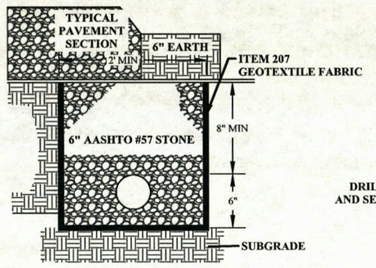
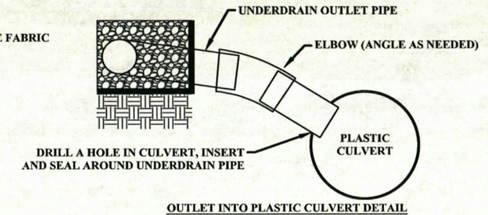
ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-62

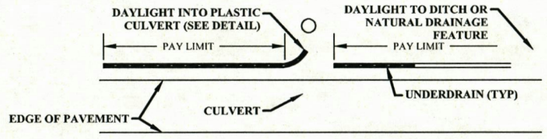


NOTE:
1) PLASTIC PIPE TO BE 4"Ø PERFORATED SDR 35.
2) GEOTEXTILE TO BE OVERLAPPED 24" AT JOINTS

CROSS SECTION



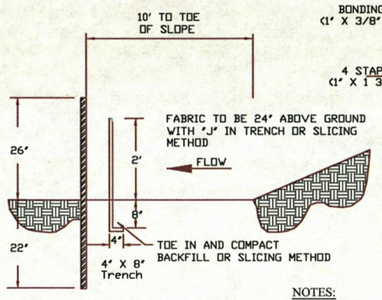
OUTLET INTO PLASTIC CULVERT DETAIL



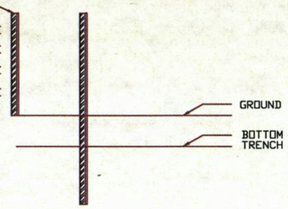
UNDER DRAIN MAY TAIL OUT AND END AT PIPE INLET LOCATION (SEE DETAIL B) ABOVE USE THIS DETAIL FOR METAL PIPE CULVERTS

PLAN VIEW

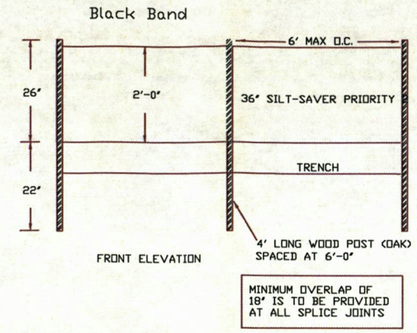
ROADWAY UNDERDRAIN
NOT TO SCALE



SIDE VIEW



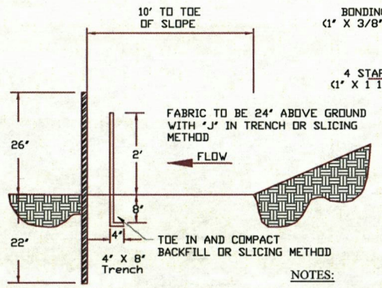
POST (OAK)
(1 1/8" X 1 1/8" X 48")



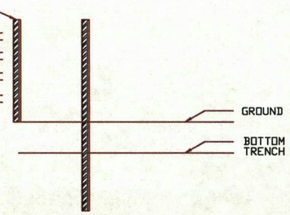
FRONT ELEVATION

NOTES:
1. POST HOLES MAY NEED TO BE DRILLED IN ROCKY SOIL OR AREAS WHERE CONVENTIONAL INSTALLATION IS DIFFICULT TO ACHIEVE REQUIRED DEPTH.
2. REPAIR DETAIL APPLIES TO BOTH SS-1 AND SS-2.

