

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 033 - 05843 County Harrison District Eagle
Quad Wallace Pad Name Boguess Unit A Field/Pool Name Marcellus
Farm name XTO Energy Inc. Well Number Boguess A North Unit 7H
Operator (as registered with the OOG) XTO Energy Inc.
Address PO Box 1008 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4358702 Easting 552901
Landing Point of Curve Northing 4358718 Easting 552630
Bottom Hole Northing 4360048 Easting 551598

Elevation (ft) 1,183' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based Mud - Anchor Drilling Fluids

Date permit issued 2/9/15 Date drilling commenced 3/15/15 Date drilling ceased 5/19/15
Date completion activities began 12/16/15 Date completion activities ceased 12/30/15
Verbal plugging (Y/N) NA Date permission granted NA Granted by NA

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 870' Open mine(s) (Y/N) depths N
Salt water depth(s) ft None Noted Void(s) encountered (Y/N) depths N
Coal depth(s) ft 512' - 517' Cavern(s) encountered (Y/N) depths N

Is coal being mined in area (Y/N) N

APPROVED

NAME: Quackie Thornton
DATE: 7/6/16

Office

Reviewed by:

AX 08DMS
09/23/2016
09/20/16

API 47-033 - 05843 Farm name XTO Energy Inc. Well number Boggess A North Unit 7H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	28"	24"	40'	New	PE&B - 94.62#		Grouted to Surface
Surface	17 1/2"	13 3/8"	570'	New	H-40 - 48#		Y
Coal							
Intermediate 1	12 3/8" & 12 1/4"	9 5/8"	2,677'	New	J-55 - 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	13,136'	New	P-110 - 20#		TOC - 5,002'
Tubing							
Packer type and depth set							

Comment Details 22 bbls to surface on 13 3/8". 37 bbls to surface on 9 5/8". 5 1/2" - pump 108 bbl lead 50:50 Poz Premium Class H, 279 bbl tail Premium Class H.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Redi-mix	5 yards				0	8
Surface	Class A	500	15.60	1.19	595	0	8
Coal							
Intermediate 1	Class A	965	15.60	1.19	1148	0	8
Intermediate 2							
Intermediate 3							
Production	Ld. 50:50 Poz / Ti. Prem Class H	510 / 825	14.50 / 15.00	1.19 / 1.90	607 / 1568	5,002'	8
Tubing							

Drillers TD (ft) 13,166' MD Loggers TD (ft) 13,166' MD

Deepest formation penetrated Marcellus Plug back to (ft)

Plug back procedure

Kick off depth (ft) 5,900'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING

Surface/Mine: Bow Spring Centralizers Every 3rd Joint

Intermediate: Bow Spring Centralizers Every 3rd Joint

Production: Spiral Glide Centralizers Every Other Joint From TD to TOC

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS Well shot with 0.5" perf. diameter HERO charges, 6 spf, 60 degree phasing, 4-5 clusters per stage.

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS

Received
Office of Oil & Gas

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED

NOV 24 2016

API 47- 033 - 05843 Farm name XTO Energy Inc. Well number Bogges A North Unit 7H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
0	12/16/15	12,982'	13,038'	36	Marcellus
1	12/17/15	12,732'	12,902'	48	Marcellus
2	12/17/15	12,482'	12,650'	48	Marcellus
3	12/18/15	12,232'	12,400'	48	Marcellus
4	12/18/15	11,982'	12,152'	48	Marcellus
5	12/18/15	11,732'	11,902'	48	Marcellus
6	12/19/15	11,484'	11,672'	48	Marcellus
7	12/19/15	11,240'	11,410'	60	Marcellus
8	12/20/15	10,996'	11,166'	60	Marcellus
9	12/20/15	10,752'	10,922'	60	Marcellus
10	12/20/15	10,508'	10,678'	60	Marcellus
11	12/21/15	10,264'	10,434'	60	Marcellus
12	12/21/15	10,020'	10,190'	60	Marcellus
13	12/21/15	9,776'	9,946'	60	Marcellus
14	12/22/15	9,532'	9,702'	60	Marcellus
15	12/22/15	9,288'	9,458'	60	Marcellus

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
0	12/16/15	77	7,982	6,250	4,909	172,940	9,167	0
1	12/17/15	81.9	7,435	5,708	5,673	308,060	9,052	0
2	12/17/15	82.0	7,417	5,704	5,410	280,120	8,796	0
3	12/18/15	80.0	7,385	5,525	5,403	374,740	9,320	0
4	12/18/15	81.1	7,610	5,817	5,546	379,640	9,581	0
5	12/19/15	81.0	7,961	5,645	5,615	251,560	9,815	0
6	12/19/15	85.2	7,677	6,126	5,393	336,260	8,893	0
7	12/20/15	85.0	7,252	5,531	5,456	359,340	9,027	0
8	12/20/15	83.8	7,514	5,721	4,457	348,600	11,659	0
9	12/20/15	85.3	7,390	5,760	5,446	358,260	8,991	0
10	12/21/15	85.0	7,422	5,636	5,531	348,640	9,785	0
11	12/21/15	85.1	7,406	5,683	5,476	358,582	9,948	0
12	12/21/15	84.6	7,614	5,771	5,583	315,960	11,255	0
13	12/22/15	85	7,746	6,197	5,842	358,590	8,921	0
14	12/22/15	84.3	7,745	6,540	5,583	359,360	11,210	0
15	12/22/15	84.9	7,441	6,732	5,815	359,000	9,038	0

Please insert additional pages as applicable.

Received
Office of Oil & Gas

SEP 24 2016

09/23/2016

API: 47-033-05843
 Farm Name: XTO Energy Inc.
 Well Number: Boggess A North Unit 7H

Lithology / Formation	Top Depth In Ft. TVD	Bottom Depth In Ft TVD	Top Depth In Ft MD	Bottom Depth In Ft MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
SOIL / GRAY SHALE	0	370	0	370	
GRAY / WHITE SAND	370	512	370	512	
COAL	512	517	512	517	
GRAY/ WHITE SAND	517	550	517	550	
GRAY SHALE	550	680	550	680	
GRAY/RED SHALE	680	740	680	740	
GRAY SAND	740	775	740	775	
GRAY SHALE	775	870	775	870	Fresh Water @ 870'
GRAY SAND	870	1000	870	1000	
GRAY SAND / SHALE	1000	1155	1000	1155	
RED SHALE	1155	1190	1155	1190	
GRAY SHALE	1190	1280	1190	1280	
RED SHALE	1280	1315	1280	1315	
GRAY SAND	1315	1505	1315	1505	
GRAY SHALE	1505	1665	1505	1665	
GRAY SAND	1665	1700	1665	1700	
GRAY SHALE / SAND	1700	1820	1700	1820	
GRAY SHALE	1820	2205	1820	2205	
GRAY SAND	2205	2360	2205	2360	
GRAY SHALE	2360	2425	2360	2425	
SAND / SHALE	2425	2800	2425	2800	
GRAY SHALE	2800	4710	2800	4710	
SAND / SHALE	4710	5002	4710	5002	
BURKETT SHALE	6801	6843	6945	7015	
TULLY LIMESTONE	6843	6896	7015	7112	
HAMILTON SHALE	6896	6953	7112	7230	
UPPER MARCELLUS	6953	7053	7230	7555	
LOWER MARCELLUS	7053	TD	7555	13166	

Received
 Office of Oil & Gas
 MA 04 2016

09/23/2016

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/11/2015
Job End Date:	12/30/2015
State:	West Virginia
County:	Harrison
API Number:	47-033-05843-00-00
Operator Name:	XTO Energy/ExxonMobil
Well Name and Number:	Boggess A North Unit 7H
Longitude:	-80.23095000
Latitude:	39.22338000
Datum:	NAD27
Federal/Tribal Well:	YES
True Vertical Depth:	7,020
Total Base Water Volume (gal):	9,023,070
Total Base Non Water Volume:	0



