



west virginia department of environmental protection

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

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

July 29, 2014

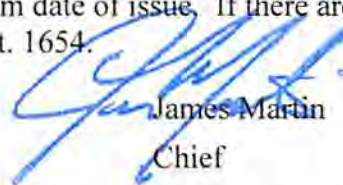
WELL WORK PLUGGING PERMIT

Plugging

This permit, API Well Number: 47-3301241, 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: 301383 (JOHN M. COFFMAN 2)
Farm Name: COFFMAN, EDWARD
API Well Number: 47-3301241
Permit Type: Plugging
Date Issued: 07/29/2014

PERMIT CONDITIONS

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

CONDITIONS

1. 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.

WG-4B
Rev. 2/01

1) Date 5/20, 2014
2) Operator's Well No. Coffman 2
3) AP: Well No. 47-033 - 07241

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 X / Liquid injection / Waste disposal /
(If "Gas, Production X or Underground storage) Deep / Shallow X

5) Location: Elevation 1255' Watershed
District Eagle County Harrison Quadrangle Wallace 7.5'

6) Well Operator XTO Energy Inc 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 Sam Ward Plugging Contractor Name
Address PO Box 2327 Address
Buckhannon, WV 26201

10) Work Order: The work order for the manner of plugging this well is as follows:
Run in well and check TD, pull out and run 2" tubing down to TD estimated at 4700', circulate 6% gel back to surface, then pump a cement plug up to ~~4550'~~^{4400'} pull tubing up to 3750'
and pump cement plug up to 3500', perfs are 3690' - 3664', pull tubing up to 3435' and wait on cement to set up and RIH with small tools and tag top of cement, pull tools out and pump
cement plug up to 3200', perfs are at 3362' - 3336', pull 2" tubing out and run a CBL to find top of cement and shoot apart, pump a 150' cement plug at cut, pull casing up to
1900' and pump cement up 1700', pull casing up to 1300' and pump cement plug up to 1100', elevation at 1228' and botom of 8 5/8" at 1169', pull casing up to 500' and pump cement plug up
to 400', pull casing up to 200' and pump cement to surface. Install well monument.

GAS@ 4435'
OK
gmm

Cement 4700' ~~4550'~~^{4400' 300'} = 150' in 4 1/2" Cement 150' at cut in 7 7/8" hole Cement 500'-400' inside 8 5/8" - Coal at 420'-425'
Cement 3750'-3500' = 250' in 4 1/2" Cement 1900'-1700' in 7 7/8" hole Cement 200' - Surface inside 8 5/8"
Cement 3435'-3200' = 235' in 4 1/2" Cement 1300'-1100' in 7 7/8" hole

Notification must be given to the District oil and gas inspector of the well to be plugged and the permit holder before work can commence.

RECEIVED
Office of Oil and Gas
MAY 23 10 22 / 2014
S. P. D. Ward III
WV Department of
Environmental Protection

08/01/2014

3301241 P

OG-10
Rev. - 9-71



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

Oil and Gas Division

WELL RECORD

Rotary Oil _____
Cable _____ Gas
Recycling _____ Comb. _____
Water Flood _____ Storage _____
Disposal _____ (Kind) _____

Quadrangle Wallace
Permit No. HAR-1241

Company <u>Appalachian Energy, Inc. D/B/A LDR</u>	Casing and Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft. (Sks.)
Address <u>728 Washington Road, Pittsburgh, PA15228</u>				
Farm <u>John M. Coffman #2</u> Acres <u>240</u>	Size			
Location (waters) <u>Bennett Run</u>	20-16			
Well No. <u>A-E-12</u> Elev. <u>1228'</u>	Cond.			
District <u>EAGLE</u> County <u>Harrison</u>	13-10" 11 3/4"	30'	30'	
The surface of tract is owned in fee by _____	9 5/8			
<u>Ethel P. Coffman</u>	8 5/8	1169'		300
Address <u>Rt. 1, Box 10101, Lumberport, WVA</u>	7			
Mineral rights are owned by _____	5 1/2			
Address _____	4 1/2	4855'		175
Drilling Commenced <u>6/15/78</u>	3			
Drilling Completed <u>6/23/78</u>	2			
Initial open flow <u>55,000</u> cu. ft. _____ bbls.	Liners Used			
Final production <u>531,000</u> cu. ft. per day _____ bbls.				
Well open _____ hrs. before test <u>1350#</u> RP.				
Well treatment details:				

Attach copy of cementing record.
Stimulation record

INTERVAL PERFORATED	From	To	Amt. Fluid	Amt. Sand
DATE: <u>7/11/78</u>	<u>3664</u>	<u>3690</u>	600 BBLs.	60,000 #
	<u>3336</u>	<u>3362</u>	615 BBLs.	60,000#

Coal was encountered at 420 Feet _____ Inches
Fresh water 70 Feet _____ Salt Water _____ Feet
Producing Sand Speechley, Balltown Depth 3300, 3660

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Substructure			0	10		
Clay and Sandy Shale			10	40		
Sand			40	110	F.W. @ 70'	TO 4707'
Sandy Shale			110	160		
Sand			160	420		
Coal			420	425		
Shale			425	475		
Sand & Shale			475	580		
Red Rock			580	590		
Shale			590	610		
Red Rock			610	625		
Shale			625	660		
Red Rock			660	685		
Shale			685	740		
Red Rock			740	765		
Sand & Shale			765	1250		
Hard White Sand			1250	1390		
Big Lime			1390	1510		
Injun			1510	1565		
Red Rock			1565	1600		
Red Rock & Shale			1600	1695		
Sand			1695	1845	Gas @ 1830'	
Sand & Shale			1845	1985		

RECEIVED
Office of Oil and Gas

MAY 23 2014

WV Department of
Energy and Mineral Resources

(over)

* Indicates Electric Log tops in the remarks section.

