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**west virginia** department of environmental protection

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

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

June 27, 2014

**WELL WORK PLUGGING PERMIT**

**Plugging**

This permit, API Well Number: 47-4901459, issued to XTO ENERGY, INC., is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. The above named operator will also file, as required in WV Code 22-6-23, an affidavit on form WR-38 by two experienced persons in the operator's employment and the Oil and Gas inspector that the work authorized under this permit was performed and a description given. Failure to abide by all statutory and regulatory provisions governing all duties and operations here under may result in suspensions or revocation of this permit and in addition may result in civil and/or criminal penalties being imposed upon the operator.

This permit will expire in two (2) years from date of issue. If there are any questions, please free to contact me at (304) 926-0499 ext. 1654.

James Martin  
Chief

Operator's Well No: FENNELL 1562  
Farm Name: FLOYD, GENE & LINDA  
**API Well Number: 47-4901459**  
**Permit Type: Plugging**  
Date Issued: 06/27/2014

**Promoting a healthy environment.**

## PERMIT CONDITIONS

West Virginia Code § 22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

### CONDITIONS

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1. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.
3. Well work activities shall not constitute a hazard to the safety of persons.
4. This well is under a consent order and must be plugged within two years of the date of issuance of this permit.

1) Date 4/11, 2014  
2) Operator's  
Well No. Fennell 1562  
3) API Well No. 47-049 - 01450

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil  / Gas  / Liquid injection  / Waste disposal   
(If "Gas, Production  or Underground storage  ) Deep  / Shallow

5) Location: Elevation 1371 Watershed Bingamon Creek  
District Lincoln County Marion Quadrangle Shinnston 7.5'

6) Well Operator XTO Energy Inc 7) Designated Agent Gary Beall  
Address PO Box 1008 Address PO Box 1008  
Jane Lew, WV 26378 Jane Lew, WV 26378

8) Oil and Gas Inspector to be notified Name Bill Hendershot  
Address 403 James Street  
Mannington, WV 26582  
9) Plugging Contractor Name \_\_\_\_\_  
Address \_\_\_\_\_

10) Work Order: The work order for the manner of plugging this well is as follows:  
RIH inside the 7" casing and check TD at 1380', POOH and run 2" tubing to 1380' and circulate 6% gel back to surface, then pump cement from 1380' up to 1200'. pull tubing up to 1000' and wait on cement to set, RIH with small tools and tag T.O.C. Pull 2" tubing out and run CBL and find T.O.C. on 7" casing, cut casing and circulate 6% gel back to surface, pump a 100' cement plug at cut and pull casing to 200' and pump cement to surface. Install monument.

Cement - 1380' - 1200' = 180' in 7" casing  
Cement - 700' - 600' = 100' in 9 5/8" casing at cut *AND CONT.* *JMM 6/26/14*  
Cement - 200' - 0' = 200' in 9 5/8" casing  
*COVER COAL @ 553'-562' WITH CEMENT. MINIMUM CEMENT PLUG IS 100'*

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Office of Oil and Gas

Notification must be given to the district oil and gas inspector 24 hours before work can commence. APR 18 2014

Work order approved by inspector Bill Hendershot Date APR 18 2014

WV Department of Environmental Protection

WK-55

API # 47-049-01459

State of West Virginia  
Division of Environmental Protection  
Section of Oil and Gas

*ml*

Well Operator's Report of Well Work

Farm name: **Floyd, Gene L. etux** Operator Well No.: **Fennell 1562**

LOCATION: Elevation: **1,368.00'** Quadrangle: **Shinnston**

District: **Lincoln** County: **Marion**  
Latitude: **3100** Feet South of **39** Deg. **27** Min. **30** Sec.  
Longitude: **1940** Feet West of **80** Deg. **17** Min. **30** Sec.

Company: **Linn Operating, LLC**  
**P. O. BOX 368**  
**GLENVILLE, WV 26351-0368**

Agent: **Judson E. Shreves**

Casing & Tubing Size	Used in Drilling	Left in Well	Cement Fill Up Cu. Ft.
9 5/8	624'	624'	C.T.S.
7	1291'	1291'	50 sks

*Free point & Pull out of hole  
Free*

Office of Oil and Gas

APR 28 2014

WV Department of Environmental Protection

INSPECTOR: **Terry Urban**  
Permit Issued: **01/26/04**  
Well work commenced: **09/03/04**  
Well Work completed: **09/08/04**  
Verbal Plugging  
Permission granted on:  
Rotary  Cable Rig  
Total Depth (feet) **1380'**  
Fresh water depths (ft) **95'**  
Salt water depths (ft) **none**  
Is coal being mined in area (Y/N)? **y**  
Coal Depths (ft): **553-562**

OPEN FLOW DATA

Producing formation **Salt Sand** Pay zone depth (ft) **1500**  
Gas: Initial open flow **na** MCF/d Oil: Initial open flow **na** Bbl/d  
Final open flow **1500** MCF/d Final open flow **na** Bbl/d  
Time of open flow between initial and final tests **4** Hours  
Static Rock pressure **340** psig (surface pressure) after **48** Hours

Second producing formation \_\_\_\_\_ pay zone depth (ft) \_\_\_\_\_  
Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d  
Final open flow \_\_\_\_\_ MCF/d Final open flow \_\_\_\_\_ Bbl/d  
Time of open flow between initial and final tests \_\_\_\_\_ Hours  
Static rock pressure \_\_\_\_\_ psig (surface pressure) after \_\_\_\_\_ Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATE INTERVALS, FRACTURING OR STIMULATION, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

*Daniel R. Chapman*  
For: **Linn Operating, LLC**

By: **Daniel R. Chapman, Geologist**  
Date: **November 29, 2004**

*MAR 14 2004*

Salt Sand, natural, no treatment needed

No open hole log

Sand, shale	0	476	Damp @ 95'
Sand, shale, RR	476	1100	Coal @ 553-562
Sand, shale	1100	1380	T.D.

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Office of Oil and Gas  
APR 28 2014  
WV Department of  
Environmental Protection

4901459P

WW-4A  
Revised 6-07

1) Date: 4/11/14  
2) Operator's Well Number  
Fennell 1562

3) API Well No.: 47 - 049 - 01459

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL**

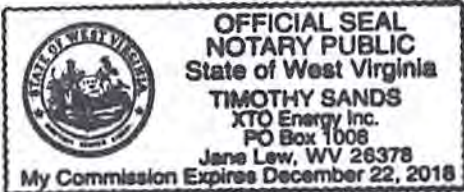
<b>4) Surface Owner(s) to be served:</b>	<b>5) (a) Coal Operator</b>
(a) Name <u>Gene &amp; Linda Floyd</u>	Name <u>Consol Mining Company LLC</u>
Address <u>65 Farmers Pl.</u>	Address <u>1000 Consol Energy Drive</u>
<u>Worthington, WV 26591</u>	<u>Cannonsburg, PA 15317</u>
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name <u>None</u>
(c) Name _____	Address _____
Address _____	Name _____
(6) Inspector <u>Bill Hendershot</u>	(c) Coal Lessee with Declaration
Address <u>403 James Street</u>	Name <u>None</u>
<u>Mannington, WV 26582</u>	Address _____
Telephone <u>304-206-7750</u>	_____

**TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:**

- (1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
- (2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.