Received
 Office
 Mar 14 2016

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	XTO	Carrier/Base Fluid	Water	NA	100.00000	90.31914	None
Sand (Proppant)	Keane	Proppant	Crystalline Silica, Quartz	NA	100.00000	9.04111	None
Hydrochloric Acid (15%)	FSTI	Acid	HCL	7647-01-0	15.00000	0.06205	None
Hydrochloric Acid (7.5%)	FSTI	Acid	HCL	7647-01-0	7.50000	0.00937	None
Bactron K 139	Nalco	Biocide	Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	30.00000	0.00599	None
			Glutaraldehyde	111-30-8	10.00000	0.00200	None
FFR 730	Nalco	Friction Reducer	Oxyalkylated alcohol A	Proprietary	5.00000	0.00338	None
AI 600P	Weatherford	Acid Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00053	None
			Dimethylformamide	68-12-2	20.00000	0.00027	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00020	None

			Pyridine, alkyl derives., quaternized with benzyl chloride	68909-18-2	15.00000	0.00020	None
			Cinnamaldehyde	104-55-2	15.00000	0.00020	None
			2-Butoxyethanol	111-76-2	5.00000	0.00007	None
			1-Octanol	111-87-5	5.00000	0.00007	None
			1-Decanol	112-30-1	5.00000	0.00007	None
			Methanol	67-56-1	2.50000	0.00003	None
			Triethyl Phosphate	78-40-0	2.50000	0.00003	None
			Alkyl Pyridine	68391-11-7	1.00000	0.00001	None
EC6330A	Nalco	Scale Inhibitor					
			Ethylene Glycol	107-21-1	5.00000	0.00061	None
			Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00061	None
FFR 760	Nalco	Friction Reducer					
			Hydrotreated Light Distillate	64742-47-8	30.00000	0.00007	None
			Alkyl Alcohol	Proprietary	10.00000	0.00002	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00001	None

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

- * Total Water Volume sources may include fresh water, produced water, and/or recycled water
- ** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

Received
Office of Oil & Gas
MAR 24 2016



XTO

Harrison County, WV
Bogges A PAD
North Unit 7H

Main Wellbore

Design: 7H AS Drilled Surveys

Standard Survey Report

18 May, 2015

Received
Office of Oil & Gas

MAR 24 2016



09/23/2016



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Boggess A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Project	Harrison County, WV		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Site	Boggess A PAD				
Site Position:		Northing:	320,323.00 usft	Latitude:	39.38
From:	Map	Easting:	1,749,542.00 usft	Longitude:	-80.39
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.57 °

Well	North Unit 7H					
Well Position	+N/-S	0.0 usft	Northing:	320,323.00 usft	Latitude:	39° 22' 33.907 N
	+E/-W	0.0 usft	Easting:	1,749,542.00 usft	Longitude:	80° 23' 9.591 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	1,183.0 usft

Wellbore	Main Wellbore				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/21/2015	-8.98	66.80	52,519

Design	7H AS Drilled Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	307.40	

Survey Program	Date	5/18/2015			
From ()	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	4,959.0	Boggess A North Unit 7H Gyro (Main Wellb)	Javins Gyros	Surface Read Out Inertial Gyroscope	
0.00	13,166.0	PHX MWD Surveys (Main Wellbore)	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	-1,205.0	0.0	0.0	0.0	0.00	0.00	0.00	
59.0	0.73	31.20	59.0	-1,146.0	0.3	0.2	0.0	1.24	1.24	0.00	
109.0	0.78	34.60	109.0	-1,096.0	0.9	0.6	0.1	0.13	0.10	6.80	
159.0	0.91	30.70	159.0	-1,046.0	1.5	0.9	0.2	0.28	0.26	-7.80	
209.0	0.59	4.20	209.0	-996.0	2.1	1.2	0.3	0.93	-0.64	-53.00	
259.0	0.53	351.90	259.0	-946.0	2.6	1.2	0.6	0.27	-0.12	-24.60	
309.0	0.35	323.50	309.0	-896.0	2.9	1.0	1.0	0.56	-0.36	-56.80	
359.0	0.33	311.10	359.0	-846.0	3.1	0.8	2.2	0.15	-0.04	-24.80	

Received
Office of...



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Boggs A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
409.0	0.31	296.20	409.0	-796.0	3.3	0.6	1.5	0.17	-0.04	-29.80
459.0	0.33	313.30	459.0	-746.0	3.5	0.4	1.8	0.19	0.04	34.20
509.0	0.33	322.30	509.0	-696.0	3.7	0.2	2.1	0.10	0.00	18.00
559.0	0.35	328.90	559.0	-646.0	3.9	0.0	2.4	0.09	0.04	13.20
609.0	0.33	337.30	609.0	-596.0	4.2	-0.1	2.6	0.11	-0.04	16.80
659.0	0.17	232.60	659.0	-546.0	4.3	-0.2	2.8	0.82	-0.32	-209.40
709.0	0.20	200.70	709.0	-496.0	4.1	-0.3	2.8	0.21	0.06	-63.80
759.0	0.43	168.40	759.0	-446.0	3.9	-0.3	2.6	0.56	0.46	-64.60
809.0	0.48	173.60	809.0	-396.0	3.5	-0.3	2.3	0.13	0.10	10.40
859.0	0.50	161.00	859.0	-346.0	3.1	-0.2	2.0	0.22	0.04	-25.20
909.0	0.49	176.50	909.0	-296.0	2.7	-0.1	1.7	0.27	-0.02	31.00
959.0	0.33	173.60	959.0	-246.0	2.3	0.0	1.4	0.32	-0.32	-5.80
1,009.0	0.36	175.60	1,009.0	-196.0	2.0	0.0	1.2	0.06	0.06	4.00
1,059.0	0.67	158.80	1,059.0	-146.0	1.6	0.1	0.9	0.68	0.62	-33.60
1,109.0	0.70	147.60	1,109.0	-96.0	1.0	0.4	0.3	0.27	0.06	-22.40
1,159.0	0.65	102.30	1,159.0	-46.0	0.7	0.8	-0.2	1.04	-0.10	-90.60
1,209.0	0.52	71.50	1,209.0	4.0	0.7	1.3	-0.6	0.67	-0.26	-61.60
1,259.0	0.54	59.90	1,259.0	54.0	0.9	1.7	-0.8	0.22	0.04	-23.20
1,309.0	0.37	2.40	1,309.0	104.0	1.2	1.9	-0.8	0.92	-0.34	-115.00
1,359.0	0.41	335.50	1,359.0	154.0	1.5	1.9	-0.6	0.37	0.08	-53.80
1,409.0	0.34	334.50	1,408.9	203.9	1.8	1.7	-0.3	0.14	-0.14	-2.00
1,459.0	0.43	326.30	1,458.9	253.9	2.1	1.6	0.0	0.21	0.18	-16.40
1,509.0	0.38	322.60	1,508.9	303.9	2.4	1.4	0.4	0.11	-0.10	-7.40
1,559.0	0.45	312.60	1,558.9	353.9	2.7	1.1	0.7	0.20	0.14	-20.00
1,609.0	0.45	307.30	1,608.9	403.9	2.9	0.8	1.1	0.08	0.00	-10.60
1,659.0	0.43	290.10	1,658.9	453.9	3.1	0.5	1.5	0.27	-0.04	-34.40
1,709.0	0.45	261.00	1,708.9	503.9	3.1	0.1	1.8	0.44	0.04	-58.20
1,759.0	0.43	226.70	1,758.9	553.9	3.0	-0.2	2.0	0.52	-0.04	-68.60
1,809.0	0.43	212.60	1,808.9	603.9	2.7	-0.5	2.0	0.21	0.00	-28.20
1,859.0	0.43	197.40	1,858.9	653.9	2.3	-0.6	1.9	0.23	0.00	-30.40
1,909.0	0.38	50.60	1,908.9	703.9	2.3	-0.5	1.8	1.55	-0.10	-293.60
1,959.0	0.47	21.50	1,958.9	753.9	2.6	-0.3	1.8	0.46	0.18	-58.20
2,009.0	0.52	328.80	2,008.9	803.9	3.0	-0.4	2.1	0.88	0.10	-105.40
2,059.0	0.53	276.10	2,058.9	853.9	3.2	-0.7	2.5	0.93	0.02	-105.40
2,109.0	0.51	246.10	2,108.9	903.9	3.1	-1.2	2.8	0.54	-0.04	-60.00
2,159.0	0.49	238.30	2,158.9	953.9	2.9	-1.6	3.0	0.14	-0.04	-15.60
2,209.0	0.36	182.90	2,208.9	1,003.9	2.6	-1.7	3.0	0.82	-0.26	-110.80
2,259.0	0.35	175.70	2,258.9	1,053.9	2.3	-1.7	2.8	0.09	-0.02	-14.40
2,309.0	0.32	77.50	2,308.9	1,103.9	2.2	-1.6	2.6	1.01	-0.06	-196.40
2,359.0	0.43	13.50	2,358.9	1,153.9	2.4	-1.4	2.6	0.82	0.22	-128.00
2,409.0	0.47	2.70	2,408.9	1,203.9	2.8	-1.4	2.8	0.19	0.08	-21.60
2,459.0	0.52	330.20	2,458.9	1,253.9	3.2	-1.5	3.1	0.56	0.10	-65.00