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	Remarks
Shale			1985	3550		
Sandy Shale			3550	3710		
Shale & Sand			3710	4786	Gas @ 4435'	
Driller's T.D.				4786		
* Speechley			3300	3360		
* Tiona			3448	3472	Gas @ 3470'	
* Balltown			3660	3700		
* Riley			4672	4700		
* Logger's T.D.				4707		

08/01/2014

Date November 3rd 1978
 APPROVED Donald R. Laughlin Owner
 By Donald R. Laughlin, President
 (Title)

WW-4A
Revised 6-07

1) Date: 5/20/14
2) Operator's Well Number
Coffman 2

3) API Well No.: 47 - 033 - 01241

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

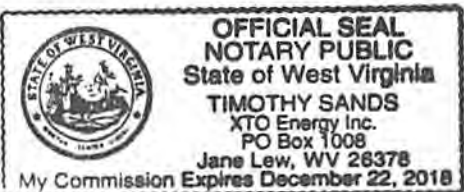
4) Surface Owner(s) to be served:	5) (a) Coal Operator
(a) Name <u>Edward Coffman</u> ✓	Name _____
Address <u>1041 Bennett Run Rd.</u>	Address _____
<u>Lumberport, WV 26386</u>	_____
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name <u>Guy Corporation</u> ✓
_____	Address <u>92 16th St.</u>
(c) Name _____	<u>Wheeling, WV 26003</u>
Address _____	Name <u>Virginia Tetrick Estate</u> ✓
_____	Address <u>92 16th St.</u>
6) Inspector <u>Sam Ward</u>	<u>Wheeling, WV 26003</u>
Address <u>PO Box 2327</u>	(c) Coal Lessee with Declaration
<u>Buckhannon, WV 26201</u>	Name _____
Telephone <u>304-389-7583</u>	Address _____
_____	_____

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.

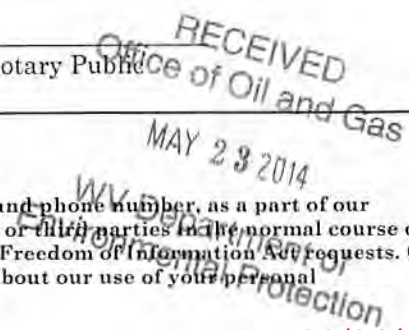


Well Operator XTO Energy Inc.
 By: [Signature]
 Its: Production Superintendent
 Address PO Box 1008
Jane Lew, WV 26378
 Telephone 304-884-6000

Subscribed and sworn before me this 20th day of May 2014
[Signature] Notary Public
 My Commission Expires 12/22/18

Oil and Gas Privacy Notice

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




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Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		
Total Postage & Fees	\$	

Guy Corporation
92 16th St.
Wheeling, WV 26003

Plugging App Coffman 1-AE-11 Coffman 2

for instructions

7012 1010 0002 5911 6628

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Restricted Delivery Fee (Endorsement Required)		
Total Postage & Fees	\$	

Edward Coffman
1041 Bennett Run Rd.
Lumberport, WV 26386

Plugging App Coffman 2

for instructions

7012 1010 0002 5911 6604

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Restricted Delivery Fee (Endorsement Required)		
Total Postage & Fees	\$	

Virginia Tetrick Estate
92 16th St.
Wheeling, WV 26003

Plugging App Coffman 1-AE-11 Coffman 2

for instructions

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Office of Oil and Gas
MAY 23 2014
WV Department of
Environmental Protection
08/01/2014

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 Tenmile Creek Quadrangle Wallace 7.5'

Elevation 1255' County Harrison District Eagle

Description of anticipated Pit Waste: Fluids from plugging operations.

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

*SDW
5/22/2014*

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

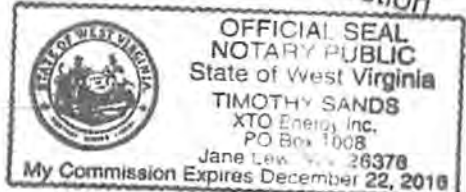
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Office of Oil and Gas
MAY 28 2014

Subscribed and sworn before me this 20th day of May, 2014

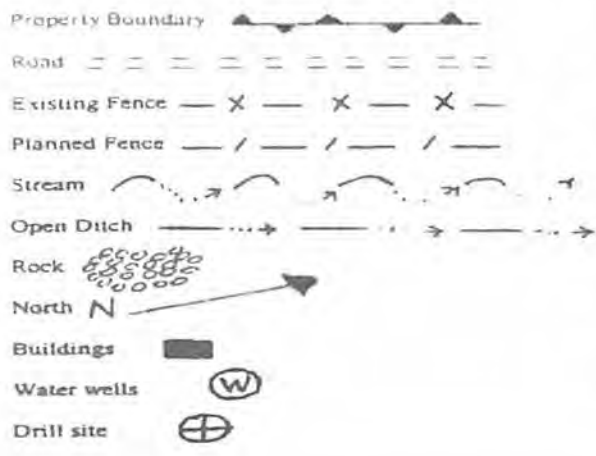
[Signature]
Notary Public

WV Department of
Environmental Protection

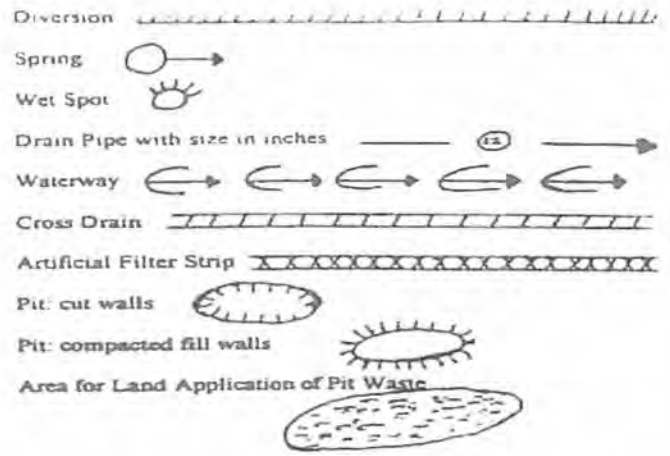
My commission expires 12/22/18



08/01/2014



LEGEND



Proposed Revegetation Treatment: Acres Disturbed .76 +/- 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	lbs/acre	Seed Type	Area II	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: [Signature]