Well Operator XTO Energy Inc.  
 By: [Signature]  
 Its: Production Superintendent  
 Address PO Box 1008  
Jane Lew, WV 26378  
 Telephone 304-884-6000

Subscribed and sworn before me this 11<sup>th</sup> day of April 2014  
[Signature]  
 My Commission Expires 12/22/18

Notary Public  
**RECEIVED**  
 Office of Oil and Gas  
 APR 28 2014

**Oil and Gas Privacy Notice**

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

4901459A

7012 1010 0002 5911 6505

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Total Postage & Fees	\$	

Postmark Here: JANE LEW WV APR 14 2011 26378

Consolidated Coal Company  
 1000 Consol Energy Drive  
 Canonsburg, PA 15317-6506

PS: Fennell 1562 Plugging Application ✓

Instructions

7012 1010 0002 5911 6499

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Total Postage & Fees	\$	

Postmark Here: JANE LEW WV APR 14 2011 26378

Gene & Linda Floyd  
 65 Farmers Pl.  
 Worthington, WV 26591

PS: Fennell 1562 Plugging Application ✓

Instructions

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 APR 28 2014  
 WV Department of  
 Environmental Protection

4901459 P  
CF 1169  
100

WW-9  
Rev. 5/08

Page \_\_\_\_\_ of \_\_\_\_\_  
API Number 47 - 049 - 01459  
Operator's Well No. Fennell 1562

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

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM  
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name XTO Energy Inc. OP Code 494487940

Watershed Bingamon Creek Quadrangle Shinnston 7.5'

Elevation 1371 County Marion District Lincoln

Description of anticipated Pit Waste: Fluids from plugging operations.

Will a synthetic liner be used in the pit? Yes 20 mil.

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number 4707302523, 4708505151, 4708509721 )
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Meadowbrook Landfill SWF#1032, RES Water Recycling -WMGR123SW005 (PA))

Proposed Work For Which Pit Will Be Used:

- Drilling
- Workover
- Other (Explain \_\_\_\_\_)
- Swabbing
- Plugging

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

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature [Signature]

Company Official (Typed Name) Gary Beall

Company Official Title Production Superintendent

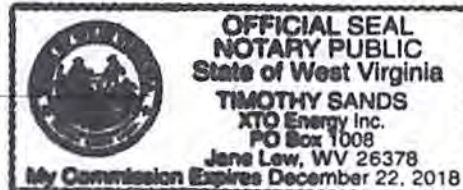
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Subscribed and sworn before me this 11<sup>th</sup> day of April, 2014 APR 28 2014

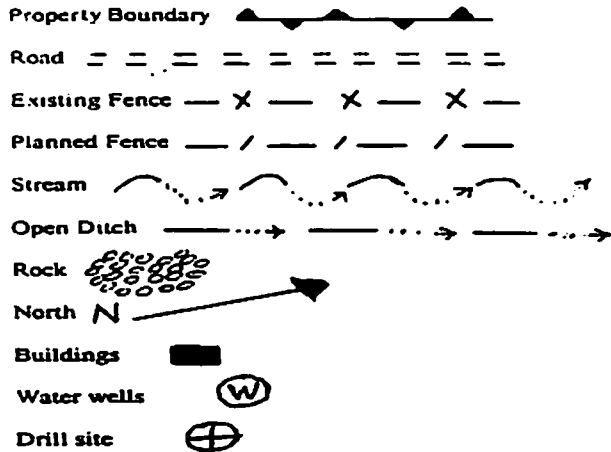
[Signature]  
Notary Public

WV Department of  
Environmental Protection

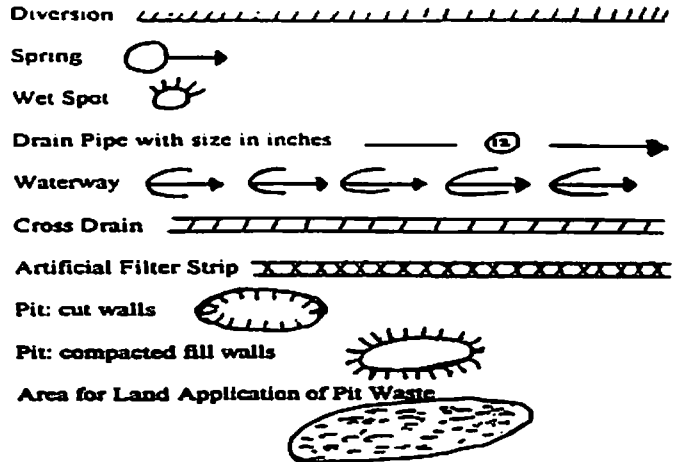
My commission expires 12/22/18







**LEGEND**



Proposed Revegetation Treatment: Acres Disturbed 2.03 +/- Prevegetation pH \_\_\_\_\_

Lime 3 Tons/acre or to correct to pH \_\_\_\_\_

Fertilizer (10-20-20 or equivalent) 1000 lbs/acre (500 lbs minimum)

Mulch 3 Tons/acre

**Seed Mixtures**

Seed Type	Area I		Seed Type	Area II	
		lbs/acre			lbs/acre
Kentucky Bluegrass		20			
Redtop		3			
Birdsfoot Trefoil		10			

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

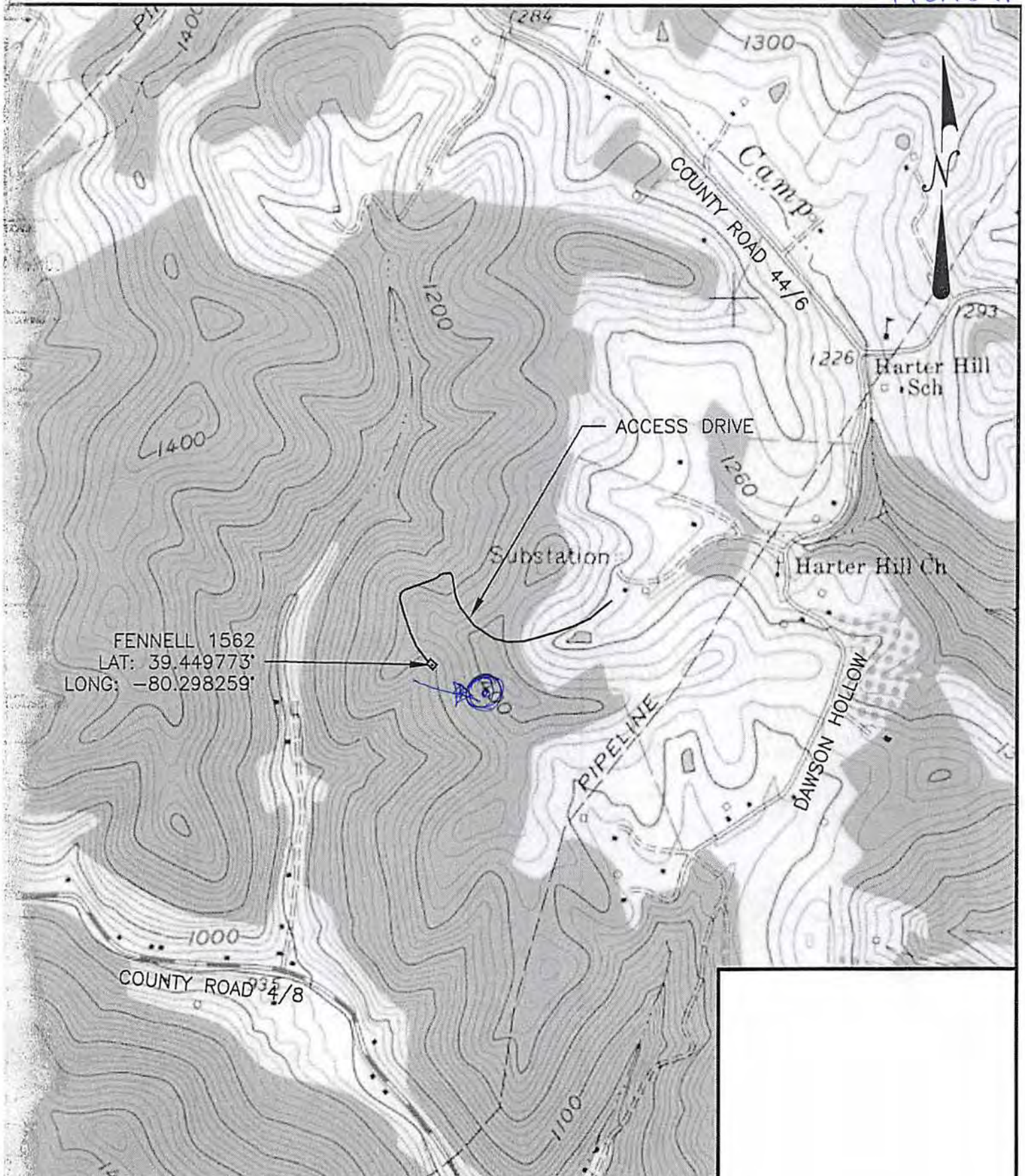
Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Bill Humber*

