

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

API 47 - 049 - 02486 County Marion District Lincoln  
Quad Shinnston Pad Name Crim Pad Field/Pool Name Marcellus  
Farm name Rochester & Pittsburgh Coal Co. Well Number Crands Unit 8H  
Operator (as registered with the OOG) XTO Energy Inc.  
Address P.O. 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 4369360.669 Easting 560041.310  
Landing Point of Curve Northing 4368905.745 Easting 559616.842  
Bottom Hole Northing 4366318.494 Easting 562239.480

Elevation (ft) 1,221' 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)  
SOBM

Date permit issued 6/4/2019 Date drilling commenced 6/8/2019 Date drilling ceased 9/19/2019  
Date completion activities began 2/12/2020 Date completion activities ceased 3/2/2020  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

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

Freshwater depth(s) ft None Noted 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 130' - 134', 460' - 465' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
SDW8/13/2020  
RECEIVED  
Office of Oil and Gas  
MAY 14 2020  
WV Department of  
Environmental Protection

API 47-049 - 02486 Farm name Rochester & Pittsburgh Coal Co. Well number Grands Unit 8H

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	30"	24"	76'	New	PE&B/95		N
Surface	17 1/2"	13 3/8"	510'	New	H-40/48	426'	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	3,191'	New	J-55/36		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	20,049'	New	P-110/20		Est. TOC 5,100'
Tubing							
Packer type and depth set							

Comment Details Conductor - concrete poured directly into annulus.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	A	10 yards				0	8
Surface	A	510	15.6	1.21	617.1	0	8
Coal							
Intermediate 1	A	1135	15.6	1.19	1350.65	0	8
Intermediate 2							
Intermediate 3							
Production	H	540/2055	15.2/15.6	1.1/1.57	594/3226.35	Est. TOC 5,100'	8
Tubing							

Drillers TD (ft) 20,115' Loggers TD (ft) 20,090'  
 Deepest formation penetrated Marcellus Plug back to (ft) NA  
 Plug back procedure NA

Kick off depth (ft) 7,401'

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 - Every 3rd joint.  
Intermediate - Every 3rd joint.  
Production - Every joint to top of production cement.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_  
ProTechnics Spectra Chem water soluble tracers

RECEIVED  
Office of Oil and Gas

MAY 14 2020

WV Department of  
Environmental Protection



API 47- 049 - 02486 Farm name Rochester & Pittsburgh Coal Co. Well number Crands Unit 8H

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	7,598'	TVD 20,115' MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface \_\_\_\_\_ psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas \_\_\_\_\_ mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ bpd GAS MEASURED BY  
 Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
See attached	0		0		

Please insert additional pages as applicable.

Drilling Contractor Appalachian Drillers / Patterson - UTI  
 Address 409 Butler Road, Suite A / 207 Carlton Drive City Kittanning / Eighty Four State PA/PA Zip 16201/15330  
 Logging Company Baker Hughes  
 Address 370 Westec Drive City Mt. Pleasant State PA Zip 15666  
 Cementing Company C&J Energy Services  
 Address 1650 Hackers Creek Rd. City Jane Lew State WV Zip 26378  
 Stimulating Company Universal Pressure Pumping, Inc.  
 Address 10713 West Sam Houston Parkway North, Suite 800 City Houston State TX Zip 77064

Please insert additional pages as applicable.

Completed by Tim Sands Telephone 304-884-6000  
 Signature *Tim Sands* Title Regulatory Coordinator Date 5/7/2020

