

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

September 09, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-5101672, issued to TRANS 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.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

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

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions please test free to contact me at (304) 926-0499 ext. 1654.

James Martin

Chief

Operator's Well No: WOODRUFF 2H

Farm Name: MATTHEWS, VIOLETTA

API Well Number: 47-5101672

Permit Type: Horizontal 6A Well

Date Issued: 09/09/2013

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

- 1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
- 2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
- 3. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
- 4. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
- 5. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
- 6. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
- 7. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

09/13/2013

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

1) Well Operator:	Trans Energy	Inc.	494481575	Marshall	Cameron	Cameron
_			Operator ID	County	District	Quadrangle
2) Operator's Well N	umber: Woodruff	2H	1	Well Pad Nam	ne: Woodruff	
3 Elevation, current	ground: 1484	E	Elevation, proposed	post-construc	tion:	460'
4) Well Type: (a) Ga	as _	Oil	Undergroun	d Storage		_
C	Other					
(b) If			Deep			
	Horizonta					
5) Existing Pad? Yes	or No: Yes-Building the Pa	ad under the Woodruff 1H				
6) Proposed Target F	ormation(s), Deptl	n(s), Anticipa	ated Thicknesses an	d Associated	Pressure(s):	
Marcellus Shale - 7200*	60' thick 3000 psi				Office of	CEIVED
7) Proposed Total Ve	ertical Depth:	7200'			O,	CEIVED Oil and Gas
8) Formation at Total	Vertical Depth:	Marcellus Sh	ale		AUG 2	2 2013
9) Proposed Total Me	easured Depth:	14,860'		En	MAL	
10) Approximate Fre	sh Water Strata De	epths:	50' 150'		"ionmento	rtment of Il Protection
11) Method to Determ	nine Fresh Water I	Depth:	Water Wells drilled in the	County, information	n provided by Heal	th Dept.
12) Approximate Sal	twater Depths:	1525'				
13) Approximate Coa	al Seam Depths:	900'				
14) Approximate Dep	pth to Possible Voi	id (coal mine	e, karst, other):	Bailey (9401	
15) Does proposed w adjacent to an act			directly overlying and depth of mine:	yes Bailey	940'	
16) Describe propose	ed well work:	Drill and Complete hor	rizontal well in the Marcellus Shale.	Lateral to be approxima	tely 7600' in length.	
If Mine void is encounter	, please see attached lett	er.				
17) Describe fracturi			il: r will be used to stimulate t	he Marcellus Shal	е	
18) Total area to be d	listurbed, including	g roads, stocl	kpile area, pits, etc,	(acres):	12.78 acres	
19) Area to be disturb	bed for well pad or	ıly, less acce	ess road (acres):	5.37 acres		
				4	WRH 3-13-13	Page 1 of 3



July 11, 2013

Ms. Laura Cooper West Virginia DEP 601 57th Street Charleston, WV 25304

Re: Void Encounter Woodruff 2H

Dear Laura,

If a Mine Void would be encountered we will run casing no deeper than 50' beyond the void and set a basket as the ceiling and at the bottom and grout/cement, and we will notify the inspector immediately.

We are also adding additional language as per the state; that we will to go at least 30' beyond. (§22-6-20 "When a well is drilled through the horizon of a coal bed from which the coal has been removed, the hole shall be drilled at least thirty feet below the coal bed...")

Once you have reviewed and would have any questions regarding this permit please feel free contact me at 304-684-7053 ext. 26 or Leslie Gearhart at ext. 32

As always thank you for your help in these matters.

Sincerely yours,

Trans Energy Incorporated

Debra A. Martin Land Administrator

DM/dm

Office of Oil and Gas Wy Dept. of Environmental Protection WW - 6B (3/13)

20)

CASING AND TUBING PROGRAM

ТҮРЕ	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20	new	J-55	94	100	100	CTS
Fresh Water	13 3/8	new	J-55	54.5	1000	1000	CTS
Coal							
Intermediate	9 5/8	new	J-55	40	3000	3000	CTS
Production	5 1/2	new	J-110	20		14860	CTS
Tubing							
Liners							

