

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

February 09, 2015

WELL WORK PERMIT Horizontal 6A Well

This permit, API Well Number: 47-3305841, 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.

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: BOGGESS A NORTH UNIT 5H

Farm Name: XTO ENERGY, INC.

API Well Number: 47-3305841

Permit Type: Horizontal 6A Well

Date Issued: 02/09/2015

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. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE 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.
- 9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

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

			4	653		
1) Well Operator: XTO Energy Inc.	494487940	Harrison	Eagle	Wallace		
	Operator ID	County	District	Quadrangle		
2) Operator's Well Number: Boggess A North	Unit 5H Well Pac	l Name: Bogg	ess A Pa	d		
3) Farm Name/Surface Owner: XTO Energy In	nc. Public Roa	d Access: Ree	se's Run (F	Harrison Co. Rt. 20/7)		
4) Elevation, current ground: 1183' El	evation, proposed	post-constructi	on: 1183'			
5) Well Type (a) Gas Oil	Unde	erground Storag	ge			
Other		.54				
(b)If Gas Shallow ■	Deep					
Horizontal				5DW 9/30/2014		
6) Existing Pad: Yes or No Yes		=		9/30/2014		
7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s): Target Formation: Marcellus, Depth 7,089', Anticipated Thickness: 150', Associated pressure: 4,650 psi						
8) Proposed Total Vertical Depth: 7,100'	-	-				
9) Formation at Total Vertical Depth: Marcellus	S	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
10) Proposed Total Measured Depth: 11,850'						
11) Proposed Horizontal Leg Length: 4,350'						
12) Approximate Fresh Water Strata Depths: 114', 125'						
13) Method to Determine Fresh Water Depths: Offsetting Reports						
14) Approximate Saltwater Depths: 1012'						
15) Approximate Coal Seam Depths: Pittsburgh	n Coal was strip m	nined at this loc	ation			
16) Approximate Depth to Possible Void (coal m	ine, karst, other):	None anticipated	d - Pittsburg	h Coal was strip mined		
17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No						
(a) If Yes, provide Mine Info: Name:						
Donth						
Seam:						
Owner:						



WW-6B (9/13)

18)

CASING AND TUBING PROGRAM

TYPE	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	H-40	94#	40'	40'	40 cuft - C.T.S
Fresh Water	13 3/8"	New	MS-50	48#	300'	300'	300 cuft - C.T.S.
Coal							000 Gait - 0.1.G.
Intermediate	9 5/8"	New	J-55	36#	2,700'	2,700'	Lead 600//Tail 600' + C T S.
Production	5 1/2"	New	CYP-110	17#	11,850'	11,850'	2600 cuft
Tubing		1.00.000			71,000	11,000	2000 Cuit
Liners							

5DW 2/4/2015

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	24"	0.438"	960	Type 1	1.19
Fresh Water	13 3/8"	17.5"	0.33"	2,160	Type 1	1.19
Coal					1	
Intermediate	9 5/8"	12.25"	0.352"	3,520	Type 1	Lead 1.26/Tail 1.19
Production	5 1/2"	8.75" 8.5"/7.875"	0.304"	10,640	Type 1	1.32
Tubing					.,,,,,	1,02
Liners				-		

PACKERS

Kind:		
Sizes:		
Depths Set:	 -	

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Office of Oil and Gas WV Dept. of Environmental Protection

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:
Drill a new horizontal Marcellus well, utilizing synthetic mud and a closed loop system for both drilling and completion. Install new casing with centralizers.
20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:
1. Acid Stage - Typically 1500 gallons of 7.5% hydrochloric acid to clear the perforation path in the wellbore. 1500 gals 15% HCl acid. 2. Sand / Proppant Stages - Several stages of pumping water combined with sand at a targeted 80 bpm rate. The maximum pressure and rate used is 10,000 psig and 120 bpm. The sand size may vary from 100 mesh to30/50 mesh size. 12,500 bbls slick water with 220,000 lbs 40/70, 270,000 lbs 100 mesh sands and 2,200 gals FR 133, 1,500 gals Bioplex 301 and 1,500 gals Bioplex 301 and 1,190 gals antiscale 30. 3. Flush Stage - Slickwater water stage to fill the wellbore to flush the sand from the wellbore. Depending on the water quality, a biocide, friction reducer, iron control, and scale inhibitor may be injected during the completion as well.
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): 5.26+/-
23) Describe centralizer placement for each casing string:
Conductor: none Fresh Water: 1"-6" above float shoe, 1 at float collar, & 1 at every 4th joint to surface Intermediate: 1"-6" above float shoe, 1 at float collar, & 1 at every 4th joint to surface Production: 1 at every 4th joint from the kickoff point to 1000' above the kickoff point
24) Describe all cement additives associated with each cement type:
Conductor - Type 1 - no additives Fresh Water - Tail - Type 1 - 2% Calcium Chloride, Super Flake Intermediate - Lead - Type 1 - 2% Calcium Chloride, Super Flake Tail - Type 1 - 2% Calcium Chloride, Super Flake Production - Tail 50/50 POZ - Type 1 - Sodium Chloride, Bentonite, Super Flake, Air-Out, R-1, AG-350
25) Proposed borehole conditioning procedures:
See attached sheet
*Note: Attach additional sheets as needed.