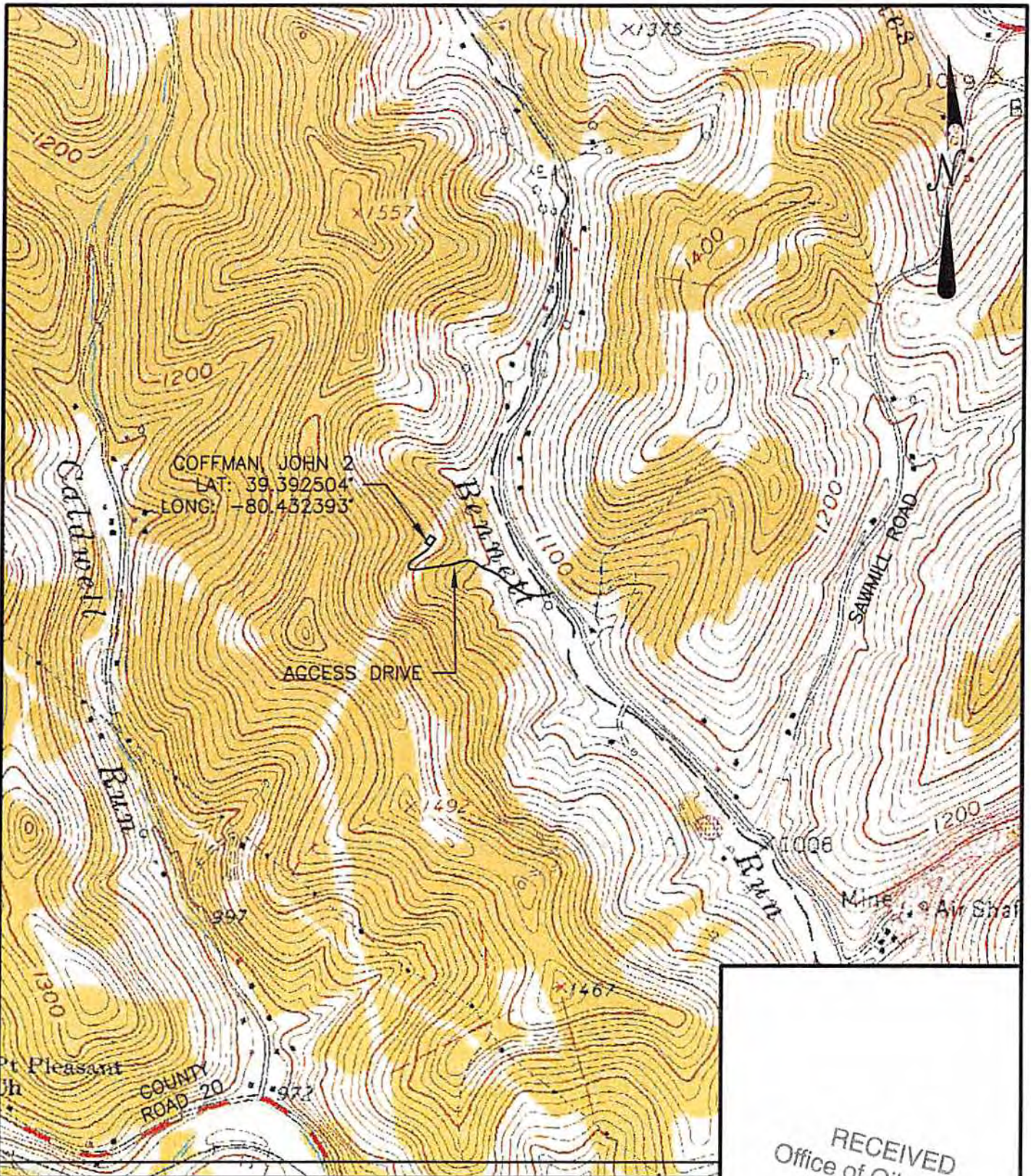
Comments: _____

Title: Oil & Gas Inspector

Date: 5/22/2014

Field Reviewed? () Yes (X) No

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Office of Oil and Gas
MAY 23 2014
WV Department of
Environmental Protection
08/01/2014



COFFMAN JOHN 2
 LAT: 39.392504
 LONG: -80.432393

ACCESS DRIVE

RECEIVED
 Office of Oil and Gas
 MAY 23 2014

SCALE: 1:1000	DESIGNED BY: JMH	REVISION BY: _____	DATE: _____	DESCRIPTION: _____
	REVIEWED BY: MMV	REVISION BY: _____	DATE: _____	DESCRIPTION: _____
	DRAWN BY: JMH	REVISION BY: _____	DATE: _____	DESCRIPTION: _____
	DATE: 5/06/14	REVISION BY: _____	DATE: _____	DESCRIPTION: _____
	PROJ. NO.:	REVISION BY: _____	DATE: _____	DESCRIPTION: _____
DRAWING NO.:	REVISION BY: _____	DATE: _____	DESCRIPTION: _____	

DRAWING NO.

SHEET NO.
1

COFFMAN JOHN 2
 prepared for
XTO ENERGY, INC.
 situated
 BENNETTS RUN, HARRISON COUNTY, WEST VIRGINIA
 UG&G MAP - WALLACE QUADRANGLE

WV Department of
Morris Knowles
 & Associates, Inc.
 Consulting Engineers and Geologists
 143 Adams Drive
 Dalton, PA 15228
 Telephone: (724) 466-4122
 Fax: (724) 466-2010

WW-7
8-30-06



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

API: 47-033-01241 WELL NO.: 301383 (John M. Coffman 2)
FARM NAME: John M. Coffman
RESPONSIBLE PARTY NAME: XTO Energy, Inc.
COUNTY: Harrison DISTRICT: Eagle 4
QUADRANGLE: Wallace 7.5' 655
SURFACE OWNER: Edward Coffman
ROYALTY OWNER: Paula Kay Lane, et al.
UTM GPS NORTHING: 4360489
UTM GPS EASTING: 548878 GPS ELEVATION: 382 m (1255 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.