8-13-13

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20	26	0.438	1530	Type 1	13 cu ft/sk
Fresh Water	13 3/8	17 1/2	0.38	2730	Type 1	1.25 cu ft/sk
Coal						
Intermediate	9 5/8	12 1/2	.352	3520	Type 1	1.26 cu ft/sk
Production	5 1/2	8 3/4	.361	12630	Pos H Class H	1.18 cu ft/sk
Tubing						
Liners						

PACKERS

RECEIVED
Office of Oil and Gas
AUG 9 9 2012

WV Department of Environmental Protectionage 2 of 3

WELLBORE SCHEMATIC

Well Name:

Woodruff 2H

County:

Marshall

Latitude:

39.856568

Longitude: -80.526488

TVD:

7,200 ft.

TD:

14,860 ft.

Type Casing	Size	<u>Footage</u>
Conductor	20"	100'
Fresh Water	13-3/8"	1,000'
Intermediate	9-5/8"	3,000'
Production	5-1/2"	14 860'

WP 13/13

RECEIVED Office of Oil and Gas WV Department of Environmental Protection

WW - 6B (3/13)

2	1) Describe centralizer placement for each casing string.
	Fresh water string - 1 centralizer every 160'
	Intermediate string - 1 centralizer every 100' from 3300' to 900'
	Production string - 1 centralizer every 80' from TD to above ROP (7000')
2	2) Describe all cement additives associated with each cement type.
	Standard Type 1 cement additives associated with each cement type.
/	Type 1 + 2% CaC12 + Y4# Flake - Surface Cement mixed @ 15.6 ppg CaC12, Flake (cellohane flake)
	Type 1 + 1% CaC12 + Y4# Flake - Intermediate Cement mixed @ 15.6 ppg
	Class H in lateral - retarder and fluid loss and dree water additive
2	3) Proposed borehole conditioning procedures.
	Before cement casing mud will be thinned and all gas will be circulated out of the mud before cementing.

*Note: Attach additional sheets as needed.

Received

1 8 2013

Office of Oil and Gas
WV Dept. of Environmental Protection

	Page	of	
API Number 47 - SI		1672	
Operator's Well N	lo. Woodi	ruiff 2H	

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name_ Trans Energy	Inc.	OP Code 494481575	
Watershed (HUC 10) North Fo	ork of Grave Creek C	Quadrangle Cameron	
Elevation 1484'	County_Marshall	District_Cameron	
Do you anticipate using more th	nan 5,000 bbls of water to complete the	e proposed well work? Yes x No	_
Will a pit be used for drill cuttir	ngs? Yes No x		
If so, please describe a	inticipated pit waste:		
		If so, what ml.?	
Proposed Disposal Me	thod For Treated Pit Wastes:		
Land	I Application		
		ber	
	se (at API Number Site Disposal (Supply form WW-9 for	disposal location)	
	r (Explain_All fracthilds will be flowed back into storage containers and i		
Will closed loop system be used	1º Yes		
		ata Fasahurata and mail anahina Masallus than an	4141-
		etc. Freshwater mud until reaching Marcellus then syn	
Additives to be used in drilling			
Drill cuttings disposal method?	Leave in pit, landfill, removed offsite.	e, etc. All cuttings will be hauled to approved landf	fill
-If left in pit and plan t	to solidify what medium will be used?	(cement, lime, sawdust) No Pit	
-Landfill or offsite nan	ne/permit number? Short Creek Landfill	II SWF - 1034	
on August 1, 2005, by the Offic	te of Oil and Gas of the West Virginia le forceable by law. Violations of any to forcement action.	ions of the GENERAL WATER POLLUTION P Department of Environmental Protection. I under term or condition of the general permit and/or o mined and am familiar with the information sub-	erstand that the ther applicab
law or regulation can lead to end I certify under penalty application form and all attack obtaining the information, I be	y of law that I have personally exam hments thereto and that, based on n elieve that the information is true, ac formation, including the possibility of	my inquiry of those individuals immediately recurate, and complete. I am aware that there in fine or imprisonment. Office of Oil and O	responsible f are significa
law or regulation can lead to enter I certify under penalty application form and all attact obtaining the information, I be penalties for submitting false in Company Official Signature	y of law that I have personally exam hments thereto and that, based on nelieve that the information is true, ac formation, including the possibility of Leslie Gearhart	my inquiry of those individuals immediately recurate, and complete. I am aware that there in fine or imprisonment.	responsible are signific