09/23/2016



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Bogges A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,509.0	0.55	334.30	2,508.9	1,303.9	3.6	-1.7	3.5	0.10	0.06	8.20	
2,559.0	0.55	329.70	2,558.9	1,353.9	4.0	-1.9	4.0	0.09	0.00	-9.20	
2,609.0	0.55	323.00	2,608.9	1,403.9	4.4	-2.2	4.4	0.13	0.00	-13.40	
2,659.0	0.53	280.30	2,658.9	1,453.9	4.7	-2.5	4.9	0.79	-0.04	-85.40	
2,709.0	0.21	242.80	2,708.9	1,503.9	4.7	-2.8	5.1	0.77	-0.64	-75.00	
2,759.0	0.08	97.20	2,758.9	1,553.9	4.6	-2.9	5.1	0.56	-0.26	-291.20	
2,809.0	0.40	341.20	2,808.9	1,603.9	4.8	-2.9	5.2	0.88	0.64	-232.00	
2,859.0	0.37	298.50	2,858.9	1,653.9	5.0	-3.1	5.5	0.56	-0.06	-85.40	
2,909.0	0.51	294.10	2,908.9	1,703.9	5.2	-3.5	5.9	0.29	0.28	-8.80	
2,959.0	0.16	240.10	2,958.9	1,753.9	5.3	-3.7	6.2	0.87	-0.70	-108.00	
3,009.0	0.40	1.50	3,008.9	1,803.9	5.4	-3.8	6.3	1.00	0.48	242.80	
3,059.0	0.40	354.50	3,058.9	1,853.9	5.7	-3.8	6.5	0.10	0.00	-14.00	
3,109.0	0.50	330.50	3,108.9	1,903.9	6.1	-3.9	6.8	0.42	0.20	-48.00	
3,159.0	0.59	300.50	3,158.9	1,953.9	6.4	-4.2	7.3	0.59	0.18	-60.00	
3,209.0	0.28	265.50	3,208.9	2,003.9	6.5	-4.6	7.6	0.79	-0.62	-70.00	
3,259.0	0.32	15.10	3,258.9	2,053.9	6.7	-4.7	7.8	0.98	0.08	219.20	
3,309.0	0.47	357.60	3,308.9	2,103.9	7.0	-4.6	8.0	0.38	0.30	-35.00	
3,359.0	0.59	355.30	3,358.9	2,153.9	7.5	-4.7	8.3	0.24	0.24	-4.60	
3,409.0	0.70	328.90	3,408.9	2,203.9	8.0	-4.9	8.7	0.63	0.22	-52.80	
3,459.0	0.29	295.00	3,458.9	2,253.9	8.3	-5.1	9.1	0.97	-0.82	-67.80	
3,509.0	0.49	356.00	3,508.9	2,303.9	8.6	-5.3	9.4	0.86	0.40	122.00	
3,559.0	0.55	300.40	3,558.9	2,353.9	8.9	-5.5	9.8	0.98	0.12	-111.20	
3,609.0	0.29	295.20	3,608.9	2,403.9	9.1	-5.8	10.1	0.53	-0.52	-10.40	
3,659.0	0.64	315.20	3,658.9	2,453.9	9.3	-6.1	10.5	0.76	0.70	40.00	
3,709.0	0.66	298.40	3,708.9	2,503.9	9.7	-6.6	11.1	0.38	0.04	-33.60	
3,759.0	0.67	337.10	3,758.9	2,553.9	10.1	-6.9	11.6	0.88	0.02	77.40	
3,809.0	0.56	304.00	3,808.9	2,603.9	10.5	-7.2	12.1	0.73	-0.22	-66.20	
3,859.0	0.71	327.30	3,858.9	2,653.9	10.9	-7.6	12.7	0.59	0.30	46.60	
3,909.0	0.53	276.50	3,908.9	2,703.9	11.2	-8.0	13.1	1.11	-0.36	-101.60	
3,959.0	0.58	274.10	3,958.9	2,753.9	11.2	-8.5	13.6	0.11	0.10	-4.80	
4,009.0	0.53	264.60	4,008.9	2,803.9	11.2	-9.0	13.9	0.21	-0.10	-19.00	
4,059.0	0.92	272.80	4,058.9	2,853.9	11.2	-9.6	14.4	0.81	0.78	16.40	
4,109.0	0.73	306.60	4,108.9	2,903.9	11.4	-10.3	15.1	1.03	-0.38	67.60	
4,159.0	0.53	293.90	4,158.9	2,953.9	11.7	-10.7	15.6	0.49	-0.40	-25.40	
4,209.0	0.80	295.80	4,208.9	3,003.9	11.9	-11.3	16.2	0.54	0.54	3.80	
4,259.0	0.55	304.80	4,258.8	3,053.8	12.2	-11.8	16.8	0.54	-0.50	18.00	
4,309.0	1.07	281.90	4,308.8	3,103.8	12.5	-12.4	17.4	1.21	1.04	-45.80	
4,359.0	0.55	247.60	4,358.8	3,153.8	12.5	-13.1	18.0	1.38	-1.04	-68.60	
4,409.0	0.89	263.90	4,408.8	3,203.8	12.3	-13.7	18.4	0.79	0.88	32.60	
4,459.0	1.01	299.80	4,458.8	3,253.8	12.5	-14.5	19.1	1.19	0.24	71.80	
4,509.0	0.98	306.70	4,508.8	3,303.8	13.0	-15.2	20.0	0.25	-0.06	13.80	
4,559.0	1.24	283.00	4,558.8	3,353.8	13.4	-16.1	20.9	1.04	0.52	-47.40	
4,609.0	0.92	276.50	4,608.8	3,403.8	13.5	-17.0	21.7	0.68	-0.64	-13.00	

