

# Commercial/Industrial Floodplain Development Permit

## Doddridge County, WV Floodplain Management

This permit has been issued to **Antero Resources**, and is for the approved commercial and/or industrial development project associated with this permit 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: #14-259 ~ Antero Resources ~ Kuhl Well Pad**

**Date Approved: 08/14/2014**

**Expires: N/A**

**Issued to: Antero Resources**

**POC: Emily Kijowski  
303-357-7310**

**Company Address: 1615 Wynkoop Street  
Denver, CO 80202**

**Project Address: West Union District  
Lat/Long: 39.266960N/80.651508W**

**Purpose of development: Well pad construction. Project does not impact floodplain.**

**Issued by: Edwin D. "Bo" Wriston, Doddridge County FPM (or designee)**

**Date: 08/14/2014**

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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

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Legal Advertisement:  
Doddridge County  
Floodplain Permit Application

Please take notice that on the 13<sup>th</sup> day of August, 2014

**Antero Resources**

filed an application for a Floodplain Permit to develop land located at or about:

**West Union District**

**39.266960N/80.651508W**

**Permit #14-259 Kuhl Well Pad**

(Note: This project is not within the floodplain)

The Application is on file with the Clerk of the County Court and may be inspected or copied during regular business hours. As this project is outside the FEMA identified floodplain of Doddridge County, Doddridge County Floodplain Management has no regulatory authority.

Any interested persons who desire to comment shall present the same in writing by **September 8, 2014**, delivered to:

Clerk of the County Court

118 E. Court Street, West Union, WV 26456

Beth A Rogers, Doddridge County Clerk

Edwin L. "Bo" Wriston. Doddridge County Flood Plain Manager

#14-259



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

August 11, 2014

Doddridge County Commission  
Attn: Bo Wriston, Doddridge County Floodplain Manager  
118 East Court Street, Room 102  
West Union, WV 26456

Mr. Wriston:

Antero Resources Appalachian Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for our Kuhl Well Pad. Our project is located in Doddridge County, West Union District and per FIRM map #54017C0145C this location is not within the floodplain.

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- Kuhl Construction Plans
- FIRM Map
- WV Flood Tool Map

If you have any questions please feel free to contact me at (303) 357-7232.

Thank you in advance for your consideration.

Sincerely,

Emily Kijowski  
Permit Representative  
Antero Resources Appalachian Corporation

Enclosures

DEPT. OF ENGINEERS  
 COUNTY CLERK  
 DODDRIDGE COUNTY, WV  
 2014 AUG 13 PM 2:10  
 FILED

# DODDRIDGE COUNTY FLOODPLAIN DEVELOPMENT PERMIT APPLICATION

## 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. Development shall not be used or occupied until a Certificate of Compliance is issued.
5. The permit will expire if no work is commenced within six months of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
7. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
8. **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 \_\_\_\_\_



DATE August 11, 2014

## SECTION 2: PROPOSE DEVELOPMENT (TO BE COMPLETED BY APPLICANT).

**IF THE APPLICANT IS NOT A NATURAL PERSON, THE NAME, ADDRESS, AND TELEPHONE NUMBER OF A NATURAL PERSON WHO SHALL BE APPOINTED BY THE APPLICANT TO RECEIVE NOTICE PURSUANT TO ANY PROVISION OF THE CURRENT DODDRIDGE COUNTY FLOODPLAIN ORDINANCE.**

**APPLICANT'S NAME:** Antero Midstream LLC - Randy Kloberdanz,

**ADDRESS:** 1615 Wynkoop Street, Denver, CO 80202

**TELEPHONE NUMBER:** Contact Emily Kijowski: (303)-357-7232

**BUILDER'S NAME:** Antero Midstream LLC  
**ADDRESS:** 1615 Wynkoop Strett, Denver, CO 80202  
**TELEPHONE NUMBER:** (303)-357-7310

**ENGINEER'S NAME:** Navitus Energy Engineering  
**ADDRESS:** 230 Executive Drive, Suite 122, Cranberry Township, PA 16066  
**TELEPHONE NUMBER:** (888)-622-4185

**PROJECT LOCATION:**

**NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Please see Property Owner Table

**ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Please see Property Owner Table

**DISTRICT:** \_\_\_\_\_

**DATE/FROM WHOM PROPERTY**

**PURCHASED:** \_\_\_\_\_

**LAND BOOK DESCRIPTION:** Please see Property Owner Table

**DEED BOOK REFERENCE:** Please see Property Owner Table

**TAX MAP REFERENCE:** Please see Property Owner Table

**EXISTING BUILDINGS/USES OF PROPERTY:** None

**NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY** Please see Property Owner Table

**ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY** Please see Property Owner Table

To avoid delay in processing the application, please provide enough information to easily identify the project location.

**DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)**

**A. STRUCTURAL DEVELOPMENT**

**ACTIVITY**

**STRUCTURAL TYPE**

- |                                     |                         |                          |                                  |
|-------------------------------------|-------------------------|--------------------------|----------------------------------|
| <input checked="" type="checkbox"/> | New Structure           | <input type="checkbox"/> | Residential (1 – 4 Family)       |
| <input type="checkbox"/>            | Addition                | <input type="checkbox"/> | Residential (more than 4 Family) |
| <input type="checkbox"/>            | Alteration              | <input type="checkbox"/> | Non-residential (floodproofing)  |
| <input type="checkbox"/>            | Relocation              | <input type="checkbox"/> | Combined Use (res. & com.)       |
| <input type="checkbox"/>            | Demolition              | <input type="checkbox"/> | Replacement                      |
| <input type="checkbox"/>            | Manufactured/Mobil Home |                          |                                  |

**B. OTHER DEVELOPMENT ACTIVITIES:**

- |                          |      |                          |        |                          |          |                          |            |
|--------------------------|------|--------------------------|--------|--------------------------|----------|--------------------------|------------|
| <input type="checkbox"/> | Fill | <input type="checkbox"/> | Mining | <input type="checkbox"/> | Drilling | <input type="checkbox"/> | Pipelining |
|--------------------------|------|--------------------------|--------|--------------------------|----------|--------------------------|------------|
- Grading
- Excavation (except for STRUCTURAL DEVELOPMENT checked above)
- Watercourse Altercation (including dredging and channel modification)
- Drainage Improvements (including culvert work)
- Road, Street, or Bridge Construction
- Subdivision (including new expansion)
- Individual Water or Sewer System
- Other (please specify)
- 

**C. STANDARD SITE PLAN OR SKETCH**

1. SUBMIT ALL STANDARD SITE PLANS, IF ANY HAVE BEEN PREPARED.
2. IF STANDARD SITE PLANS HAVE NOT BEEN PREPARED:  
SKETCH ON A SEPARATE 8 ½ X 11 INCH SHEET OF PAPER THE SHAPE AND LOCATION OF THE LOT. SHOW THE LOCATION OF THE INTENDED CONSTRUCTION OR LAND USE INDICATING BUILDING SETBACKS, SIZE & HEIGHT. IDENTIFY EXISTING BUILDINGS, STRUCTURES OR LAND USES ON THE PROPERTY.
3. SIGN AND DATE THE SKETCH.

**ACTUAL TOTAL CONSTRUCTION COSTS OF THE COMPLETE DEVELOPMENT IRRESPECTIVE OF WHETHER ALL OR ANY PART OF THE SUBJECT PROPOSED CONSTRUCTION PROJECT IS WITHIN THE FLOODPLAIN \$ N/A - Location is not within the floodplain**

**D. ADJACENT AND/OR AFFECTED LANDOWNERS:**

**1. NAME AND ADDRESS OF ALL OWNERS OF SURFACE TRACTS ADJACENT TO THE AREA OF THE SURFACE TRACT (UP & DOWN STREAM) UPON WHICH THE PROPOSED ACTIVITY WILL OCCUR AND ALL OTHER SURFACE OWNERS UP & DOWN STREAM) WHO OWN PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY (IF ONE HAS BEEN COMPLETED).**

**NAME:** N/A-No properties sharing an  
**ADDRESS:** immediate and common boundary  
up or down stream due to the  
location not being in floodplain

**NAME:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_

**NAME:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_

**NAME:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_

**1. NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON ANY ADJACENT PROPERTY AT THE TIME THE FLOODPLAIN PERMIT APPLICATION IS FILED AND THE NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN ANY HOME ON ANY PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY.**

**NAME:** N/A-No properties sharing an  
**ADDRESS:** immediate and common boundary  
up or down stream due to the  
location not being in floodplain

**NAME:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_

**NAME:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_

**NAME:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_

**E. CONFIRMATION FORM**

**THE APPLICANT ACKNOWLEDGES, AGREES, AND CONFIRMS THAT HE/IT WILL PAY WITHIN 30 DAYS OF RECEIPT OF INVOICE BY THE COUNTY FOR ALL EXPENSES RELATIVE TO THE PERMIT APPLICATION PROCESS GREATER THAN THE REQUIRED DEPOSIT FOR EXPENSES INCLUDING:**

- (A) PERSONAL SERVICE OF PROCESS BY THE DODDRIDGE COUNTY SHERIFF AT THE RATES PERMITTED BY LAW FOR SUCH SERVICE.
- (B) SERVICE BY CERTIFIED MAIL RETURN RECEIPT REQUESTED.
- (C) PUBLICATION.

- (D) COURT REPORTING SERVICES AT ANY HEARINGS REQUESTED BY THE APPLICANT.  
(E) CONSULTANTS AND/OR HEARING EXPERTS UTILIZED BY DODDRIDGE COUNTY FLOODPLAIN ADMINISTRATOR/MANAGER OR FLOODPLAIN APPEALS BOARD FOR REVIEW OF MATERIALS AND/OR TESTIMONY REGARDING THE EFFICACY OF GRANTING OR DENYING THE APPLICANT'S FLOODPLAIN PERMIT.

NAME (PRINT):



SIGNATURE: \_\_\_\_\_

DATE: August 11, 2014

After completing SECTION 2, APPLICANT should submit form to Floodplain Administrator/Manager or his/her representative for review.

**SECTION 3: FLOODPLAIN DETERMINATION (to be completed by Floodplain Administrator/Manager or his/her representative)**

**THE PROPOSED DEVELOPMENT:**

THE PROPOSED DEVELOPMENT IS LOCATED ON:

FIRM Panel: \_\_\_\_\_

Dated: \_\_\_\_\_

Is **NOT** located in a Specific Flood Hazard Area (Notify applicant that the application review is complete and **NO FLOODPLAIN DEVELOPMENT PERMIT IS REQUIRED**).

Is located in Special Flood Hazard Area.

FIRM zone designation \_\_\_\_\_

100-Year flood elevation is: \_\_\_\_\_ NGVD (MSL)

Unavailable

The proposed development is located in a floodway.

FBFM Panel No. \_\_\_\_\_

Dated \_\_\_\_\_

See section 4 for additional instructions.



SIGNED \_\_\_\_\_

DATE \_\_\_\_\_

**SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by  
Floodplain Administrator/Manager or his/her representative)**

The applicant must submit the documents checked below before the application can be processed.

- A plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions and proposed development.
  
- Development plans, drawn to scale, and specifications, including where applicable: details for anchoring structures, storage tanks, proposed elevation of lowest floor, (including basement or crawl space), types of water resistant materials used below the first floor, details of flood proffing of utilities located below the first floor and details of enclosures below the first floor. Also \_\_\_\_\_  
\_\_\_\_\_
  
- Subdivision or other development plans (If the subdivision or development exceeds 50 lots or 5 acres, whichever is the lesser, the applicant must provide 100-year flood elevations if they are not otherwise available).
  
- Plans showing the extent of watercourse relocation and/or landform alterations.
  
- Top of new fill elevation \_\_\_\_\_ Ft. NGVD (MSL).  
For floodproofing structures applicant must attach certification from registered engineer or architect.
  
- Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood. A copy of all data and calculations supporting this finding must also be submitted.
  
- Manufactured homes located in a floodplain area must have a West Virginia Contractor's License and a Manufactured Home Installation License as required by the Federal Emergency Management Agency (FEMA).

Other:

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**SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Administrator/Manager or his/her representative)**

I have determined that the proposed activity **(type is or is not)** in conformance with provisions of the Floodplain Ordinance adopted by the County Commission of Doddridge County on May 21, 2013. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_

If the Floodplain Administrator/Manager found that the above was not in conformance with the provisions of the Doddridge County Floodplain Ordinance and/or denied that application, the applicant may complete an appealing process below.

APPEALS: Appealed to the County Commission of Doddridge County?  Yes  No

Hearing Date: \_\_\_\_\_

County Commission Decision - Approved  Yes  No

CONDITIONS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Compliance is issued).**

The following information must be provided for project structures. This section must be completed by a registered professional engineer or a licensed land surveyor (or attach a certification to this application).

COMPLETE 1 OR 2 BELOW:

- 1 Actual (As-Built) Elevation of the top of the lowest floor (including basement or crawl space is \_\_\_\_\_ FT. NGVD (MSL)
- 2 Actual (As Built) elevation of floodproofing is \_\_\_\_\_ FT. NGVD (MSL)

**Note: Any work performed prior to submittal of the above information is at risk of the applicant.**

**SECTION 7: COMPLIANCE ACTION (To be completed by the Floodplain Administrator/Manager or his/her representative).**

The Floodplain Administrator/Manager or his/her representative will complete this section as applicable based on inspection of the project to ensure compliance with the Doddridge County Floodplain Ordinance.

**INSPECTIONS:**

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
DEFICIENCIES ?      Y/N

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 8: CERTIFICATE OF COMPLIANCE (To be completed by Floodplain Administrator/Manager or his/her representative).**

Certificate of Compliance issued: DATE: \_\_\_\_\_ BY: \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE  
FOR DEVELOPMENT IN SPECIAL FLOOD HAZARD AREA  
(OWNER MUST RETAIN)**

**PERMIT NUMBER:** \_\_\_\_\_

**PERMIT DATE:** \_\_\_\_\_

**PURPOSE –**

**CONSTRUCTION LOCATION:** \_\_\_\_\_

**OWNER'S ADDRESS:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

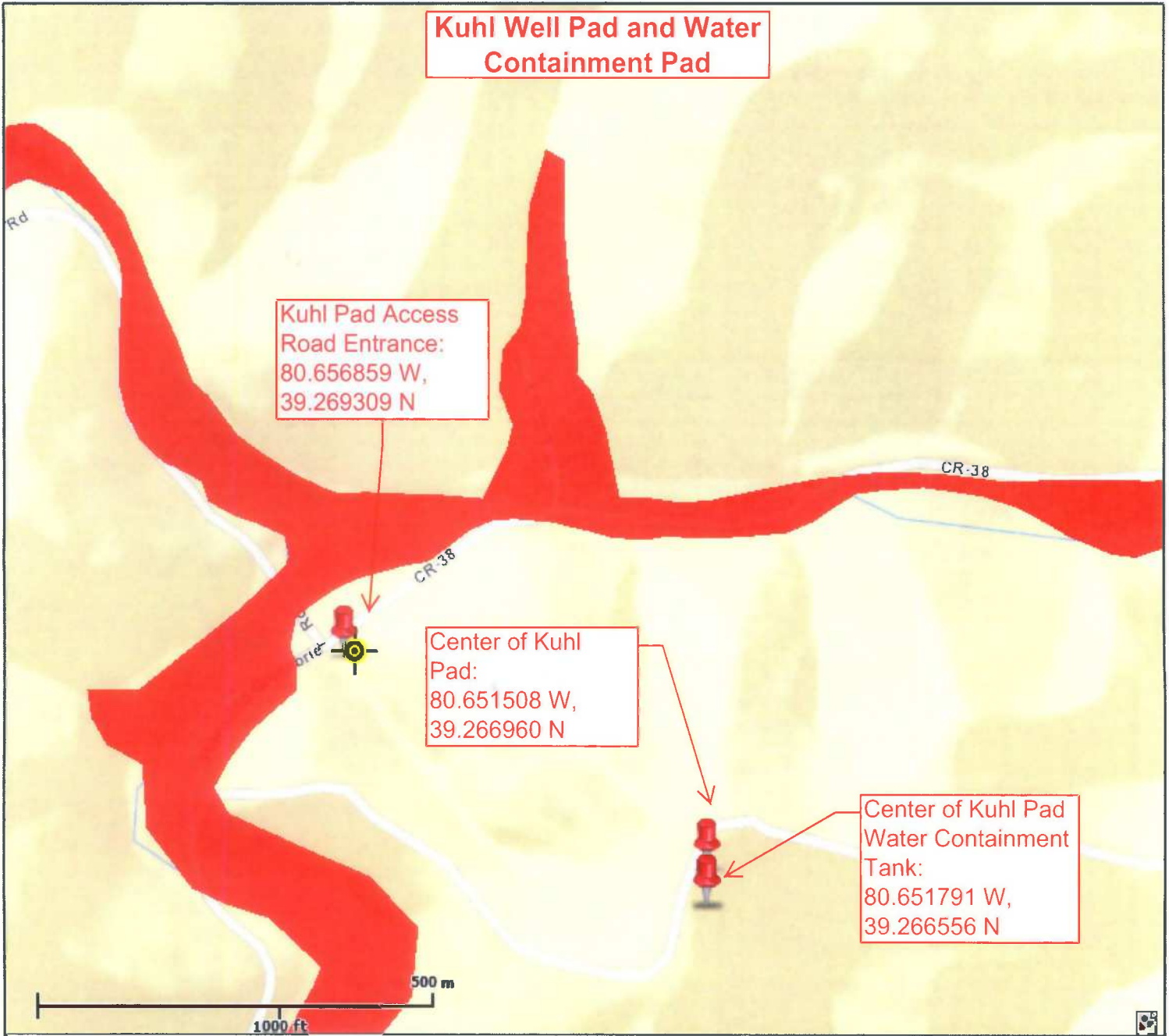
**THE FOLLOWING MUST BE COMPLETED BY THE FLOODPLAIN  
ADMINISTRATOR/MANAGER OR HIS/HER AGENT.**

**COMPLIANCE IS HEREBY CERTIFIED WITH THE REQUIREMENT OF THE  
FLOODPLAIN ORDINANCE ADOPTED BY THE COUNTY COMMISSION OF  
DODDRIDGE COUNTY ON MAY 21, 2013.**

**SIGNED** \_\_\_\_\_ **DATE** \_\_\_\_\_

# WV Flood Map

## Kuhl Well Pad and Water Containment Pad




Kuhl Pad Access  
Road Entrance:  
80.656859 W,  
39.269309 N


Center of Kuhl  
Pad:  
80.651508 W,  
39.266960 N

Center of Kuhl Pad  
Water Containment  
Tank:  
80.651791 W,  
39.266556 N

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 8/11/2014

 Location of the mouse click

 **Flood Hazard Zone**  
(1% annual chance floodplain)

**User Notes:**

**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. To obtain more detailed information in areas where Base Flood Elevations have been determined, users are encouraged to consult the latest Flood Profile data contained in the official flood insurance study. These studies are available online at [www.msc.fema.gov](http://www.msc.fema.gov).