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OCT 06 2014

(rounded up)	Other directional data KOP 6300 LP 7500 approx. TD 11850 (rounded up)					
	ctional Data	Boggess A 5H Proposed Directional Data	Вод			
						Linera
						lubing
Hole will be strubbed allowed convenience up pilar la guarence compet.	while well the cure literal de mercensky which surpring	The hole will be electeded at a obtain pendids pump rate aret the diskle map will be cetaled at the materied part.	Ar i Rom . Lobings but of its Inite, I All will be appropriately. The first will be decided all a othern product equive is based. If Eggs 14 Opgs for as other based and product and the opgs will be school of inite. The state of the opgs will be school of inite. The state of the opgs will be school of inite. The state of the opgs will be school of inite of the opgs	Ar (Kon- equeous becad	8.25 0.577 8757	Production
e je ak od bewn e esa vist jai pera na polity sad. Pode viš be field mit field and literatival is satiscas is. Caterry was an ana management and as services and personal consistence of height to that caterry. [Analysis of height to that caterry.]	Hole will be fitted with fluid and circulated I a zurtace is specially made in contract to the second secon	he he sait on his word to part of ball by suit	Figure well be circulated with high persons to	/JIM/2tel	1225	Intermediate
tion will be below with any permit grad of the will be find and because the notice of County will be County with the services of health in foreign and the county will be considered to the county of	16-in add by Etail with fluid and cacabated to so to as a conditions registed.	tive will be taken classe with an peer to pering aid of there to min curing	field will be catalased with high properties	Artico	173	Fresh Water
And the Characters with all post to part to part of 1924 and has been an indicated and parties of 1924 and has been an indicated and the control of 1924 and has been an indicated and the control of 1924 and has been an indicated and 1924 and 19	CANTY DAY OF THE STATE OF THE CANTY OF THE C	Party and the University and party and for party and for party and for finding and fin	Note will be charitized with high pressure #	A Mater	٥٤	Cost
Tell Mitte Niem telest men en print to puthing call that we be trademanded and the trade to contrast to comply we be trademand to the trademand to the trademand of the trademand to the trademan	Phin will be stad with field and this letter to authors a conditional leafure	Pale skitte Nown clean with or pive to putting call of hade to can easing	Hale will be problem and high percents of	h. filteta:	צ	Conductor
Prior to Cementing	Running Casing	OLW	Ortiling	E.	Hole Size	Hole Section
	Condition Procedures	Con				
	ctional Data	Boggess A 5H Proposed Directional Data	Bogg			

				Вод	gess A	ess A 5H Detaile	ed Casi	ng and	Boggess A 5H Detailed Casing and Cementing Program	rogran		Comenting Program	
Type	Hole Stan (Inches)	Cag Sire (in) Langth (ft) Top/Bottom	Langth (ft)	Tap/Battors of String	Grade	Grade Weight (ppi) Thickness	Wall Thickness	Pressure Rating	Contratizor Placement	Type	Yield Yield	Yield (trade names are Superior Eatimeted Volume (cu. N'ak) (Weil Services)	Eatimeted Volume (
Conductor	r	20	÷	04170	7.40	2	0438	900	Hône	t adds	119	ž	ii.
Con													
Surface / Frash Water	3.41	36 61	ĺ	1667.15	MS-50	*	037	2160	1.6" above fibat shoe 1.at fibat coffar 1-every 4th it to surface	1 mg42: 4.7	1 13	Tal-Typen 1 119 Calcium chierda SuperFolto	
						ž į	5			(aug.Type)	ะี	Calcium Chlorida, Supur Flake	Çut.
medialo	22.21	98	2,000	072000	9			100	1-every 4th ji to surface	ו פענו ובז	1.10	Tal-1306 1 1.10 Celeum exemus, Sunni Fako	
Production	6 /5/8 S 7 875	P 112	11,550	071-110 CYP-110	CXP-110	17	0.304	10840	centralizers will be run every 3rd joint from top of cameral to tanking point	Tal 80/50 POAlype 1	ig ig	Sudum chicida, tentonile Super Flate, At-Out, R-1, AG 353	2600
Tubing													
Linera													