Office
MAR 24 2016
has



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Bogges A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,659.0	0.80	280.90	4,658.8	3,453.8	13.6	-17.7	22.4	0.27	-0.24	8.80	
4,709.0	0.72	290.40	4,708.8	3,503.8	13.8	-18.4	23.0	0.30	-0.16	19.00	
4,759.0	1.05	306.40	4,758.8	3,553.8	14.2	-19.0	23.8	0.82	0.66	32.00	
4,809.0	0.73	321.50	4,808.8	3,603.8	14.7	-19.6	24.5	0.79	-0.64	30.20	
4,859.0	0.47	347.30	4,858.8	3,653.8	15.2	-19.9	25.0	0.74	-0.52	51.60	
4,909.0	0.62	301.90	4,908.8	3,703.8	15.5	-20.1	25.4	0.89	0.30	-90.80	
Gyro Tie In=4959' MD											
4,959.0	0.67	303.00	4,958.8	3,753.8	15.8	-20.6	26.0	0.10	0.10	2.20	
5,004.0	0.51	263.60	5,003.8	3,798.8	15.9	-21.0	26.4	0.95	-0.36	-87.56	
5,067.0	0.51	268.30	5,066.8	3,861.8	15.9	-21.6	26.8	0.07	0.00	7.46	
5,130.0	0.51	300.43	5,129.8	3,924.8	16.0	-22.1	27.3	0.45	0.00	51.00	
5,191.0	0.40	327.02	5,190.8	3,985.8	16.4	-22.5	27.8	0.39	-0.18	43.59	
5,254.0	0.40	359.72	5,253.8	4,048.8	16.8	-22.6	28.1	0.36	0.00	51.90	
5,316.0	0.70	357.61	5,315.8	4,110.8	17.4	-22.6	28.5	0.48	0.48	-3.40	
5,379.0	0.79	8.42	5,378.8	4,173.8	18.2	-22.5	28.9	0.26	0.14	17.16	
5,442.0	0.59	9.13	5,441.7	4,236.7	18.9	-22.4	29.3	0.32	-0.32	1.13	
5,505.0	0.70	0.91	5,504.7	4,299.7	19.6	-22.4	29.7	0.23	0.17	-13.05	
5,568.0	0.70	344.21	5,567.7	4,362.7	20.4	-22.5	30.2	0.32	0.00	-26.51	
5,631.0	0.79	341.53	5,630.7	4,425.7	21.2	-22.7	30.9	0.15	0.14	-4.25	
5,693.0	0.90	347.90	5,692.7	4,487.7	22.0	-22.9	31.6	0.23	0.18	10.27	
5,757.0	0.51	342.14	5,756.7	4,551.7	22.8	-23.1	32.2	0.62	-0.61	-9.00	
5,820.0	0.51	332.03	5,819.7	4,614.7	23.3	-23.4	32.7	0.14	0.00	-16.05	
5,883.0	0.20	163.44	5,882.7	4,677.7	23.5	-23.5	32.9	1.12	-0.49	-267.60	
5,945.0	0.11	100.50	5,944.7	4,739.7	23.3	-23.4	32.7	0.29	-0.15	-101.52	
KOP=5977' MD											
5,977.0	0.40	229.10	5,976.7	4,771.7	23.3	-23.4	32.7	1.49	0.91	401.88	
6,008.0	2.59	241.54	6,007.7	4,802.7	22.9	-24.1	33.0	7.10	7.06	40.13	
6,040.0	5.60	228.84	6,039.6	4,834.6	21.5	-25.9	33.7	9.77	9.41	-39.69	
6,071.0	8.39	223.43	6,070.4	4,865.4	18.8	-28.6	34.2	9.24	9.00	-17.45	
6,103.0	10.50	224.84	6,102.0	4,897.0	15.1	-32.3	34.8	6.63	6.59	4.41	
6,134.0	12.00	225.63	6,132.4	4,927.4	10.8	-36.6	35.6	4.86	4.84	2.55	
6,166.0	13.01	223.91	6,163.6	4,958.6	5.9	-41.5	36.5	3.36	3.16	-5.38	
6,198.0	14.20	221.10	6,194.7	4,989.7	0.4	-46.5	37.2	4.25	3.72	-8.78	
6,228.0	15.29	218.64	6,223.7	5,018.7	-5.5	-51.4	37.5	4.19	3.63	-8.20	
6,260.0	17.29	216.93	6,254.4	5,049.4	-12.6	-56.9	37.6	6.43	6.25	-5.34	
6,291.0	20.11	217.72	6,283.8	5,078.8	-20.5	-62.9	37.6	9.13	9.10	2.55	
6,323.0	22.00	217.63	6,313.6	5,108.6	-29.6	-70.0	37.6	5.91	5.91	-0.28	
6,386.0	26.19	216.62	6,371.1	5,166.1	-50.1	-85.5	37.5	6.68	6.65	-1.60	
6,448.0	31.60	216.84	6,425.4	5,220.4	-74.1	-103.4	37.1	8.73	8.73	0.35	
6,511.0	38.50	217.23	6,477.0	5,272.0	-103.0	-125.2	36.9	10.96	10.95	0.62	
6,573.0	42.61	220.22	6,524.1	5,319.1	-134.4	-150.4	37.9	7.33	6.63	4.82	
6,636.0	40.70	231.43	6,571.2	5,366.2	-163.5	-180.3	43.9	12.20	-3.03	17.79	
6,699.0	39.10	241.80	6,619.6	5,414.6	-185.7	-213.9	57.1	10.85	-2.54	16.46	

Received
Oil & Gas
01/06

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Bogges A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,762.0	39.01	247.74	6,668.5	5,463.5	-202.6	-249.8	75.4	5.94	-0.14	9.43	
6,824.0	41.60	249.32	6,715.8	5,510.8	-217.3	-287.1	96.1	4.49	4.18	2.55	
6,887.0	45.40	251.12	6,761.5	5,556.5	-232.0	-327.9	119.6	6.34	6.03	2.86	
6,919.0	47.60	255.34	6,783.5	5,578.5	-238.6	-350.1	133.2	11.78	6.88	13.19	
6,950.0	50.30	259.91	6,803.9	5,598.9	-243.6	-372.9	148.3	14.12	8.71	14.74	
6,982.0	52.50	263.82	6,823.8	5,618.8	-247.1	-397.7	165.9	11.76	6.88	12.22	
7,013.0	54.30	269.01	6,842.3	5,637.3	-248.7	-422.5	184.6	14.64	5.81	16.74	
7,044.0	56.10	273.80	6,860.0	5,655.0	-248.1	-448.0	205.2	13.95	5.81	15.45	
7,075.0	57.60	278.63	6,877.0	5,672.0	-245.2	-473.7	227.4	13.91	4.84	15.58	
7,106.0	59.00	283.51	6,893.3	5,688.3	-240.2	-499.6	251.1	14.13	4.52	15.74	
Top of Marcellus@3805' TVD											
7,129.0	59.92	287.13	6,905.0	5,700.0	-234.9	-518.7	269.5	14.11	3.98	15.71	
7,138.0	60.30	288.52	6,909.5	5,704.5	-232.5	-526.1	276.8	14.11	4.28	15.51	
7,169.0	61.60	292.43	6,924.5	5,719.5	-223.1	-551.5	302.7	11.80	4.19	12.61	
7,201.0	63.00	296.30	6,939.4	5,734.4	-211.4	-577.3	330.3	11.57	4.38	12.09	
7,264.0	64.41	302.23	6,967.3	5,762.3	-183.8	-626.5	386.2	8.73	2.24	9.41	
7,327.0	67.00	305.84	6,993.3	5,788.3	-151.6	-674.1	443.5	6.65	4.11	5.73	
7,389.0	70.69	311.33	7,015.6	5,810.6	-115.6	-719.3	501.2	10.18	5.95	8.85	
7,451.0	74.10	314.54	7,034.4	5,829.4	-75.3	-762.5	560.0	7.39	5.50	5.18	
7,513.0	79.99	316.04	7,048.3	5,843.3	-32.4	-805.0	619.9	9.79	9.50	2.42	
Top of Onondaga@7055' TVD											
7,567.7	85.90	317.49	7,055.0	5,850.0	7.1	-842.1	673.4	11.13	10.81	2.65	
7,576.0	86.80	317.71	7,055.5	5,850.5	13.3	-847.7	681.5	11.13	10.81	2.62	
LP=7639' MDI 7057' TVD											
7,639.0	90.89	320.74	7,056.8	5,851.8	61.0	-888.8	743.2	8.08	6.49	4.81	
7,702.0	90.49	320.52	7,056.0	5,851.0	109.7	-928.8	804.5	0.72	-0.63	-0.35	
7,765.0	90.60	322.32	7,055.4	5,850.4	158.9	-968.1	865.6	2.86	0.17	2.86	
7,828.0	90.69	322.41	7,054.7	5,849.7	208.8	-1,006.6	926.5	0.20	0.14	0.14	
7,891.0	90.49	324.83	7,054.1	5,849.1	259.5	-1,043.9	987.0	3.85	-0.32	3.84	
7,954.0	89.51	326.54	7,054.1	5,849.1	311.5	-1,079.4	1,046.8	3.13	-1.56	2.71	
8,017.0	89.51	326.41	7,054.6	5,849.6	364.1	-1,114.2	1,106.3	0.21	0.00	-0.21	
8,080.0	89.11	326.41	7,055.4	5,850.4	416.5	-1,149.1	1,165.9	0.63	-0.63	0.00	
8,143.0	88.89	325.70	7,056.5	5,851.5	468.8	-1,184.3	1,225.5	1.18	-0.35	-1.13	
8,206.0	88.89	324.12	7,057.7	5,852.7	520.3	-1,220.5	1,285.6	2.51	0.00	-2.51	
8,269.0	88.41	324.52	7,059.2	5,854.2	571.5	-1,257.2	1,345.9	0.99	-0.76	0.63	
8,332.0	87.90	322.10	7,061.2	5,856.2	622.0	-1,294.8	1,406.4	3.92	-0.81	3.84	
8,395.0	87.70	321.70	7,063.6	5,858.6	671.5	-1,333.7	1,467.4	0.71	-0.32	-0.63	
8,458.0	88.41	322.01	7,065.8	5,860.8	721.0	-1,372.6	1,528.3	1.23	1.13	0.49	
8,521.0	88.30	322.32	7,067.6	5,862.6	770.8	-1,411.2	1,589.2	0.52	-0.17	0.49	
8,584.0	89.40	322.41	7,068.8	5,863.8	820.7	-1,449.6	1,650.1	1.75	1.75	0.14	
8,647.0	89.90	322.32	7,069.2	5,864.2	870.5	-1,488.1	1,710.9	0.81	0.79	-0.14	
Deepest Point of Well=8710' MDI 7070' TVD											
8,710.0	89.40	321.70	7,069.6	5,864.6	920.2	-1,526.9	1,771.9	1.26	-0.79	-0.98	