Form WW-9 Operator's Well No. ____ Trans Energy Inc. Proposed Revegetation Treatment: Acres Disturbed Total 12.78 - Pad 5.37 Prevegetation pH Lime _____Tons/acre or to correct to pH 65 Fertilizer (10-20-20 or equivalent) 600 lbs/acre (500 lbs minimum) 90 Bales Mulch Tons/acre Seed Mixtures Area I Area II Seed Type lbs/acre Seed Type lbs/acre Meadow Mix 100 **Meadow Mix** 100 Oats or Rye 50 Oats or Rye 50 Attach: Drawing(s) of road, location,pit and proposed area for land application. Photocopied section of involved 7.5' topographic sheet. willen Hardest Plan Approved by:

Title: | Date: 7-12-13 Field Reviewed? () Yes () No

Office of Oil and Gas
WV Dept. of Environmental Protection

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Water Management Plan: Primary Water Sources



WMP-01376

API/ID Number:

047-051-01672

Operator:

Trans Energy Inc.

Woodruff 2H

Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- •Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- •Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for mutiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interepreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.

APPROVED AUG 2 3 2013

Source Summary

WMP-01376 API Number: 047-051-01672 Operator: Trans Energy Inc. Woodruff 2H

Stream/River

DEP Comments:

Ohio River @ J&R Excavating Source Marshall Owner: J&R Excavating

Max. daily purchase (gal) Start Date End Date Total Volume (gal) Intake Latitude: Intake Longitude:

11/1/2013 11/1/2014 6,300,000 39.998509 -80.737336

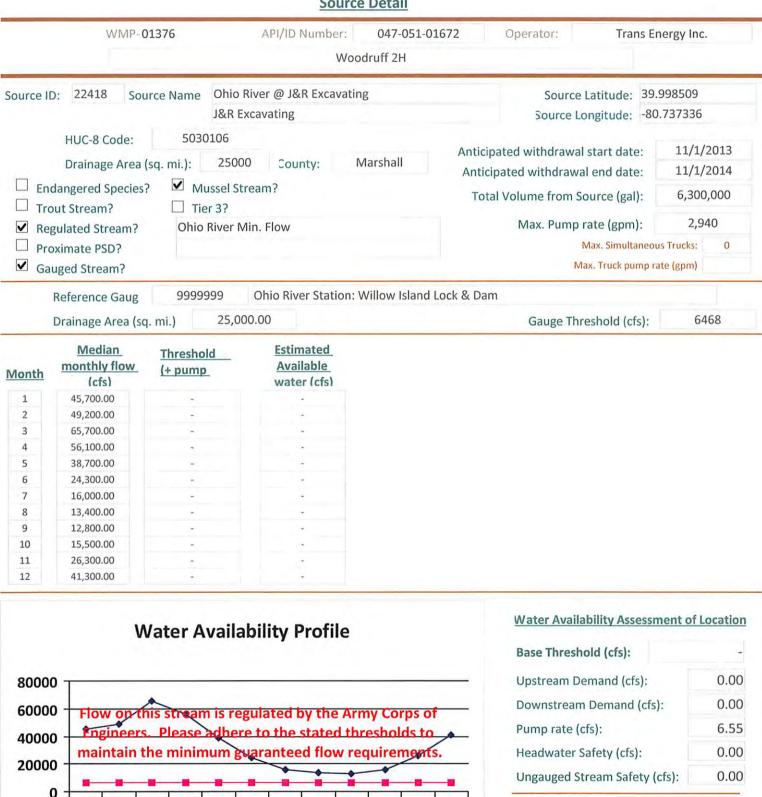
✓ Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): 2,940 Min. Gauge Reading (cfs): Min. Passby (cfs)

Refer to the specified station on the National Weather Service's Ohio River forecast

6,468.00

Source Detail



"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

10

11

12

9

09/13/2013

Min. Gauge Reading (cfs): Passby at Location (cfs):

5

Median Monthly Flow -

west virginia department of environmental protection



Water Management Plan: Secondary Water Sources



WMP-01376

API/ID Number

047-051-01672

Operator:

Trans Energy Inc.