Signature *Steve Ober*
Date 1/23/14

Title PS # 2180

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Office of Oil and Gas
MAY 23 2014
WV Department of
Environmental Protection
08/01/2014

3301241P



CK 1176
100

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

Re: Application to Plug and Abandon
Coffman 2
Eagle District
Harrison 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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Office of Oil and Gas
MAY 23 2014
WV Department of
Environmental Protection

08/01/2014

330124 P

□	EX. MONUMENT BOX
○	PROP. MONUMENT BOX
●	EX. MONUMENT (AS NOTED)
●	5/8" BAR W/ H&A CAP (SET)
●	BOUNDARY (AS NOTED)
—	BOUNDARY LINE
○	CENTER LINE
—	LOT LINE
—	PROPERTY LINE
R/W	RIGHT OF WAY
()	RECORD BEARINGS & DIST.
E.O.P.	EDGE OF PAVEMENT
FF	FINISH FLOOR
—	EX. CONTOUR LINE
—	PROP. CONTOUR LINE
—	CONTOUR LABEL
—	BOLLARD
—	FENCE (AS NOTED)
—	DIAPHRAGM
—	MAILBOX
+++++	RAIL ROAD
—	SION
—	H.C. PARKING SPACE
—	DECIDUOUS TREE (AS NOTED)
—	EVERGREEN TREE (AS NOTED)
—	BUSH (AS NOTED)
—	SOIL BORING
—	POLE ANCHOR
—	GUY POLE
—	GENERAL POLE
—	FLAG POLE
—	LIGHT POLE
—	LIGHT & POWER POLE
—	LIGHT, POWER, TELE. POLE
—	LIGHT, POWER, TELE, TV POLE
—	POWER POLE
—	TELEPHONE POLE
—	TELEPHONE, LIGHT POLE
—	TELEPHONE, POWER POLE
—	PULL BOX
—	TRAFFIC CONTROL BOX
—	POLE W/ P.D. SIGNAL
—	POLE W/ TRAFFIC SIGNAL
—	OVERHEAD ELECTRIC LINE
—	UNDERGROUND ELECTRIC LINE
—	ELECTRIC LINE MARKER
—	ELECTRIC BOX
—	ELECTRIC MANHOLE
—	ELECTRIC METER
—	FIBER OPTIC LINE
—	FIBER OPTIC LINE MARKER

LEGEND

—	GAS LINE
—	GAS LINE MARKER
—	GAS METER
—	GAS VALVE
—	GAS TANK
—	GAS WELL
—	SANITARY SEWER LINE
—	SANITARY SEWER LINE MARKER
—	SANITARY M.H. / C.D.
—	MANHOLE
—	CLEAN OUT
—	STORM SEWER LINE
—	STORM SEWER LINE MARKER
—	STORM CATCH BASIN
—	STORM CURB INLET
—	STORM MANHOLE
—	STORM DOWNSPOUT
—	STORM HEADWALL
—	CATCH BASIN
—	CURB INLET
—	TOP OF GRATE
—	TOP OF COVER
—	TOP OF CURB
—	FLOWLINE
—	HARD DRAIN
—	DOWNSPOUT
—	OVERHEAD TELEPHONE LINE
—	UNDERGROUND TELEPHONE LINE
—	TELEPHONE LINE MARKER
—	TELEPHONE BOX
—	TELEPHONE MANHOLE
—	OVERHEAD TV LINE
—	UNDERGROUND TV LINE
—	TV LINE MARKER
—	TV/CABLE BOX
—	TV/CABLE MANHOLE
—	WATER LINE
—	WATER LINE MARKER
—	WATER MANHOLE
—	WATER METER
—	WATER VALVE
—	WATER SPRINKLER
—	FIRE HYDRANT
—	MONITORING WELL

EROSION AND SEDIMENT CONTROL PLAN
COFFMAN, JOHN 2

COUNTY ROUTE 20/6
HARRISON 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 P.E. CPESC, CPSM
PHONE: 724-468-4822 (PA)
330-499-8817 (OH)
mva@hammontree-engineers.com

OWNER/DEVELOPER

KTD ENERGY, INC
480 INDUSTRIAL PARK ROAD
JANE LEW, WV 26378
ATTN: TIM SANDS
PHONE: 304-884-6042
Tim_Sands@ktdenergy.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.

Daniel R. Garcia 05-02-14

DANIEL R. GARCIA, REGISTERED PROFESSIONAL ENGINEER

DATE

INDEX OF SHEETS

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RECEIVED

ESTIMATED QUANTITIES

	UNITS	ESTM QUANTITY	BID QUANTITY	UNIT PRICE	TOTAL COST
CLEARING & GRUBBING					
CLEARING & GRUBBING	AC	0.22			
EROSION & SEDIMENT CONTROL					
STONE CONSTRUCTION ENTRANCE	EA	1			
12" COMPOST FILTER SOCK	LF	186			
PERMANENT SEEDING	SF	1,075			
TEMPORARY WETLAND MATS	EA	4			

REQUIRED PERMIT LIST

PERMIT	DATE RECEIVED
NATIONWIDE PERMIT 33	



CALL BEFORE YOU DIG
IN WEST VIRGINIA
1-800-245-4548
WV STATE LAW REQUIRES
2 WORKING DAYS NOTICE



EROSION & SEDIMENT CONTROL, TITLE SHEET
COFFMAN, JOHN 2
KTD ENERGY, INC.
COUNTY ROUTE 20/6
HARRISON COUNTY, WEST VIRGINIA