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

Title: Environmental Inspector Date: 4-22-14

Field Reviewed? (  ) Yes (  ) No



FENNELL 1562  
 LAT: 39.449773'  
 LONG: -80.298259'

DESIGNED BY: JMH REVIEWED BY: MMV DRAWN BY: JMH DATE: 4/23/14 PROJ. NO.: DRAWING NO.:	REVISION BY: _____ DATE: _____ DESCRIPTION: _____
	REVISION BY: _____ DATE: _____ DESCRIPTION: _____
	REVISION BY: _____ DATE: _____ DESCRIPTION: _____
	REVISION BY: _____ DATE: _____ DESCRIPTION: _____
	REVISION BY: _____ DATE: _____ DESCRIPTION: _____
	REVISION BY: _____ DATE: _____ DESCRIPTION: _____

NO. NO.  
1

**FENNELL 1562**  
 prepared for  
**XTO ENERGY, INC.**  
 situated  
**DAWSON HOLLOW, MARION COUNTY, WEST VIRGINIA**  
 USGS MAP - SHINNSTON QUADRANGLE

**MKA Morris Knowles & Associates, Inc.**  
*Consulting Engineers and Land Surveyors*  
 443 Athens Drive  
 Delmont, PA 15623  
 Telephone: (724) 466-6222  
 Fax: (724) 466-6940

WW-7  
8-30-06



West Virginia Department of Environmental Protection  
Office of Oil and Gas  
**WELL LOCATION FORM: GPS**

API: 47-049-01459 WELL NO.: 301625 (Fennel 1562)

FARM NAME: Gene & Linda Floyd

RESPONSIBLE PARTY NAME: XTO Energy, Inc.

COUNTY: Marion DISTRICT: Lincoln

QUADRANGLE: Shinnston 7.5'

SURFACE OWNER: Gene L. & Linda W. Floyd

ROYALTY OWNER: Waco Oil and Gas

UTM GPS NORTHING: 4366926

UTM GPS EASTING: 560378 GPS ELEVATION: 418 m (1371 ft)

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone: 17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:

Survey grade GPS     : Post Processed Differential       
Real-Time Differential     

Mapping Grade GPS X: Post Processed Differential X  
Real-Time Differential     

4. Letter size copy of the topography map showing the well location.

I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.

*Stacy Ohm*  
Signature  
1/3/14  
Date

PS # 2180  
Title

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APR 28 2014  
WV Department of  
Environmental Protection

49 01459A



WVDEP  
Office of Oil & Gas  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304-2345

*[Handwritten scribble]*

Re: Application to Plug and Abandon  
Fennell 1562  
Lincoln District  
Marion County, WV

To Whom It May Concern:

In accordance with Article 22-6-23 of the West Virginia State Code regarding oil and gas operations, please find the attached application for the plugging and abandonment of the subject well. Notices of our intention to plug this wellbore have been sent to the surface owner, coal owners with declarations recorded, and coal operators associated with this well. Copies of the certified mail receipts are attached for your records. If you have any questions or need additional information, please feel free to contact me at 304-884-6000.

Sincerely,

Gary Beall  
PO Box 1008  
Jane Lew, WV 26378

GB/tps

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APR 28 2014  
WV Department of  
Environmental Protection

# EROSION AND SEDIMENT CONTROL PLAN

## FENNELL 1562

DAWSON HOLLOW  
MARION COUNTY, WEST VIRGINIA  
JANUARY 2014

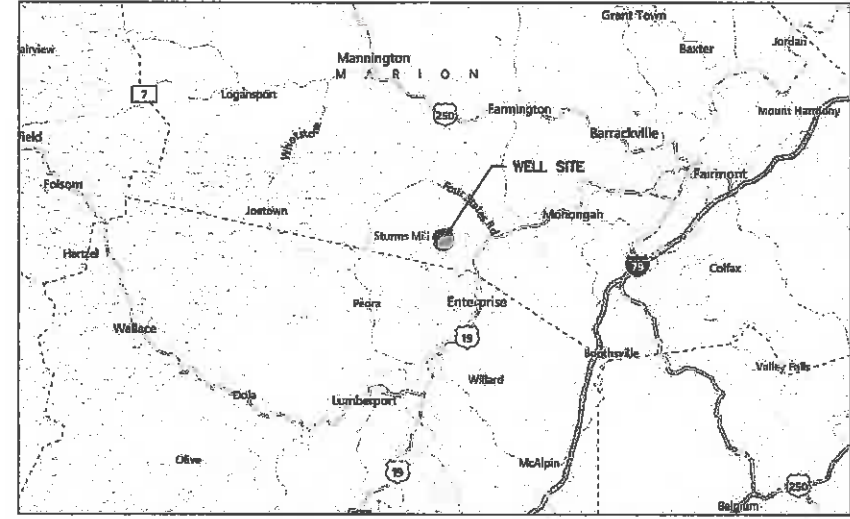
### ENGINEER / SURVEYOR

MORRIS KNOWLES & ASSOCIATES, INC.  
A HAMMONTREE COMPANY  
443 ATHENA DRIVE  
DELMONT, PA 15626  
  
HAMMONTREE & ASSOCIATES, LIMITED  
5233 STONEHAM RD.  
NORTH CANTON, OH 44720  
  
ATTN- MICHAEL M. VALE PE, CPESC, OPSWQ  
PHONE- 724-468-4622 (PA)  
330-499-8817 (OH)  
  
mvale@hammontree-engineers.com

### OWNER / DEVELOPER

XTO ENERGY, INC.  
480 INDUSTRIAL PARK ROAD  
JANE LEW, WV 26378  
  
ATTN- TIM SANDS  
PHONE- 304-884-6042  
  
Tim\_Sands@xtoenergy.com

### VICINITY MAP N.T.S.



### NOTES:

MORRIS KNOWLES & ASSOCIATES, INC. / HAMMONTREE & ASSOCIATES, LIMITED EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND OTHER RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR MANIPULATED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT PERMISSION AND CONSENT OF MORRIS KNOWLES & ASSOCIATES, INC/ HAMMONTREE & ASSOCIATES, LIMITED.

THE ENGINEER ASSUMES NO RESPONSIBILITY FOR ANY CHANGES IN DESIGN PLANS UNLESS WRITTEN CONSENT IS GIVEN BY THE ENGINEER. THE CONTRACTOR AND/OR THE OWNER WILL BE HELD RESPONSIBLE FOR ANY FIELD MODIFICATIONS MADE WITHOUT THE WRITTEN CONSENT OF THE ENGINEER AND NECESSARY APPROVALS BY PERMITTING AGENCIES.

THE LOCATION OF EXISTING UTILITIES WERE TAKEN FROM RECORDS AND MARKING PROVIDED BY OTHERS AND OBSERVED EVIDENCE. THE LOCATIONS SHOWN MAY BE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS, SIZES AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL EXERCISE CARE TO AVOID DAMAGE TO ALL EXISTING UTILITIES.