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

RECEIVED  
Office of Oil and Gas  
  
MAY 14 2020  
  
WV Department of  
Environmental Protection

Well Crands Unit 8H  
 API 47-049-02486

Stage	Perf Date	Perf from MD ft.	Perf to MD ft.	Number of Perfs	Formation(s)
1.00	2/12/2020	19,704.00	19,854.00	48	Marcellus
2.00	2/13/2020	19,504.00	19,654.00	48	Marcellus
3.00	2/14/2020	19,305.00	19,454.00	48	Marcellus
4.00	2/14/2020	19,104.00	19,251.00	48	Marcellus
5.00	2/14/2020	18,904.00	19,054.00	48	Marcellus
6.00	2/14/2020	18,704.00	18,854.00	48	Marcellus
7.00	2/15/2020	18,504.00	18,654.00	48	Marcellus
8.00	2/15/2020	18,304.00	18,454.00	48	Marcellus
9.00	2/15/2020	18,104.00	18,254.00	48	Marcellus
10.00	2/15/2020	17,904.00	18,054.00	48	Marcellus
11.00	2/16/2020	17,704.00	17,854.00	48	Marcellus
12.00	2/16/2020	17,504.00	17,654.00	48	Marcellus
13.00	2/16/2020	17,304.00	17,454.00	48	Marcellus
14.00	2/16/2020	17,104.00	17,259.00	48	Marcellus
15.00	2/17/2020	16,904.00	17,054.00	48	Marcellus
16.00	2/17/2020	16,704.00	16,854.00	48	Marcellus
17.00	2/17/2020	16,504.00	16,654.00	48	Marcellus
18.00	2/18/2020	16,304.00	16,454.00	48	Marcellus
19.00	2/18/2020	16,104.00	16,257.00	48	Marcellus
20.00	2/18/2020	15,901.00	16,054.00	48	Marcellus
21.00	2/18/2020	15,704.00	15,854.00	48	Marcellus
22.00	2/18/2020	15,504.00	15,656.00	48	Marcellus
23.00	2/19/2020	15,299.00	15,454.00	48	Marcellus
24.00	2/19/2020	15,104.00	15,254.00	48	Marcellus
25.00	2/19/2020	14,904.00	15,054.00	48	Marcellus
26.00	2/19/2020	14,704.00	14,854.00	48	Marcellus
27.00	2/20/2020	14,504.00	14,651.00	48	Marcellus
28.00	2/20/2020	14,301.00	14,454.00	48	Marcellus
29.00	2/20/2020	14,104.00	14,254.00	48	Marcellus
30.00	2/21/2020	13,904.00	14,055.00	48	Marcellus
31.00	2/21/2020	13,704.00	13,854.00	48	Marcellus
32.00	2/21/2020	13,504.00	13,650.00	48	Marcellus
33.00	2/22/2020	13,301.00	13,454.00	48	Marcellus
34.00	2/22/2020	13,104.00	13,254.00	48	Marcellus
35.00	2/22/2020	12,904.00	13,081.00	48	Marcellus
36.00	2/23/2020	12,705.00	12,854.00	48	Marcellus
37.00	2/23/2020	12,504.00	12,652.00	48	Marcellus
38.00	2/23/2020	12,304.00	12,454.00	48	Marcellus
39.00	2/23/2020	12,104.00	12,254.00	48	Marcellus
40.00	2/24/2020	11,904.00	12,059.00	48	Marcellus
41.00	2/24/2020	11,700.00	11,854.00	48	Marcellus
42.00	2/25/2020	11,504.00	11,654.00	48	Marcellus
43.00	2/25/2020	11,304.00	11,454.00	48	Marcellus
44.00	2/25/2020	11,102.00	11,254.00	48	Marcellus
45.00	2/26/2020	10,904.00	11,054.00	48	Marcellus
46.00	2/26/2020	10,704.00	10,858.00	48	Marcellus
47.00	2/26/2020	10,500.00	10,658.00	48	Marcellus
48.00	2/26/2020	10,304.00	10,454.00	48	Marcellus
49.00	2/27/2020	10,104.00	10,254.00	48	Marcellus
50.00	2/28/2020	9,904.00	10,054.00	48	Marcellus
51.00	2/28/2020	9,704.00	9,853.00	48	Marcellus
52.00	2/28/2020	9,502.00	9,654.00	48	Marcellus
53.00	2/28/2020	9,304.00	9,454.00	48	Marcellus
54.00	2/29/2020	9,130.00	9,254.00	48	Marcellus
55.00	2/29/2020	8,906.00	9,054.00	48	Marcellus