ES-1

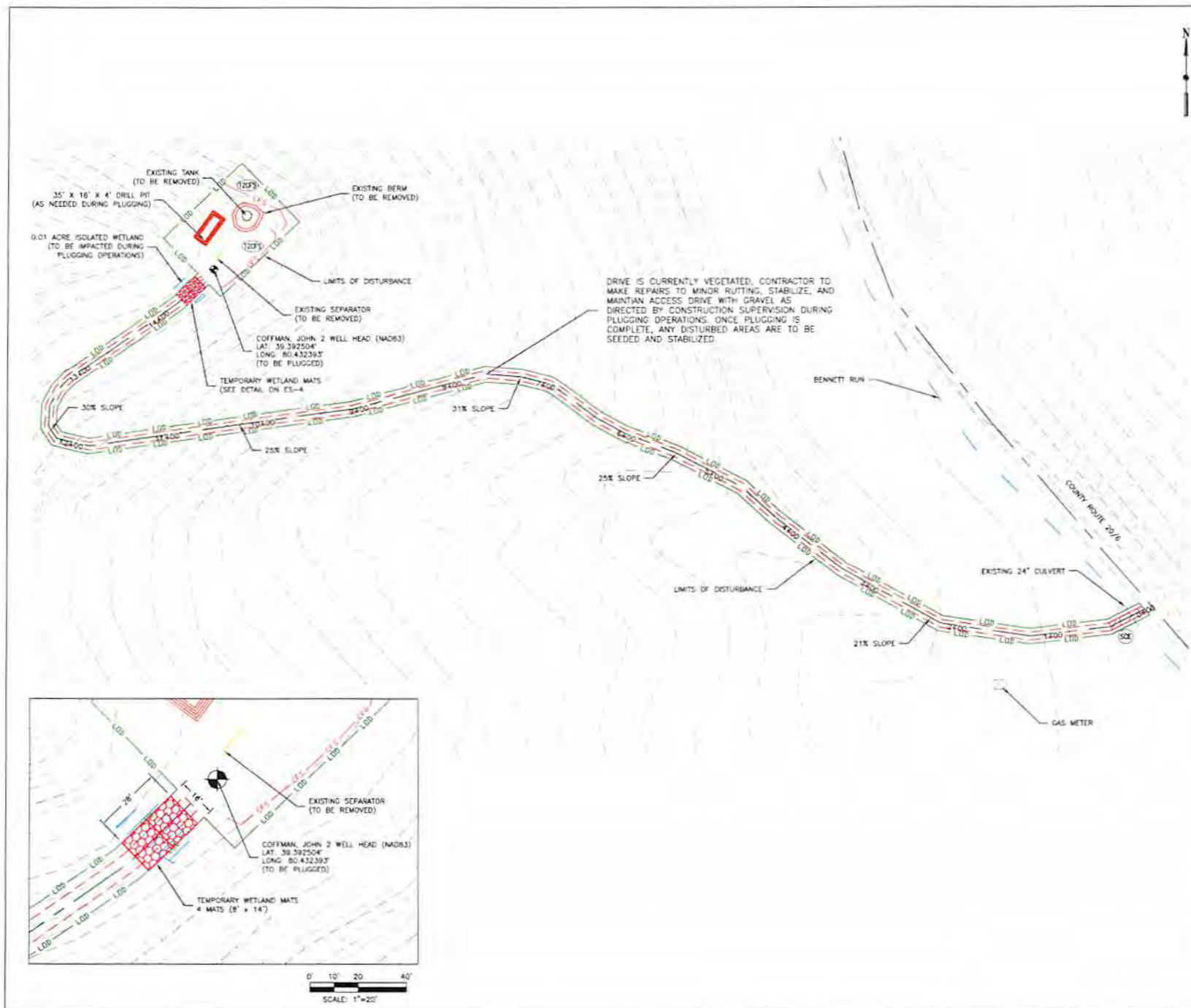
Office of Morris Knowles & Associates, Inc. / Hammontree & Associates, Limited

ENGINEERS, PLANNERS, SURVEYORS

MAJOR PROJECTS: HARRISON COUNTY, WEST VIRGINIA

MAJOR PROJECTS: HARRISON COUNTY, WEST VIRGINIA

3301241 P



ZONING:
NO ZONING

WETLANDS:
WETLANDS LOCATED ON SITE REFER TO WETLAND DELINEATION REPORT

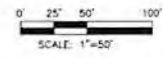
FLOOD ZONE:
ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP MAP NUMBER 5403300430, EFFECTIVE DATE: OCTOBER 2012, THE SUBJECT PROPERTIES LIES WITHIN ZONE X, WHICH IS DEFINED ON SAID MAP AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."

NOTES:

1. EROSION CONTROL BLANKETS OR FLEXITERA 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.

LEGEND

- (IP) INLET PROTECTION
- (SE) STONE CONSTRUCTION ENTRANCE
- (RF) ROCK FILTER
- (RO) ROCK CHANNEL OUTLET PROTECTION
- (PC) PERMANENT CHANNEL
- (TC) TEMPORARY CHANNEL
- (20%) 12" COMPOST FILTER SOCK
- (18%) 18" COMPOST FILTER SOCK
- (24%) 24" COMPOST FILTER SOCK
- (32%) 32" COMPOST FILTER SOCK
- (CS) COMPOST FILTER SOCK PYRAMID
(3) 18" OR (2) 24" W/ (1) 18"



RECEIVED
 of Oil and Gas
 MAY 29 2014
 MORRIS KNOWLES & ASSOCIATES, INC.
 A HAMMILL COMPANY
 ENGINEERS, PLANNERS, SURVEYORS
 1000 W. MAIN ST. SUITE 200
 HARRISON COUNTY, WEST VIRGINIA