Woodruff 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- •For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- •For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Lake/Reservior

Source ID: 22419		Source Name	Christopher Fa	Source start date:		11/1/2013		
					Source end	date:	11/1/2014	
		Source Lat:	39.88061	Source Long:	-80.572528	County	M	arshall
		Max. Daily Pu	rchase (gal)		Total Volum	me from Source (g	gal):	6,300,000
	DEP Co	mments:						

WMP-01376 API/ID Number 047-051-01672 Operator: Trans Energy Inc.

Woodruff 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- •For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- •For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Multi-site impoundment

Source ID: 22420 Source Name Stout Centralized Freshwater Impoundment Source start date: 11/1/2013

Source end date: 11/1/2014

Reference: WMP-971

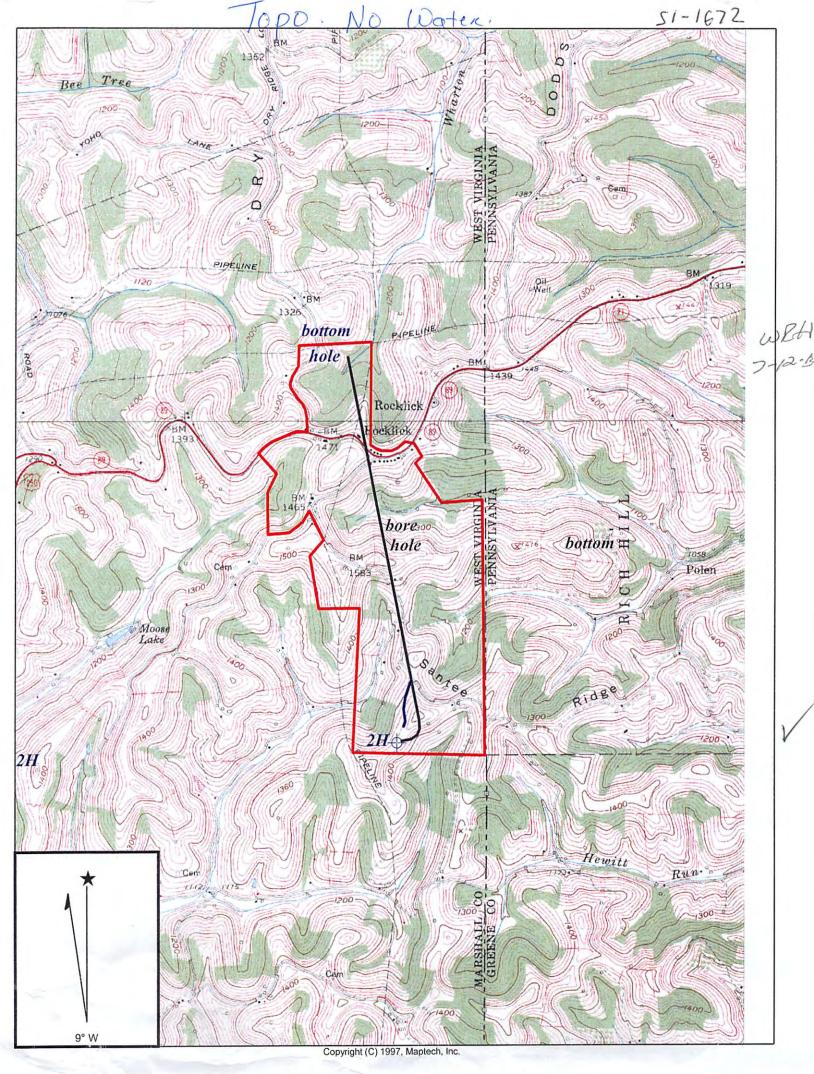
Source Lat: 39.866624 Source Long: -80.543362 County Marshall

Max. Daily Purchase (gal)

Total Volume from Source (gal): 6,300,000

DEP Comments:

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.



CARERON QUADRANGLE

SCALE 1" = 2000'

TRANS ENERGY, INC. Receive 13/2013

WELL: WOODRUFF 2 H WOODRUFF, ET AL 530 ACRE LEASE

Office of Oil and Gas of Environmental Protection WEST VIRGINIA

JUL 1.8 2013

CAMERON DISTRICT

MARSHALL COUNTY