WV Flood Tool is supported by FEMA, WV NFIP Office, and WV GIS Technical Center  
(<http://www.MapWV.gov/flood>)

**Flood Hazard Area:**  
Elevation: About 881 feet  
Location (long, lat): 80.656709 W, 39.269127 N  
Location (UTM 17N): (529613, 4346699)  
FEMA Issued Flood Map: 54017C0145C  
Contacts: Doddridge County  
CRS Information: N/A  
Parcel Number:

STATE OF WEST VIRGINIA,  
COUNTY OF DODDRIDGE, TO WIT

I, Virginia Nicholson, Editor of THE  
HERALD RECORD, a weekly newspaper  
published regularly, in Doddridge County,  
West Virginia, Do Hereby Certify  
That the Accompanying Legal Notice  
Entitled:

*Floodplain Permit*  
*Application*  
*Permit # 14-259*

was published in said paper for . . . . . 2 . . . . .

successive weeks beginning with the issue  
of . . . . . *August 19<sup>th</sup>* . . . . . 2014 and  
ending with the issue of

. . . . . *August 26<sup>th</sup>* . . . . . 2014 and

that said notice contains . . . . . *189* . . . . .

WORD SPACE at . . . . . *115* . . . . . cents a word

amounts to the sum of \$ . . . . . *21174* . . . . .

FOR FIRST PUBLICATION, SECOND  
PUBLICATION IS 75% OF THE FIRST  
PUBLICATION

\$ . . . . . *1631* . . . . .  
and each publication thereafter

\$ . . . . . *3805* . . . . . TOTAL

EDITOR

*Virginia Nicholson*

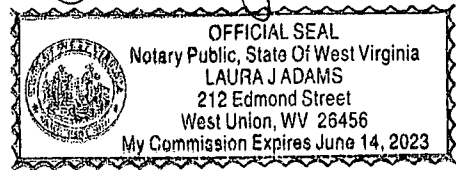
SWORN TO AND SUBSCRIBED

BEFORE ME THIS THE . . . . . *28<sup>th</sup>* . . . . . DAY

OF . . . . . *August* . . . . . 2014

NOTARY PUBLIC

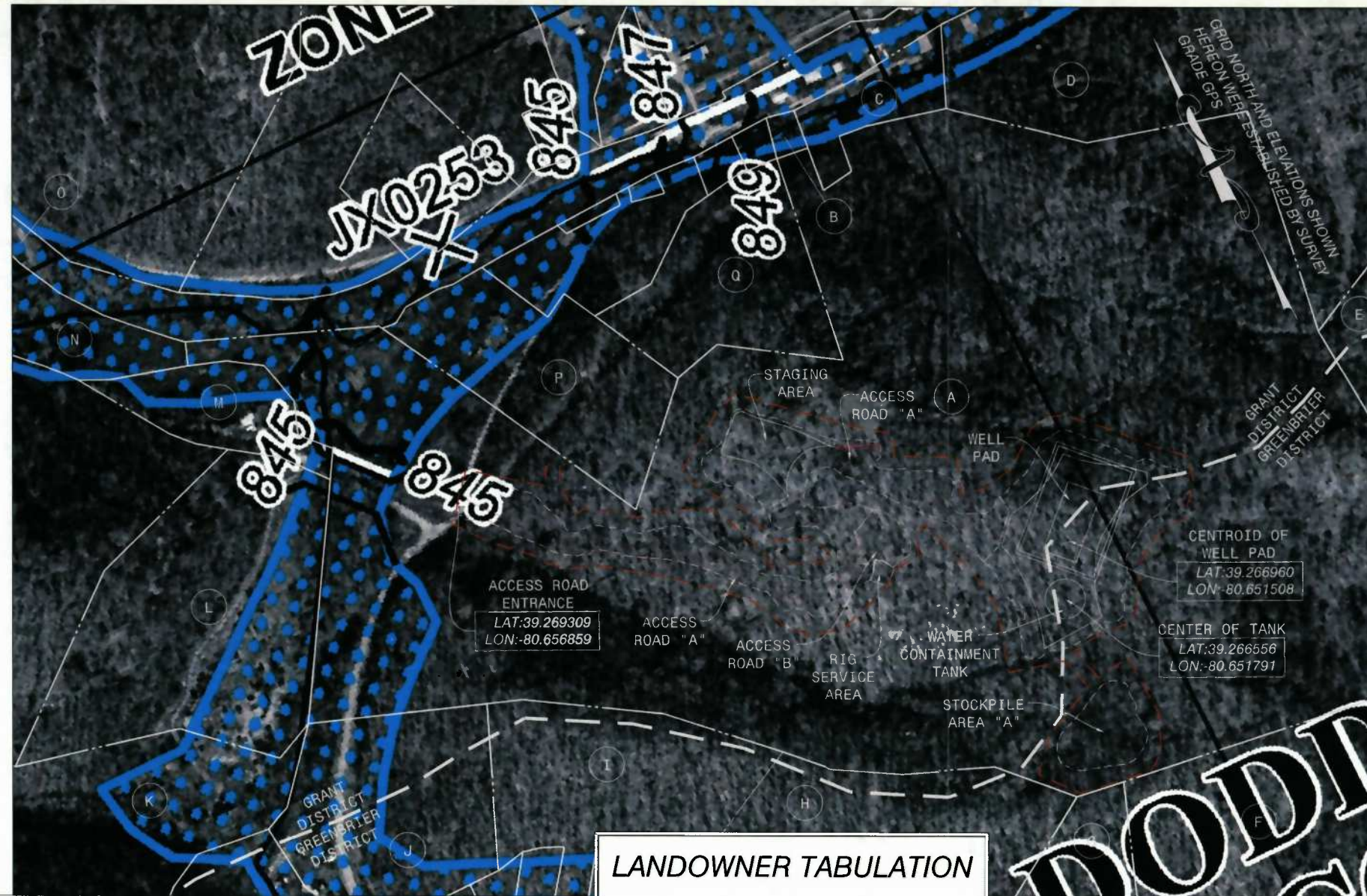
*Laura J Adams*



LEGAL ADVERTISEMENT:  
Doddridge County  
Floodplain Permit Application  
Please take notice that on the 31<sup>st</sup> day of August, 2014,  
Antero Resources filed an application for a Floodplain  
Permit to develop land located at or about: West Union  
District: 39 266960N/80 651508W Permit # 14-259 Kuhl  
Well Pad (Note: This project is not within the floodplain)  
The Application is on file with the Clerk of the County  
Court and may be inspected or copied during regular  
business hours. As this project is outside the FEMA  
identified floodplain of Doddridge County, Doddridge  
County Floodplain Management has no regulatory  
authority. Any interested persons who desire to comment  
shall present the same in writing by September 8, 2014.  
Delivered to the  
Clerk of the County Court  
118 E. Court Street, West Union, WV 26456  
Beth A. Rogers, Doddridge County Clerk  
Edwin L. Bo, West Union, Doddridge County Flood Plain  
Manager  
8-19-21b



# FIRM EXHIBIT



PANEL 0145C

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**DODDRIDGE COUNTY,**  
**WEST VIRGINIA**  
**AND INCORPORATED AREAS**

PANEL 145 OF 325  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0145	C

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
54017C0145C  
**MAP REVISED**  
OCTOBER 4, 2011

Federal Emergency Management Agency



**FLOODPLAIN NOTE**  
 THE PROPOSED SITE IS LOCATED IN FLOOD ZONE "X" PER FEMA MAP NUMBER #54017C0145C.

## LANDOWNER TABULATION

<b>A</b> TM 20-48 SPERRY HARDWOODS, INC HALCYON KUHL, ET AL DB 264 PG 138 DB 125 PG 155 98.26 ACRES 150 S. WEBB ST. NEWARK, OH 43055 P.O. BOX 289 BRISTOL, WV 26426	<b>D</b> TM 20-40 GUSS T. & MERELENE N. KELLEY DB 187 PG 653 18.96 ACRES RT 1 BOX 411 SALEM, WV 26426	<b>G</b> TM 3-4 GREGORY L. KELLEY DB 275 PG 188 39 ACRES RT 1 BOX 414 SALEM, WV 26426	<b>J</b> TM 1-4 WILLIAM G. & DEBORAH K. THOMPSON DB 251 PG 304 6.48 ACRES NO ADDRESS	<b>M</b> TM 20-36 DREMIA K. MILLER WB 042 PG 534 2.5 ACRES RT 1 BOX 425A SALEM, WV 26426	<b>P</b> TM 20-31 RODNEY L. & ESTIE V. DAVIS DB 209 PG 304 7 ACRES 14001 GREEN ROAD GLYNDON, MD 21071
<b>B</b> TM 20-39 BERNARD E. LATTEA DB 249 PG 234 0.25 ACRES RT 1 BOX 434A SALEM, WV 26426	<b>E</b> TM 1-26 GUSS T. & MERELENE N. KELLEY DB 187 PG 653 27.7 ACRES RT 1 BOX 411 SALEM, WV 26426	<b>H</b> TM 1-24 DANIEL K. & LISA A. JOZWICK DB 282 PG 666 20.25 ACRES RT 1 BOX 421 SALEM, WV 26426	<b>K</b> TM 20-46 MICHAEL J. & SUSAN LORUSSO DB 282 PG 043 42 ACRES RT 1 BOX 425 SALEM, WV 26426	<b>N</b> TM 20-30 PAULINE F. SHARPES DB 261 PG 14 75.33 ACRES RT 1 BOX 426 SALEM, WV 26426	<b>Q</b> TM 20-37 CALEB C. & TONYA J. LLOYD DB 283 PG 223 5.92 ACRES RT 1 BOX 433A SALEM, WV 26426
<b>C</b> TM 20-48.1 PAUL D. WILLIAMSON WB 46 PG 441 1.58 ACRES RT 1 BOX 435 SALEM, WV 26426	<b>F</b> TM 3-6 GUSS T. & MERELENE N. KELLEY DB 176 PG 473 123.45 ACRES RT 1 BOX 411 SALEM, WV 26426	<b>I</b> TM 1-25 RICHARD THOMPSON ESTATE DB 81 PG 30 7 ACRES RT 1 BOX 424 SALEM, WV 26426	<b>L</b> TM 20-36.1 MICHAEL J. & SUSAN LORUSSO DB 282 PG 43 11.59 ACRES RT 1 BOX 425 SALEM, WV 26426	<b>O</b> TM 20-60 WV RAILROAD MAINTENANCE AUTHORITY DB 216 PG 166 26.24 ACRES P.O. BOX 470 MOOREFIELD, WV 26836	

**NAVITUS**  
ENERGY ENGINEERING

REVISION	DATE

**Antero**

THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

FIRM EXHIBIT  
**KUHL**  
WELL PAD & WATER CONTAINMENT PAD  
GRANT & GREENBRIER DISTRICTS  
DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 06/12/2014  
 SCALE: 1" = 200'  
 SHEET 21 OF 21



# KUHL WELL PAD & WATER CONTAINMENT PAD SITE DESIGN & CONSTRUCTION PLAN, EROSION & SEDIMENT CONTROL PLANS

GRANT & GREENBRIER DISTRICTS, DODDRIDGE COUNTY, WEST VIRGINIA  
BUCKEYE CREEK WATERSHED

USGS 7.5 BIG ISAAC, NEW MILTON, SALEM, & SMITHBURG QUAD MAPS



WEST VIRGINIA STATE PLANE COORDINATE SYSTEM  
NORTH MIDDLE MERIDIAN  
ELEVATION BASED ON NAVD83  
ESTABLISHED BY SURVEY GRADE GPS & OPUS  
POST-PROCESSING

**LOCATION COORDINATES**

ACCESS ROAD ENTRANCE  
LATITUDE: 39.269309 LONGITUDE: -80.656859 (NAD 83)  
N 4346718.92 E 529600.21 (UTM ZONE 17 METERS)

CENTROID OF WELL PAD  
LATITUDE: 39.266960 LONGITUDE: -80.651508 (NAD 83)  
N 4346459.96 E 530062.68 (UTM ZONE 17 METERS)

CENTER OF WATER CONTAINMENT TANK  
LATITUDE: 39.286556 LONGITUDE: -80.651791 (NAD 83)  
N 4346414.99 E 530038.61 (UTM ZONE 17 METERS)

**GENERAL DESCRIPTION**

THE ACCESS ROAD(S), WELL PAD, AND WATER CONTAINMENT PAD ARE BEING CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

**FLOODPLAIN NOTE**

THE PROPOSED SITE IS LOCATED IN FLOOD ZONE "X" PER FEMA FLOOD MAP #54017C0145C.

**MISS UTILITY STATEMENT**

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1312129033. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

**ENTRANCE PERMIT**

ANTERO RESOURCES CORPORATION WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

**ENVIRONMENTAL NOTES**

WETLAND DELINEATIONS WERE PERFORMED NOVEMBER, 2012, DECEMBER, 2012, SEPTEMBER, 2013, & OCTOBER, 2013 BY POTESTA ENGINEERS AND ENVIRONMENTAL CONSULTANTS TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE OCTOBER 7, 2013 JURISDICTIONAL AQUATIC FEATURES MAP WAS PREPARED BY POTESTA ENGINEERS AND ENVIRONMENTAL CONSULTANTS AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFOREMENTIONED AGENCIES BE CONSULTED IN AN EFFORT TO GAIN WRITTEN CONFIRMATION OF THE DELINEATION SHOWN ON THIS EXHIBIT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

KUHL EPIHEMERAL STREAM IMPACT (LINEAR FEET)			
Stream and Impact Cause	Culvert /Fill (LF)	Inlets/Outlets Structures (LF)	Total Impact (LF)
Stream 3 (Access Road "A")	44	9	53

**GEOTECHNICAL NOTE**

THE PROPOSED ACCESS ROAD CUT SLOPE (1.5:1) SHALL BE FIELD VERIFIED BY A CERTIFIED GEOTECHNICAL ENGINEER TO ENSURE THE PROPOSED SLOPES ARE ADEQUATE PRIOR TO CONSTRUCTION. ACCESS ROAD CONSTRUCTION SHALL BE MONITORED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER OR PROJECT DESIGN ENGINEER DURING CONSTRUCTION.

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY KLEINFELDER BETWEEN APRIL 23 AND MAY 01, 2014. THE REPORT PREPARED BY KLEINFELDER DATED MAY 21, 2014, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WAS USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY KLEINFELDER FOR ADDITIONAL INFORMATION, AS NEEDED.

**PROJECT CONTACTS**

**OPERATOR:**  
ANTERO RESOURCES CORPORATION  
535 WHITE OAKS BLVD.  
BRIDGEPORT, WV 26330  
PHONE: (304) 842-4100  
FAX: (304) 842-4112

ELI WAGONER - ENVIRONMENTAL ENGINEER  
OFFICE: (304) 842-4068 CELL: (304) 476-9770  
JOHN KAWCAK - OPERATIONS SUPERINTENDENT  
CELL: (817) 368-1553

AARON KUNZLER - CONSTRUCTION SUPERVISOR  
CELL: (405) 227-8344

ANTHONY SMITH - FIELD ENGINEER  
OFFICE: (304) 842-4208 CELL: (304) 673-8196

MARK JOHNSON - SURVEYING COORDINATOR  
OFFICE: (304) 842-4162 CELL: (304) 719-6449

MARK HUTSON - LAND AGENT  
CELL: (304) 669-8315

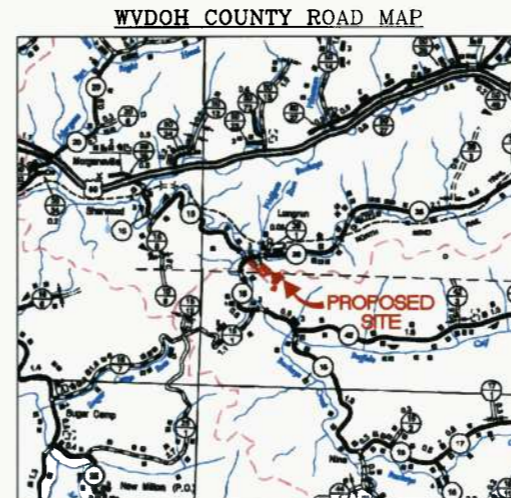
**ENGINEER/SURVEYOR:**  
NAVITUS ENGINEERING, INC.  
CYRUS S. KUMP, PE - PROJECT  
MANAGER/ENGINEER  
OFFICE: (888) 662-4185 CELL: (540) 686-8747

**ENVIRONMENTAL:**  
POTESTA ENGINEERS AND ENVIRONMENTAL  
CONSULTANTS  
TIMOTHY R. FERGUSON M.S. - STAFF SCIENTIST I  
OFFICE: (304) 342-1400 CELL: (304) 382-8217

**GEOTECHNICAL:**  
KLEINFELDER  
JOSHUA D. FREGOSI-ENGINEER  
OFFICE: (724) 772-7072 CELL: (704) 400-1103

**RESTRICTIONS NOTES:**

- THERE ARE NO PERENNIAL STREAMS, WETLANDS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD.
- THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE WELL PAD AND LOD.
- THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LOD.
- THERE ARE NO EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELL(S) BEING DRILLED.
- THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.
- THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.



MISS Utility of West Virginia  
1-800-245-4848  
West Virginia State Law  
(Section XIV: Chapter 24-C)  
Requires that you call two  
business days before you dig in  
the state of West Virginia.  
IT'S THE LAW!!

**DESIGN CERTIFICATION**

THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 35-8.