RECEIVED  
 Office of Oil and Gas

MAY 14 2020

WV Department of  
 Environmental Protection

56.00	2/29/2020	8,704.00	8,854.00	48	Marcellus
57.00	3/1/2020	8,504.00	8,654.00	48	Marcellus
58.00	3/1/2020	8,304.00	8,454.00	48	Marcellus
59.00	3/1/2020	8,104.00	8,257.00	48	Marcellus

RECEIVED  
Office of Oil and Gas

MAY 14 2020

WV Department of  
Environmental Protection

Well Crands Unit 8H  
 API 47-049-02486

Stage	Stimulation Date	Avg. Pump Rate (BPM)	Avg. Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen
1	2/12/2020	85	8,111	6,253	4,995	406,400	10,616	N/A
2	2/13/2020	85	8,108	7,165	4,720	406,300	10,728	N/A
3	2/13/2020	85	8,416	7,780	4,700	406,000	10,534	N/A
4	2/14/2020	85	8,377	7,434	4,945	406,400	11,068	N/A
5	2/14/2020	85	8,336	7,292	4,971	406,400	10,693	N/A
6	2/14/2020	85	8,695	7,207	4,750	404,400	9,889	N/A
7	2/14/2020	85	8,614	6,045	5,062	404,600	9,321	N/A
8	2/15/2020	84	8,519	6,166	4,929	407,300	9,547	N/A
9	2/15/2020	86	8,486	6,828	5,641	404,700	9,379	N/A
10	2/15/2020	85	8,426	5,473	6,075	405,600	9,319	N/A
11	2/16/2020	85	8,642	6,108	4,947	405,400	9,327	N/A
12	2/16/2020	84	8,694	5,703	5,340	294,500	8,672	N/A
13	2/16/2020	85	8,349	6,103	5,230	405,000	9,319	N/A
14	2/17/2020	85	8,252	6,262	5,238	404,900	9,292	N/A
15	2/17/2020	85	8,456	5,719	5,890	405,500	9,340	N/A
16	2/17/2020	85	8,036	5,359	4,563	405,200	9,231	N/A
17	2/17/2020	85	8,071	5,716	4,945	406,700	9,271	N/A
18	2/18/2020	86	8,315	6,653	6,181	406,300	9,249	N/A
19	2/18/2020	83	8,244	6,848	4,792	405,100	9,394	N/A
20	2/18/2020	85	8,411	6,033	5,826	405,700	9,292	N/A
21	2/18/2020	85	7,973	5,741	5,188	406,200	9,211	N/A
22	2/18/2020	86	8,238	5,511	5,369	406,600	9,216	N/A
23	2/19/2020	85	7,901	6,130	5,257	407,100	9,255	N/A
24	2/19/2020	86	8,117	5,661	4,705	407,500	9,246	N/A
25	2/19/2020	85	8,148	5,353	5,020	406,000	9,130	N/A
26	2/20/2020	86	7,831	5,735	5,829	406,500	9,183	N/A
27	2/20/2020	85	7,845	6,210	5,457	405,500	9,226	N/A
28	2/20/2020	86	7,690	5,552	5,053	405,800	9,186	N/A
29	2/20/2020	86	7,713	5,229	5,871	406,500	10,192	N/A
30	2/21/2020	85	7,785	5,474	5,420	405,000	9,243	N/A
31	2/21/2020	85	7,470	4,843	5,610	405,200	8,708	N/A
32	2/21/2020	85	7,692	5,853	5,979	406,600	9,209	N/A
33	2/22/2020	85	7,530	5,813	5,424	405,000	9,155	N/A
34	2/22/2020	85	7,555	6,422	5,417	405,100	9,144	N/A
35	2/22/2020	85	7,515	5,912	5,790	406,400	9,228	N/A
36	2/23/2020	85	7,482	5,774	5,620	405,100	9,154	N/A
37	2/23/2020	85	7,565	6,123	4,730	404,900	9,085	N/A
38	2/23/2020	85	7,614	5,779	4,947	406,000	9,173	N/A
39	2/24/2020	85	7,384	5,529	5,081	405,783	9,166	N/A
40	2/24/2020	85	7,607	5,941	4,834	405,400	9,233	N/A
41	2/24/2020	85	7,601	6,101	5,573	406,400	9,173	N/A
42	2/25/2020	85	7,275	4,984	5,880	404,900	8,996	N/A
43	2/25/2020	85	7,215	6,141	5,700	404,900	9,037	N/A
44	2/25/2020	86	7,653	6,327	4,568	404,500	9,213	N/A
45	2/26/2020	86	7,410	6,226	4,860	404,800	9,174	N/A
46	2/26/2020	85	7,218	6,075	5,080	405,000	9,028	N/A
47	2/27/2020	85	7,029	6,060	5,343	405,100	9,183	N/A
48	2/27/2020	85	7,141	6,275	5,380	405,100	8,928	N/A
49	2/27/2020	86	6,978	5,828	5,376	404,800	9,171	N/A
50	2/28/2020	85	6,997	5,650	5,530	404,600	9,165	N/A
51	2/28/2020	85	7,094	5,786	5,340	405,100	8,924	N/A
52	2/28/2020	86	7,238	6,449	6,073	405,200	9,151	N/A