**RECEIVED**  
Office of Oil and Gas  
*[Signature]*  
APR 10 2014  
CHARLES F. HAMMONTREE, REGISTERED PROFESSIONAL ENGINEER  
DATE: 4-10-14  
WV Department of Environmental Protection



THE GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED IN THE SITE NO MORE TEN DAYS AND NO LESS THAN 48 HOURS IN ADVANCE OF EXCAVATION (WV CHAPTER 24C-1-5, UNDERGROUND FACILITY DAMAGE PREVENTION ACT).

### INDEX OF SHEETS

EROSION AND SEDIMENT CONTROL TITLE SHEET	ES-1
EROSION AND SEDIMENT CONTROL PLAN - OVERALL	ES-2
EROSION AND SEDIMENT CONTROL NOTES	ES-3
EROSION AND SEDIMENT CONTROL DETAILS	ES-4

### ESTIMATED QUANTITIES

	UNITS	ESTIM. QUANTITY	BID QUANTITY	UNIT PRICE	TOTAL COST
<b>CLEARING &amp; GRUBBING</b>					
CLEARING & GRUBBING	AC	0.21			
<b>EROSION &amp; SEDIMENT CONTROL</b>					
STONE CONSTRUCTION ENTRANCE	EA	1			
PERMANENT SEEDING	SY	1,035			
18" COMPOST FILTER SOCK	LF	140			

### LEGEND

EX. MONUMENT BOX	-G-	GAS LINE
PROP. MONUMENT BOX	⊙	GAS LINE MARKER
EX. MONUMENT (AS NOTED)	⊙	GAS METER
5/8" BAR W/ H&A CAP (SET)	⊙	GAS VALVE
BENCHMARK (AS NOTED)	⊙	GAS TANK
BOUNDARY LINE	⊙	GAS WELL
CENTER LINE	-S-	SANITARY SEWER LINE
LOT LINE	⊙	SANITARY SEWER LINE MARKER
PROPERTY LINE	⊙	SANITARY M.H./ C.O.
R/W RIGHT OF WAY	M.H.	MANHOLE
RECORD BEARINGS & DIST.	C.O.	CLEAN OUT
E.O.P. EDGE OF PAVEMENT	-ST-	STORM SEWER LINE
F.F. FINISH FLOOR	⊙	STORM SEWER LINE MARKER
EX. CONTOUR LINE	□	STORM CATCH BASIN
PROP. CONTOUR LINE	□	STORM CURB INLET
-980- CONTOUR LABEL	⊙	STORM MANHOLE
BOLLARD	□	STORM DOWNSPOUT
FENCE (AS NOTED)	—	STORM HEADWALL
GUARDRAIL	C.B.	CATCH BASIN
MAILBOX	C.I.	CURB INLET
RAIL ROAD	T/G	TOP OF GRATE
SIGN	T/C	TOP OF COVER
H.C. PARKING SPACE	T/CU	TOP OF CURB
DECIDUOUS TREE (AS NOTED)	ℓ	FLOWLINE
EVERGREEN TREE (AS NOTED)	Y.D.	YARD DRAIN
BUSH (AS NOTED)	D.S.	DOWNSPOUT
SOIL BORING	-OT-	OVERHEAD TELEPHONE LINE
POLE ANCHOR	-UT-	UNDERGROUND TELEPHONE LINE
GUY POLE	⊙	TELEPHONE LINE MARKER
GENERAL POLE	□	TELEPHONE BOX
FLAG POLE	⊙	TELEPHONE MANHOLE
LIGHT POLE	-OTV-	OVERHEAD TV LINE
LIGHT & POWER POLE	-UTV-	UNDERGROUND TV LINE
LIGHT, POWER, TELE POLE	⊙	TV LINE MARKER
LIGHT, POWER, TELE, TV POLE	□	TV/CABLE BOX
POWER POLE	⊙	TV/CABLE MANHOLE
TELEPHONE POLE	-W-	WATER LINE
TELEPHONE, LIGHT POLE	⊙	WATER LINE MARKER
TELEPHONE, POWER POLE	⊙	WATER MANHOLE
PULL BOX	⊙	WATER METER
TRAFFIC CONTROL BOX	⊙	WATER VALVE
POLE W/ PED. SIGNAL	⊙	WATER SPRINKLER
POLE W/ TRAFFIC SIGNAL	⊙	FIRE HYDRANT
OVERHEAD ELECTRIC LINE	⊙	MONITORING WELL
UNDERGROUND ELECTRIC LINE		
ELECTRIC LINE MARKER		
ELECTRIC BOX		
ELECTRIC MANHOLE		
ELECTRIC METER		
FIBER OPTIC LINE		
FIBER OPTIC LINE MARKER		

### REQUIRED PERMIT LIST

PERMIT	DATE RECEIVED

MORRIS KNOWLES & ASSOCIATES, INC.  
A HAMMONTREE COMPANY  
ENGINEERS, PLANNERS, SURVEYORS  
443 ATHENA DRIVE DELMONT, PA 15626  
PHONE (724) 468-4622 FAX (724) 468-8840  
www.morrisknowles.com

DESIGN: \_\_\_\_\_ DATE: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
REVISED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
FIELD BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
BK PG: \_\_\_\_\_ DATE: 01/10/14

EROSION & SEDIMENT CONTROL TITLE SHEET  
FENNELL 1562  
XTO ENERGY, INC.  
DAWSON HOLLOW  
MARION COUNTY, WEST VIRGINIA  
ES-1