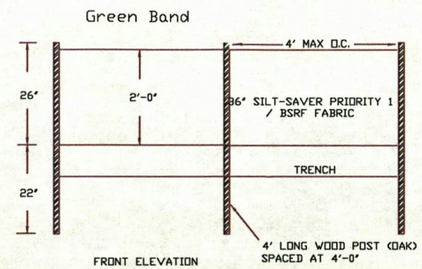
SILT SAVER SS-2 (BLACK BAND) SILT FENCE
NOT TO SCALE



SIDE VIEW



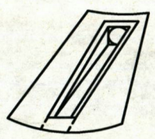
POST (OAK)
(1 3/4" X 1 1/4" X 48")



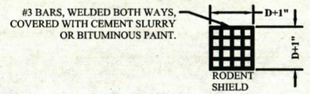
FRONT ELEVATION

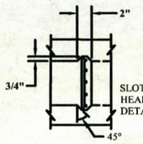
NOTES:
1. POST HOLES MAY NEED TO BE DRILLED IN ROCKY SOIL OR AREAS WHERE CONVENTIONAL INSTALLATION IS DIFFICULT TO ACHIEVE REQUIRED DEPTH.
2. REPAIR DETAIL APPLIES TO BOTH SS-1 AND SS-2.

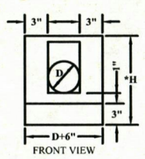
SILT SAVER SS-1 (GREEN BAND) SILT FENCE
NOT TO SCALE



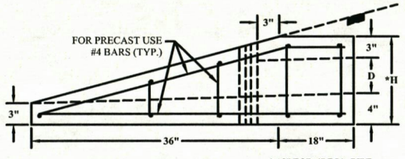
PERSPECTIVE VIEW







FRONT VIEW

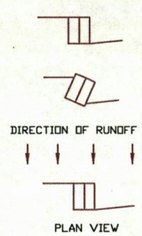


* 12" FOR 4" DIA. PIPE
15" FOR 6" DIA. PIPE
16" FOR 8" DIA. PIPE
18" FOR 10" DIA. PIPE

NOTES:
1. SLOPEWALL SHALL BE INSTALLED AT EACH LOCATION WHERE TRENCH DRAIN DAYLIGHTS.
2. THE SHIELD IS TO HAVE THE CAPABILITY OF BEING REMOVED AND REINSTALLED FOR MAINTENANCE OPERATIONS.

SLOPEWALL FOR DRAIN OUTLET DETAIL
NOT TO SCALE

ATTACHING TWO SILT FENCES WHEN TREACHING IS USED



PLACE THE END POST OF ONE FENCE INSIDE THE END POST OF THE OTHER FENCE

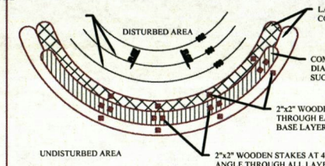
ROTATE BOTH POST AT LEAST 160° IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL

DRIVE BOTH POSTS ABOUT 12 INCHES INTO THE GROUND AND BURY THE FLAP IN A TRENCH

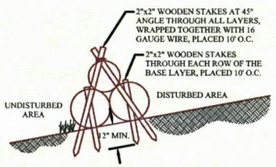
PLAN VIEW

NOTES:
1. POST HOLES MAY NEED TO BE DRILLED IN ROCKY SOIL OR AREAS WHERE CONVENTIONAL INSTALLATION IS DIFFICULT TO ACHIEVE REQUIRED DEPTH.
2. REPAIR DETAIL APPLIES TO BOTH SS-1 AND SS-2.