DESIGN BY: JMS	DATE: 07/20/14	DESC: EROSION CONTROL PLAN
DRWN BY: JMS	DATE: 07/20/14	DESC: EROSION CONTROL PLAN
CHKD BY: JMS	DATE: 07/20/14	DESC: EROSION CONTROL PLAN
APP'D BY: JMS	DATE: 07/20/14	DESC: EROSION CONTROL PLAN
FILED BY: JMS	DATE: 07/20/14	DESC: EROSION CONTROL PLAN
PK. NO.:		
DATE: 07/20/14		
EROSION & SEDIMENT CONTROL PLAN - OVERALL COFFMAN, JOHN Z KYS ENERGY, INC. COUNTY ROUTE 2016 HARRISON COUNTY, WEST VIRGINIA		
ES-2		

Environmental Protection

3301241 P

EROSION AND SEDIMENTATION CONTROL PLAN NOTES:

1. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO CHANNELS OF CONVEYANCE AS APPROPRIATE FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE CONTROLS.
2. EROSION AND SEDIMENTATION CONTROLS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE WITHIN THE TRIBUTARY AREAS OF THOSE CONTROLS.
3. AFTER SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE CONTROLS MUST BE STABILIZED.
4. STORMWATER INLETS WHICH DO NOT DISCHARGE TO SEDIMENT TRAPS OR BASINS, MUST BE PROTECTED UNTIL THE TRIBUTARY AREAS ARE STABILIZED.
5. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
6. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
7. ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 30 DAYS MUST BE STABILIZED IMMEDIATELY. DURING NON-CONTRACTING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE RESTORED WITHIN ONE YEAR MAY BE STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE RESTORED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS.
8. STOCKPILES MUST BE STABILIZED IMMEDIATELY.
9. HAY OR STRAW MULCH MUST BE APPLIED AT RATES OF AT LEAST 3.0 TONS PER ACRE.
10. 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 REGULAR BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REGRADING, AND RESETTING.
11. THE CONTRACTOR SHALL RECYCLE MATERIALS WHENEVER APPROPRIATE AND WHEN IN ACCORDANCE WITH LOCAL, STATE, & FEDERAL 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 CAS PLAN IF OVER 5000 SQUARE FEET OF AREA IS DISTURBED.

EROSION AND SEDIMENT CONTROL FACILITIES MAINTENANCE SCHEDULE:

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

STONE CONSTRUCTION ENTRANCE:

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

COMPOST FILTER SOCK:

1. COMPOST FILTER SOCK MUST BE INSTALLED AT LEVEL GRADE, BOTH ENDS OF EACH COMPOST FILTER SOCK SECTION MUST EXTEND AT LEAST 10 FEET UP SLOPE AT 45 DEGREES TO THE MAIN COMPOST FILTER SOCK ALIGNMENT.
2. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTER SOCK IN A FUNCTIONAL CONDITION AT ALL TIMES AND IT SHALL BE ROUTINELY INSPECTED.
3. WHERE THE SOCK REQUIRES REPAIR, IT WILL BE ROUTINELY REPAIRED.
4. 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.
5. THE COMPOST FROM THE FILTER SOCK WILL BE DISPERSED ON THE SITE WHEN SITE REACHES 70% VEGETATIVE COVER.

VEGETATION:

1. THE CONTRACTOR SHALL INSPECT VEGETATED AREAS WEEKLY AND AFTER EACH STORM (RUNOFF) EVENT.
2. 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.
3. THE REPAIRS SHALL BE MADE WITHIN 2 DAYS OF DISCOVERING PROBLEMS.

GRADING NOTES:

1. THE CONTRACTOR SHALL REMOVE ALL EXISTING ASPHALT PAVEMENT AND CONCRETE SLABS FROM THE SITE.
2. THE CONTRACTOR SHALL PROOF ROLL THE SITE TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER AND REMOVE ANY SOFT SPOTS PRIOR TO THE IMPORTING OF ANY FILL MATERIAL.
3. 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.
4. THE CONTRACTOR SHALL ADJUST TO GRADE ALL WATER AND GAS VALVES.
5. THE CONTRACTOR SHALL COMPACT ALL FILL MATERIALS TO NOT LESS THAN 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D1557 TO PROMOTE STABILITY AND PREVENT SETTLEMENT.
6. THE CONTRACTOR SHALL USE WEST VIRGINIA EROSION AND SEDIMENT CONTROL FIELD MANUAL.

SITE STABILIZATION INSTALLATION AND MAINTENANCE (TEMPORARY AND PERMANENT):

1. TILL SOIL TO DEPTH OF 2". REMOVE ALL OBJECTS 2" OR LARGER.
2. BLEND COMMERCIAL FERTILIZER INTO THE SOIL TO A DEPTH OF 2". FERTILIZER MAY BE BLENDED DURING TILLING.
3. SOW REQUIRED SEED MIXTURE UNIFORMLY ON THE PREPARED AREA BY HYDRAULIC SEEDING EQUIPMENT, HAND SEEDING, OR ANY OTHER APPROPRIATE METHOD.
4. AFTER SEEDING ROLL TOPSOILED AREAS THAT ARE TO BE MOWED. USE A ROLLER WEIGHING NOT MORE THAN 65 LBS./FT. WIDTH.
5. FOR PERMANENT SITE STABILIZATION APPLY SLOW RELEASE NITROGEN FERTILIZER TO THE SURFACE OF SEEDED AREAS.
6. PLACE MULCH IMMEDIATELY AFTER SEEDING OR WITHIN 48 HOURS AFTER SEEDING IS COMPLETED. PLACE MAY A 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.
7. MAINTENANCE - SATISFACTORILY MAINTAIN GRASS AREAS WITHIN GRADING LIMITS, UNTIL THE ENTIRE PROJECT HAS BEEN COMPLETED. WORK AS DICTATED AND WHEN DIRECTED. CONTROL PROMOTED 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.
8. 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% PERMANENT 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.
9. THE CONTRACTOR SHALL MAINTAIN THE SITE PER THE PROVISIONS OF THIS PLAN UNTIL PERMANENT STABILIZATION IS ESTABLISHED.