Received
Office of Oil & Gas
SEP 24 2016



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Bogges A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,773.0	90.69	320.91	7,069.6	5,864.6	969.4	-1,566.3	1,833.0	2.40	2.05	-1.25
8,836.0	92.41	319.42	7,067.9	5,862.9	1,017.7	-1,606.6	1,894.5	3.61	2.73	-2.37
8,900.0	93.00	319.11	7,064.8	5,859.8	1,066.2	-1,648.3	1,957.0	1.04	0.92	-0.48
8,962.0	91.40	319.73	7,062.5	5,857.5	1,113.2	-1,688.6	2,017.6	2.77	-2.58	1.00
9,025.0	90.89	319.42	7,061.2	5,856.2	1,161.2	-1,729.5	2,079.2	0.95	-0.81	-0.49
9,088.0	91.51	320.43	7,059.9	5,854.9	1,209.4	-1,770.0	2,140.7	1.88	0.98	1.60
9,152.0	90.69	320.83	7,058.7	5,853.7	1,258.8	-1,810.6	2,203.0	1.43	-1.28	0.63
9,215.0	90.89	321.62	7,057.8	5,852.8	1,307.9	-1,850.1	2,264.1	1.29	0.32	1.25
9,278.0	90.60	321.62	7,057.0	5,852.0	1,357.3	-1,889.2	2,325.2	0.46	-0.46	0.00
9,341.0	90.60	322.63	7,056.3	5,851.3	1,407.0	-1,927.8	2,386.1	1.60	0.00	1.60
9,404.0	90.01	322.10	7,056.0	5,851.0	1,456.9	-1,966.3	2,447.0	1.26	-0.94	-0.84
9,467.0	90.21	323.73	7,055.8	5,850.8	1,507.2	-2,004.3	2,507.7	2.61	0.32	2.59
9,530.0	90.10	324.21	7,055.7	5,850.7	1,558.1	-2,041.4	2,568.1	0.78	-0.17	0.76
9,593.0	89.90	324.03	7,055.7	5,850.7	1,609.2	-2,078.3	2,628.4	0.43	-0.32	-0.29
9,655.0	90.01	325.44	7,055.7	5,850.7	1,659.8	-2,114.1	2,687.6	2.28	0.18	2.27
9,718.0	90.21	324.83	7,055.6	5,850.6	1,711.5	-2,150.1	2,747.6	1.02	0.32	-0.97
9,781.0	89.51	324.74	7,055.8	5,850.8	1,763.0	-2,186.4	2,807.7	1.12	-1.11	-0.14
9,844.0	88.80	324.83	7,056.7	5,851.7	1,814.4	-2,222.7	2,867.8	1.14	-1.13	0.14
9,907.0	88.49	324.91	7,058.2	5,853.2	1,865.9	-2,259.0	2,927.9	0.51	-0.49	0.13
9,970.0	88.89	325.00	7,059.6	5,854.6	1,917.5	-2,295.2	2,987.9	0.65	0.63	0.14
10,032.0	89.59	324.61	7,060.4	5,855.4	1,968.2	-2,330.9	3,047.1	1.29	1.13	-0.63
10,095.0	89.90	323.20	7,060.7	5,855.7	2,019.1	-2,368.0	3,107.5	2.29	0.49	-2.24
10,158.0	88.60	322.94	7,061.5	5,856.5	2,069.4	-2,405.8	3,168.1	2.10	-2.06	-0.41
10,221.0	89.79	322.54	7,062.4	5,857.4	2,119.6	-2,444.0	3,228.9	1.99	1.89	-0.63
10,285.0	91.70	321.62	7,061.6	5,856.6	2,170.0	-2,483.3	3,290.8	3.31	2.98	-1.44
10,347.0	93.40	319.90	7,058.8	5,853.8	2,218.0	-2,522.5	3,351.1	3.90	2.74	-2.77
10,410.0	93.70	319.90	7,054.9	5,849.9	2,266.1	-2,563.0	3,412.4	0.48	0.48	0.00
10,473.0	93.59	319.82	7,050.9	5,845.9	2,314.2	-2,603.5	3,473.8	0.22	-0.17	-0.13
10,536.0	93.79	320.12	7,046.9	5,841.9	2,362.3	-2,644.0	3,535.2	0.57	0.32	0.48
10,599.0	93.70	320.83	7,042.8	5,837.8	2,410.8	-2,684.0	3,596.4	1.13	-0.14	1.13
10,661.0	93.70	320.30	7,038.8	5,833.8	2,458.6	-2,723.3	3,656.7	0.85	0.00	-0.85
10,723.0	92.60	320.21	7,035.4	5,830.4	2,506.2	-2,762.8	3,717.0	1.78	-1.77	-0.15
10,787.0	91.59	321.70	7,033.0	5,828.0	2,555.9	-2,803.1	3,779.2	2.81	-1.58	2.33
10,849.0	91.11	321.31	7,031.6	5,826.6	2,604.4	-2,841.7	3,839.3	1.00	-0.77	-0.63
10,912.0	90.89	321.22	7,030.5	5,825.5	2,653.5	-2,881.1	3,900.5	0.38	-0.35	-0.14
10,975.0	89.11	322.94	7,030.5	5,825.5	2,703.2	-2,919.8	3,961.4	3.93	-2.83	2.73
11,038.0	88.69	322.10	7,031.7	5,826.7	2,753.2	-2,958.2	4,022.2	1.49	-0.67	-1.33
11,099.0	89.31	322.32	7,032.7	5,827.7	2,801.4	-2,995.5	4,081.2	1.08	1.02	0.86
11,162.0	89.70	324.03	7,033.3	5,828.3	2,851.8	-3,033.3	4,141.8	2.78	0.62	2.71
11,224.0	89.40	322.94	7,033.8	5,828.8	2,901.6	-3,070.2	4,201.4	1.82	-0.48	-1.76
11,288.0	90.41	322.94	7,033.9	5,828.9	2,952.7	-3,108.8	4,263.0	1.58	1.58	0.00
11,351.0	91.20	322.80	7,033.0	5,828.0	3,002.9	-3,146.8	4,323.7	1.27	1.25	-0.22

