

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

March 13, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-4902279, 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 feel free to contact me at (304) 926-0499 ext. 1654.

James Martin

Chief

Operator's Well No: MICHAEL 2H

Farm Name: MICHAEL, WILLIAM J. & JUANIT

API Well Number: 47-4902279

Permit Type: Horizontal 6A Well

Date Issued: 03/13/2014

API Number: 49-02279

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. <u>Failure to adhere to the specified permit</u> conditions may result in enforcement action.

CONDITIONS

- 1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.
- 2. 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.
- 3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. 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.
- 4. 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.
- 5. 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.
- 6. 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.
- 7. 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.
- 8. 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.

WW-6B (9/13)

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

1) Well Operator: Trans En	ergy Inc	494481575	Marion	Mannington	Glover Gap
		Operator ID	County	District	Quadrangle
2) Operator's Well Number: Mi	chael 2H	Well Pac	l Name: Micl	nael	
3) Farm Name/Surface Owner:	Juanita O Michael & William J	Michael Public Roa	d Access: Co	o Rd 3/3	
4) Elevation, current ground:	1397' E	levation, proposed	post-construc	tion: 1390'	
5) Well Type (a) Gas		Unde	Action in the control of the control of the		
Other					
(b)If Gas Sha	allow	Deep			
	rizontal =				
6) Existing Pad: Yes or No No		Cr. See S.			
 Proposed Target Formation(s Marcellus Shale 7200' 60' thic 	s), Depth(s), Antic ck 4000 psi	ipated Thickness a	nd Associated	d Pressure(s):	
8) Proposed Total Vertical Dept	th: 7200'				
9) Formation at Total Vertical I	Depth: Marcellus	Shale			
10) Proposed Total Measured D	epth: 12,200				
11) Proposed Horizontal Leg Le	ength: 5000'	H			
12) Approximate Fresh Water S	trata Depths:	60, 150			
13) Method to Determine Fresh	Water Depths: V	Water Wells drilled in	the County, in	formation prov	vided by Health Dept.
14) Approximate Saltwater Dep	ths: 1525'				2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
15) Approximate Coal Seam De	epths: 1200'				
16) Approximate Depth to Possi	ible Void (coal mi	ne, karst, other):	N/A		
17) Does Proposed well location directly overlying or adjacent to		ns Yes	N	o v	
(a) If Yes, provide Mine Info:	Name:				
	Depth:				
	Seam:				
	°Mecei	ved	-		
	MAR - 4	2014	WRN	-13	
	Office of Oil an		10-17 2-28	-14	Page 1 of 3 03/14/2014

WW-6B (9/13)

18)

CASING AND TUBING PROGRAM

ТҮРЕ	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20	new	J-55	94	110'	110'	CTS
Fresh Water	13-3/8	new	J-55	54.5	1250'	1250'	CTS
Coal			1.501				
Intermediate	9-5/8	new	J-55	36	3000'	3000'	CTS
Production	5-1/2	new	P-110	20		12200'	CTS
Tubing			/ = 1				
Liners							

WRH 2-28-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20	26	0.438	1530	Type 1	13 cu ft/sk
Fresh Water	13-3/8	17-1/2	.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	12360	Poz H Class H	1.18 cu ft/sk
Tubing						
Liners						

PACKERS

Kind:		
Sizes:		
Depths Set:		

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MAR - 4 2014

WW-6B (9/13)

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:
Drill and Complete horizontal well in the Marcellus Shale. Lateral to be approximately 5000' in length.
20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:
Fracture 17-21 stages with Proppant: 150,000 of 100 mesh sand 80,000 of 20/40 white sand, 169,998 of 40/70 white sand. Fluid summary: 1,500 of 15% HCL, 412,665 of Slickwater I, 11,000 Slickwater II,
Max Pressure = 10,000 psi
Max Rate = 100 bbl/min
21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres):
22) Area to be disturbed for well pad only, less access road (acres):
23) 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')
to receive the second s
24) Describe all cement additives associated with each cement type:
Standard Type 1 cement - retarder and fluid loss (surface and interm) Type 1 + 2% CaCl ₂ + Y4# Flake - Surface Cement mixed @ 15.6 ppg CaCl ₂ , Flake)cellophane flake).
Type 1 + 2% CaCl ₂ + Y4# Flake - Intermediate Cement mixed @ 15.6 ppg Class H in lateral - retarder and fluid loss and free water additive
Class H in lateral - retarder and fidid loss and free water additive
25) Proposed borehole conditioning procedures: Before cement casing mud will be thinned and all gas will be circulated out of the mud before cementing
perore cernain casing muo wiii be unimieo and an gas wiii be circulated but of the mud before cementing
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*Note: Attach additional sheets as needed.

MAR - 4 2014

WELLBORE SCHEMATIC

Well Name: Michael 1H

County: Marion

Latitude: 39.555255 Longitude: -80.413705

TVD: 7,200 ft.

TD: 12,200 ft.