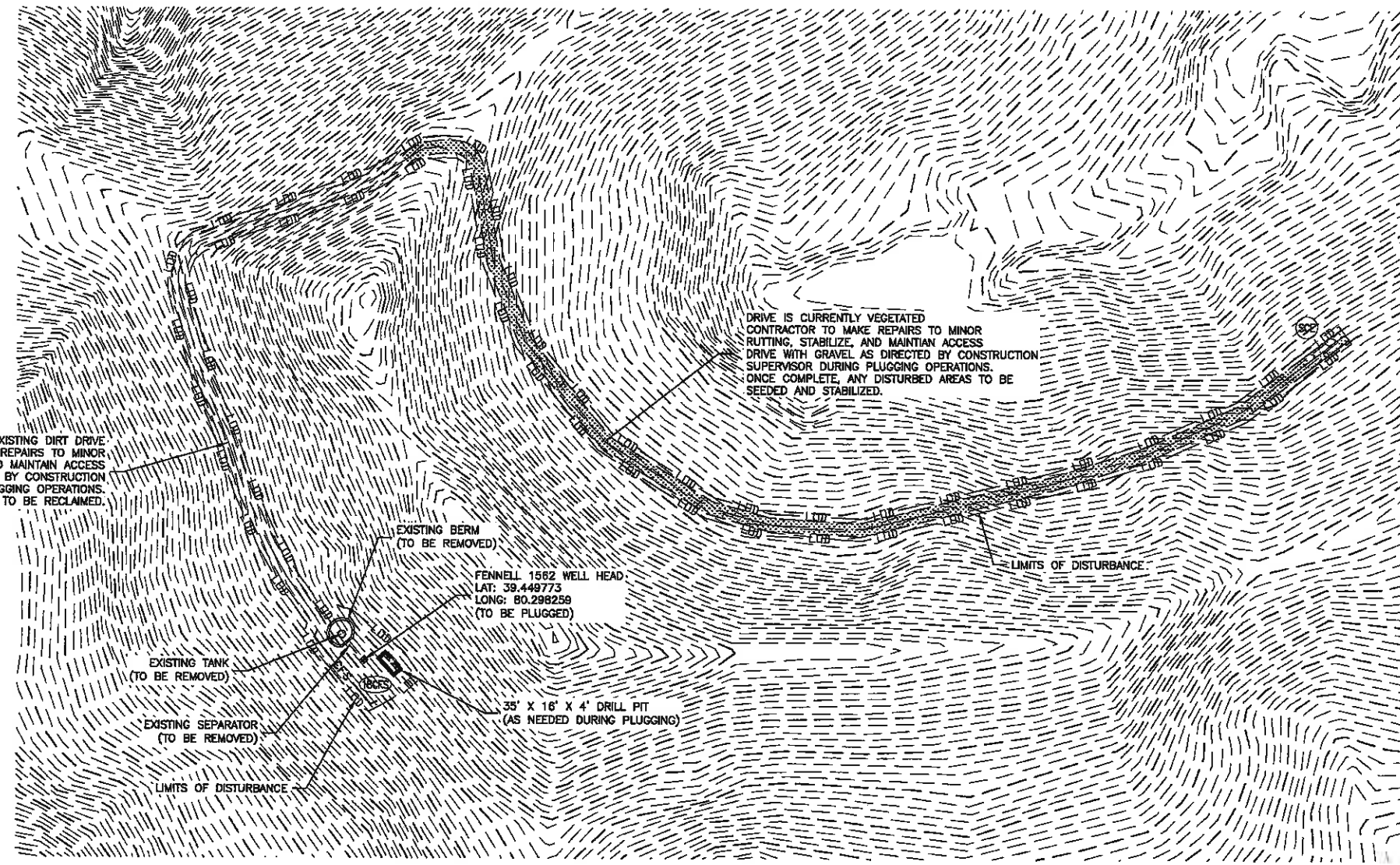
**ZONING:**  
NO ZONING

**WETLANDS:**  
NO WETLANDS ON SITE

**FLOOD\_ZONE:**  
ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP, MAP NUMBER 540490D183D, EFFECTIVE DATE: JUNE 19, 2012, THE SUBJECT PROPERTIES LIES WITHIN ZONE X WHICH IS DEFINED ON SAID MAP AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN".

- NOTES:**
1. EROSION CONTROL BLANKETS OR FLEXTERRA TO BE INSTALLED ON ALL CUT AND FILL SLOPES OF 3:1 OR STEEPER.
  2. WHEREVER SEED AND MULCH IS APPLIED BY HYDROSEEDING METHODS, THE SEED AND MULCH SHOULD BE APPLIED IN SEPARATE APPLICATIONS WITH THE SEED BEING APPLIED FIRST AND THE MULCH SPRAYED ON TOP OF THE SEED. THIS IS TO ENSURE THAT THE SEED MAKES CONTACT WITH THE UNDERLYING SOIL. SOIL PREPARATION SHOULD BE COMPLETED PRIOR TO ADDING SEED TO THE HYDROSEEDING EQUIPMENT. RUNNING SEED THROUGH THE PUMPING SYSTEM CAN RESULT IN EXCESSIVE ABRASION OF THE SEED AND REDUCE THE PERCENTAGE OF PURE LIVE SEED IN THE APPLICATION. THEREFORE ALL SITE PREPARATION SHOULD BE COMPLETED PRIOR TO THE ARRIVAL OF THE HYDROSEEDER.

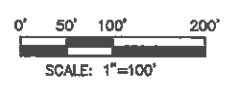
MORRIS KNOWLES & ASSOCIATES, INC.  
A HAMMONTREE COMPANY  
ENGINEERS, PLANNERS, SURVEYORS  
443 AETHERIA DRIVE BELMONT, PA 19008  
PH: (717) 468-4822 FAX: (717) 468-4840  
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WRH  
4-22-14

**LEGEND**

- (IP) INLET PROTECTION
- (SCE) STONE CONSTRUCTION ENTRANCE
- (RF) ROCK FILTER
- (RO) ROCK CHANNEL OUTLET PROTECTION
- (PC) PERMANENT CHANNEL
- (TC) TEMPORARY CHANNEL
- (12CFS) 12" COMPOST FILTER SOCK
- (18CFS) 18" COMPOST FILTER SOCK
- (24CFS) 24" COMPOST FILTER SOCK
- (32CFS) 32" COMPOST FILTER SOCK
- (CFS) COMPOST FILTER SOCK PYRAMID (3) 18" OR (2) 24" W/ (1) 18"



DESIGN BY:	DATE:	DESC.:
DRW BY:		
FLD BK:		
BK PG:		
DATE:	01/10/14	

EROSION & SEDIMENT CONTROL PLAN - OVERALL  
FENNEL 1562  
XTO ENERGY, INC.  
DANSON HOLLOW  
MARION COUNTY, WEST VIRGINIA

ES-2

**EROSION AND SEDIMENTATION CONTROL PLAN NOTES:**

- ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO CHANNELS OF CONVEYANCE AS APPROPRIATE FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE CONTROLS.
- EROSION AND SEDIMENTATION CONTROLS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE WITHIN THE TRIBUTARY AREAS OF THOSE CONTROLS.
- AFTER SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE CONTROLS MUST BE STABILIZED.
- STORMWATER INLETS WHICH DO NOT DISCHARGE TO SEDIMENT TRAPS OR BASINS, MUST BE PROTECTED UNTIL THE TRIBUTARY AREAS ARE STABILIZED.
- SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
- STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
- ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 20 DAYS MUST BE STABILIZED IMMEDIATELY. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN ONE YEAR MAY BE STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE REDISTURBED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS.
- STOCKPILES MUST BE STABILIZED IMMEDIATELY.
- HAY OR STRAW MULCH MUST BE APPLIED AT RATES OF AT LEAST 3.0 TONS PER ACRE.
- UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION CONTROLS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING.
- THE CONTRACTOR SHALL RECYCLE MATERIALS WHENEVER APPROPRIATE AND WHEN IN ACCORDANCE WITH LOCAL, STATE, & WDEP REQUIREMENTS. ALL MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF PROPERLY IN A C&D LANDFILL IF CLEAN FILL MATERIAL IS REMOVED FROM THE SITE, IT SHALL BE TAKEN TO AN APPROVED C&D LANDFILL OR IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AN APPROVED E&S PLAN IF OVER 5000 SQUARE FEET OF AREA IS DISTURBED.

**EROSION AND SEDIMENT CONTROL FACILITIES MAINTENANCE SCHEDULE:**

- ALL EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED UNTIL A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.

**STONE CONSTRUCTION ENTRANCE:**

- THE STONE CONSTRUCTION ENTRANCES ARE TO BE INSPECTED AT THE END OF EACH WORKING DAY AND REPAIRED IMMEDIATELY.
- THE THICKNESS OF THE ROCK CONSTRUCTION ENTRANCE SHALL BE CONSTANTLY MAINTAINED AT 8".
- A STONE STOCKPILE IS TO BE READILY AVAILABLE ON THE SITE AT ALL TIMES FOR IMMEDIATE REPAIR.

**COMPOST FILTER SOCK:**

- COMPOST FILTER SOCK MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH COMPOST FILTER SOCK SECTION MUST EXTEND AT LEAST 10 FEET UPSLOPE AT 45 DEGREES TO THE MAIN COMPOST FILTER SOCK ALIGNMENT.
- THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTER SOCK IN A FUNCTIONAL CONDITION AT ALL TIMES AND IT SHALL BE ROUTINELY INSPECTED.
- WHERE THE SOCK REQUIRES REPAIR, IT WILL BE ROUTINELY REPAIRED.
- THE CONTRACTOR SHALL REMOVE SEDIMENT COLLECTED AT THE BASE OF THE SOCK WHEN IT REACHES 1/2 OF THE EXPOSED HEIGHT OF THE SOCK OR AS DIRECTED BY THE ENGINEER.
- THE COMPOST FROM THE FILTER SOCK WILL BE DISPERSED ON THE SITE WHEN SITE REACHES 70% VEGETATIVE COVER.