**SHEET INDEX**

- 1 - COVER SHEET
- 2 - CONSTRUCTION AND E&S CONTROL NOTES
- 3 - MATERIAL QUANTITIES
- 4 - EXISTING CONDITIONS
- 5 - OVERALL PLAN SHEET INDEX & VOLUMES
- 6 - ACCESS ROAD & STAGING AREA PLAN
- 7 - WELL PAD & WATER CONTAINMENT PAD PLAN
- 8 - ACCESS ROAD PROFILES
- 9-10 - ACCESS ROAD SECTIONS
- 11-12 - WELL PAD & WATER CONTAINMENT PAD SECTIONS
- 13-18 - CONSTRUCTION DETAILS
- 19 - ACCESS ROAD & STAGING AREA RECLAMATION PLAN
- 20 - WELL PAD & WATER CONTAINMENT PAD RECLAMATION PLAN
- 21 - FIRM EXHIBIT
- GE501-GE517 - GEOTECHNICAL DETAILS

KUHL LIMITS OF DISTURBANCE AREA (AC)	
Total Site	
Impacts to Sperry Hardwoods, Inc., Halcyon Kuhl, Et Al T.M. 29-43	
Access Road "A" (2,270')	8.75
Access Road "B" (127')	0.58
Staging Area	2.02
Well Pad	6.52
Excess/Topsoil Material Stockpiles	2.03
<b>Total Affected Area</b>	<b>19.90</b>
Total Wooded Acres Disturbed	17.90

Proposed Well Name	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Gourd	N 281478.43	N 281515.67	N 4346484.23	LAT 39-16-01.8401
Unit 2H	E 1674004.12	E 1642583.17	E 530085.09	LONG -80-39-04.4965
Gourd	N 281472.58	N 281508.82	N 4346482.10	LAT 39-16-01.7718
Unit 1H	E 1673996.83	E 1642555.88	E 530082.91	LONG -80-39-04.5881
Dumont	N 281465.74	N 281501.97	N 4346479.98	LAT 39-16-01.7030
Unit 2H	E 1673989.54	E 1642548.59	E 530080.72	LONG -80-39-04.6796
Dumont	N 281458.89	N 281485.13	N 4346477.88	LAT 39-16-01.8344
Unit 1H	E 1673982.25	E 1642541.30	E 530078.54	LONG -80-39-04.7712
Beaumont	N 281452.04	N 281488.28	N 4346475.74	LAT 39-16-01.5658
Unit 2H	E 1673974.96	E 1642534.01	E 530076.35	LONG -80-39-04.8627
Beaumont	N 281445.20	N 281481.43	N 4346473.61	LAT 39-16-01.4972
Unit 1H	E 1673967.68	E 1642526.73	E 530074.16	LONG -80-39-04.9543
Barbara	N 281436.35	N 281474.59	N 4346471.49	LAT 39-16-01.4286
Unit 2H	E 1673960.39	E 1642519.44	E 530071.98	LONG -80-39-05.0458
Barbara	N 281431.51	N 281467.74	N 4346469.37	LAT 39-16-01.3800
Unit 1H	E 1673953.10	E 1642512.15	E 530069.79	LONG -80-39-05.1374
Amy	N 281424.66	N 281460.89	N 4346467.24	LAT 39-16-01.2914
Unit 2H	E 1673945.81	E 1642504.86	E 530067.81	LONG -80-39-05.2290
Amy	N 281417.81	N 281454.05	N 4346465.12	LAT 39-16-01.2228
Unit 1H	E 1673938.52	E 1642497.57	E 530065.42	LONG -80-39-05.3205
Conley	N 281410.97	N 281447.20	N 4346463.00	LAT 39-16-01.1542
Unit 2H	E 1673931.23	E 1642490.28	E 530063.24	LONG -80-39-05.4121
Conley	N 281404.12	N 281440.35	N 4346460.88	LAT 39-16-01.0857
Unit 1H	E 1673923.94	E 1642482.99	E 530061.05	LONG -80-39-05.5036
Well Pad Elevation	1,232.0			

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ENERGY ENGINEERING

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DATE	REVISION

**Antero**  
RESOURCES  
THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

**KUHL**  
WELL PAD & WATER CONTAINMENT PAD  
GRANT & GREENBRIER DISTRICTS  
DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 06/12/2014  
SCALE: AS SHOWN  
SHEET 1 OF 21



# ACCESS ROAD PROFILES

REVISION

DATE

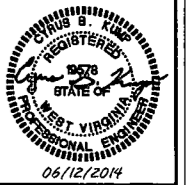


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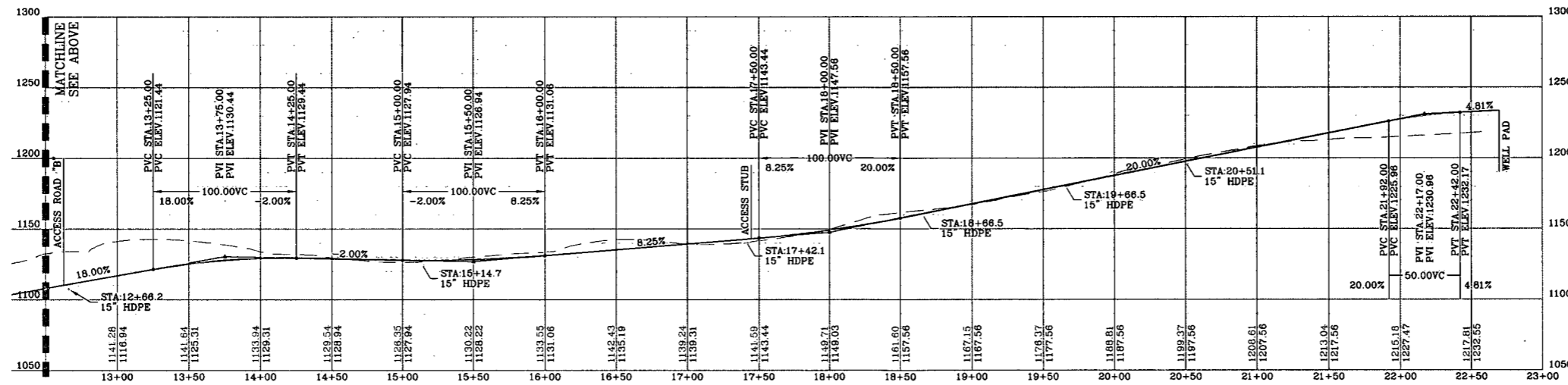
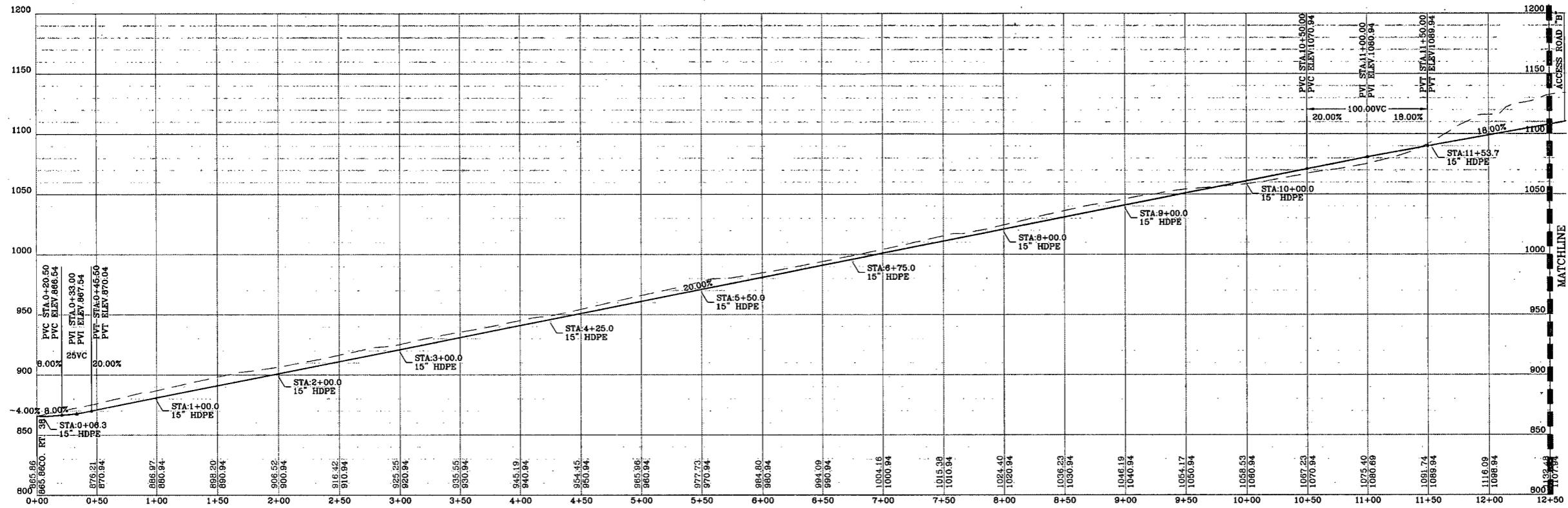
ACCESS ROAD PROFILES

## KUHLMAN

**WELL PAD & WATER CONTAINMENT PAD**  
GRANT & GREENBRIER DISTRICTS  
DODDRIDGE COUNTY, WEST VIRGINIA



06/12/2014  
DATE: 06/12/2014  
SCALE: AS SHOWN  
SHEET 8 OF 21



**ACCESS ROAD "A" PROFILE**

SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

LEGEND	
X-SECTION GRID INDEX	———
X-SECTION GRID INTERMEDIATE	———
X-SECTION PROPOSED GRADE	———
X-SECTION EXISTING GRADE	———
X-SECTION WATER SURFACE	———
MATCHLINE	———

# ACCESS ROAD SECTIONS

## LEGEND

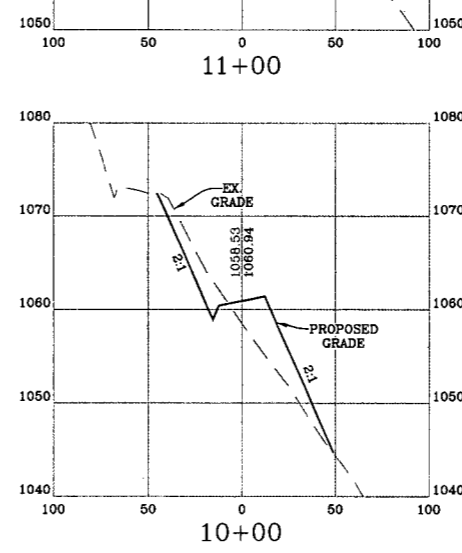
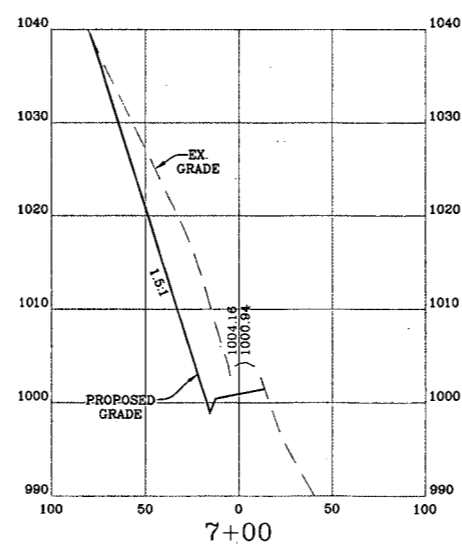
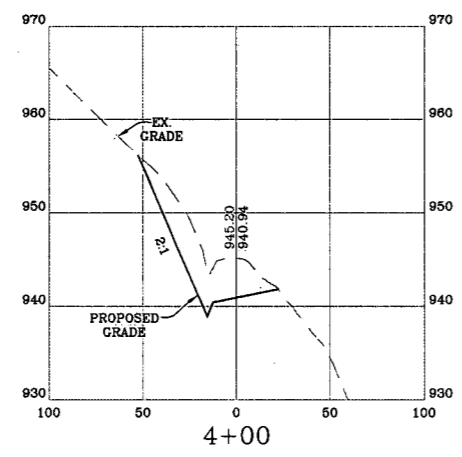
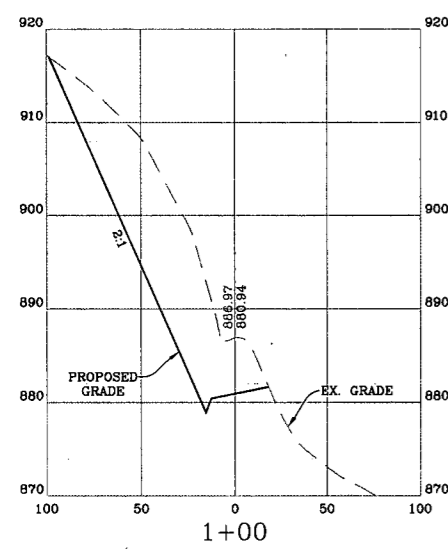
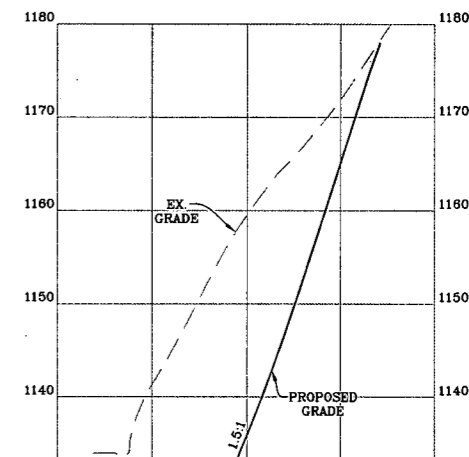
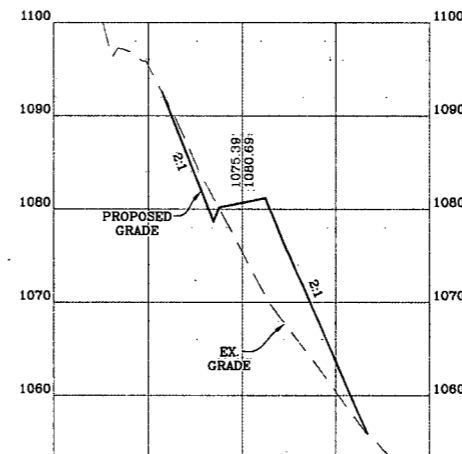
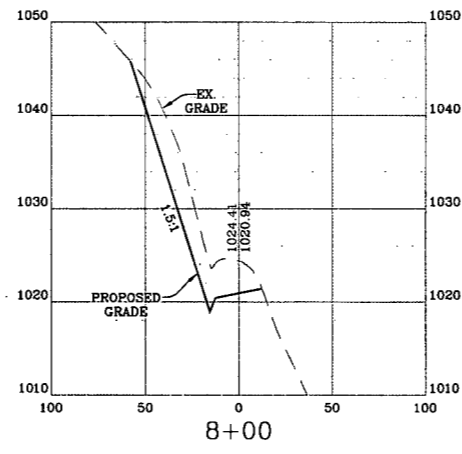
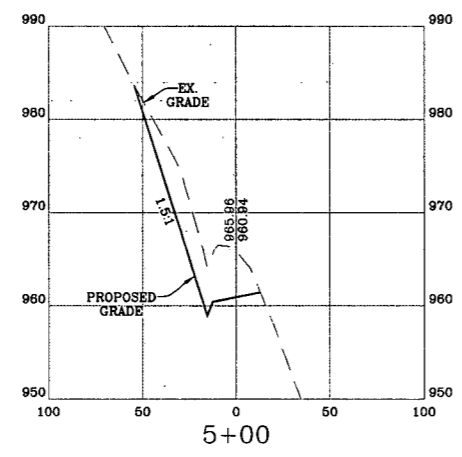
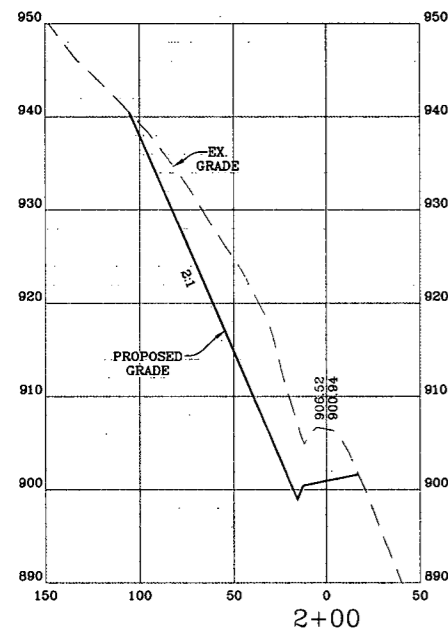
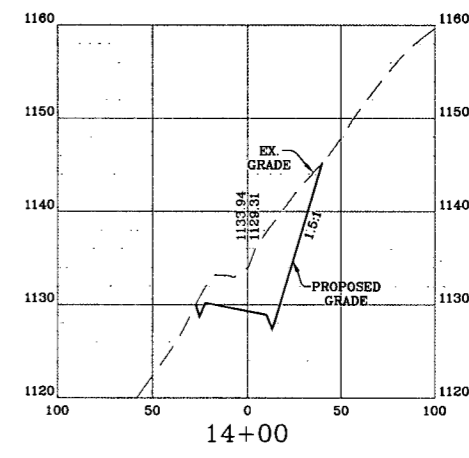
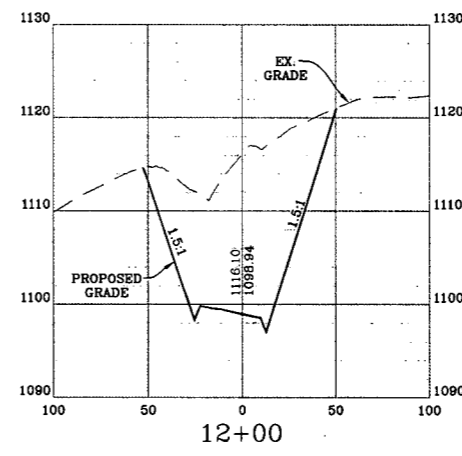
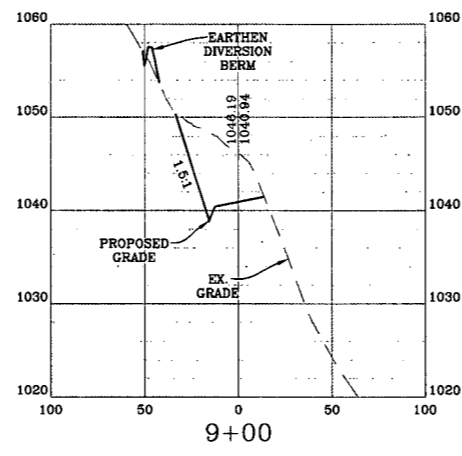
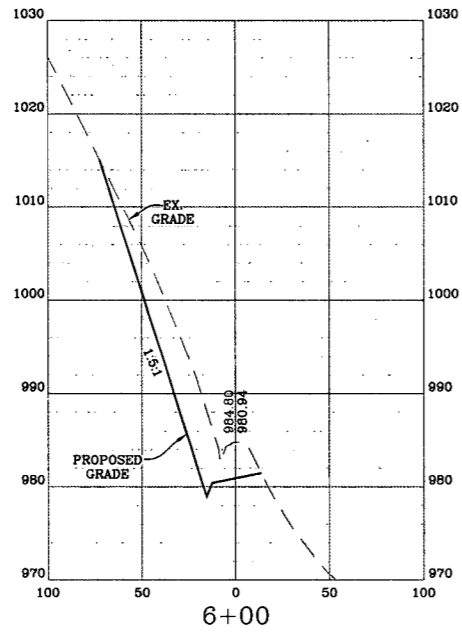
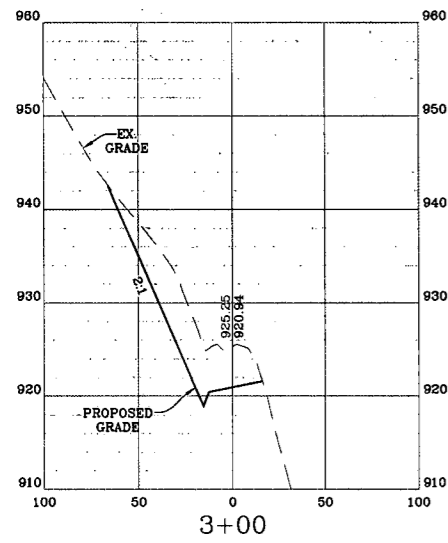
- X-SECTION GRID INDEX
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- MATCHLINE

NOTE:  
1. ALL FILL AREAS, INCLUDING ACCESS ROADS AND EXCESS MATERIAL STOCKPILES, SHALL BE "KEYED IN" AND COMPACTED IN 12" (MAXIMUM) LOOSE LIFT THICKNESS WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTOR. MOISTURE CONTENT WILL BE CONTROLLED IN ACCORDANCE WITH THE STANDARD PROCTOR TEST (ASTM-D698) RESULTS.  
2. ALL CUT & FILL SLOPES SHALL BE 2:1 UNLESS STATED OTHERWISE.