Type Casing	<u>Size</u>	<u>Footage</u>
Conductor	20"	110'
Fresh Water	13-3/8"	1250'
Intermediate	9-5/8	3,000'
Production	5-1/2"	12.200'

Office of OII and Gas

Office of OII and Gas

OCT 222013

OCT 222013

WV Department of Protection

Environmental Protection

03/14/2014

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name_Trans Energ	y Inc	OP Code 494481575
Watershed (HUC 10)_Dents	Run & Bartholomew Fork	Quadrangle Glover Gap
Elevation 1397'	County_Marion	District Mannington
Do you anticipate using more Will a pit be used? Yes	than 5,000 bbls of water to comple	ete the proposed well work? Yes No
If so, please describe	e anticipated pit waste:	
Will a synthetic line	r be used in the pit? Yes	No If so, what ml.?
Proposed Disposal N	Method For Treated Pit Wastes:	
Ur Re	nd Application Inderground Injection (UIC Permit Insertion (UIC Pe)
Will closed loop system be us	sed? If so, describe: yes	
Drilling medium anticipated	for this well (vertical and horizonta	I)? Air, freshwater, oil based, etc.
-If oil based, what ty	pe? Synthetic, petroleum, etc.Synth	netic
Additives to be used in drilling	g medium? None	
Drill cuttings disposal method	d? Leave in pit, landfill, removed of	offsite, etc. All cuttings will be hauled to approved landfill
-If left in pit and pla	n to solidify what medium will be u	used? (cement, lime, sawdust)_Sawdust
-Landfill or offsite n	ame/permit number?Short Creek La	andfill SWF - 1034
on August 1, 2005, by the Of provisions of the permit are a law or regulation can lead to I certify under pena application form and all att obtaining the information, I penalties for submitting false Company Official Signature_	fice of Oil and Gas of the West Virgenforceable by law. Violations of enforcement action. If you have that I have personally achments thereto and that, based believe that the information is trainformation, including the possibility.	examined and am familiar with the information submitted on this on my inquiry of those individuals immediately responsible for ue, accurate, and complete. I am aware that there are significant ity of fine or imprisonment.
Company Official (Typed Na		Office or 2 311/3
Company Official Title VP-	Operations	OCT 232 cont of
Subscribed and sworn before	me this JCK day of C	OFFICIAL SEAL OF
My commission expires	Morentes 29. 2020	

Operator's Well No. Michael 2H Form WW-9 Trans Energy Inc Proposed Revegetation Treatment: Acres Disturbed ______ 10.85 Total - 2.24 Well Pad Prevegetation pH _____ _____Tons/acre or to correct to pH 65 Fertilizer type ____ Fertilizer amount 600 lbs/acre Mulch 90 Bales Tons/acre **Seed Mixtures Temporary** Permanent Seed Type lbs/acre Seed Type lbs/acre Meadow Mix **Meadow Mix** 100 100 50 Oats or Rye 50 Oats or Rye Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided) Photocopied section of involved 7.5' topographic sheet. Plan Approved by: Bull Hanlash Comments:

2 Jb-14

07/10/2012

TRANS ENERGY INC.

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MAR - 4 2014

WELL SITE SAFETY PLAN Michael 1H, 2H

Office of Oil and Gas
WV Dept. of Environmental Protection

west virginia department of environmental protection



Water Management Plan: Primary Water Sources



WMP 01651

API/ID Number:

047-049-02279

Operator:

Trans Energy Inc.

Michael 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 DEC 0 8 2013

Source Summary

WMP-01651

API Number:

047-049-02279

Operator:

Trans Energy Inc.

Michael 2H

Stream/River

Ohio River @ J&R Excavating Source

Marshall

Owner:

J&R Excavating

Start Date

End Date

Total Volume (gal)

Max. daily purchase (gal)

Intake Latitude: Intake Longitude:

6/15/2014

6/15/2015

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):

6,468.00

Min. Passby (cfs)

DEP Comments:

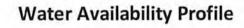
Refer to the specified station on the National Weather Service's Ohio River forecast

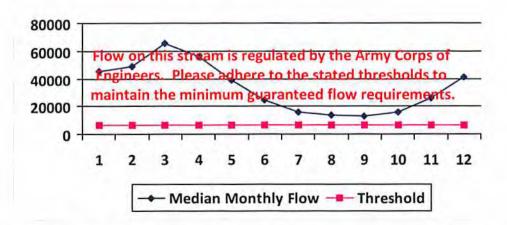
website: http://www.erh.noaa.gov/ohrfc//flows.shtml

Source Detail

WMP-01651	API/ID Number: 0	047-049-02279 Operator: Trans E	nergy Inc.
	Michael	12H	
ource ID: 30524 Source Name	Ohio River @ J&R Excavating	Source Latitude: 39.	998509
	J&R Excavating	Source Longitude: -80	.737336
Drainage Area (sq. mi.): ☐ Endangered Species? ✓ M ☐ Trout Stream? ☐ Tie	0106 25000 County: Mars ussel Stream? er 3? River Min. Flow	Anticipated withdrawal start date: Anticipated withdrawal end date: Total Volume from Source (gal): Max. Pump rate (gpm): Max. Simultaneou Max. Truck pump rate	
Reference Gaug 9999 Drainage Area (sq. mi.)	999 Ohio River Station: Willo 25,000.00	ow Island Lock & Dam Gauge Threshold (cfs):	6468