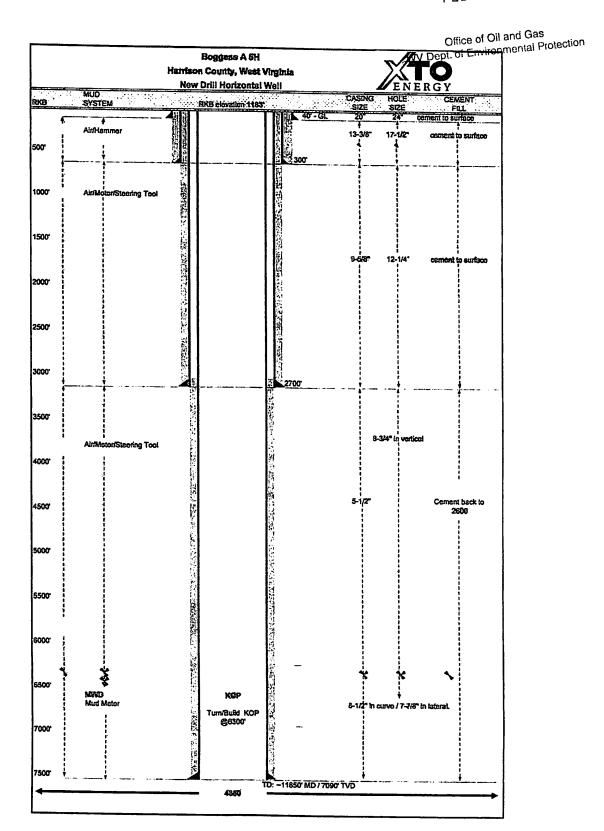
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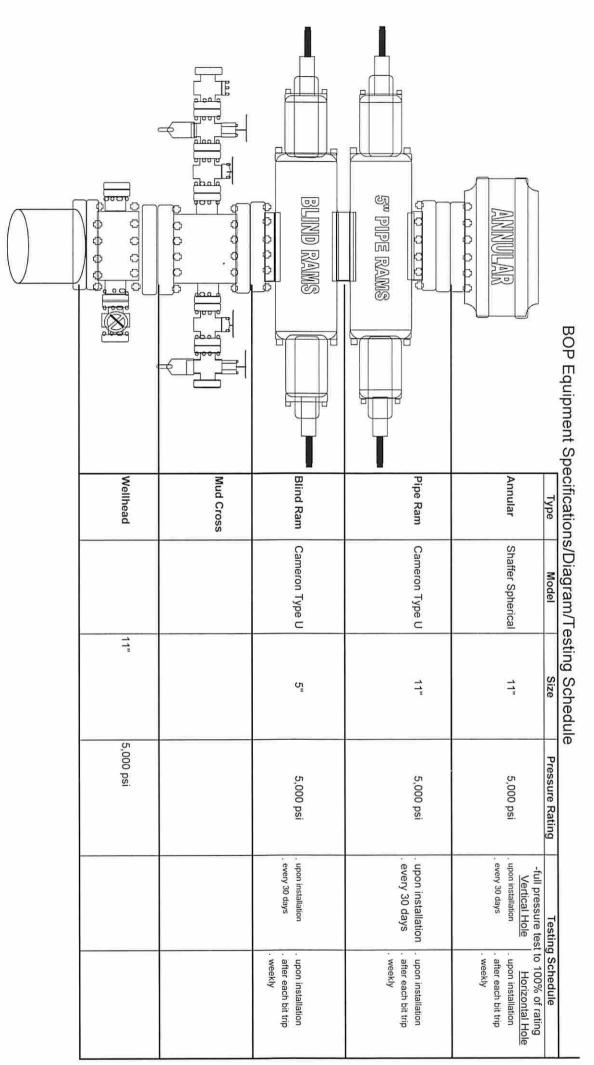
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Memo to File

1/2/13

Re: Boggess Unit A Location Coal

On Wednesday January 2, 2013 | called Kenny Ashton with the WVGES and asked about potential coal seams and mining operations under our planned Boggess Unit A location. I provided him with the following NAD 83 coordinates: 39.376147, -80.385799.

Later that day Mr. Ashton called back and said that the Pittsburgh coal at this location had been stripped. He also said that we are in no danger of hitting the nearby O & R mine because our surface location is at the same elevation of the mine.