Received
Office of Oil & Gas
MAR 24 2016

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Bogges A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,414.0	90.69	321.70	7,031.9	5,826.9	3,052.7	-3,185.3	4,384.6	1.92	-0.81	-1.75
11,476.0	90.41	323.11	7,031.3	5,826.3	3,101.9	-3,223.2	4,444.5	2.32	-0.45	2.27
11,539.0	90.69	324.74	7,030.7	5,825.7	3,152.8	-3,260.3	4,504.9	2.63	0.44	2.59
11,602.0	89.79	324.34	7,030.5	5,825.5	3,204.1	-3,296.8	4,565.1	1.56	-1.43	-0.63
11,665.0	89.59	324.43	7,030.8	5,825.8	3,255.3	-3,333.5	4,625.3	0.35	-0.32	0.14
11,727.0	90.89	326.94	7,030.6	5,825.6	3,306.5	-3,368.4	4,684.2	4.56	2.10	4.05
11,790.0	90.80	326.80	7,029.6	5,824.6	3,359.3	-3,402.9	4,743.6	0.26	-0.14	-0.22
11,853.0	90.10	325.53	7,029.1	5,824.1	3,411.6	-3,438.0	4,803.2	2.30	-1.11	-2.02
11,916.0	90.41	326.41	7,028.9	5,823.9	3,463.8	-3,473.2	4,862.9	1.48	0.49	1.40
11,979.0	91.51	326.72	7,027.8	5,822.8	3,516.4	-3,507.9	4,922.4	1.81	1.75	0.49
12,042.0	90.49	326.72	7,026.7	5,821.7	3,569.0	-3,542.5	4,981.9	1.62	-1.62	0.00
12,105.0	89.70	324.52	7,026.6	5,821.6	3,621.0	-3,578.1	5,041.7	3.71	-1.25	-3.49
12,168.0	90.21	323.11	7,026.6	5,821.6	3,671.9	-3,615.2	5,102.1	2.38	0.81	-2.24
12,231.0	90.10	322.32	7,026.5	5,821.5	3,722.0	-3,653.4	5,162.9	1.27	-0.17	-1.25
12,294.0	89.70	322.01	7,026.6	5,821.6	3,771.7	-3,692.1	5,223.8	0.80	-0.63	-0.49
12,356.0	88.89	321.44	7,027.4	5,822.4	3,820.4	-3,730.5	5,283.9	1.60	-1.31	-0.92
12,418.0	88.69	320.91	7,028.7	5,823.7	3,868.7	-3,769.3	5,344.1	0.91	-0.32	-0.85
12,480.0	90.89	321.13	7,028.9	5,823.9	3,916.9	-3,808.3	5,404.3	3.57	3.55	0.35
12,544.0	90.69	319.64	7,028.0	5,823.0	3,966.2	-3,849.1	5,466.7	2.35	-0.31	-2.33
12,607.0	90.21	319.11	7,027.5	5,822.5	4,014.0	-3,890.1	5,528.3	1.13	-0.76	-0.84
12,670.0	92.80	319.82	7,025.9	5,820.9	4,061.9	-3,931.1	5,589.9	4.26	4.11	1.13
12,732.0	92.69	319.73	7,022.9	5,817.9	4,109.1	-3,971.1	5,650.4	0.23	-0.18	-0.15
12,795.0	90.89	320.03	7,020.9	5,815.9	4,157.3	-4,011.6	5,711.9	2.90	-2.86	0.48
12,858.0	90.80	320.52	7,020.0	5,815.0	4,205.7	-4,051.9	5,773.3	0.79	-0.14	0.78
12,920.0	89.79	320.21	7,019.7	5,814.7	4,253.5	-4,091.4	5,833.7	1.70	-1.63	-0.50
12,983.0	89.40	320.61	7,020.1	5,815.1	4,302.0	-4,131.6	5,895.1	0.89	-0.62	0.63
13,046.0	90.10	321.13	7,020.4	5,815.4	4,350.9	-4,171.3	5,956.3	1.38	1.11	0.83
Final Survey=13092' MD/ 7020' TVD										
13,092.0	90.30	321.62	7,020.2	5,815.2	4,386.8	-4,200.1	6,001.0	1.15	0.43	1.07
Projection to TD=13166' MD/ 7020' TVD										
13,166.0	90.30	321.62	7,019.8	5,814.8	4,444.9	-4,246.0	6,072.7	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,129.0	6,905.0	Top of Marcellus@6905' TVD		0.00	
7,567.7	7,055.0	Top of Onondaga@7055' TVD		0.00	

Received
Office of Oil & Gas

MAR 24 2016



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well North Unit 7H
Company:	XTO	TVD Reference:	KB@23 @ 1205.0usft
Project:	Harrison County, WV	MD Reference:	KB@23 @ 1205.0usft
Site:	Bogges A PAD	North Reference:	True
Well:	North Unit 7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	7H AS Drilled Surveys		

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,959.0	4,958.8	15.8	-20.6	Gyro Tie In=4959' MD
5,977.0	5,976.7	23.3	-23.4	KOP=5977' MD
7,639.0	7,056.8	61.0	-888.8	LP=7639' MD/ 7057' TVD
8,710.0	7,069.6	920.2	-1,526.9	Deepest Point of Well=8710' MD/ 7070' TVD
13,092.0	7,020.2	4,386.8	-4,200.1	Final Survey=13092' MD/ 7020' TVD
13,166.0	7,019.8	4,444.9	-4,246.0	Projection to TD=13166' MD/ 7020' TVD