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## ACCESS ROAD "A" CROSS-SECTIONS

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



REVISION	DATE

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Resources  
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WAS PREPARED FOR:  
ANTERO RESOURCES  
CORPORATION

ACCESS ROAD SECTIONS  
**KUHL**  
WELL PAD & WATER CONTAINMENT PAD  
GRANT & GREENBRIER DISTRICTS  
DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 06/12/2014  
SCALE: AS SHOWN  
SHEET 9 OF 21

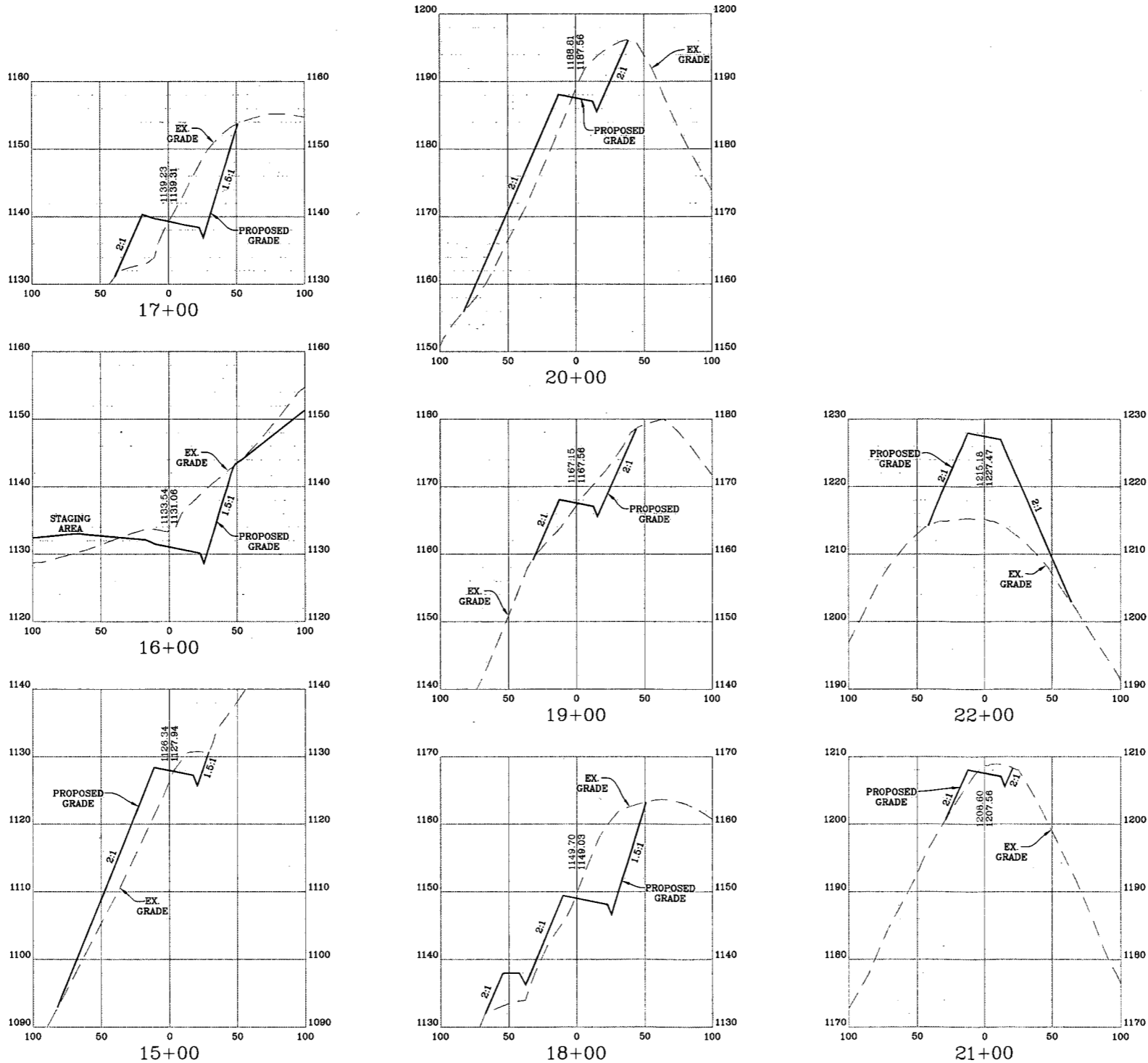
# ACCESS ROAD SECTIONS

LEGEND	
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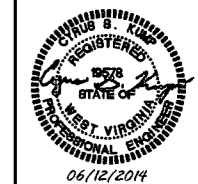
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ACCESS ROAD SECTIONS  
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GRANT & GREENBRIER DISTRICTS  
DODDRIDGE COUNTY, WEST VIRGINIA



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SHEET 10 OF 21

# WELL PAD & WATER CONTAINMENT PAD SECTIONS

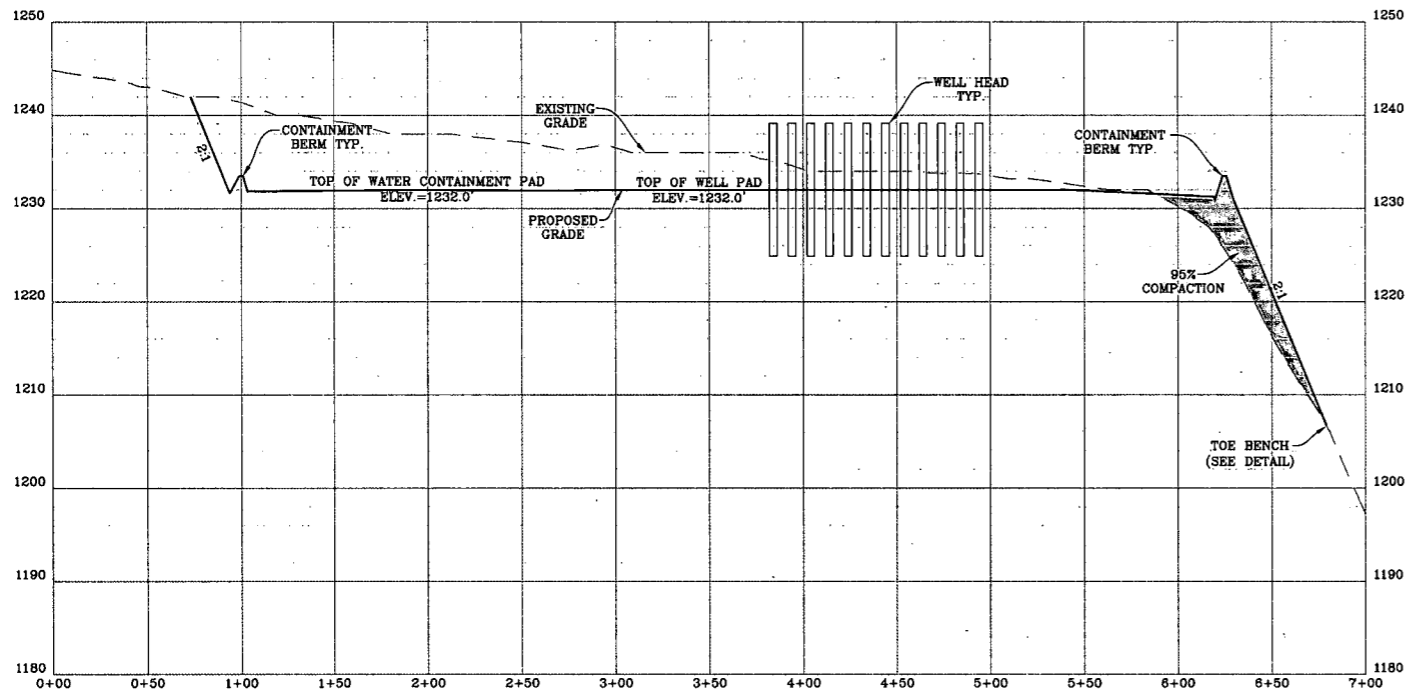
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- X-SECTION GRID INDEX
- X-SECTION GRID INTERMEDIATE
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### NOTE:

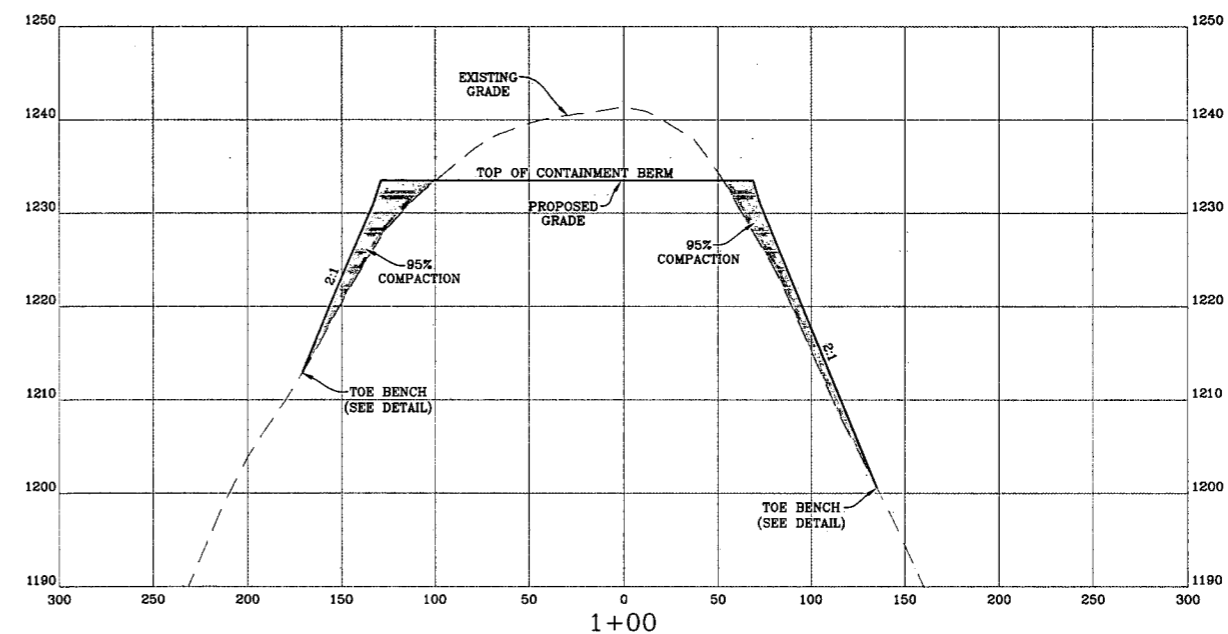
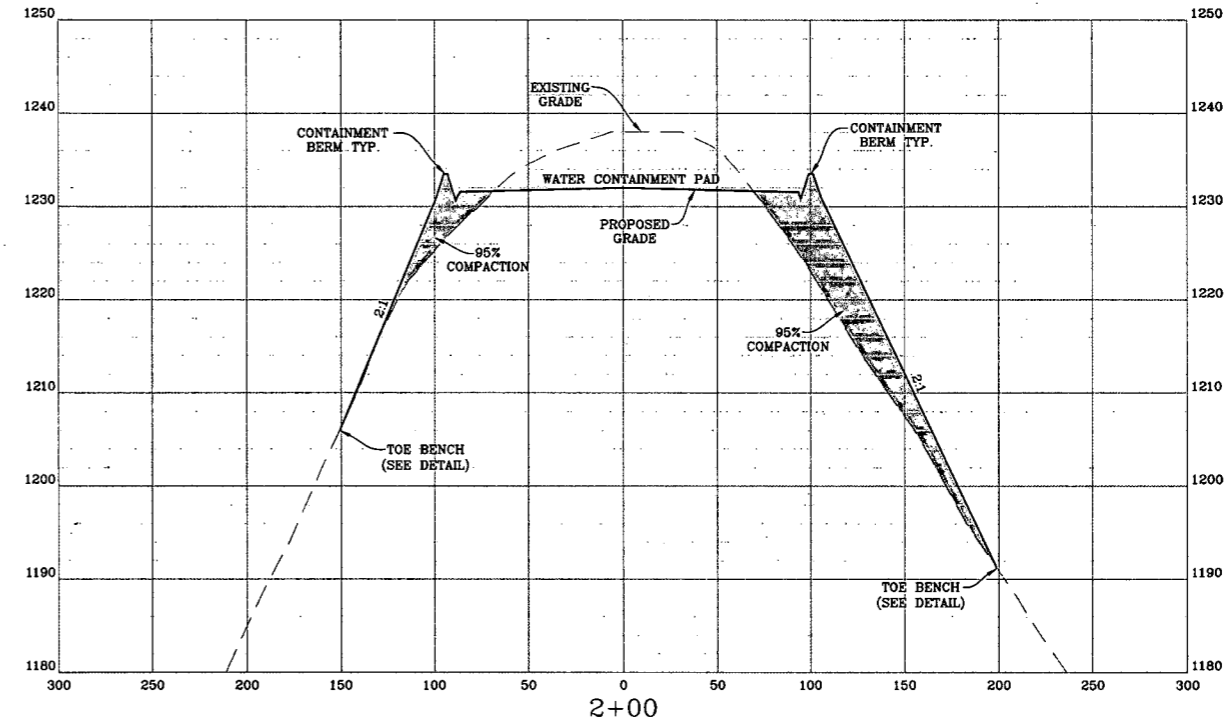
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WELL PAD & WATER CONTAINMENT PAD CROSS-SECTION "A-A"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



WELL PAD & WATER CONTAINMENT PAD CROSS-SECTIONS ALONG BASELINE "A-A"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

REVISION	DATE	BY	CHECKED	APP. DATE	DESCRIPTION

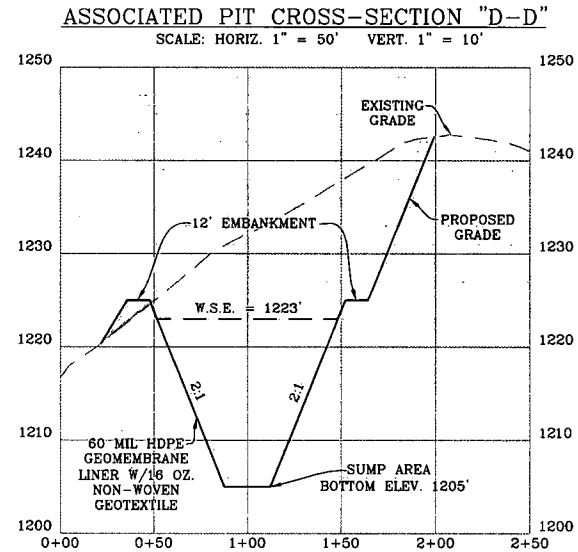
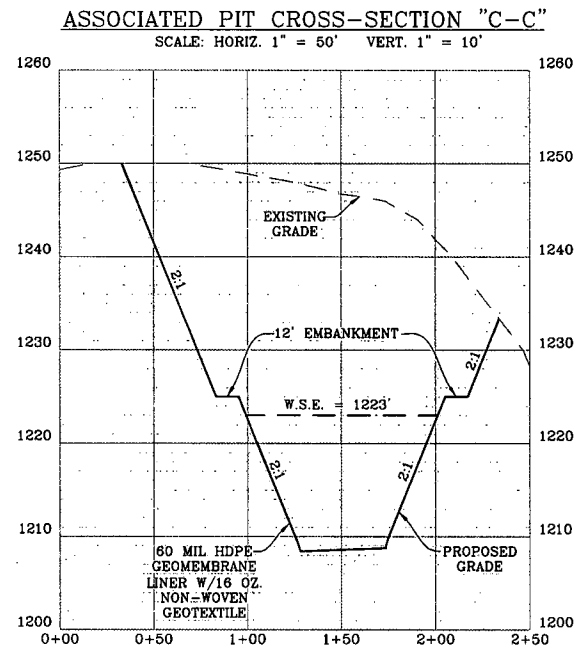
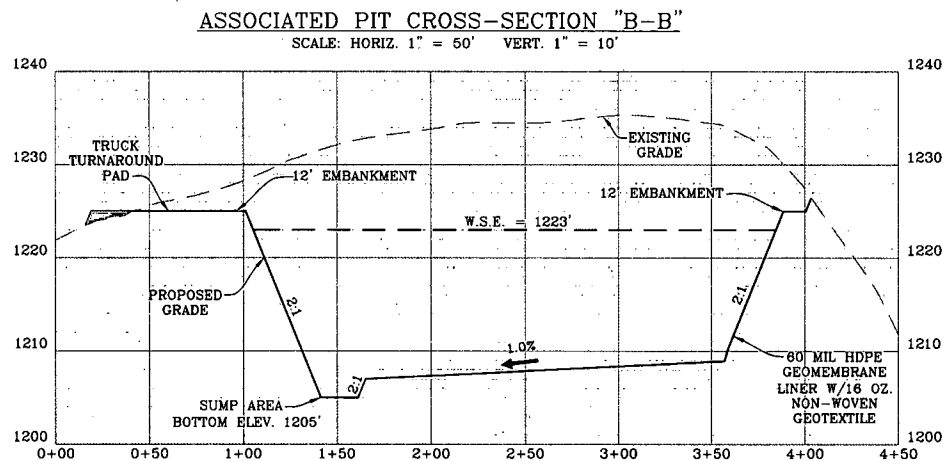
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 THIS DOCUMENT WAS PREPARED FOR:  
 ANTERO RESOURCES CORPORATION

WELL PAD & WATER CONTAINMENT PAD SECTIONS  
**KUHL**  
 WELL PAD & WATER CONTAINMENT PAD  
 GRANT & GREENBRIER DISTRICTS  
 DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 06/12/2014  
 SCALE: AS SHOWN  
 SHEET 11 OF 21

# ASSOCIATED PIT SECTIONS



**NOTE:**  
1. ALL FILL AREAS SHALL BE "KEYED IN" AND COMPACTED IN 9" (MAXIMUM) LOOSE LIFT THICKNESS WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTOR.