**VEGETATION:**

- THE CONTRACTOR SHALL INSPECT VEGETATED AREAS WEEKLY AND AFTER EACH STORM (RUNOFF) EVENT.
- THE CONTRACTOR SHALL INSPECT THE SITE FOR RILLS OR GULLIES ON CUT OR FILL SLOPES. THE CONTRACTOR SHALL FILL RILLS AND GULLIES, REGRADE DISTURBED AREAS TO PROVIDE A UNIFORM SLOPE, THEN RESEED/MULCH AND REPAIR/REPLACE MATS TO ORIGINAL SPECIFICATIONS.
- THE REPAIRS SHALL BE MADE WITHIN 2 DAYS OF DISCOVERING PROBLEM.

**GRADING NOTES:**

- THE CONTRACTOR SHALL REMOVE ALL EXISTING ASPHALT PAVEMENT AND CONCRETE SLABS FROM THE SITE.
- THE CONTRACTOR SHALL PROOF ROLL THE SITE TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER AND REMOVE ANY SOFT SOFT PRIOR TO THE IMPORTING OF ANY FILL MATERIAL.
- THE CONTRACTOR SHALL REPLACE ALL CURB SECTIONS, SIDEWALKS, AND PAVEMENT, WHICH HAS BEEN CUT AND DISTURBED WITHIN THE RIGHT-OF-WAY WITH WEST VIRGINIA DEPARTMENT OF TRANSPORTATION'S STANDARD MATERIALS.
- THE CONTRACTOR SHALL ADJUST TO GRADE ALL WATER AND GAS VALVES.
- THE CONTRACTOR SHALL COMPACT ALL FILL MATERIALS TO NOT LESS THAN 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D1557 TO PROVIDE STABILITY AND PREVENT SETTLEMENT.
- THE CONTRACTOR SHALL USE WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL.

**SITE STABILIZATION INSTALLATION AND MAINTENANCE (TEMPORARY AND PERMANENT):**

- TILL SOIL TO DEPTH OF 2". REMOVE ALL OBJECTS 2" OR LARGER.
- BLEND COMMERCIAL FERTILIZER INTO THE SOIL TO A DEPTH OF 2". FERTILIZER MAY BE BLENDED DURING TILLING.
- SOW REQUIRED SEED MIXTURE UNIFORMLY ON THE PREPARED AREA BY HYDRAULIC SEEDING EQUIPMENT, HAND SEEDING, OR ANY OTHER APPROPRIATE METHOD.
- AFTER SEEDING ROLL TOPSOILED AREAS THAT ARE TO BE MOWED. USE A ROLLER WEIGHING NOT MORE THAN 85 LBS./FT. WIDTH.
- FOR PERMANENT SITE STABILIZATION APPLY SLOW RELEASE NITROGEN FERTILIZER TO THE SURFACE OF SEEDED AREAS.
- PLACE MULCH IMMEDIATELY AFTER SEEDING OR WITHIN 48 HOURS AFTER SEEDING IS COMPLETED. PLACE HAY & STRAW UNIFORMLY IN A CONTINUOUS BLANKET AT THE MINIMUM RATE SPECIFIED ABOVE. AN ACCEPTABLE MECHANICAL BLOWER MAY BE USED TO APPLY MULCH. MACHINES WHICH CUT MULCH INTO SHORT PIECES WILL NOT BE PERMITTED.
- MAINTENANCE - SATISFACTORILY MAINTAIN GRASS AREAS WITHIN GRADING LIMITS, UNTIL THE ENTIRE PROJECT HAS BEEN COMPLETED. MOW, AS INDICATED AND WHEN DIRECTED. CONTROL PROHIBITED AND NOXIOUS WEED GROWTH BY HERBICIDE SPRAYING OR CUTTING. AFTER THE SEEDING AND SOIL SUPPLEMENT WORK ON A SLOPE HAS BEEN SATISFACTORILY COMPLETED, IF A SLOPE FAILURE OCCURS, ONE WHICH REQUIRES REDRESSING, EXCAVATION, OR ESTABLISHMENT OF A NEW SLOPE, REAPPLY SOIL SUPPLEMENTS, THEN RESEED, AS SPECIFIED FOR THE ORIGINAL TREATMENT.
- A SITE WILL BE CONSIDERED TO BE PERMANENTLY STABILIZED WHEN ALL PERMANENT CONTROL MEASURES AND FACILITIES HAVE BEEN COMPLETED AND ARE OPERATIONAL. TEMPORARY CONTROL MEASURES AND FACILITIES REMOVED, AND UNIFORM 70% PERENNIAL VEGETATION COVER IS ESTABLISHED TO THE POINT WHERE THE SURFACE SOIL IS CAPABLE OF RESISTING EROSION DURING RUNOFF EVENTS. THE STANDARD FOR THIS VEGETATIVE COVER WILL BE A UNIFORM COVERAGE OR DENSITY OF 70% ACROSS THE DISTURBED AREA.
- THE CONTRACTOR SHALL MAINTAIN THE SITE PER THE PROVISIONS OF THIS PLAN UNTIL PERMANENT STABILIZATION IS ESTABLISHED.

**PERMANENT STABILIZATION:**

SPECIES: KENTUCKY BLUEGRASS/ REDTOP/ BIRDSFOOT TREFOL  
 % PURE LIVE SEED: 99%  
 APPLICATION RATE: 20 LBS/ACRE, 3 LBS/ACRE, AND 10 LBS/ACRE, RESPECTIVELY  
 FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-20-20  
 FERTILIZER APPL. RATE: COMMERCIAL - 1000 LBS/ACRE  
 LIMING RATE: 3 TONS/ACRE  
 MULCH TYPE: HAY & STRAW  
 MULCHING RATE: 3 TONS/ACRE  
 ANCHOR MATERIAL: RECYCLED CELLULOSE FIBER/WOOD FIBER MIXTURE  
 ANCHORING METHOD: HYDRAULIC SEEDING EQUIPMENT  
 RATE OF ANCHOR: 310 LBS/1000 SQ. YD.  
 MATERIAL APPLICATION: YEAR AROUND  
 SEEDING SEASON DATES:

**TEMPORARY STABILIZATION:**

SPECIES: ANNUAL RYEGRASS  
 % PURE LIVE SEED: 95%  
 APPLICATION RATE: 40 LBS/ACRE  
 FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-10-10  
 FERTILIZER APPL. RATE: 1060 LBS/ACRE  
 LIMING RATE: 3 TONS/ACRE  
 MULCH TYPE: HAY & STRAW  
 MULCHING RATE: 3 TONS/ACRE

**PERMANENT-STEEP SLOPE:**

SPECIES: KENTUCKY BLUEGRASS/ REDTOP/ BIRDSFOOT TREFOL  
 % PURE LIVE SEED: 99%  
 APPLICATION RATE: 20 LBS/ACRE, 3 LBS/ACRE, 6 LBS/ACRE, RESPECTIVELY  
 FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-20-20  
 FERTILIZER APPL. RATE: COMMERCIAL - 1000 LBS/ACRE  
 LIMING RATE: 3 TONS/ACRE  
 MULCH TYPE: HAY & STRAW  
 MULCHING RATE: 3 TONS/ACRE  
 ANCHOR MATERIAL: RECYCLED CELLULOSE FIBER/WOOD FIBER MIXTURE  
 ANCHORING METHOD: HYDRAULIC SEEDING EQUIPMENT  
 RATE OF ANCHORING: 310 LBS/1000 SQ. YD.  
 MATERIAL APPL.: YEAR AROUND  
 SEEDING DATES:

**GENERAL NOTES:**

- 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 EXCLUDING SATURDAY, SUNDAY, AND FEDERAL OR STATE HOLIDAYS. (WV CHAPTER 24C-1-5, UNDERGROUND FACILITY DAMAGE PROTECTION ACT).
- TRAFFIC SHALL BE MAINTAINED ON ALL ADJOINING STREETS AND DRIVES AT ALL TIMES. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH WVDOT'S REQUIREMENTS.
- CONTRACTOR SHALL VERIFY THE LOCATION AND INVERT ELEVATION OF ALL EXISTING UTILITIES WITH PROPOSED CONNECTIONS PRIOR TO CONSTRUCTION AND GRADING OF THE SITE.