PERMANENT STABILIZATION

SPECIES: KENTUCKY BLUEGRASS/ REDTOP/ BROODFOOT TREFOIL
 % PURE LIVE SEED: 95%
 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
 ANCHORING MATERIAL: RECYCLED CELLULOSE FIBER/WOOD FIBER MIXTURE
 ANCHORING METHOD: HYDRAULIC SEEDING EQUIPMENT
 RATE OF ANCHORING MATERIAL APPLICATION: 310 LBS./1000 SQ. YD.
 SEEDING SEASON DATES: YEAR AROUND

TEMPORARY STABILIZATION:

SPECIES: ANNUAL RYEGRASS
 % PURE LIVE SEED: 95%
 APPLICATION RATE: 40 LBS./ACRE
 FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-10-10
 FERTILIZER APPL. RATE: 1000 LBS./ACRE
 LIMING RATE: 3 TONS/ACRE
 MULCH TYPE: HAY & STRAW
 MULCHING RATE: 3 TONS/ACRE

PERMANENT-STEEP SLOPE:

SPECIES: KENTUCKY BLUEGRASS/ REDTOP/ BROODFOOT TREFOIL
 % PURE LIVE SEED: 95%
 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
 ANCHORING MATERIAL: RECYCLED CELLULOSE FIBER/WOOD FIBER MIXTURE
 ANCHORING METHOD: HYDRAULIC SEEDING EQUIPMENT
 RATE OF ANCHORING MATERIAL APPLICATION: 310 LBS./1000 SQ. YD.
 SEEDING SEASON DATES: YEAR AROUND

GENERAL NOTES:

1. 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. (BY CHAPTER 24C-1-5, UNDERGROUND FACILITY DAMAGE PROTECTION ACT).
2. TRAFFIC SHALL BE MAINTAINED ON ALL ADJOINING STREETS AND DRIVES AT ALL TIMES. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH WVDOT'S REQUIREMENTS.
3. 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:

1. THE PIT SHALL BE CONSTRUCTED AND MAINTAINED SO AS TO PREVENT SEEPAGE, LEAKAGE, AND OVERFLOWS.
2. 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.
3. ALL PITS SHALL BE DESIGNED, CONSTRUCTED, LOCATED, MAINTAINED, AND USED IN ACCORDANCE WITH TITLE 20, CHAPTER 2 AND IN SUCH A MANNER AS TO MINIMIZE ADVERSE ENVIRONMENTAL IMPACTS AND TO ASSURE SAFETY TO THE PUBLIC.

EROSION CONTROL BLANKETING:

1. EROSION CONTROL BLANKETING TO BE INSTALLED ON ALL SLOPES OF 3:1 GRADING OR STEEPER IN ACCORDANCE WITH EROSION CONTROL BLANKETING DETAIL PROVIDED.
2. PROPERLY PREPARE SOIL BEFORE INSTALLING BLANKETS.
3. ANCHOR BLANKETS IN A TRENCH AT THE TOP OF SLOPE USING A ROW OF STAPLES/STAKES
4. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
5. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL.
6. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES ACROSS THE WIDTH OF THE BLANKET
7. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE.
8. OVERLAP PARALLEL BLANKETS.
9. 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:

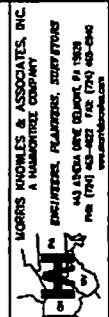
1. HYDRAULICALLY APPLIED BLANKETS SHOULD NOT BE USED IN AREAS OF CONCENTRATED FLOW (E.G. CHANNELS).
2. A BONDED FIBER MATRIX (BFM) CAN BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. BFMS MAKE USE OF A CROSS-LINKED HYDROCOLLOID TACKIFIER TO BOND INTERNALLY PROCESSED WOOD FIBERS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS. FOR SLOPES UP TO 3:1, 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 SOIL EFFECTIVE IN PREVENTING ACCELERATED EROSION. BONDED FIBER MATS SHOULD NOT BE APPLIED BETWEEN SEPTEMBER 30 AND APRIL 1. ONCE FIBER MATS 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.
3. A FLEXIBLE GROWTH MEDIUM (FGM) HAS THE ADDED COMPONENT OF 1/2 INCH LONG, CRIMPED ORGANIC OR MANURE FIBERS WHICH ADD A MECHANICAL BOND TO THE CHEMICAL BOND PROVIDED BY BFMS. THIS INCREASES THE BLANKETS RESISTANCE TO BOTH RUNOFF IMPACT AND PRODSION 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.
4. 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 DISLOODED 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 BANKSLOPE OF 3:1 SLOPE	MAXIMUM BANKSLOPE OF 2:1 SLOPE					
	0-1	1-1	1-1	1-1	1-1	1-1
SOIL STABILIZER (tons/acre)	4	5	6	7	8	10
FIBER (lb/acre)	1,500	1,500	1,500	1,600	2,000	2,500

MAXIMUM BANKSLOPE OF 2:1 SLOPE AND FOR SITE WINTERIZATION	SLOPE		
	2:1	4:1	4:1
SOIL STABILIZER (tons/acre)	8	8	10
FIBER (lb/acre)	2,000	2,500	3,000

5. UNLIKE ROLLED BLANKETS, THERE IS NO NEED TO SMOOTH THE SLOPE PRIOR TO APPLICATION OF HYDRAULICALLY APPLIED BLANKETS. IN FACT SOME ROUNDING OF THE SURFACE, EITHER NATURAL OR MECHANICALLY INDUCED, IS PREFERABLE. HOWEVER, LARGE ROCKS, THOSE 4 INCHES AND EXISTING RILLS SHOULD BE REMOVED PRIOR TO APPLICATION. TRACKING OR GRADING OF SLOPES SHOULD BE CONSIDERED TO SLOW WATER FLOWS DURING A STORM EVENT. SLOPE INTERRUPTION DEVICES SUCH AS STAIR STEP GRADING OR BONDING SHOULD BE APPLIED PRIOR TO THE APPLICATION. MOWING AND APPLICATION RATES SHOULD FOLLOW MANUFACTURER'S RECOMMENDATIONS.
6. 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.