SILT SAVER SILT FENCE REPAIR
NOT TO SCALE



PLAN VIEW



SECTION VIEW

NOTES:
1. COMPOST FILTER SOCK TO BE INSTALLED IN ACCORDANCE WITH FILTREXX MANUFACTURER SPECIFICATIONS, OR AN APPROVED EQUAL AND THE COMPOST FILTER SOCK DETAIL CONTAINED IN THESE PLANS.
2. COMPOST FILTER SOCK SHALL NOT BE PLACED PER THE FOLLOWING:
   2.1. IN ANY AREA OF CONCENTRATED FLOW SUCH AS SWALES, DITCHES, CHANNELS, ETC.
   2.2. IN AREAS WHERE ROCK OR ROCKY SOILS PREVENT THE FULL AND UNIFORM ANCHORING.
   2.3. ACROSS THE ENTRANCE TO PIPES OR CULVERTS AND WILL NOT BE WRAPPED AROUND THE PRINCIPAL SPILLWAY STRUCTURES OF SEDIMENT TRAPS OF BASINS.
3. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8' UP SLOPE AT 45° TO THE MAIN SOCK ALIGNMENT.
4. COMPOST FILTER SOCK SHALL BE INSTALLED WITH LITTLE, IF ANY DISTURBANCE TO THE DOWNSLOPE SIDE OF THE COMPOST FILTER SOCK.
5. MINIMUM BASE WIDTH SHALL BE EQUAL TO THE HEIGHT OF THE STACKED COMPOST FILTER SOCK.
6. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
7. SOCKS SHALL BE INSPECTED AS DESCRIBED IN THE MAINTENANCE AND INSPECTION NOTES IN THE EROSION AND SEDIMENT CONTROL NOTES OF THESE PLANS. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
8. BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1YR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

STACKED COMPOST FILTER SOCK DETAIL
NOT TO SCALE

Antero Resources

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APPROVED FOR BIDS — BY: — DATE:
APPROVED FOR CONSTRUCTION — BY: — DATE:

EARTHRES ENGINEERING FOR SUCCESS™

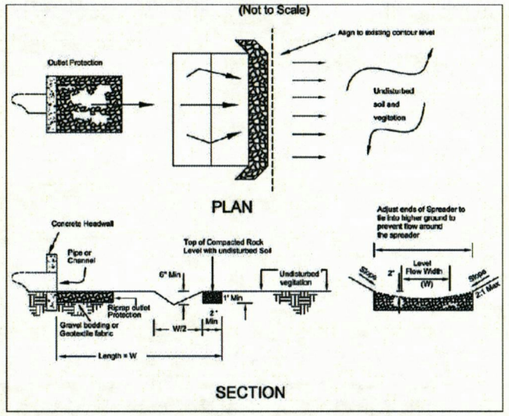
NO.	BY	DATE	DESCRIPTION
4	KRT	01/31/2019	PRELIMINARY DESIGN FOR PERMITTING
3	KRT	12/20/2018	PRELIMINARY DESIGN FOR REVIEW
2	KRT	11/14/2018	PRELIMINARY DESIGN FOR REVIEW

ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-63

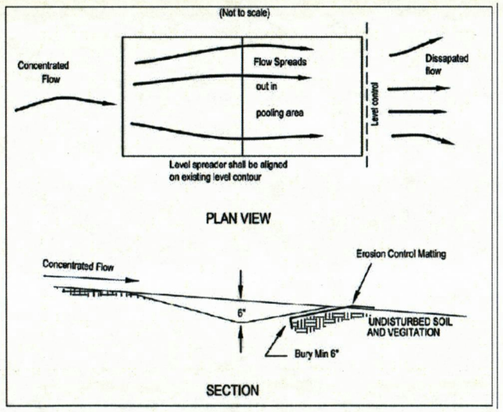
CAD FILE: P:\PROJECTS\Antero Resources\13102264 Hughes River Road\CAD\Drawings\Rev 01\13102264 HUGHES_RIVER_ROAD_MASTER_PRELIM_4945.dwg
PLOT DATE/TIME: 1/31/2019 2:16 PM