**DRILL PITS:**

- THE PIT SHALL BE CONSTRUCTED AND MAINTAINED SO AS TO PREVENT SEEPAGE, LEAKAGE, AND OVERFLOWS.
- PITS SHOULD BE CONSTRUCTED BELOW SURFACE GROUND LEVEL, WHEN POSSIBLE. ANY ABOVEGROUND PIT WALLS, AS IS THE CASE WITH PITS CONSTRUCTED IN THE LOWER SLOPE AREAS OF THE WELLSITE, SHALL BE COMPACTED, WITH A SIDE SLOPE BEING MAINTAINED THAT WILL PRESERVE THE STRUCTURAL INTEGRITY. THE FILL MATERIAL SHOULD CONTAIN THE PROPER AMOUNT OF MOISTURE TO ENSURE THAT COMPACTION WILL BE ACHIEVED.
- ALL PITS SHALL BE DESIGNED, CONSTRUCTED, LOCATED, MAINTAINED, AND USED IN ACCORDANCE WITH TITLE 35CSR4.21 AND IN SUCH A MANNER AS TO MINIMIZE ADVERSE ENVIRONMENTAL IMPACTS AND TO ASSURE SAFETY TO THE PUBLIC.

**EROSION CONTROL BLANKETING:**

- EROSION CONTROL BLANKETING TO BE INSTALLED ON ALL SLOPES OF 3:1 GRADING OR STEEPER IN ACCORDANCE WITH EROSION CONTROL BLANKETING DETAIL PROVIDED.
- PROPERLY PREPARE SOIL BEFORE INSTALLING BLANKETS.
- ANCHOR BLANKETS IN A TRENCH AT THE TOP OF SLOPE USING A ROW OF STAPLES/STAKES.
- BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL.
- SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES ACROSS THE WIDTH OF THE BLANKET
- ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE.
- OVERLAP PARALLEL BLANKETS.
- IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

**HYDRAULICALLY APPLIED BLANKETS:**

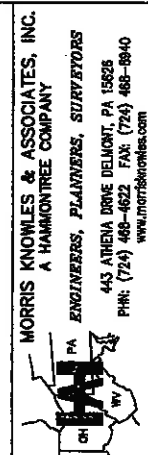
- HYDRAULICALLY APPLIED BLANKETS SHOULD NOT BE USED IN AREAS OF CONCENTRATED FLOW (E.G. CHANNELS).
- A BONDED FIBER MATRIX (BFM) CAN BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. BFMS MAKE USE OF A CROSS-LINKED HYDROCOLLOID TACKIFIER TO BOND THERMALLY PROCESSED WOOD FIBERS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS. FOR SLOPES UP TO 3H:1V THE BFM SHOULD BE APPLIED AT A RATE OF 3,000 LB/ACRE. STEEPER SLOPES MAY NEED AS MUCH AS 4,000 LB/ACRE. IN ANY CASE, MANUFACTURER'S RECOMMENDATIONS SHOULD BE FOLLOWED. BFMS SHOULD ONLY BE USED WHEN NO RAIN IS FORECAST FOR AT LEAST 48 HOURS FOLLOWING THE APPLICATION. THIS IS TO ALLOW THE TACKIFIER SUFFICIENT TIME TO CURE PROPERLY. ONCE PROPERLY APPLIED, A BFM IS TYPICALLY 90% EFFECTIVE IN PREVENTING ACCELERATED EROSION. BONDED FIBER MATRIX SHOULD NOT BE APPLIED BETWEEN SEPTEMBER 30 AND APRIL 1. ONCE FIBER MATRICES THAT HAVE BEEN SHOWN TO BE EFFECTIVE IN PREVENTING EROSION ON DISTURBED SURFACES MAY BE USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS IF SUFFICIENT SUPPORTING DOCUMENTATION IS PROVIDED.
- A FLEXIBLE GROWTH MEDIUM (FGM) HAS THE ADDED COMPONENT OF 1/2 INCH LONG, CRIMPED ORGANIC OR MANMADE FIBERS WHICH ADD A MECHANICAL BOND TO THE CHEMICAL BOND PROVIDED BY BFMS. THIS INCREASES THE BLANKET'S RESISTANCE TO BOTH RAINDROP IMPACT AND EROSION DUE TO RUNOFF. UNLIKE BFMS, A FLEXIBLE GROWTH MEDIUM TYPICALLY DOES NOT REQUIRE A CURING TIME TO BE EFFECTIVE. PROPERLY APPLIED, AN FGM MAY BE AS MUCH AS 99% EFFECTIVE.
- A POLYMER STABILIZED FIBER MATRIX (PSFM) CAN ALSO BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. PSFMS MAKE USE OF A LINEAR SOIL STABILIZING TACKIFIER THAT WORKS DIRECTLY ON SOIL TO MAINTAIN SOIL STRUCTURE, MAINTAIN PORE SPACE CAPACITY AND FLOCCULATE DISLODGED SEDIMENT THAT WILL SIGNIFICANTLY REDUCE RUNOFF TURBIDITY. PROPERLY APPLIED, A PSFM MAY BE AS MUCH AS 99% EFFECTIVE. PSFMS CAN BE USED IN RE-VEGETATION APPLICATIONS AND FOR SITE WINTERIZATION AND/OR DORMANT SEEDING - FALL PLANTING FOR SPRING GERMINATION - APPLICATIONS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS AND THE FOLLOWING APPLICATION RATES ARE SUGGESTED. IN ANY CASE, MANUFACTURER'S RECOMMENDATIONS SHOULD BE FOLLOWED. THE FOLLOWING ARE TYPICAL APPLICATION RATES:

TYPICAL POLYMER STABILIZED FIBER MATRIX APPLICATION RATES

MAXIMUM RAINFALL OF ≤ 20"							
SLOPE	6:1	5:1	4:1	3:1	2:1	1.5:1	1:1
SOIL STABILIZER (gals/acre)	4	5	6	7	8	9	10
FIBER (lb/acre)	1,500	1,500	1,500	1,800	2,000	2,500	3,000

MAXIMUM RAINFALL OF > 20" AND FOR SITE WINTERIZATION			
SLOPE	≤ 3:1	4:1	≥ 4:1
SOIL STABILIZER (gals/acre)	6	8	10
FIBER (lb/acre)	2,000	2,500	3,000

- UNLIKE ROLLED BLANKETS, THERE IS NO NEED TO SMOOTH THE SLOPE PRIOR TO APPLICATION OF HYDRAULICALLY APPLIED BLANKETS. IN FACT SOME ROUGHENING OF THE SURFACE, EITHER NATURAL OR MECHANICALLY INDUCED, IS PREFERABLE. HOWEVER, LARGE ROCKS, THOSE ≥ 8 INCHES, AND EXISTING RILLS SHOULD BE REMOVED PRIOR TO APPLICATION. TRACKING OR GROOVING OF SLOPES SHOULD BE CONSIDERED TO SLOW WATER FLOWS DURING A STORM EVENT. SLOPE INTERRUPTION DEVICES SUCH AS STAIR STEP GRADING OR BENCHING SHOULD BE APPLIED PRIOR TO THE APPLICATION. MIXING AND APPLICATION RATES SHOULD FOLLOW MANUFACTURER'S RECOMMENDATIONS.
- HYDRAULICALLY APPLIED BLANKETS ARE TYPICALLY APPLIED IN TWO STAGES. UNLESS SPECIFICALLY RECOMMENDED TO BE APPLIED IN ONE APPLICATION BY THE MANUFACTURER, THE SEED MIXTURE AND SOIL AMENDMENTS SHOULD BE APPLIED FIRST. IF THE SEED IS APPLIED AT THE SAME TIME AS THE HYDRAULICALLY APPLIED BLANKET, THE BONDED FIBERS MAY KEEP THE SEED FROM MAKING SUFFICIENT CONTACT WITH THE SOIL TO GERMINATE. AFTER THE SEED MIXTURE IS APPLIED, THE BFM, FGM, OR PSFM SHOULD BE SPRAYED OVER THE AREA AT THE REQUIRED APPLICATION RATE.