**LEGEND**

X-SECTION GRID INDEX	---
X-SECTION GRID INTERMEDIATE	---
X-SECTION PROPOSED GRADE	---
X-SECTION EXISTING GRADE	---
X-SECTION WATER SURFACE	---
MATCHLINE	---

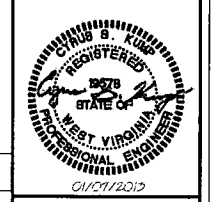
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151 Windy Hill Lane  
Winchester, Virginia 22602  
Telephone: (888) 662-4185  
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ASSOCIATED PIT SECTIONS  
**KUHL PAD**  
CENTRAL DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA

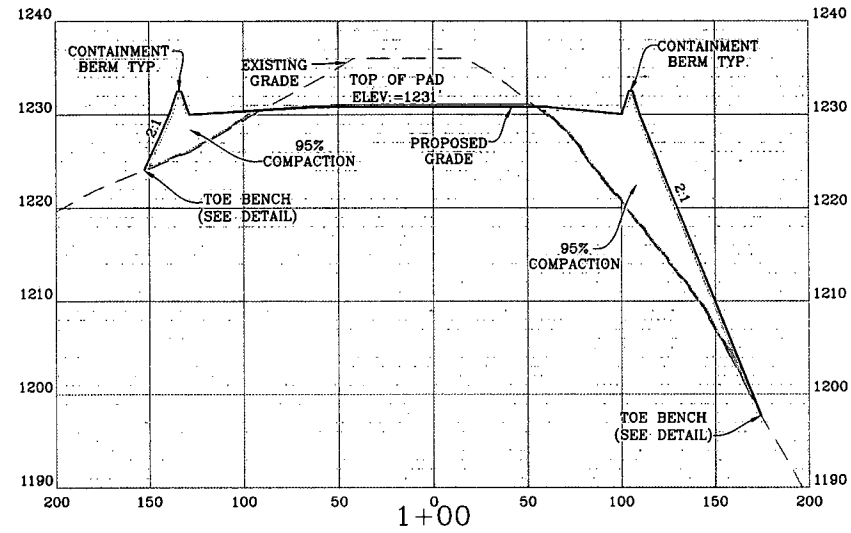


DATE: 01/07/2013  
SCALE: AS SHOWN  
SHEET 14 OF 23

# WELL PAD SECTIONS

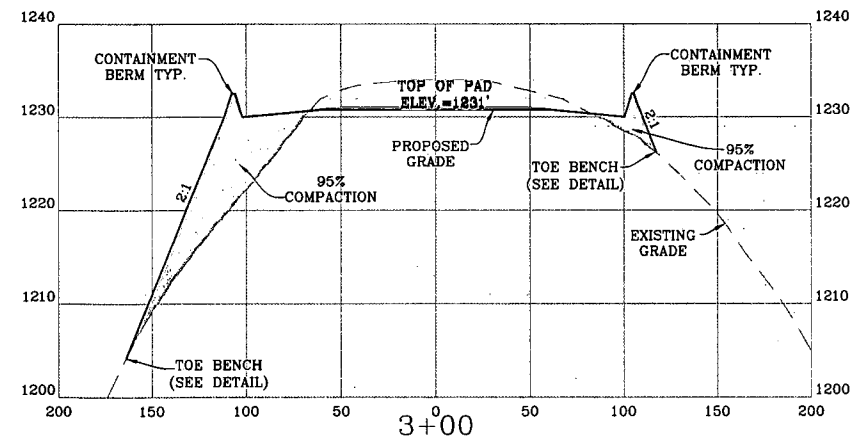
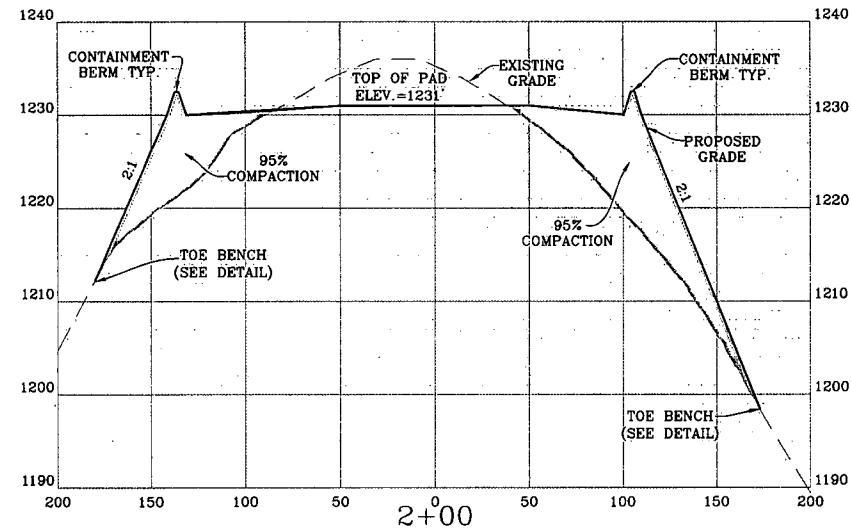
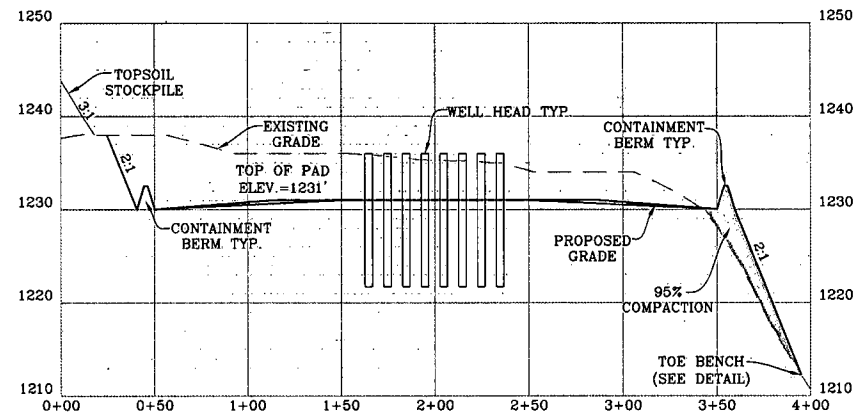
WELL PAD CROSS-SECTIONS ALONG BASELINE "A-A"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



WELL PAD CROSS-SECTION "A-A"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



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- X-SECTION EXISTING GRADE
- X-SECTION WATER SURFACE
- MATCHLINE

Engineering Survey Environmental GIS

**NAVITUS ENGINEERING INC.**

151 Windy Hill Lane  
Winchester, Virginia 26602  
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WELL PAD SECTIONS

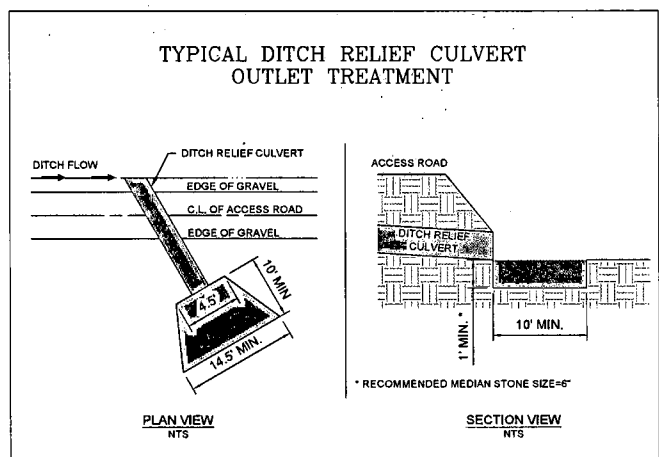
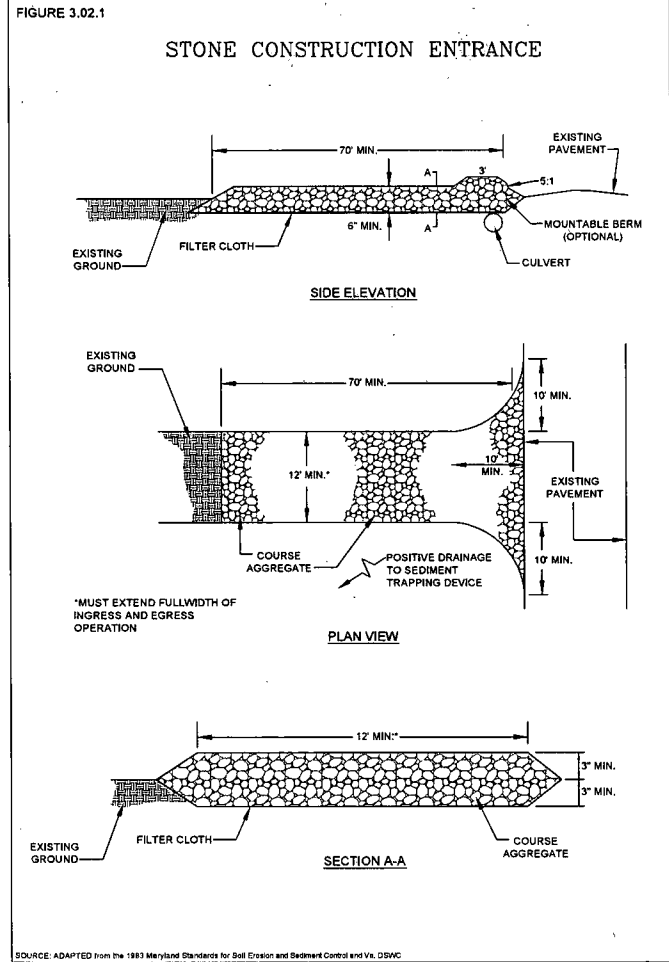
**KUHL PAD**

CENTRAL DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA

Professional Engineer  
West Virginia State Board of Professional Engineering

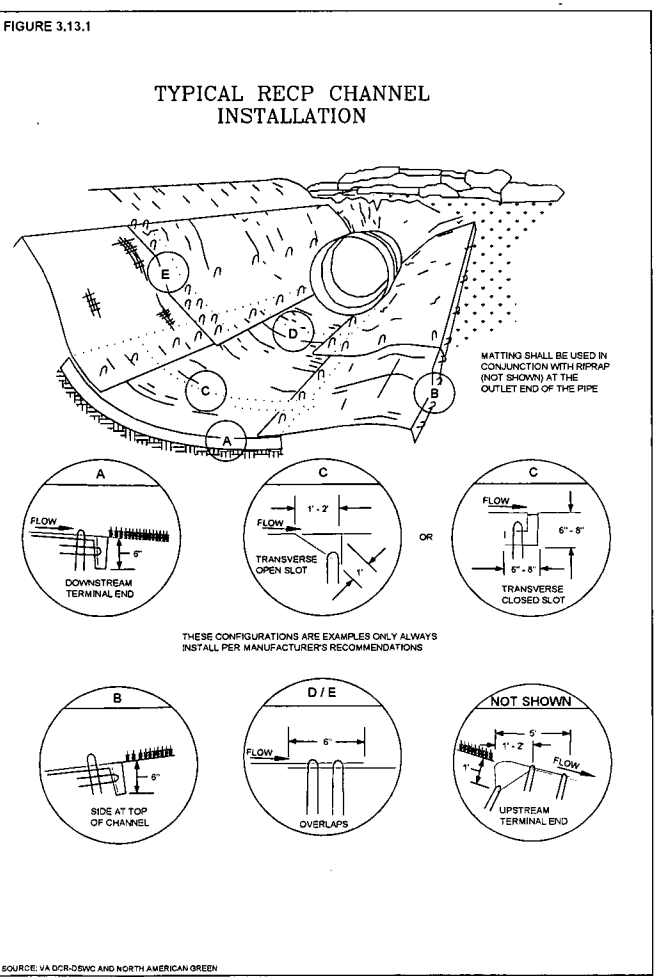
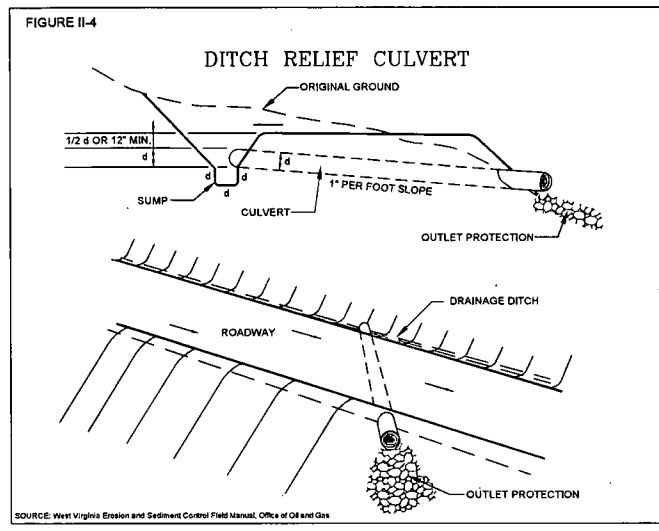
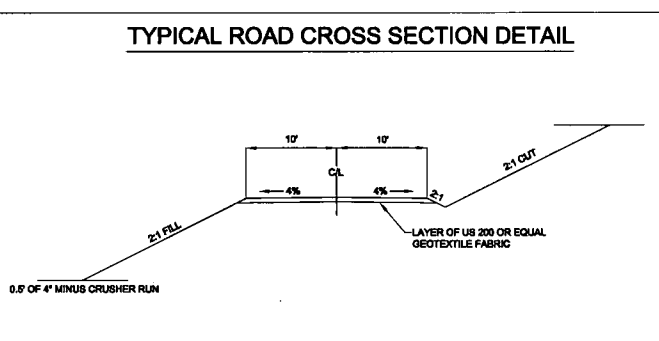
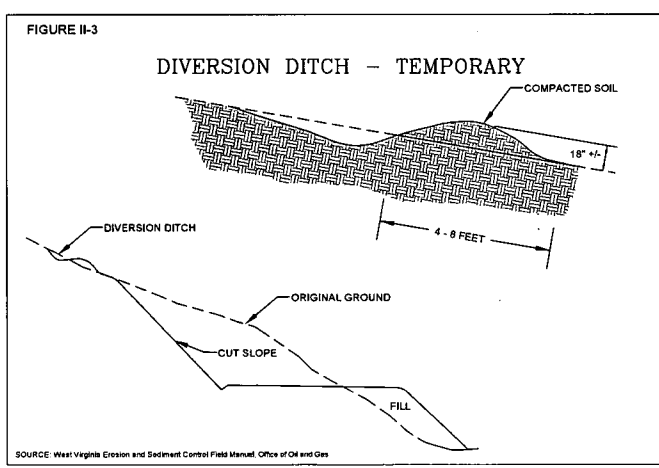
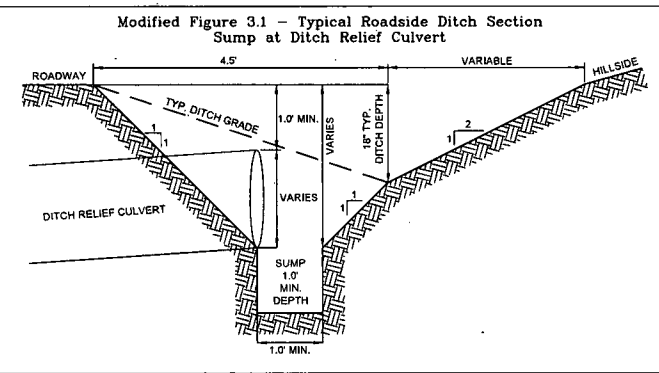
01/07/2013

DATE: 01/07/2013  
SCALE: AS SHOWN  
SHEET 15 OF 23



NOTE:  
ALL DITCH LINE PROTECTION SHALL BE INSTALLED AS RECOMMENDED IN THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE (BMP) MANUAL. DITCH LINE PROTECTION SHALL BE BASED ON THE FOLLOWING GRADES:  
1. LESS THAN 3% - GRASSED  
2. 3-8% - GRASS WITH ROLLED EROSION CONTROL PRODUCTS (RECP)  
3. GREATER THAN 9% - RIPRAP OR EQUIVALENT GEOTEXTILE

IF HIGH EROSION SOILS ARE ENCOUNTERED DURING CONSTRUCTION, THE ENGINEER SHOULD BE CONTACTED FOR FURTHER EVALUATION.