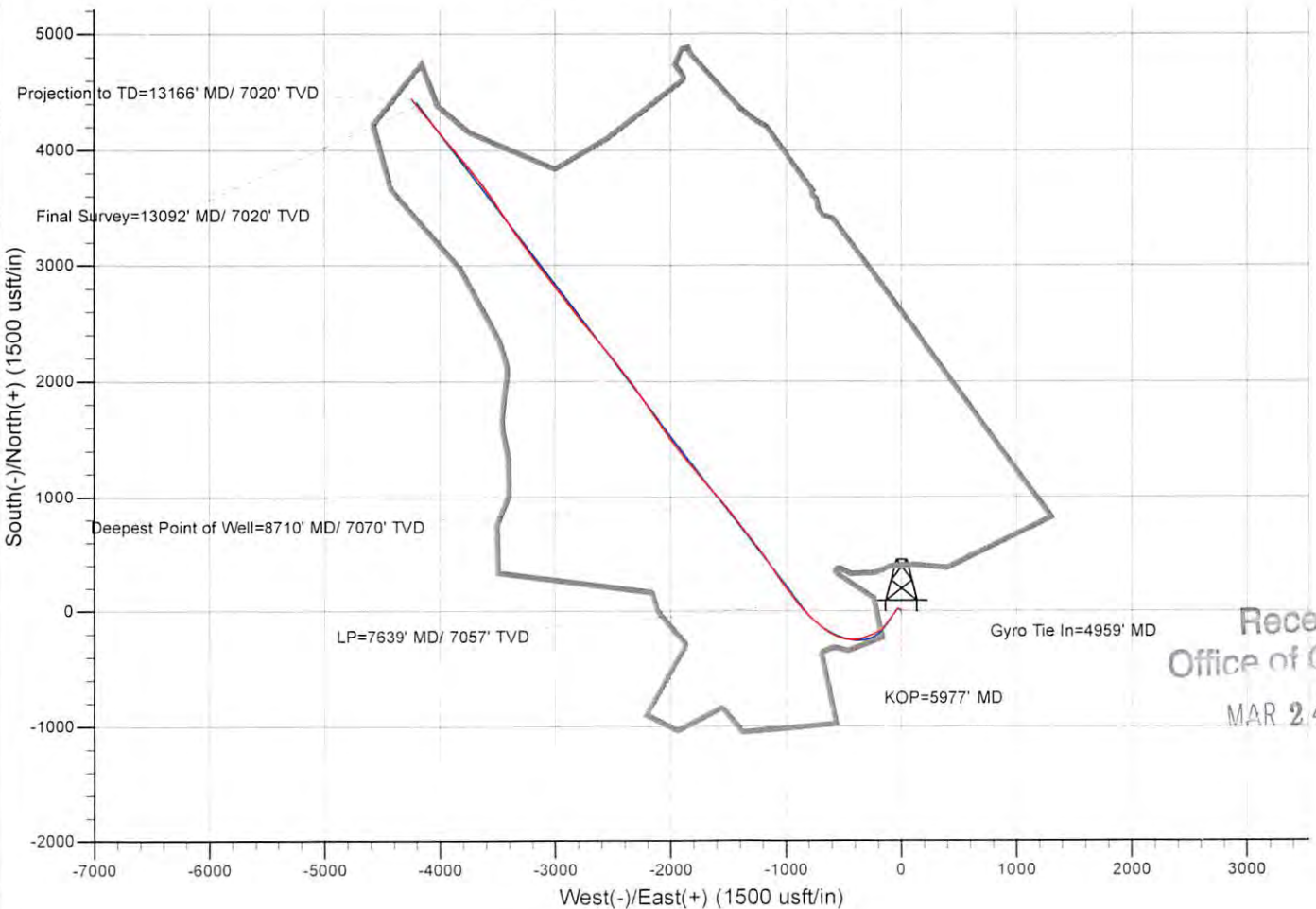
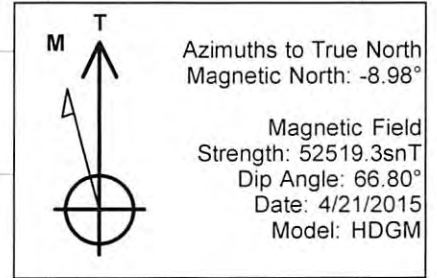
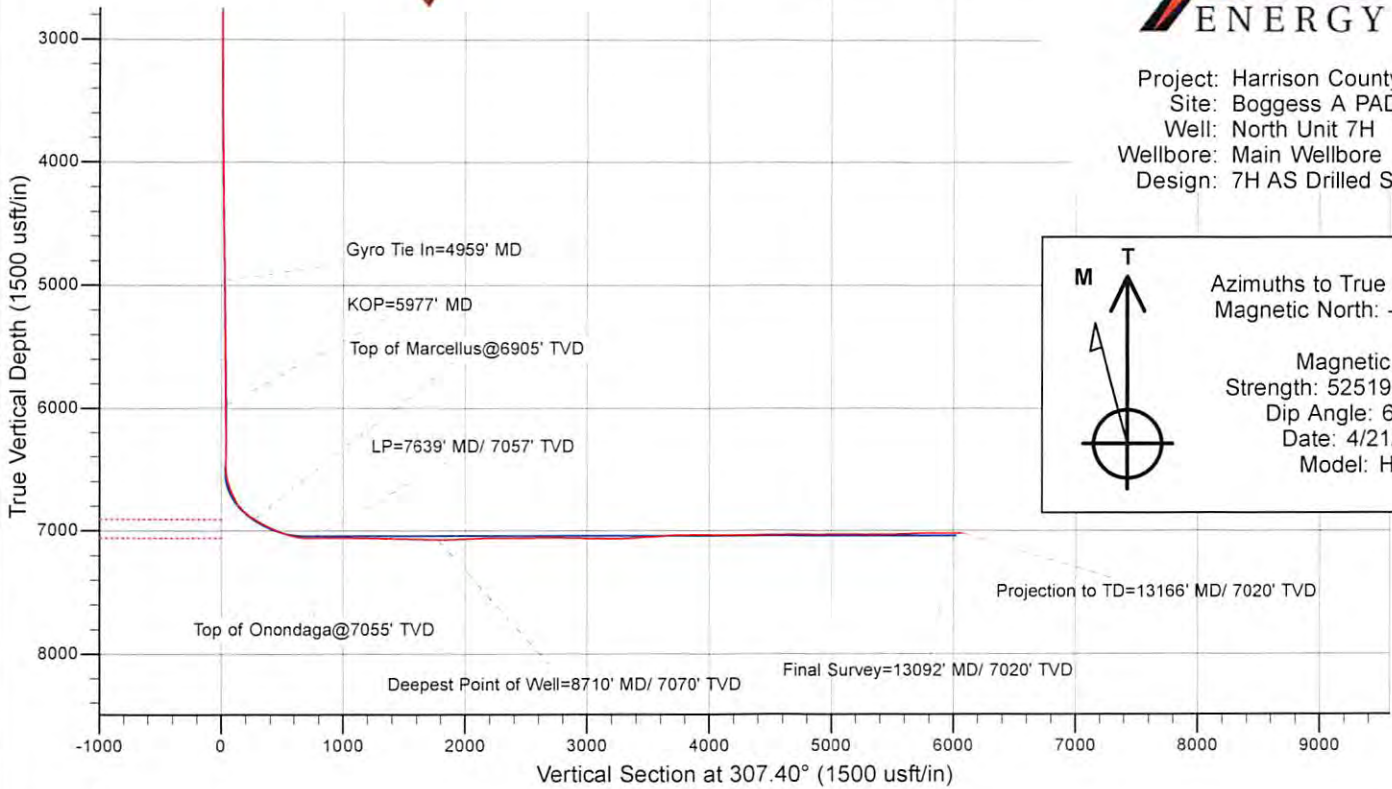
Checked By: _____ Approved By: _____ Date: _____

Received
Office of Oil & Gas
MAR 24 2016

09/23/2016



Project: Harrison County, WV
Site: Boggess A PAD
Well: North Unit 7H
Wellbore: Main Wellbore
Design: 7H AS Drilled Surveys