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	45,700.00		-
2	49,200.00	-	2
3	65,700.00		
4	56,100.00		-
5	38,700.00	4	
6	24,300.00	9	
7	16,000.00		3
8	13,400.00		
9	12,800.00		
10	15,500.00		-
11	26,300.00	7	
12	41,300.00		-





Water Availability Assessment of Location

Base Threshold (cfs):	4
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.55
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"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.

west virginia department of environmental protection



Water Management Plan: Secondary Water Sources



WMF 01651

API/ID Number

047-049-02279

Operator:

Trans Energy Inc.

Michael 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: 30525 Source Name

Mannington Water Supply Dam (WV04921)

Source start date:

6/15/2014

City of Mannington

Source end date:

6/15/2015

Source Lat:

39.532404

Source Long:

-80.36676

County

Marion

Max. Daily Purchase (gal)

Total Volume from Source (gal):

6,300,000

DEP Comments:

WMF 01651 API/ID Number 047-049-02279 Operators Trans Energy Inc.

Michael 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:

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- 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.

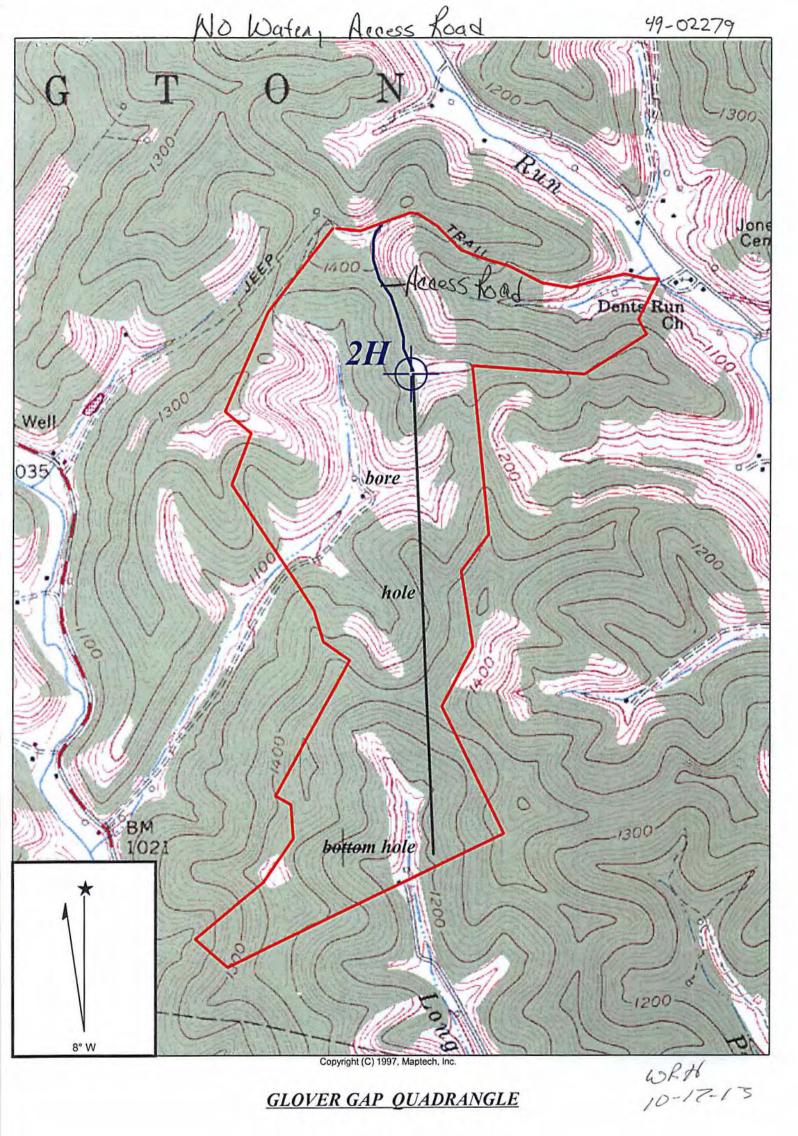
Upper Buffalo No. 16 Dam (WV04928) Source ID: 30526 Source Name 6/15/2014 Source start date: 6/15/2015

Source end date:

-80.387961 Marion 39.545545 County Source Lat: Source Long:

6,300,000 Total Volume from Source (gal): Max. Daily Purchase (gal)

Also known as Dent's Run Dam DEF Comments.



SCALE 1" = 1000'

03/14/2014

TRANS ENERGY, INC.

WELL: MICHAEL 2 H +/- 386.5 ACRE UNIT MICHAEL, ET AL

Office of Oil and Gas OCT 22 2013

RECEIVED

MICHAEL, ET AL WV Department of MANNINGTON DISTRICT MARION COUNTY WEST WIRGINIA Protection