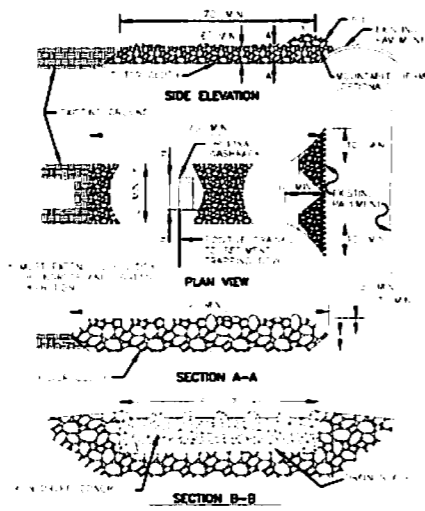


DESIGN BY: JOHN JEFFREY	DATE: 04/21/14	REVISION: 1	DATE: 04/21/14	REVISION: 2	DATE: 04/21/14	REVISION: 3	DATE: 04/21/14
CHECKED BY: JOHN JEFFREY	DATE: 04/21/14	REVISION: 4	DATE: 04/21/14	REVISION: 5	DATE: 04/21/14	REVISION: 6	DATE: 04/21/14
DESIGNED BY: JOHN JEFFREY	DATE: 04/21/14	REVISION: 7	DATE: 04/21/14	REVISION: 8	DATE: 04/21/14	REVISION: 9	DATE: 04/21/14
SCALE: AS SHOWN	DATE: 04/21/14	REVISION: 10	DATE: 04/21/14	REVISION: 11	DATE: 04/21/14	REVISION: 12	DATE: 04/21/14

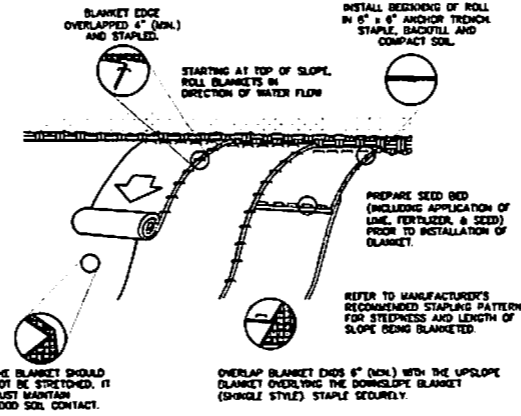
EROSION & SEDIMENT CONTROL NOTES
 COFFMAN, JOHN J
 PLO DESIGN, INC.
 COUNTY ROUTE 20/A
 MARSHTON COUNTY, WEST VIRGINIA

3301 241 P

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

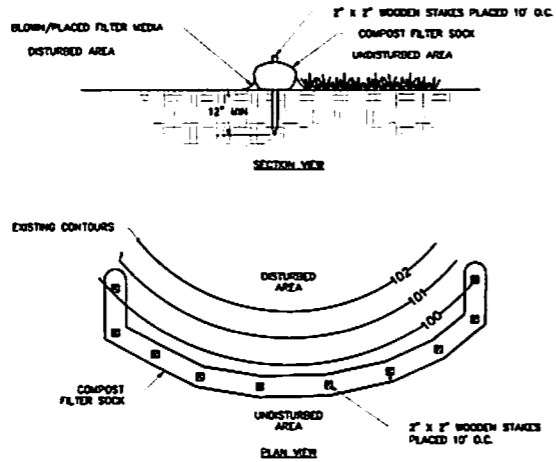


**STANDARD CONSTRUCTION DETAIL
EROSION CONTROL BLANKET**
NOT TO SCALE



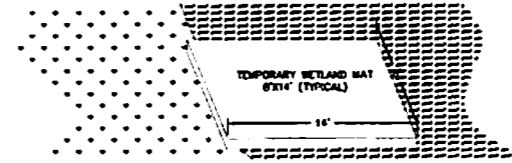
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP x 6" (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 REHARDENING 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 2" (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/SOL/ROCK/SEED FILL TO MEET DEP REQUIREMENTS.
 3. FILTER SOCK DEPICTED IS FOR MODIUM SLOPES. GREATER SLOPES MAY REQUIRE LARGER SOCKS FOR THE ENGINEER.
 4. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

**STANDARD CONSTRUCTION DETAIL
TEMPORARY WETLAND MATS**
NOT TO SCALE



NOTES:
ALLOWS FOR MINIMAL WETLAND IMPACT DURING CONSTRUCTION AND QUICK RESTORATION TO PRE-CONSTRUCTION CONDITIONS.
USE WETLAND MATS FROM PALMERSON GROUP, MADEY INC., OR APPROVED EQUIVALENT.

CONSTRUCTION SEQUENCE, COFTMAN, JOHN 2:

- STAGE 1: INSTALL ROCK CONSTRUCTION ENTRANCE AT COUNTY ROUTE 20/9.
 - A. EXCAVATE FOR, AND FORM ENTRANCE.
 - B. IMMEDIATELY STABILIZE ENTRANCE WITH ROCK.
- STAGE 2: INSTALL TEMPORARY WETLAND MATS PER PLAN.
- STAGE 3: INSTALL 12" COMPOST FILTER SOCKS.
- STAGE 4: INSTALL DRILL PIT (AS NEEDED).
- STAGE 5: STABILIZE, REPAIR, AND MAINTAIN ACCESS DRIVE WITH GRAVEL AS NEEDED.
- STAGE 6: DRILL PIT TO BE RECLAIMED WHEN DONE.
- STAGE 7: 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 HAMBURG/DE COMPANY
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EROSION & SEDIMENT CONTROL DETAILS
COFTMAN, JOHN 2
370 ENDRY, INC.
COUNTY ROUTE 20/9
HARRISON COUNTY, WEST VIRGINIA