1. CONSTRUCT LEVEL SPREADER ON A LEVEL GRADE TO ENSURE UNIFORM SPREADING OF STORM RUNOFF.
2. LEVEL SPREADERS MUST BE CONSTRUCTED ON UNDISTURBED SOIL, NOT ON FILL.
3. THE LEVEL SPREADER MUST OUTLET TO EROSION-RESISTANT AREAS WITH ESTABLISHED EXISTING VEGETATION.
4. ROCK SHALL BE OF THE TYPE WHERE 50% OF THE MATERIAL BY WEIGHT IS LARGER THAN 6 INCHES, AND 85% OF THE MATERIAL BY WEIGHT IS LARGER THAN 3 INCHES BUT LESS THAN 12 INCHES.
5. ROCK IN LEVEL SPREADER SHALL BE COMPACTED WITH AT LEAST TWO PASSES OF HEAVY MACHINERY TO PREVENT FURTHER SETTLING. SPREAD GRAVEL OR SOIL OVER TOP OF THE PLACED RIPRAP SURFACE TO FILL THE VOIDS AND INTERLOCK THE RIPRAP TOGETHER.
6. FERTILIZING, SEEDING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPLICABLE VEGETATIVE SPECIFICATION.



RIGID LIP LEVEL SPREADER
NOT TO SCALE

1. CONSTRUCT LEVEL SPREADER ON A LEVEL GRADE TO ENSURE UNIFORM SPREADING OF STORM RUNOFF.
2. LEVEL SPREADERS MUST BE CONSTRUCTED ON UNDISTURBED SOIL, NOT ON FILL.
3. THE LEVEL SPREADER MUST OUTLET TO EROSION-RESISTANT AREAS WITH ESTABLISHED EXISTING VEGETATION.
4. VEGETATED LIP SPREADERS SHALL BE PROTECTED USING AN EROSION CONTROL BLANKET INSTALLED ACCORDING TO MANUFACTURES' RECOMMENDATIONS. THE BLANKET SHALL START A MINIMUM OF 4 FEET ABOVE THE LIP AND EXTEND AT LEAST 1 FOOT DOWNSTREAM OVER THE SPREADER LIP, SECURED WITH HEAVY-DUTY STAPLES AND THE DOWNSTREAM AND UPSTREAM ENDS BURIED AT LEAST 6 INCHES IN A VERTICAL TRENCH.
5. FERTILIZING, SEEDING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPLICABLE VEGETATIVE SPECIFICATION.



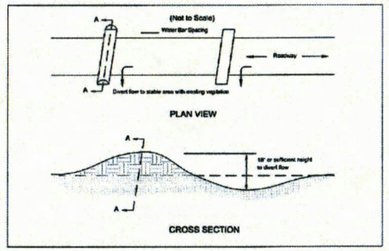
VEGETATED LEVEL SPREADER
NOT TO SCALE

1. THE MINIMUM WATER BAR DIMENSIONS SHALL BE:
   1.1. TOP WIDTH OF BERM/DIKE = 2 FEET MINIMUM.
   1.2. HEIGHT / DEPTH = 18 INCHES UNLESS OTHERWISE NOTED ON PLANS.
   1.3. SIDE SLOPES = SUFFICIENTLY FLAT TO ACCOMMODATE THE EXPECTED TRAFFIC.
2. THE SPACING BETWEEN WATER BARS SHALL BE AS NOTED:

TABLE II-3 WATER BAR SPACING

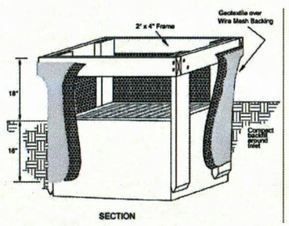
ROAD GRADE (%)	DISTANCE (FT.)	ROAD GRADE (%)	DISTANCE (FT.)
1	400	10	80
2	250	15	60
5	135	20	45

3. THE FIELD LOCATION SHALL BE ADJUSTED AS NEEDED TO PROVIDE A STABILIZED SAFE OUTLET.
4. THE DIVERTED RUNOFF SHALL BE DIRECTED ONTO AN UNDISTURBED VEGETATIVE AREA, TO A SETTLING TRAP OR BASIN OR TRAP IF CONTRIBUTING AREA IS STABLE.
5. DIVERSIONS / DIKES SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT DURING CONSTRUCTION.
6. THE WATER BARS SHALL BE ANGLED SLIGHTLY DOWN-SLOPE ACROSS THE CENTERLINE OF THE TRAVEL LANE.