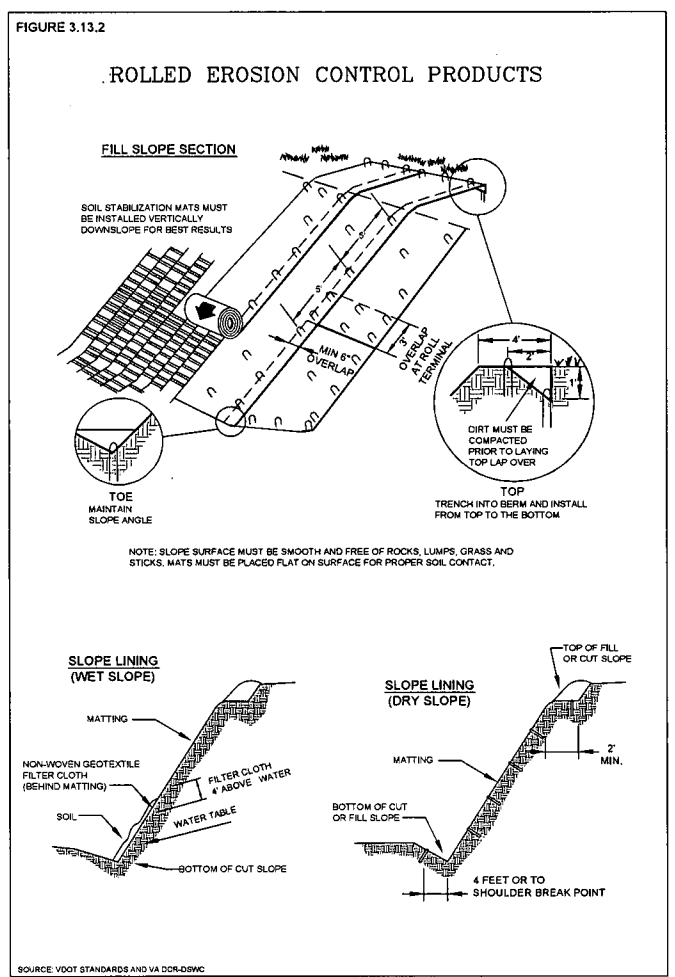
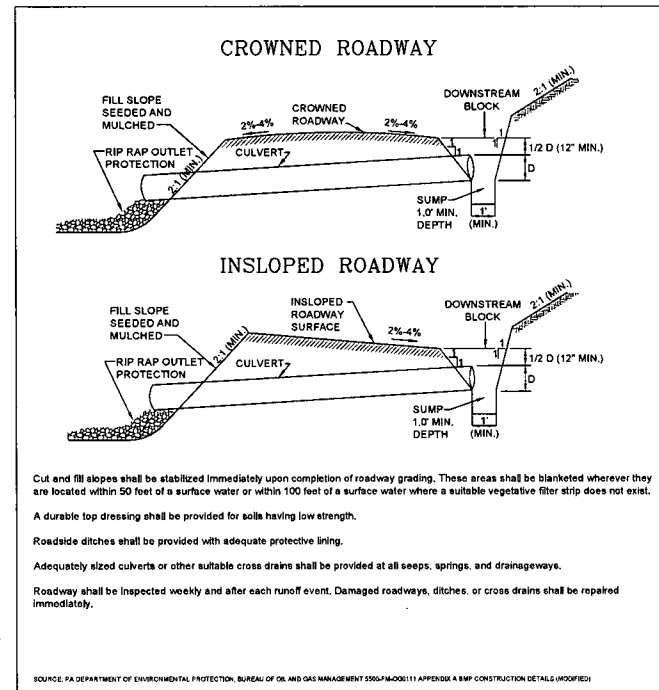
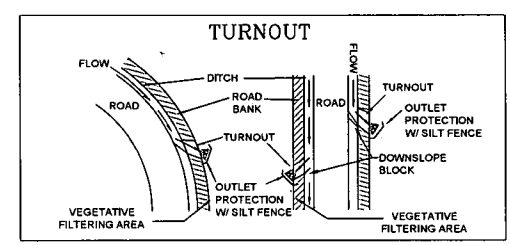


**Table II-5**  
**Pipe Sizes for Culverts Across Roads**

Drainage Area (Ac)	Pipe Diameter (In)	Pipe Capacity (Cfs)
10	15	5
20	18	9
30	21	12
50	24	18
80	27	24
100	30	29
300	36	60
500	42	85

**Table II-6**  
**Spacing of Culverts**

Road Grade %	Distance (Ft)
2-5	500-300
6-10	300-200
11-15	200-100
16-20	100



Engineering Survey Environmental GIS

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Winchester, Virginia 22602  
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DATE

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CONSTRUCTION DETAILS  
**KUHL PAD**  
CENTRAL DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA

REGISTERED PROFESSIONAL ENGINEER  
WEST VIRGINIA  
STATE OF WEST VIRGINIA  
NO. 5578  
01/07/2012

DATE: 01/07/2013  
SCALE: N/A  
SHEET 16 OF 23

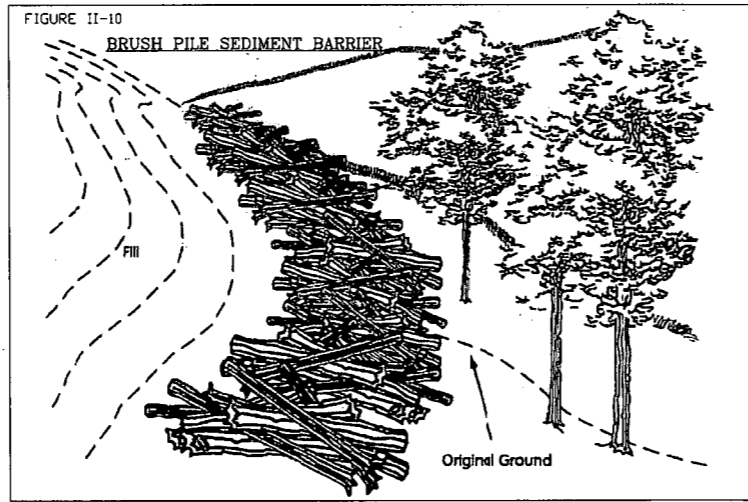
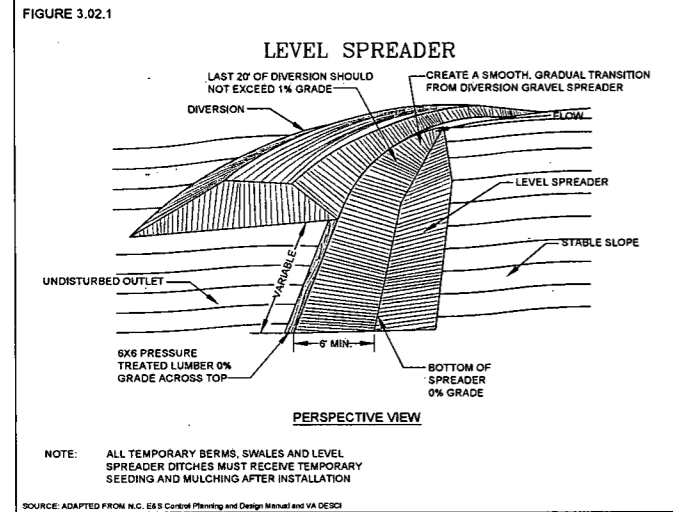
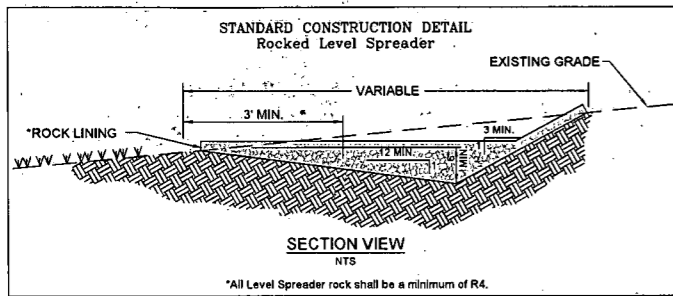
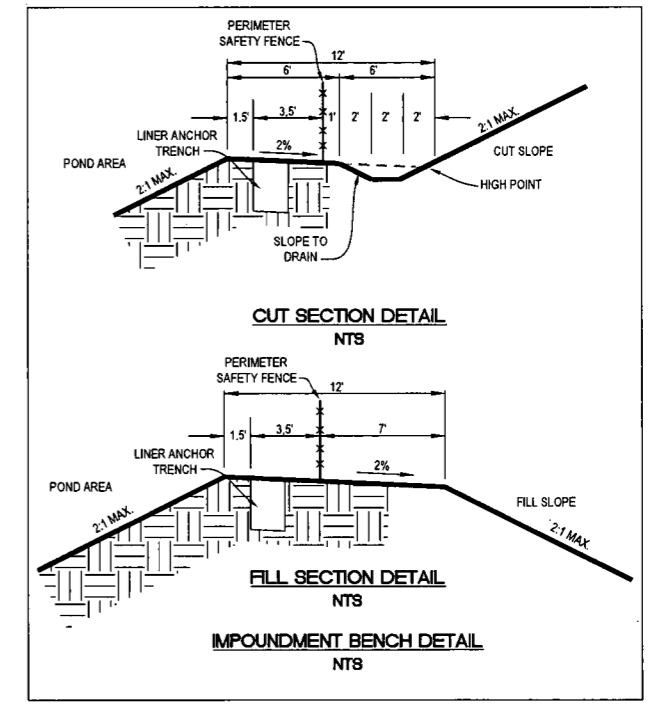
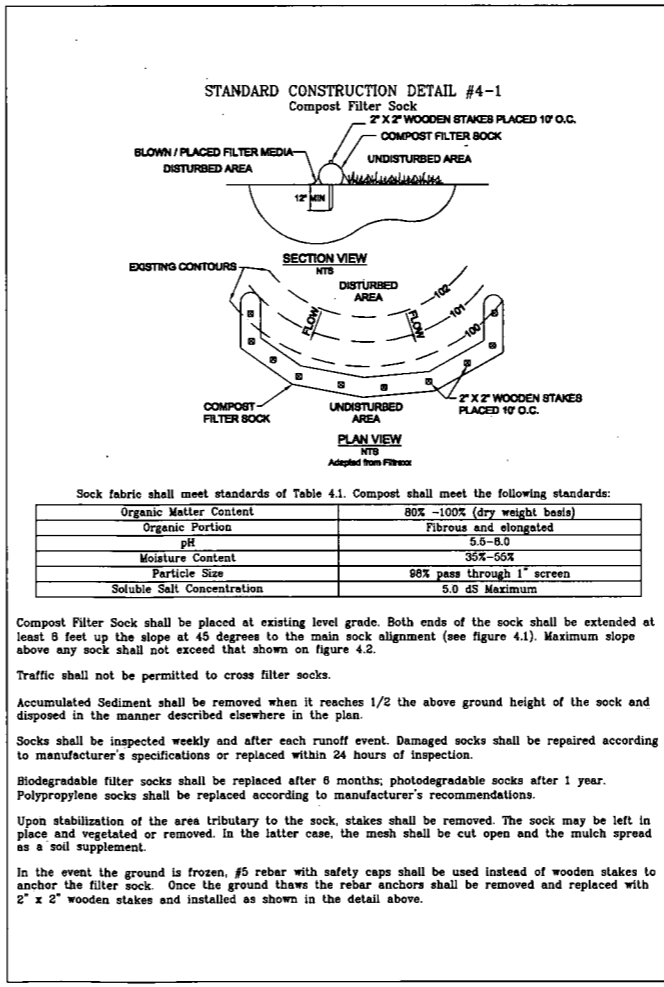
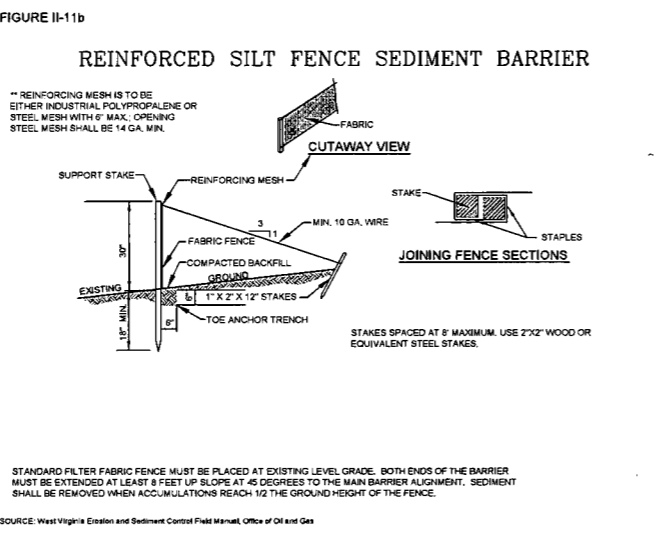
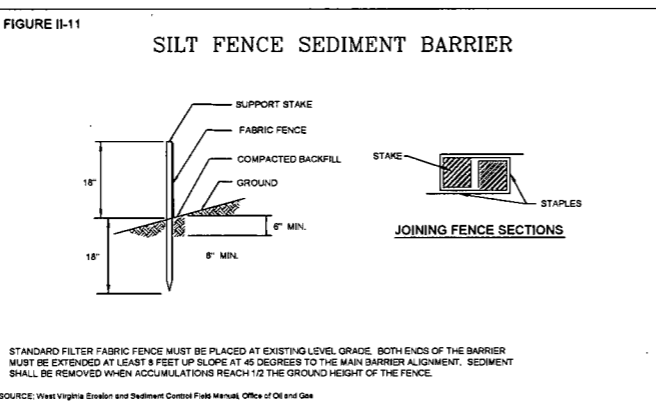
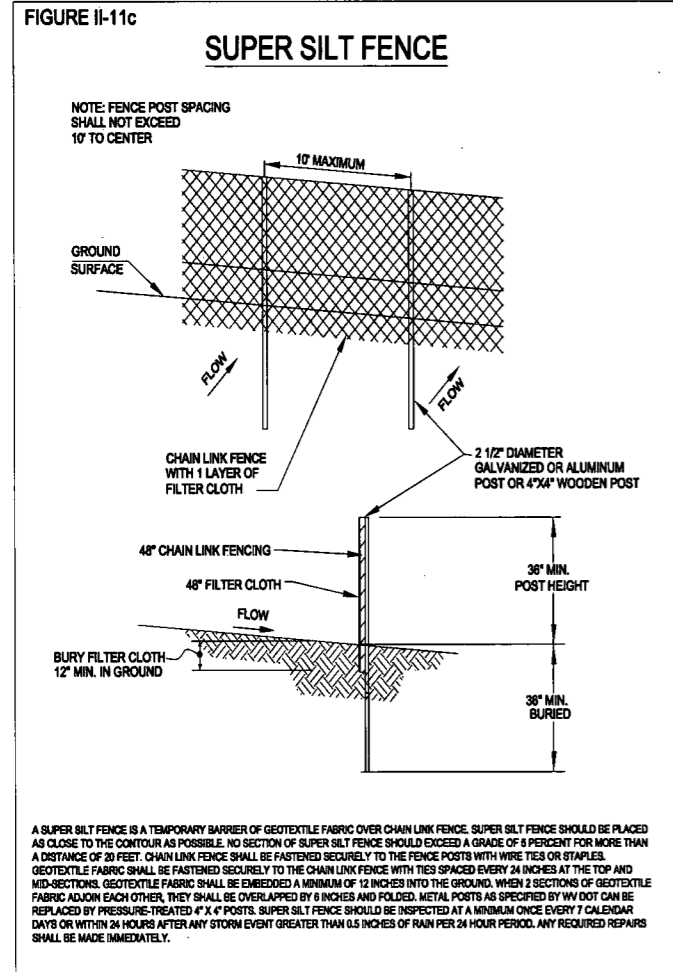
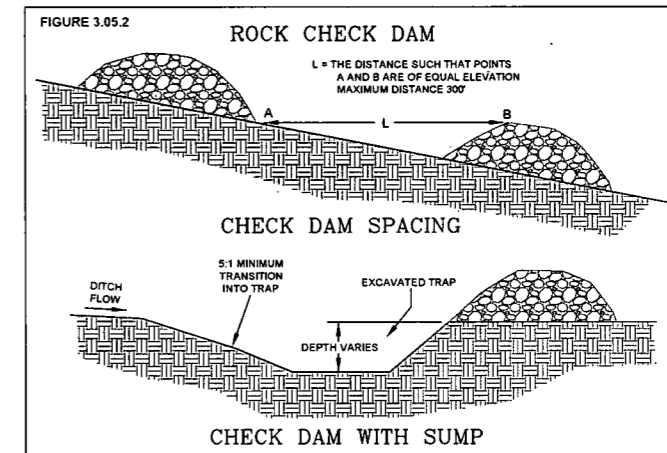
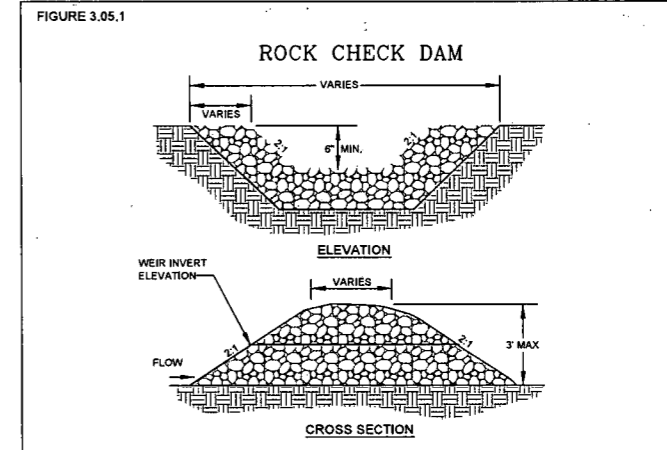


Table 4.1  
Compost Sock Fabric Minimum Specifications

Material Type	3 mil HDPE Photo-degradable	5 mil HDPE Photo-degradable	5 mil HDPE Bio-degradable	Multi-Filament Polypropylene (MFPP) Photo-degradable	Heavy Duty Multi-Filament Polypropylene (HDMFPP) Photo-degradable
Material Characteristic	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Textile Strength	26 psi	26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	8 months	6 months	1 year	2 years
Two-ply systems					
Inner Containment Netting	HDPE biaxial net Continuously wound Fusion-welded junctures 3/4" x 3/4" Max. aperture size				
Outer Filtration Mesh	Composite Polypropylene Fabric (Woven layer & non-woven fleece mechanically fused via needle punch) 3/16" Max. aperture size				
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					