Tim Sands

Regulatory Compliance Technician

RECEIVED Office of Oil and Gas

JUL 1 5 2013

WV Department of Environmental Protection

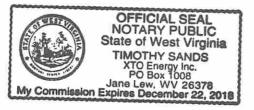
OCT 06 2014

API Number	47 -		<u> </u>	
One	rator's W	ell No.	Boggess A North Unit 5H	

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name XTO Energy Inc.		OP Code	494487940
Watershed (HUC 10) Tenmile Creek		Quadrangle Wallace	
Elevation 1183	County Harrison	Distric	t_Eagle
Do you anticipate using more than 5,000 Will a pit be used? Yes No	bbls of water to complete	the proposed well work?	Yes No No
If so, please describe anticipate			
Will a synthetic liner be used in	the pit? Yes No	If so, what m	1.?
Proposed Disposal Method For	Treated Pit Wastes:		9/30/2014
Reuse (at Al Off Site Disp Other (Expla	Injection (UIC Permit Nu PI Number_ osal (Supply form WW-9 f iin	or disposal location)))))))
Will closed loop system be used? If so,	describe: Depending on brand, system	would entail 2 centrifuges & another cutting	drying method grinder, drying shakers or verti-g mud.
Drilling medium anticipated for this we	l (vertical and horizontal)?	Air, freshwater, oil based	I, etc. Air/water to 7100°, then switch to synthetic
-If oil based, what type? Synth	etic, petroleum, etc.Synthet	ic	
Additives to be used in drilling medium	? See additional page		
Drill cuttings disposal method? Leave	n pit, landfill, removed offs	ite, etc. Landfill	
-If left in pit and plan to solidit	y what medium will be use	d? (cement, lime, sawdus	t) NA
-Landfill or offsite name/perm	t number?Meadowbrook La	ndfill - #SWF 1032	
on August 1, 2005, by the Office of Oil provisions of the permit are enforceabl law or regulation can lead to enforceme I certify under penalty of law application form and all attachments obtaining the information, I believe the penalties for submitting false information.	and Gas of the West Virgin e by law. Violations of an nt action. that I have personally ex- thereto and that, based or at the information is true,	ia Department of Environ y term or condition of the amined and am familiar n my inquiry of those in accurate, and complete. of fine or imprisonment.	WATER POLLUTION PERMIT issued amental Protection. I understand that the egeneral permit and/or other applicable with the information submitted on this adividuals immediately responsible for I am aware that there are significant
Company Official Signature	, Dooll		
Company Official (Typed Name) Gar			
Company Official Title Production S	uperintendent		
Subscribed and sworn before me this_	John day of Sep Firt Sank	itenber No	tary Public
My commission expires	12/22/18		Received 3/2015
	t)		0//00/01/01/01/01/01/01/01/01/01/01/01/0



Office of Oil & Gas

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Operator's Well No.	Boggess A	North	Unit 5H
Operator's Well No.			

XTO Energy Inc	D.		
Proposed Revegetation Tre	eatment: Acres Disturbed 6.	78 +/- (already re-vegetated) Prevegetation pl	Н
Lime 2-6		et to pH	
E ALL	-20-20		
Fertilizer amount_	678 - 1000	lbs/acre	
Mulch 3		Tons/acre	
.Haicii		Tolls/acic	
		Seed Mixtures	
r°	Гетрогагу	Perma	nent
Seed Type	lbs/acre	Seed Type	lbs/acre
Timothy	50	Tall Fescue	40
		Birdsfoot Trefoil	10
Plan Approved by:	A DWar	TD	
			1/2
regulation.		non as reasonably poss	
		as needed per WU	
Manual		as needed per WU	
Manual	Upgrade Eds	as needed per WU	
Manual	Upgrade Eds	as needed per WU	
Manual	Upgrade Eds	as needed per WU	
Manual	Upgrade Eds	as needed per WU	
	Upgrade Eds	as needed per WV	DEP ES
	Upgrade Eds	as needed per WU	DEP ES

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XTO Drilling Additives

		Approximate Amount
Product Name	CAS#	on Location (lbs)
Bentone 910	14808-60-7	2500
Cedar Fiber	n/a	5000
CyberDrill	93762-80-2	20000
Calcium Chloride	10043-52-4	20000
	111-40-0	
	26952-14-7	
CyberCoat	62442-97-7	3000
CyberMul	70321-73-2	3000
CyberPlus	71-36-3	3000
Lime	1305-62-0	15000
New Carb	1317-65-3	3000
Walnut Shells	n/a	2500
	7727-43-7	
	1332-58-7	
	14808-60-7	
New Bar	471-34-1	200000
OptiThin	68442-97-7	8000
	12174-11-7	
	14808-60-7	
Oil Dry	01309-48-4	600
	9016-45-9	
	68131-71-5	
	1310-73-2	
	27176-87-0	
	1300-72-7	
OptiClean	7758-29-4	1800
OptiG	12002-43-6	5000
SynDril 470	64741-86-2	81000