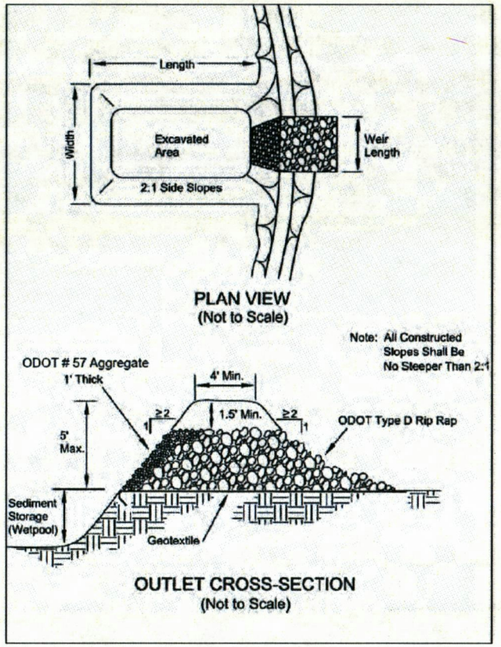
WATER BAR
NOT TO SCALE

1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UP-SLOPE LAND DISTURBANCE BEGINS OR BEFORE THE INLET BECOMES FUNCTIONAL.
2. THE EARTH AROUND THE INLET SHALL BE EXCAVATED COMPLETELY TO A DEPTH AT LEAST 18 INCHES.
3. THE WOODEN FRAME SHALL BE CONSTRUCTED OF 2-INCH BY 4-INCH CONSTRUCTION GRADE LUMBER. THE 2-INCH BY 4-INCH POSTS SHALL BE DRIVEN ONE (1) FOOT INTO THE GROUND AT THE FOUR CORNERS OF THE INLET AND THE TOP PORTION OF THE 2-INCH BY 4-INCH FRAME SHALL BE ASSEMBLED USING THE OVERLAP JOINT SHOWN. THE TOP OF THE FRAME SHALL BE AT LEAST 6 INCHES BELOW ADJACENT ROADS IF PONDED WATER WILL POSE A SAFETY HAZARD TO TRAFFIC.
4. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC WITH WATER FULLY IMPOUNDED AGAINST IT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY TO THE FRAME.
5. GEOTEXTILE MATERIAL SHALL HAVE AN EQUIVALENT OPENING SIZE OF 20-40 SIEVE AND BE RESISTANT TO SUNLIGHT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY. IT SHALL EXTEND FROM THE TOP OF THE FRAME TO 18 INCHES BELOW THE INLET NOTCH ELEVATION. THE GEOTEXTILE SHALL OVERLAP ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.
6. BACKFILL SHALL BE PLACED AROUND THE INLET IN COMPACTED 6-INCH LAYERS UNTIL THE EARTH IS EVEN WITH NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON SIDES.
7. A COMPACTED EARTH DIKE OR CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION. THE TOP OF THE DIKE SHALL BE AT LEAST 6 INCHES HIGHER THAN THE TOP OF THE FRAME.