Engineering Survey Environmental GIS

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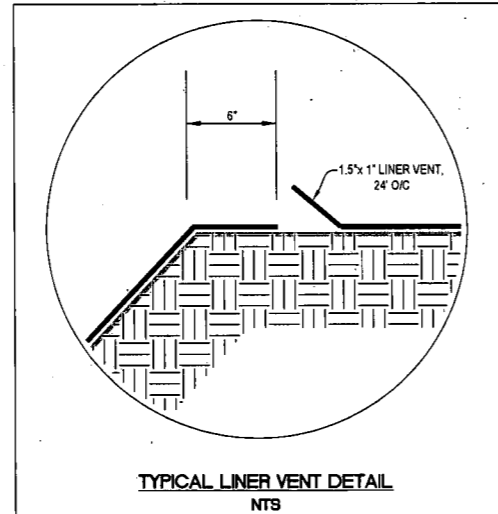
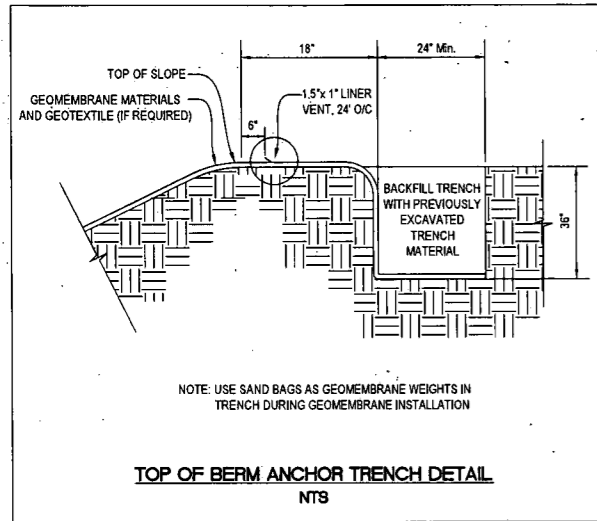
ANTERO RESOURCES  
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CONSTRUCTION DETAILS  
**KUHL PAD**  
CENTRAL DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA

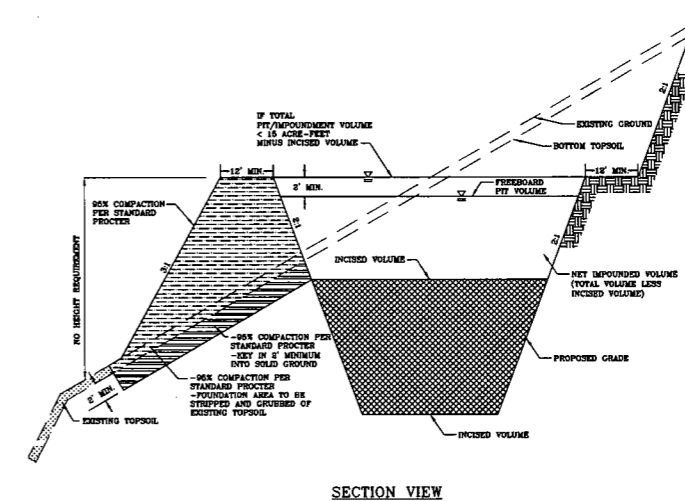
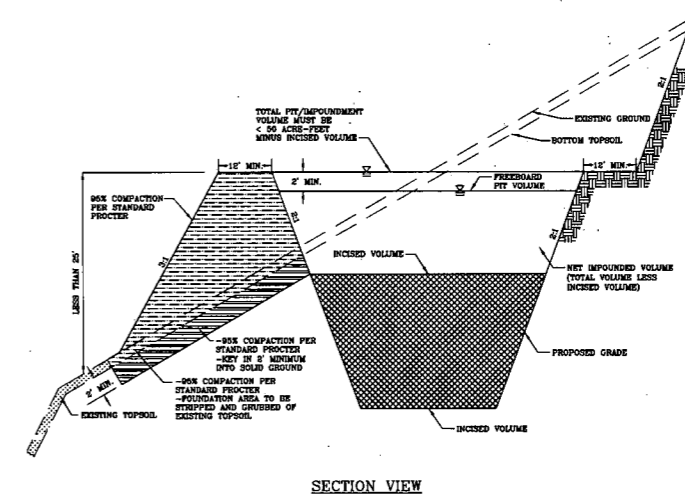
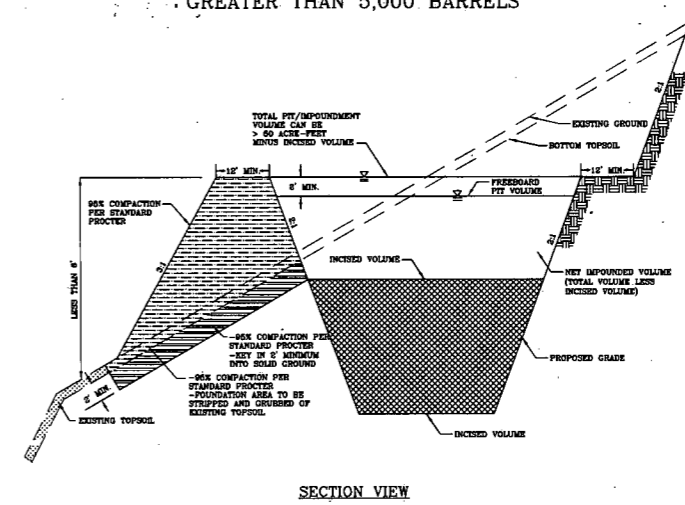
REGISTERED PROFESSIONAL ENGINEER  
WEST VIRGINIA STATE BOARD OF PROFESSIONAL ENGINEERS  
01/07/2013

DATE: 01/07/2013  
SCALE: N/A  
SHEET 17 OF 23





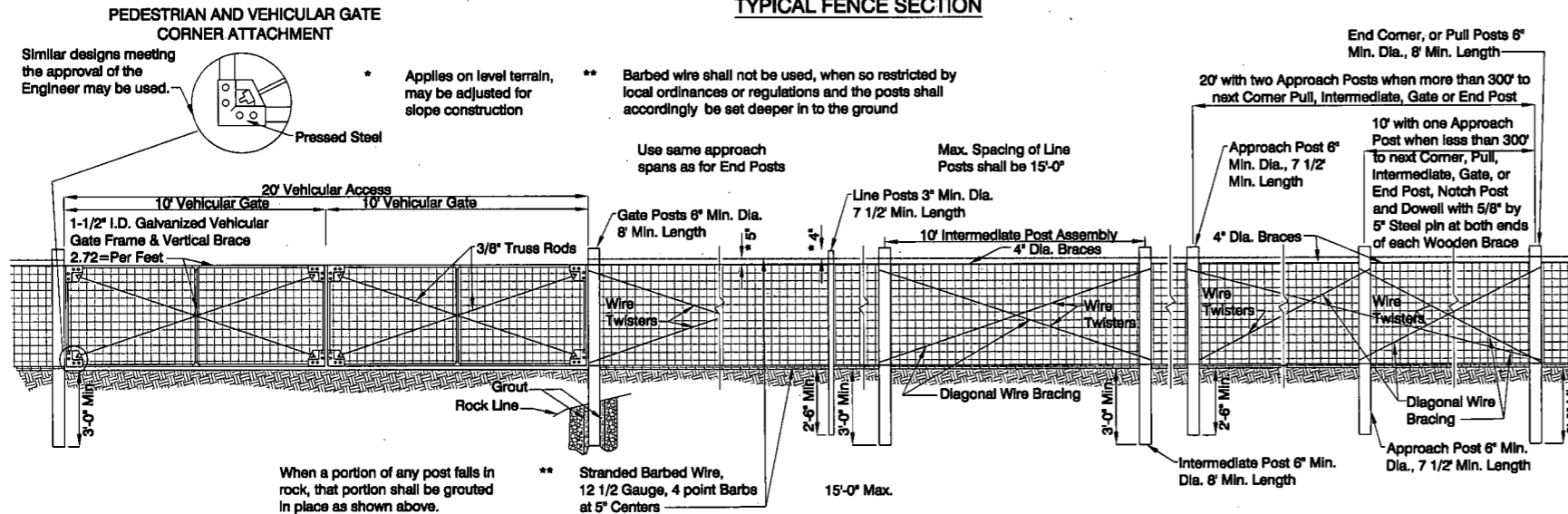
WEST VIRGINIA CODE 35 CSR-4  
DESIGN AND CONSTRUCTION REQUIREMENTS  
FOR ASSOCIATED PITS, ASSOCIATED IMPOUNDMENTS, &  
CENTRALIZED IMPOUNDMENTS  
GREATER THAN 5,000 BARRELS



NOTES:  
1. ALL FILL SHOULD BE KEYED IN TO ORIGINAL GROUND EVERY 2-5 VERTICAL FEET DEPENDING ON EXISTING GROUND SLOPE.  
2. MINIMUM OUTSIDE AND INSIDE EMBANKMENT (FILL) SLOPES SHALL BE 2H:1V. THE INSIDE AND OUTSIDE SLOPES MUST ADD UP TO 5H:1V.

NTS

CONSTRUCTION DETAIL  
TYPICAL FENCE SECTION



NOTES:

Posts and braces may be either round or square shaped. Dimensions shown on the plans are for round posts and braces only. When square posts are used, line posts shall be 3" square (min.); braces 4" square (min.); corner, end, pull, gate, approach, and intermediate posts 6" square (min.).  
The positioning of the fence fabric and barbed wire on the posts, as shown on the "Typical Fence Section" detail, applies for level and gentle sloping terrain. For fence erected on slopes, the positioning may be adjusted to meet the slope conditions as long as the adjustment is continued from post to post in a uniform manner. Trenching on slopes may be warranted. On slopes, posts will continue to be erected vertically, unless otherwise directed, and the ends of the fencing fabric shall be cut on a skew as may be necessary for proper connection to the posts.

Dumped rock channel protection will be used at channel crossings when called for on the plans.

Install drainage structure terminal installation as called for on the plans and/or as shown on typical fence details.

Unless otherwise specified, or directed by the Engineer, the farm field fence may be installed with the fence fabric and barbed wire positioned on either side of the fence posts.

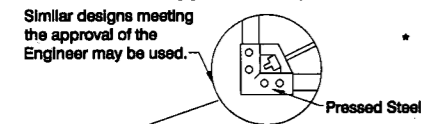
Hardware and miscellaneous fittings, not specifically designated herein as to type or dimensions, shall conform to the applicable requirements of Section 608 of the Specifications and shall be of good quality commercial design acceptable to the Engineer.

In lieu of the barbed wire detailed herein, the following additional types are acceptable, provided they retain the "4-point barb at 5-inch centers" requirement and provided they meet or exceed the strength and coating requirements for the standard, 12 1/2 gauge, barbed wire as called for in 712.10 of the Specifications.

- (a) stranded, 15 1/2 gauge, high carbon steel barbed wire
- (b) one strand, 12 gauge, steel barbed wire

Vehicular gate frames (and vertical braces) may be either galvanized steel pipe members as shown herein or may be triple-coated steel pipe members meeting the requirements specified on Standard Sheet F2. All other metal components of the gate shall be galvanized, with the exception of the die-cast aluminum corner fittings, or pressed steel corner fittings.

PEDESTRIAN AND VEHICULAR GATE  
CORNER ATTACHMENT



\* Applies on level terrain, may be adjusted for slope construction

\*\* Barbed wire shall not be used, when so restricted by local ordinances or regulations and the posts shall accordingly be set deeper in to the ground

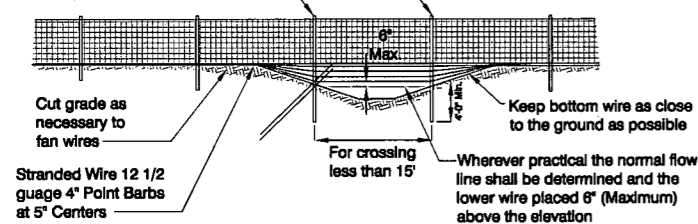
Use same approach spans as for End Posts

Max. Spacing of Line Posts shall be 15'-0"

When a portion of any post falls in rock, that portion shall be grouted in place as shown above.

\*\* Stranded Barbed Wire, 12 1/2 Gauge, 4 point Barbs at 5' Centers

Line Posts: 3" Min. Dia. to and including heights 6.5' above ground line. 4" Min. Dia. 6.5' to 8' height above ground line. Height above ground line shall be 8' (Max.).



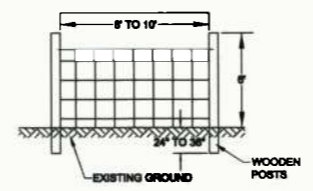
DETAIL SHOWING TYPICAL SECTION  
AT MINOR DEPRESSIONS AND WET  
WEATHER CROSSINGS



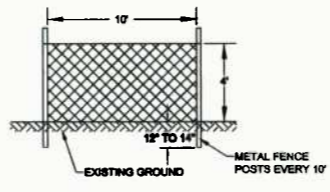
	<b>Yellow Ribbon:</b> Yellow Ribbon used to indicate top of Cuts (C) Cut to be determined at time of stakeout Slope determined by site design
	<b>Yellow &amp; Orange Ribbon:</b> Yellow and Orange Ribbon used to indicate Grade at Top of Pad/Pond/Pit
	<b>Orange Ribbon:</b> Orange Ribbon used to indicate toes of Fills (F) Fill to be determined at time of stakeout Slope determined by site design
	<b>Pink Ribbon:</b> Pink Ribbon used to indicate Top Hole Location Pink Ribbon used to indicate Survey Control Location
	<b>Pink &amp; Black Stripe Ribbon:</b> Pink & Black Stripe Ribbon used to indicate Vertical Cut (VC) at Pad/Pond/Pit corner or edge Pink & Black Stripe Ribbon used to indicate Vertical Fill (VF) at Pad/Pond/Pit corner or edge Vertical Cut/Vertical Fill to be determined at time of stakeout
	<b>Blue &amp; White Stripe Ribbon:</b> Blue & White Stripe Ribbon used to indicate clearing limits/construction limits
	<b>Orange &amp; Black Stripe Ribbon:</b> Orange & Black Stripe Ribbon used to indicate Vertical Cut (VC) at Centerline or edge of access road Orange & Black Stripe Ribbon used to indicate Vertical Fill (VF) at centerline or edge of access road
	<b>Pink &amp; White Stripe Ribbon:</b> Pink & White Stripe Ribbon used to indicate Erosion and Sediment Control Structures Silt Fence (SF) Reinforced Filter Fence (RFF) Super Silt Fence (SSF) Filter Sock (FS)
	<b>Orange &amp; White Stripe Ribbon:</b> Orange & White Stripe Ribbon used to indicate Topsoil Stockpile Locations
	<b>Blue Ribbon:</b> Blue Ribbon used to indicate Centerline (Q) Ditch Blue Ribbon used to indicate Bottom (BTM) Sediment Traps

ANTERO RESOURCES STANDARD RIBBON COLOR SCHEME  
PROVIDED BY ANTERO RESOURCES

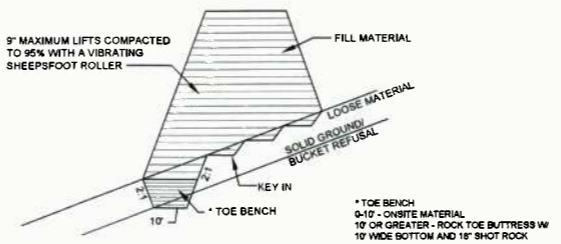
**TYPICAL WOVEN WIRE FENCE DETAIL**



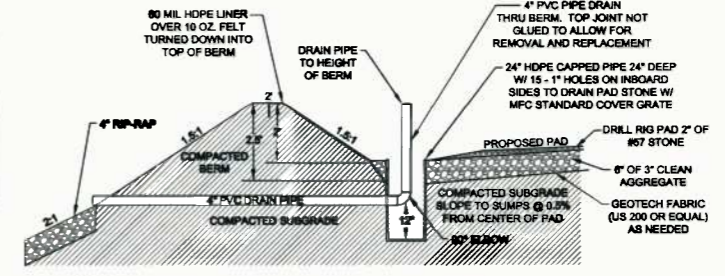
**TYPICAL CONSTRUCTION FENCE DETAIL**



**TOE BENCH DETAIL**

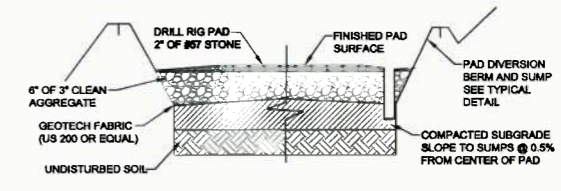


**PAD DIVERSION BERM & SUMP DETAIL**



NOTES:  
1. ALL CONTAINMENT SUMPS SHALL BE CLOSED DURING ALL WELL PAD ACTIVITIES.  
2. SUMPS AND CONTAINMENT BERM SHALL BE LINED TO PREVENT FILTRATION THROUGH THE CONTAINMENT BERM.