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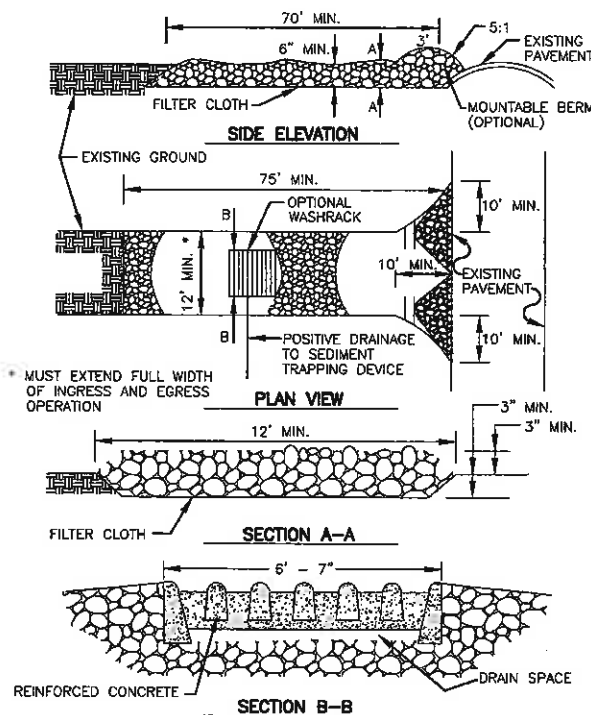
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EROSION & SEDIMENT CONTROL NOTES  
 FENNEL 1562  
 XTO ENERGY, INC.  
 DAVISON HOLLOW  
 MARION COUNTY, WEST VIRGINIA

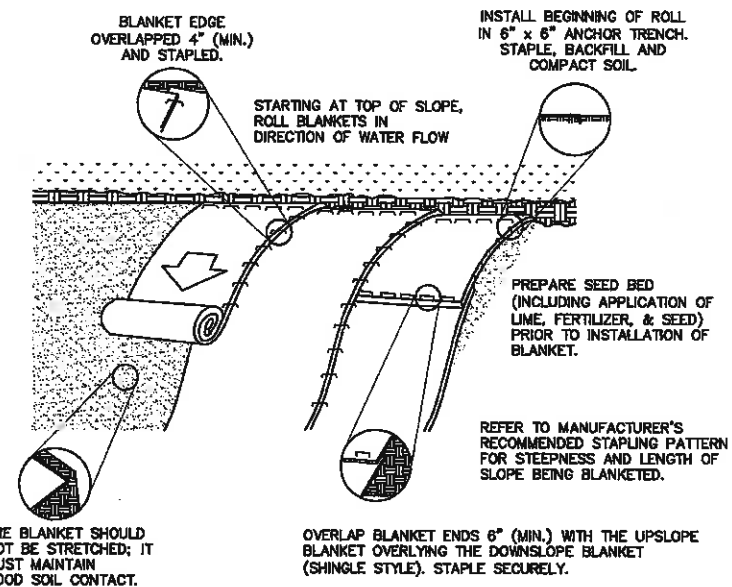
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**STANDARD CONSTRUCTION DETAIL  
STONE CONSTRUCTION ENTRANCE**  
NOT TO SCALE



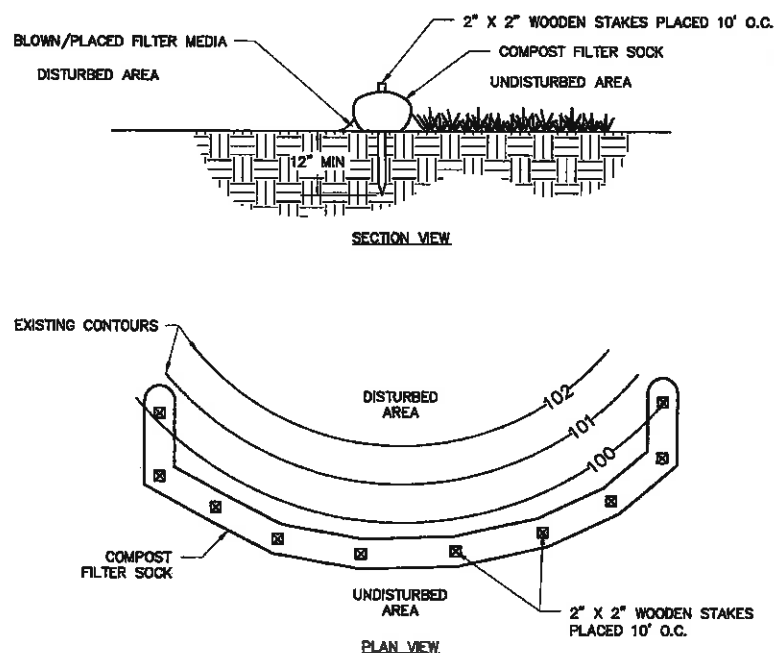
\* MUST EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION

**STANDARD CONSTRUCTION DETAIL  
EROSION CONTROL BLANKET**  
NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP x 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) 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 OPTIONAL 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" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
  5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.
- \* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

**STANDARD CONSTRUCTION DETAIL  
COMPOST FILTER SOCK**  
NOT TO SCALE



NOTES:

1. ALL MATERIAL TO MEET DEP SPECIFICATIONS.
2. FILTER SOCK/COMPOST/SOIL/ROCK/SEED FILL TO MEET DEP REQUIREMENTS.
3. FILTER SOCK DEPICTED IS FOR MINIMUM SLOPES. GREATER SLOPES MAY REQUIRE LARGER SOCKS PER THE ENGINEER.
4. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

CONSTRUCTION SEQUENCE, FENNELL 1562:

- STAGE 1: INSTALL ROCK CONSTRUCTION ENTRANCE AT EXISTING DRIVE TO DAWSON HOLLOW.  
 A. EXCAVATE FOR, AND FORM ENTRANCE.  
 B. IMMEDIATELY STABILIZE ENTRANCE WITH ROCK.
- STAGE 2: INSTALL 18" COMPOST FILTER SOCK.
- STAGE 3: INSTALL DRILL PIT (AS NEEDED).
- STAGE 4: STABILIZE, REPAIR, AND MAINTAIN ACCESS DRIVE WITH GRAVEL AS NEEDED.
- STAGE 5: EXISTING DIRT DRIVE AND DRILL PIT TO BE RECLAIMED WHEN DONE.
- STAGE 6: SEED AND MULCH.  
 A. SEED/MULCH EXISTING ACCESS DRIVE AREA WITH SPECIFIED SEEDING MIXTURE. ALL E & S CONTROL FACILITIES SHALL BE MAINTAINED AND KEPT FUNCTIONAL UNTIL SITE STABILIZATION IS COMPLETE.

MORRIS KNOWLES & ASSOCIATES, INC.  
 A HAMMOND TREE COMPANY  
 ENGINEERS, PLANNERS, SURVEYORS  
 443 AURELIA DRIVE BELMONT, PA 15808  
 PHN: (724) 462-4622 FAX: (724) 462-4640  
 www.morriknol.com

DESIGN BY:	DATE:	DESC.:
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EROSION & SEDIMENT CONTROL DETAILS  
 FENNELL 1562  
 XTO ENERGY, INC.  
 DAWSON HOLLOW  
 MARION COUNTY, WEST VIRGINIA