GEOTEXTILE INLET PROTECTION
NOT TO SCALE

1. WORK SHALL CONSIST OF THE INSTALLATION, MAINTENANCE AND REMOVAL OF ALL SEDIMENT TRAPS AT THE LOCATIONS DESIGNATED ON THE DRAWINGS.
2. SEDIMENT TRAPS SHALL BE CONSTRUCTED TO THE DIMENSIONS SPECIFIED ON THE DRAWINGS AND OPERATIONAL PRIOR TO UP-SLOPE LAND DISTURBANCE.
3. THE AREA BENEATH THE EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF VEGETATION TO A MINIMUM DEPTH OF SIX (6) INCHES. THE POOL SHALL BE CLEARED AS NEEDED TO FACILITATE SEDIMENT CLEAN-OUT.
4. FILL USED FOR THE EMBANKMENT SHALL BE EVALUATED TO ASSURE ITS SUITABILITY AND IT MUST BE FREE OF ROOTS OR OTHER WOODY VEGETATION, LARGE ROCKS, ORGANICS OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL SHALL BE PLACED IN SIX (6) INCH LIFTS AND SHALL BE COMPACTED BY TRAVERSING WITH A SHEEPSFOOT OR OTHER APPROVED COMPACTION EQUIPMENT. FILL HEIGHT SHALL BE INCREASED FIVE (5) PERCENT TO ALLOW FOR STRUCTURE / FOUNDATION SETTLEMENT. CONSTRUCTION SHALL NOT BE PERMITTED IF EITHER THE EARTH FILL OR COMPACTION SURFACE IS FROZEN.
5. THE MAXIMUM HEIGHT OF EMBANKMENT SHALL BE FIVE (5) FEET. ALL CUT AND FILL SLOPES SHALL BE 2:1 (H:V) OR FLATTER.
6. A MINIMUM STORAGE VOLUME BELOW THE CREST OF THE OUTLET OF 67 CY YD FOR EVERY ACRE OF CONTRIBUTING DRAINAGE AREA SHALL BE ACHIEVED AT EACH LOCATION NOTED ON THE DRAWINGS WITH ADDITIONAL SEDIMENT STORAGE VOLUME PROVIDED BELOW THIS ELEVATION.
7. TEMPORARY SEEDING SHALL BE ESTABLISHED AND MAINTAINED OVER THE USEFUL LIFE OF THE PRACTICE.
8. THE OUTLET FOR THE SEDIMENT TRAP STRUCTURE SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN ON THE DRAWINGS.
9. THE OUTLET SHALL BE CONSTRUCTED USING THE MATERIALS SPECIFIED ON THE DRAWINGS. WHERE GEOTEXTILE IS USED, ALL OVERLAPS SHALL BE A MINIMUM OF TWO (2) FEET OR AS SPECIFIED BY THE MANUFACTURER, WHICHEVER IS GREATER. ALL OVERLAPS SHALL BE MADE WITH THE UPPER MOST LAYER PLACED LAST. GEOTEXTILE SHALL BE KEYED IN AT LEAST 6" ON THE UPSTREAM SIDE OF THE OUTLET.
10. WARNING SIGNS AND SAFETY FENCE SHALL BE PLACED AROUND THE TRAPS AND MAINTAINED OVER THE LIFE OF THE PRACTICE.
11. AFTER ALL SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, THE STRUCTURE AND ALL ASSOCIATED SEDIMENT SHALL BE REMOVED. STABILE EARTH MATERIALS SHALL BE PLACED IN THE SEDIMENT TRAP AREA AND COMPACTED. THE AREA SHALL BE GRADED TO BLEND IN WITH ADJOINING LAND SURFACES AND HAVE POSITIVE DRAINAGE. THE AREA SHALL BE IMMEDIATELY SEEDED.