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XTO Energy Inc. Well Site Safety Plan

Boggess A Pad 1103 Reeses Run Road Lumberport, WV 26386

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SDW 9/30/2014

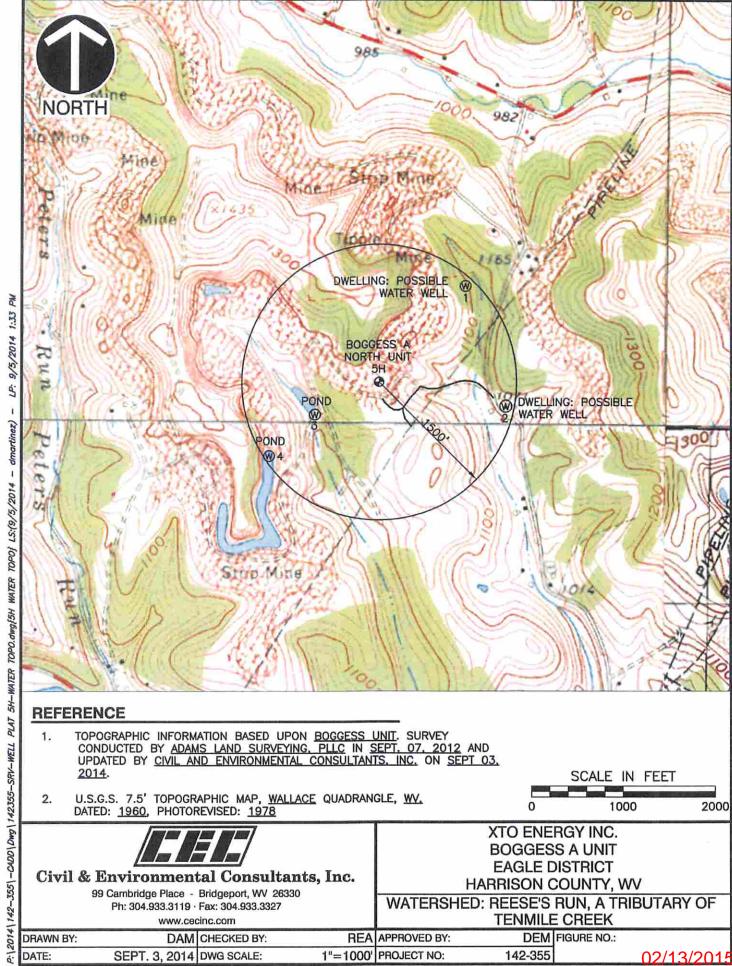
SDW 2/4/2015

Changes to Collision Awaidance

Boggess A Unit

Possible water wells or sources:

Ethan D. and Brandy L. Galicic;
 Melisha A. Harbert,
 Richard B. Jones
 Richard B. Jones
 Candle Light Dr., Clarksburg, WV 26301
 Richard B. Jones
 Candle Light Dr., Clarksburg, WV 26301



REFERENCE

- TOPOGRAPHIC INFORMATION BASED UPON BOGGESS UNIT. SURVEY CONDUCTED BY ADAMS LAND SURVEYING, PLLC IN SEPT. 07, 2012 AND UPDATED BY CIVIL AND ENVIRONMENTAL CONSULTANTS. INC. ON SEPT 03. 2014.
- U.S.G.S. 7.5' TOPOGRAPHIC MAP, <u>WALLACE</u> QUADRANGLE, <u>WV.</u> DATED: $\underline{1960}$, PHOTOREVISED: $\underline{1978}$ 2.





Civil & Environmental Consultants, Inc.

99 Cambridge Place - Bridgeport, WV 26330 Ph: 304.933.3119 · Fax: 304.933.3327

www.cecinc.com

XTO ENERGY INC. **BOGGESS A UNIT EAGLE DISTRICT** HARRISON COUNTY, WV

WATERSHED: REESE'S RUN, A TRIBUTARY OF TENMILE CRÉEK

DRAWN BY:	DAM	CHECKED BY:	REA	APPROVED BY:	DEM	FIGURE NO.:	
DATE:	SEPT. 3, 2014	DWG SCALE:	1"=1000"	PROJECT NO:	142-355		02/13/2015