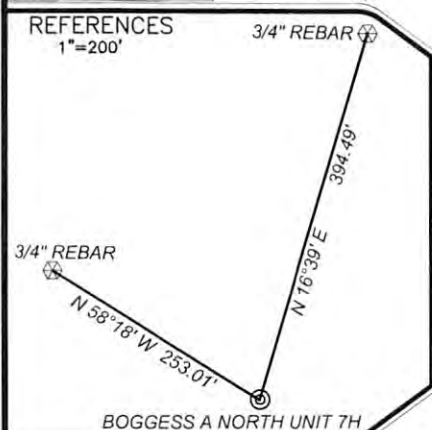
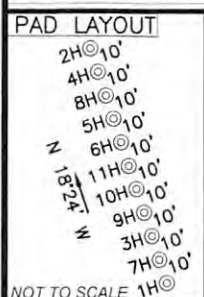
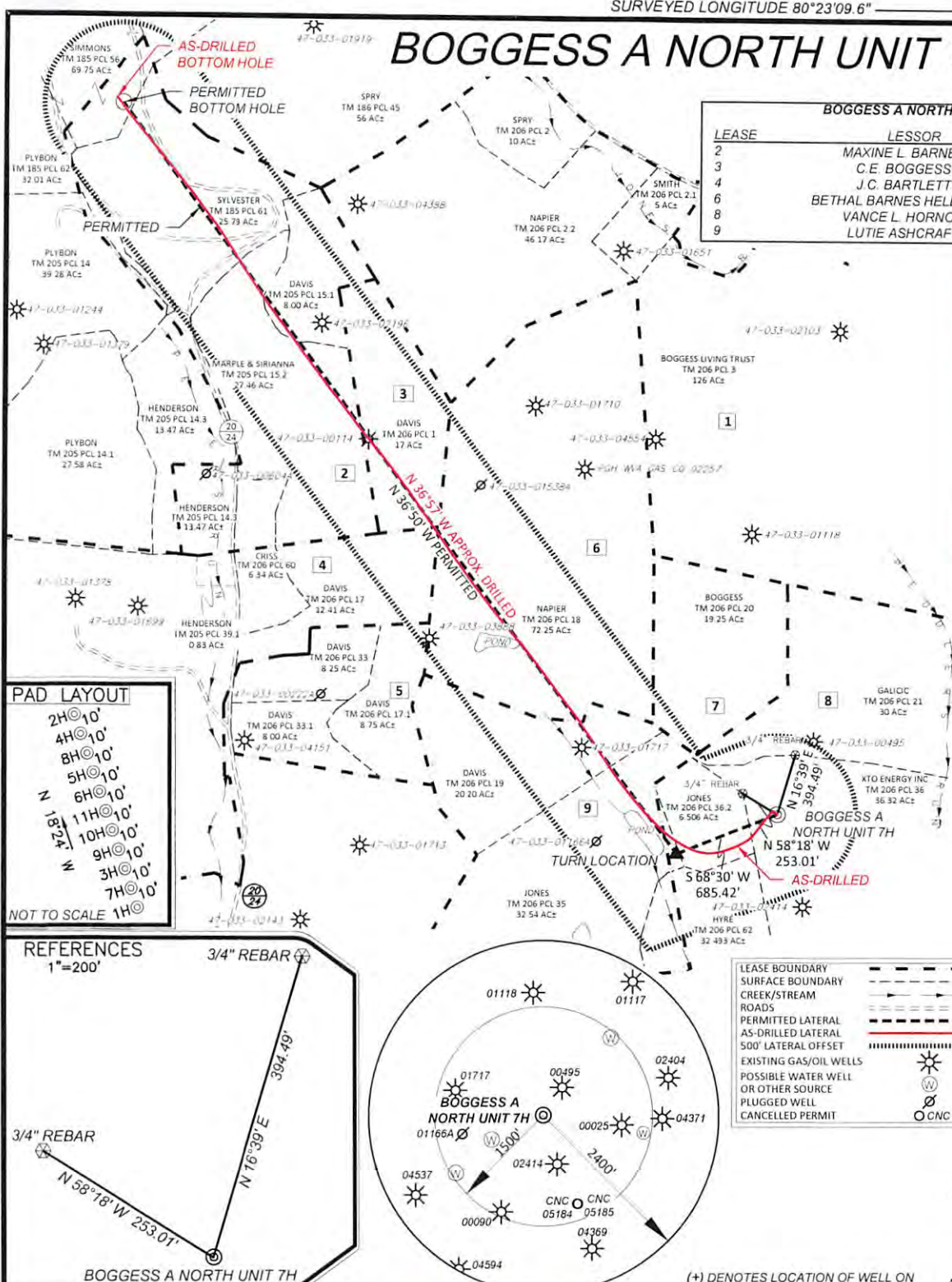


Received
Office of Oil & Gas
MAR 24 2016

09/23/2016

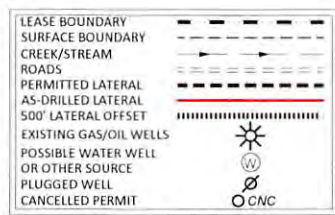
BOGGESS A NORTH UNIT 7H

LEASE	LESSOR	ACREAGE
2	MAXINE L. BARNES et al	71.74±
3	C.E. BOGGESS et al	19.25±
4	J.C. BARTLETT et al	25±
6	BETHAL BARNES HELDRETH et al	72±
8	VANCE L. HORNOR et al	186.5±
9	LUTIE ASHCRAFT et al	57±



AS-DRILLED BOGGESS A NORTH UNIT 7H SURFACE HOLE	AS-DRILLED BOGGESS A NORTH UNIT 7H BOTTOM HOLE
STATE PLANE COORDINATES NORTH ZONE-NAD 27 (N) 320323 (E) 1749542	STATE PLANE COORDINATES NORTH ZONE-NAD 27 (N) 324810 (E) 1745340
L & L DECIMAL NAD 27 39.376085 -80.385998	L & L DECIMAL NAD 27 39.388288 -80.401020
UTM (NAD 83) ZONE 17 METERS (N) 4358702 (E) 552901	UTM (NAD 83) ZONE 17 METERS (N) 4360048 (E) 551598
PERMITTED BOGGESS A NORTH UNIT 7H SURFACE HOLE	PERMITTED BOGGESS A NORTH UNIT 7H BOTTOM HOLE
STATE PLANE COORDINATES NORTH ZONE-NAD 27 (N) 320323 (E) 1749542	STATE PLANE COORDINATES NORTH ZONE-NAD 27 (N) 324774 (E) 1745382
L & L DECIMAL NAD 27 39.376086 -80.385997	L & L DECIMAL NAD 27 39.388193 -80.400869
UTM (NAD 83) ZONE 17 METERS (N) 4358702 (E) 552901	UTM (NAD 83) ZONE 17 METERS (N) 4360037 (E) 551611

- NOTES ON SURVEY
- NO OCCUPIED DWELLINGS OR BUILDINGS 2500 SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY WITHIN 625' OF THE CENTER OF THE WELL PAD WERE OBSERVED.
 - NO WATER WELLS OR DEVELOPED SPRINGS USED FOR HUMAN OR DOMESTIC ANIMAL CONSUMPTION WERE FOUND WITHIN 250'
 - SURFACE OWNERSHIP TAKEN FROM THE HARRISON COUNTY TAX ASSESSOR AND COUNTY CLERK OFFICES IN JULY, 2014.
 - WELL LATITUDE AND LONGITUDE FROM SURVEY GRADE (OPUS SOLUTION).
 - TIES TO CORNERS AND REFERENCES BASED ON WV STATE PLANE COORDINATE SYSTEM, NAD 27 NORTH ZONE.
 - LEASE INFORMATION PROVIDED BY XTO ENERGY, INC.



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

TOP HOLE WELL NO. BOGGESS A NORTH UNIT 7H

600 Marketplace, Suite 200
Bridgeport, WV 26330
Toll Free 855-488-9539
Fax 304-933-3327
Civil & Environmental Consultants, Inc.



I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Division of Environmental Protection.

Richard E. Adams

DATE AUGUST 13, 2015
SCALE 1" = 1000' ACCURACY 1/2500
OPERATORS BOGGESS A NORTH UNIT 7H (AS-DRILLED)
WELL No. 47 - 033 - 05843
API No.

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



TYPE OF WELL:
GAS:
Production Storage *Deep *Shallow

PROPOSED WORK ON LOCATION:
Drill Drill Deeper Redrill Convert
Fracture/ Stimulate *Plug off to Formation
Perforate New Formation Plug and Abandon
Clean/ Replug Other Than Above
If "Other" Please see Details below—
DETAILS OF PROPOSED WORK _____
*TARGET FORMATION MARCELLUS
ACTUAL DEPTH TVD: 7,070' TMD: 13,166'

WELL AREA & LOCATION INFORMATION:
ELEVATION SOURCE GPS (OPUS)
ELEVATION 1183'
WATERSHED REESES RUN DISTRICT 09/25/2016
COUNTY HARRISON TOPO QUAD WALLACE
SURFACE OWNER XTO ENERGY INC.
ACREAGE 36.32 ±
ROYALTY OWNER VANCE L. HORNOR, G.P. HORNOR, J.H. HORNOR, M.L. HORNOR, V.L. HORNOR INVESTMENT COMPANY, et al
LEASE ACREAGE 406.49 ±

WELL OPERATOR XTO ENERGY INC.
ADDRESS 810 HOUSTON STREET
FORT WORTH, TEXAS 76102

DESIGNATED AGENT GARY BEALL
ADDRESS P.O. BOX 1008
JANE LEW, WV 26385