**TYPICAL PAD CROSS-SECTION**



REVISION

DATE

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WAS PREPARED  
FOR:  
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APPALACHIAN CORP

CONSTRUCTION DETAILS

**KUHL PAD**

CENTRAL DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA



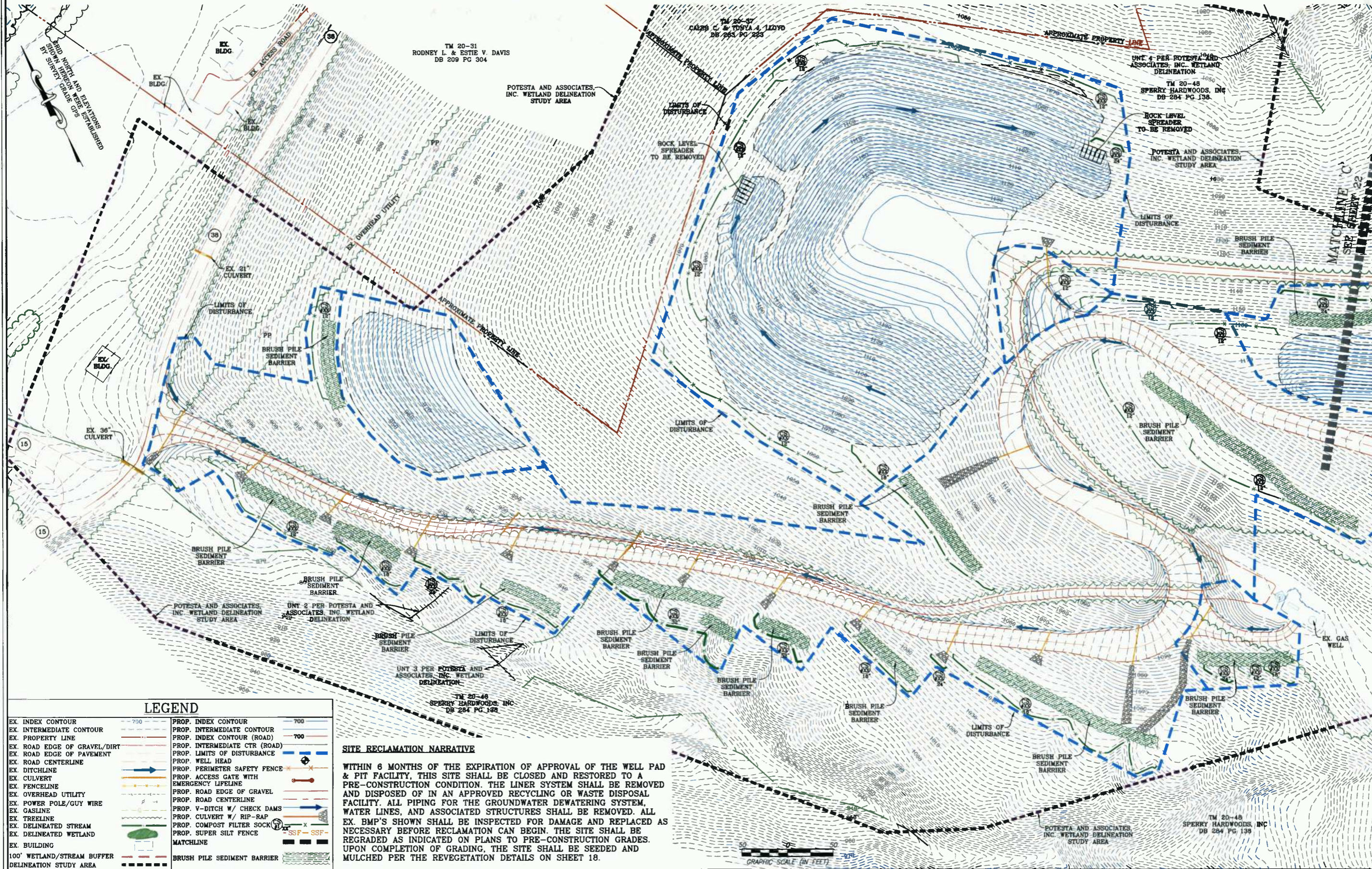
DATE: 01/07/2013

SCALE: N/A

SHEET 20 OF 23



# STAGING AREA RECLAMATION PLAN



LEGEND	
EX. INDEX CONTOUR	700
EX. INTERMEDIATE CONTOUR	700
EX. PROPERTY LINE	700
EX. ROAD EDGE OF GRAVEL/DIRT	700
EX. ROAD EDGE OF PAVEMENT	700
EX. ROAD CENTERLINE	700
EX. DITCHLINE	700
EX. CULVERT	700
EX. FENCELINE	700
EX. OVERHEAD UTILITY	700
EX. POWER POLE/GUY WIRE	700
EX. GASLINE	700
EX. TREELINE	700
EX. DELINEATED STREAM	700
EX. DELINEATED WETLAND	700
EX. BUILDING	700
100' WETLAND/STREAM BUFFER DELINEATION STUDY AREA	700
PROP. INDEX CONTOUR	700
PROP. INTERMEDIATE CONTOUR	700
PROP. INDEX CONTOUR (ROAD)	700
PROP. INTERMEDIATE CTR (ROAD)	700
PROP. LIMITS OF DISTURBANCE	700
PROP. WELL HEAD	700
PROP. PERIMETER SAFETY FENCE	700
PROP. ACCESS GATE WITH EMERGENCY LIFELINE	700
PROP. ROAD EDGE OF GRAVEL	700
PROP. ROAD CENTERLINE	700
PROP. V-DITCH W/ CHECK DAMS	700
PROP. CULVERT W/ RIP-RAP	700
PROP. COMPOST FILTER SOCK	700
PROP. SUPER SILT FENCE	700
MATCHLINE	700
BRUSH PILE SEDIMENT BARRIER	700

**SITE RECLAMATION NARRATIVE**

WITHIN 6 MONTHS OF THE EXPIRATION OF APPROVAL OF THE WELL PAD & PIT FACILITY, THIS SITE SHALL BE CLOSED AND RESTORED TO A PRE-CONSTRUCTION CONDITION. THE LINER SYSTEM SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED RECYCLING OR WASTE DISPOSAL FACILITY. ALL PIPING FOR THE GROUNDWATER DEWATERING SYSTEM, WATER LINES, AND ASSOCIATED STRUCTURES SHALL BE REMOVED. ALL EX. BMP'S SHOWN SHALL BE INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY BEFORE RECLAMATION CAN BEGIN. THE SITE SHALL BE UPGRADED AS INDICATED ON PLANS TO PRE-CONSTRUCTION GRADES. UPON COMPLETION OF GRADING, THE SITE SHALL BE SEEDED AND MULCHED PER THE REVEGETATION DETAILS ON SHEET 18.

**NAVITUS ENGINEERING INC.**  
 Engineering Survey Environmental GIS  
 151 Windy Hill Lane  
 Winchester, Virginia 22602  
 Telephone: (888) 662-4185  
 www.navituseng.com

REVISION	DATE

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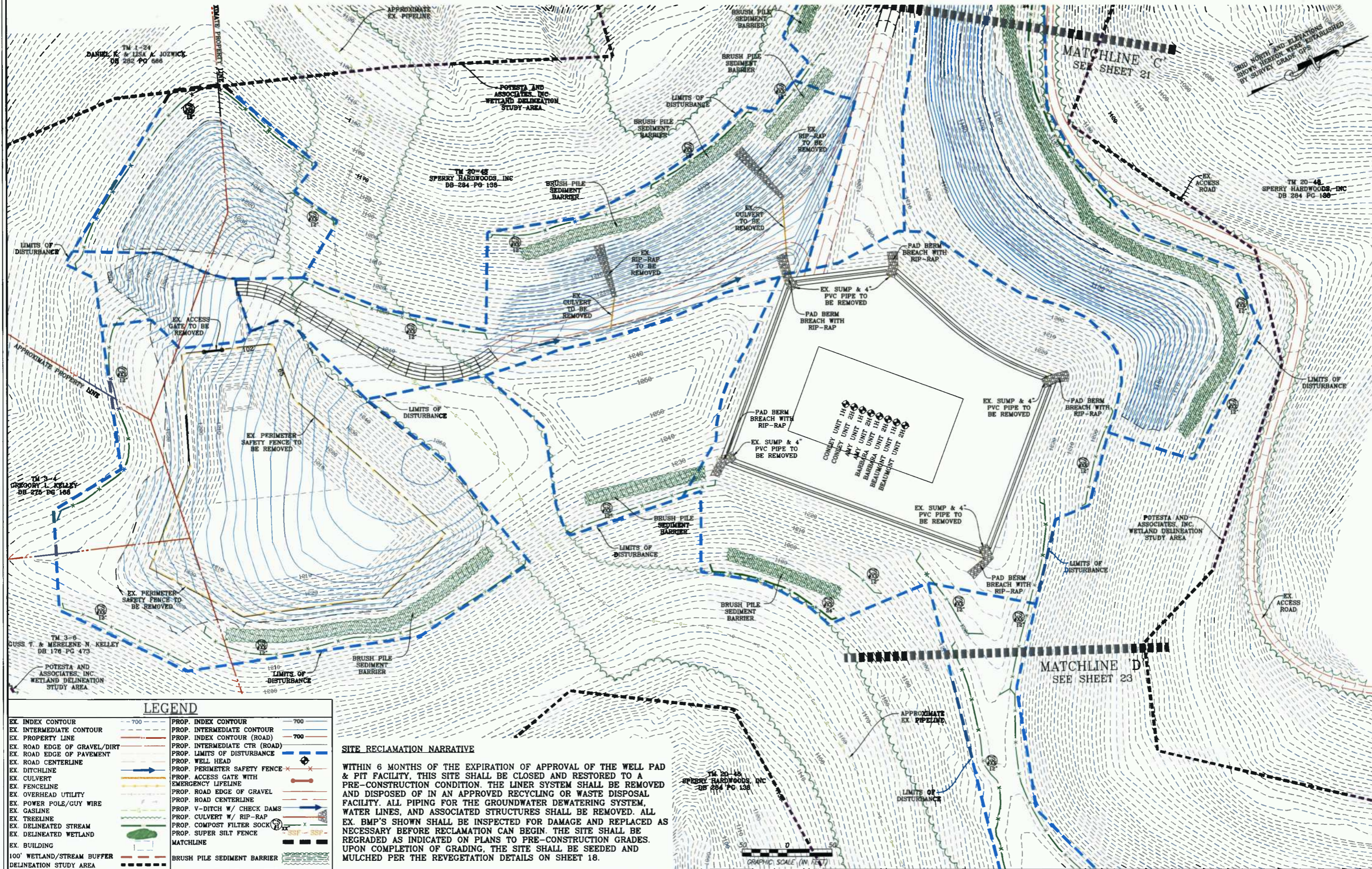
STAGING AREA RECLAMATION PLAN  
**KUHL PAD**  
 CENTRAL DISTRICT, WEST VIRGINIA  
 DODDRIDGE COUNTY, WEST VIRGINIA

REGISTERED PROFESSIONAL ENGINEER  
 STATE OF WEST VIRGINIA  
 5575

DATE: 01/07/2013  
 SCALE: 1" = 50'  
 SHEET 21 OF 23



# ASSOCIATED PIT RECLAMATION PLAN



LEGEND	
EX. INDEX CONTOUR	--- 700 ---
EX. INTERMEDIATE CONTOUR	--- 700 ---
EX. PROPERTY LINE	---
EX. ROAD EDGE OF GRAVEL/DIRT	---
EX. ROAD EDGE OF PAVEMENT	---
EX. ROAD CENTERLINE	---
EX. DITCHLINE	---
EX. CULVERT	---
EX. FENCELINE	---
EX. OVERHEAD UTILITY	---
EX. POWER POLE/GUY WIRE	---
EX. GASLINE	---
EX. TREELINE	---
EX. DELINEATED STREAM	---
EX. DELINEATED WETLAND	---
EX. BUILDING	---
100' WETLAND/STREAM BUFFER DELINEATION STUDY AREA	---
PROP. INDEX CONTOUR	--- 700 ---
PROP. INTERMEDIATE CONTOUR	---
PROP. INDEX CONTOUR (ROAD)	---
PROP. INTERMEDIATE CTR (ROAD)	---
PROP. LIMITS OF DISTURBANCE	---
PROP. WELL HEAD	---
PROP. PERIMETER SAFETY FENCE	---
PROP. ACCESS GATE WITH EMERGENCY LIFELINE	---
PROP. ROAD EDGE OF GRAVEL	---
PROP. ROAD CENTERLINE	---
PROP. V-DITCH W/ CHECK DAMS	---
PROP. CULVERT W/ RIP-RAP	---
PROP. COMPOST FILTER SOCK	---
PROP. SUPER SILT FENCE	---
MATCHLINE	---
BRUSH PILE SEDIMENT BARRIER	---

**SITE RECLAMATION NARRATIVE**

WITHIN 6 MONTHS OF THE EXPIRATION OF APPROVAL OF THE WELL PAD & PIT FACILITY, THIS SITE SHALL BE CLOSED AND RESTORED TO A PRE-CONSTRUCTION CONDITION. THE LINER SYSTEM SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED RECYCLING OR WASTE DISPOSAL FACILITY. ALL PIPING FOR THE GROUNDWATER DEWATERING SYSTEM, WATER LINES, AND ASSOCIATED STRUCTURES SHALL BE REMOVED. ALL EX. BMP'S SHOWN SHALL BE INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY BEFORE RECLAMATION CAN BEGIN. THE SITE SHALL BE REGRADED AS INDICATED ON PLANS TO PRE-CONSTRUCTION GRADES. UPON COMPLETION OF GRADING, THE SITE SHALL BE SEEDED AND MULCHED PER THE REVEGETATION DETAILS ON SHEET 18.

Engineering  
Survey  
Environmental  
GIS

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Telephone: (888) 662-4185  
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DATE	REVISION

**ANTERO RESOURCES**

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ASSOCIATED PIT RECLAMATION PLAN

**KUHL PAD**

CENTRAL DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA

REGISTERED PROFESSIONAL ENGINEER

CHRIS B. KOP

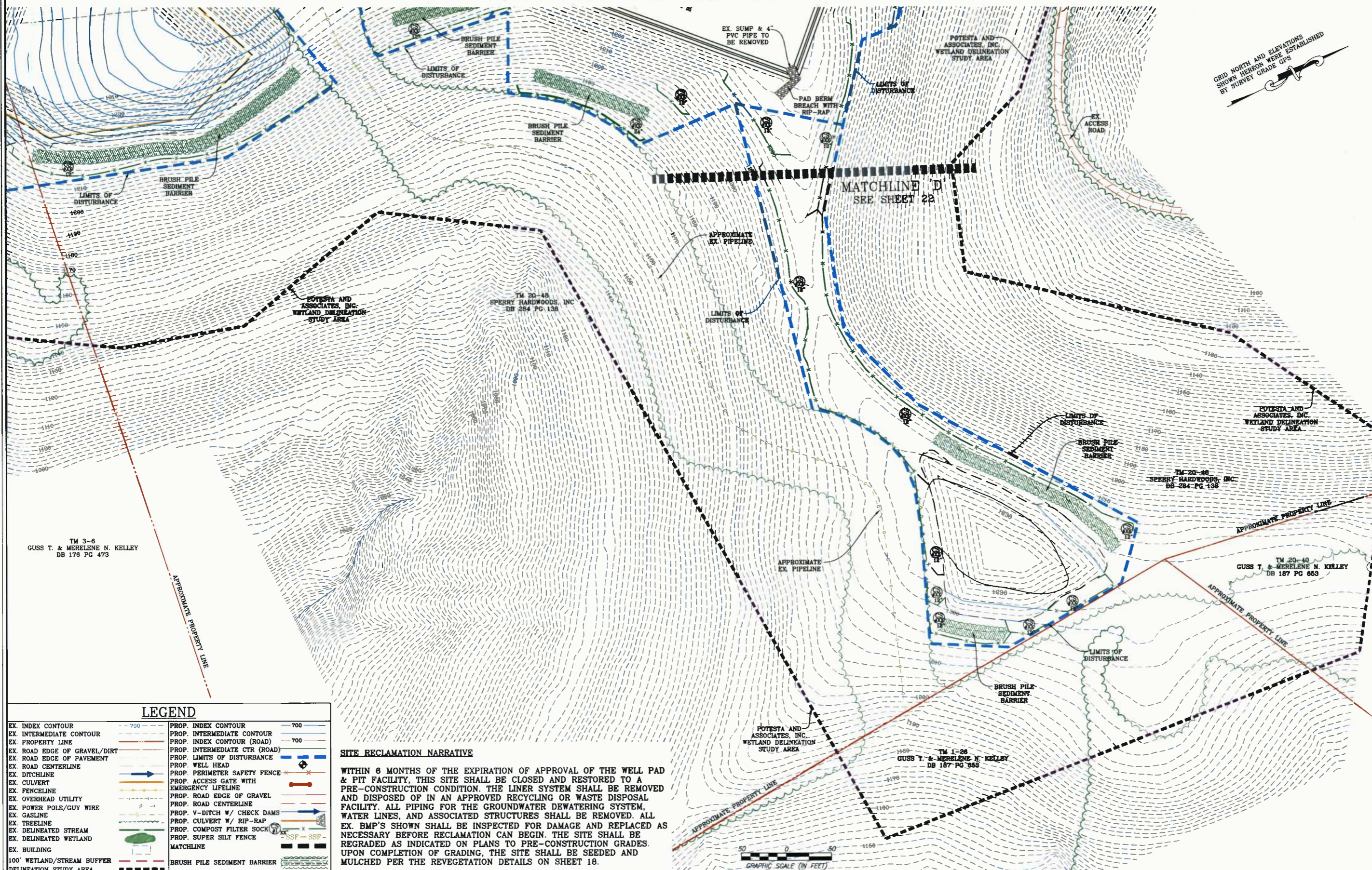
STATE OF WEST VIRGINIA

NO. 1052

DATE: 01/07/2013  
SCALE: 1" = 50'  
SHEET 22 OF 23



# STOCKPILE RECLAMATION PLAN



GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS

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 Engineering Survey Environmental GIS  
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 Winchester, Virginia 22602  
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STOCKPILE RECLAMATION PLAN  
**KUHL PAD**  
 CENTRAL DISTRICT  
 DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 01/07/2013  
 SCALE: 1" = 60'  
 SHEET 23 OF 23

**LEGEND**

EX. INDEX CONTOUR	700	PROP. INDEX CONTOUR	700
EX. INTERMEDIATE CONTOUR	700	PROP. INTERMEDIATE CONTOUR	700
EX. PROPERTY LINE	---	PROP. PROPERTY LINE	---
EX. ROAD EDGE OF GRAVEL/DIRT	---	PROP. INTERMEDIATE CTR (ROAD)	---
EX. ROAD EDGE OF PAVEMENT	---	PROP. LIMITS OF DISTURBANCE	---
EX. ROAD CENTERLINE	---	PROP. WELL HEAD	⊙
EX. DITCHLINE	---	PROP. PERIMETER SAFETY FENCE	---
EX. CULVERT	---	PROP. ACCESS GATE WITH EMERGENCY LIFELINE	---
EX. FENCELINE	---	PROP. ROAD EDGE OF GRAVEL	---
EX. OVERHEAD UTILITY	---	PROP. ROAD CENTERLINE	---
EX. POWER POLE/GUY WIRE	---	PROP. V-DITCH W/ CHECK DAMS	---
EX. GASLINE	---	PROP. CULVERT W/ RIP-RAP	---
EX. TREELINE	---	PROP. COMPOST FILTER SOCK	---
EX. DELINEATED STREAM	---	PROP. SUPER SILT FENCE	---
EX. DELINEATED WETLAND	---	MATCHLINE	---
EX. BUILDING	---	BRUSH PILE SEDIMENT BARRIER	---
100' WETLAND/STREAM BUFFER DELINEATION STUDY AREA	---		

**SITE RECLAMATION NARRATIVE**

WITHIN 6 MONTHS OF THE EXPIRATION OF APPROVAL OF THE WELL PAD & PIT FACILITY, THIS SITE SHALL BE CLOSED AND RESTORED TO A PRE-CONSTRUCTION CONDITION. THE LINER SYSTEM SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED RECYCLING OR WASTE DISPOSAL FACILITY. ALL PIPING FOR THE GROUNDWATER DEWATERING SYSTEM, WATER LINES, AND ASSOCIATED STRUCTURES SHALL BE REMOVED. ALL EX. BMP'S SHOWN SHALL BE INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY BEFORE RECLAMATION CAN BEGIN. THE SITE SHALL BE REGRADED AS INDICATED ON PLANS TO PRE-CONSTRUCTION GRADES. UPON COMPLETION OF GRADING, THE SITE SHALL BE SEEDED AND MULCHED PER THE REVEGETATION DETAILS ON SHEET 18.