SEDIMENT TRAPS
NOT TO SCALE

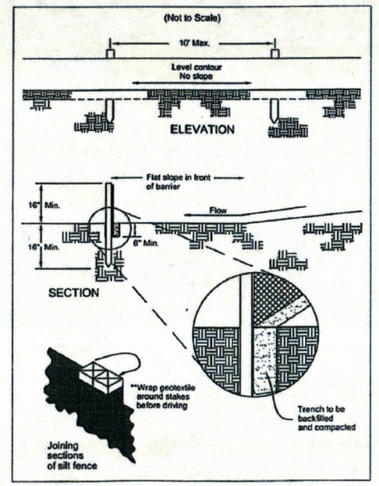
1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UP-SLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS THAT MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. ENDS OF THE SILT FENCES SHALL BE TURNED UP-SIOPE SLIGHTLY SO THAT WATER PONDED BY THE SILT FENCE WILL BE PREVENTED FROM FLOWING AROUND THE ENDS.
4. SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UP-SLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE RE-ESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
6. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
7. SILT FENCE SHALL BE PLACED IN AN EXCAVATED OR SLICED TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE MADE WITH A TRENCHER, CABLE LAYING MACHINE, SLICING MACHINE, OR OTHER SUITABLE DEVICE THAT WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
8. SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWN-SLOPE SIDE OF THE GEOTEXTILE. A MINIMUM OF 8 INCHES OF GEOTEXTILE MUST BE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6-INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED ON BOTH SIDES OF THE FABRIC.
9. SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM 6-IN. OVERLAP PRIOR TO DRIVING INTO THE GROUND (SEE DETAILS).
10. MAINTENANCE - SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSED FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER THE FABRIC OR AROUND THE FENCE ENDS, OR IN ANY OTHER WAY ALLOWS A CONCENTRATED FLOW DISCHARGE, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 3) OTHER PRACTICES SHALL BE INSTALLED.
11. SEDIMENT DEPOSITS SHALL BE ROUTINELY REMOVED WHEN THE DEPOSIT REACHES APPROXIMATELY ONE-HALF OF THE HEIGHT OF THE SILT FENCE.
12. SILT FENCES SHALL BE INSPECTED AFTER EACH RAINFALL AND AT LEAST DAILY DURING A PROLONGED RAINFALL. THE LOCATION OF EXISTING SILT FENCE SHALL BE REVIEWED DAILY TO ENSURE ITS PROPER LOCATION AND EFFECTIVENESS. IF DAMAGED, THE SILT FENCE SHALL BE REPAIRED IMMEDIATELY.

CRITERIA FOR SILT FENCE MATERIALS

1. FENCE POST - THE LENGTH SHALL BE A MINIMUM OF 32 INCHES. WOOD POSTS WILL BE 2-BY-2-IN. NOMINAL DIMENSIONED HARDWOOD OF SOUND QUALITY. THEY SHALL BE FREE OF KNOTS, SPLITS AND OTHER VISIBLE IMPERFECTIONS THAT WILL WEAKEN THE POSTS. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT. POSTS SHALL BE DRIVEN A MINIMUM 16 INCHES INTO THE GROUND, WHERE POSSIBLE. IF NOT POSSIBLE, THE POSTS SHALL BE ADEQUATELY SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT / WATER LOADING.
2. SILT FENCE FABRIC - SEE CHART BELOW.

Table 6.3.2 MINIMUM CRITERIA FOR SILT FENCE FABRIC (ODOT 2002)

FABRIC PROPERTIES	VALUES	TEST METHOD
MINIMUM TENSILE STRENGTH	120 LBS.	ASTM D 4632
MAXIMUM ELONGATION AT 60 LBS.	50%	ASTM D 4632
MINIMUM PUNCTURE STRENGTH	50 LBS.	ASTM D 4833
MINIMUM TEAR STRENGTH	40 LBS.	ASTM D 4533
APPARENT OPENING SIZE	<0.84 mm	ASTM D 4751
MINIMUM PERMITTIVITY	1x10-2 sec.-1	ASTM D 4491
UV EXPOSURE STRENGTH RETENTION	70%	ASTM G 4355



SILT FENCE
NOT TO SCALE

Antero Resources

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NO.	BY	DATE	DESCRIPTION
4	KRE	01/21/2019	PRELIMINARY DESIGN FOR PERMITTING
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1	BY	DATE	DESCRIPTION

APPROVED FOR PERMITS
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ANTERO RESOURCES
SOUTH FORK OF HUGHES RIVER
ROAD IMPROVEMENT PRELIMINARY DESIGN
FOR WEST VIRGINIA

SHEET No.
C-64

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