RECEIVED  
 Office of Oil and Gas

MAY 14 2020

WV Department of  
 Environmental Protection

53	2/29/2020	85	7,068	6,253	5,346	405,100	9,160	N/A
54	2/29/2020	85	7,015	5,698	5,524	406,000	8,922	N/A
55	2/29/2020	85	7,013	5,753	5,524	104,930	9,021	N/A
56	3/1/2020	86	7,316	6,243	4,902	405,500	8,940	N/A
57	3/1/2020	85	7,275	5,941	4,907	405,700	8,976	N/A
58	3/1/2020	85	7,075	6,172	5,954	404,900	8,887	N/A
59	3/2/2020	86	6,944	7,264	5,042	405,700	9,140	N/A

API 47-049-02486

RECEIVED  
Office of Oil and Gas

MAY 14 2020

WV Department of  
Environmental Protection



Well  
API

Crands Unit 8H  
47-049-02486

Lithology/Formation Name	Top Depth TVD	Bottom Depth TVD	Top Depth MD	Bottom Depth MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
Dirt	0	71	0	71	
Sandstone	71	130	71	130	
Coal	130	134	130	134	
Shale	134	270	134	270	
Sandstone	270	430	270	430	
Shale	430	460	430	460	
Coal	460	465	460	465	
Shale	465	533	465	533	
SDY Shale	533	620	533	620	
Red Rock	620	630	620	630	
SDY Shale	630	650	630	650	
Red Rock	650	695	650	695	
Shale	695	960	695	960	
Sandstone	960	1000	960	1000	
SDY Shale	1000	1400	1000	1400	
Sandstone	1400	1530	1400	1530	
Shale	1530	1810	1530	1810	
Sandstone	1810	1890	1810	1890	
Shale	1890	2030	1890	2030	
Sandstone	2030	2100	2030	2100	
SDY Shale	2100	2300	2100	2300	
Sandstone	2300	2380	2300	2380	
SDY Shale	2380	2510	2380	2510	
Sandstone	2510	2540	2510	2540	
SDY Shale	2540	2620	2540	2620	
Sandstone	2620	2730	2620	2730	
Shale	2730	2880	2730	2880	
Sandstone	2880	2910	2880	2910	
SDY Shale	2910	3145	2910	3145	
Shale	3145	3980	3145	3980	
Sandstone	3980	4250	3980	4250	
Shale	4250	4460	4250	4460	
SDY Shale	4460	4629	4460	4629	
Sandstone	4629	4670	4629	4670	
SDY Shale	4670	5200	4670	5200	
Shale	5200	5310	5200	5310	
Sandstone	5310	5450	5310	5450	
Shale	5450	7236	5450	7611	
Geneseo	7236	7255	7611	7635	
Burket	7255	7277	7635	7664	
Tully	7277	7328	7664	7732	
Hamilton	7328	7471	7732	7989	
Marcellus	7471		7989	20115	

RECEIVED  
Office of Oil and Gas

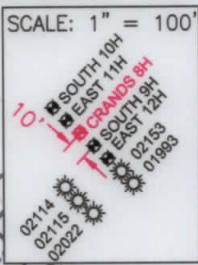
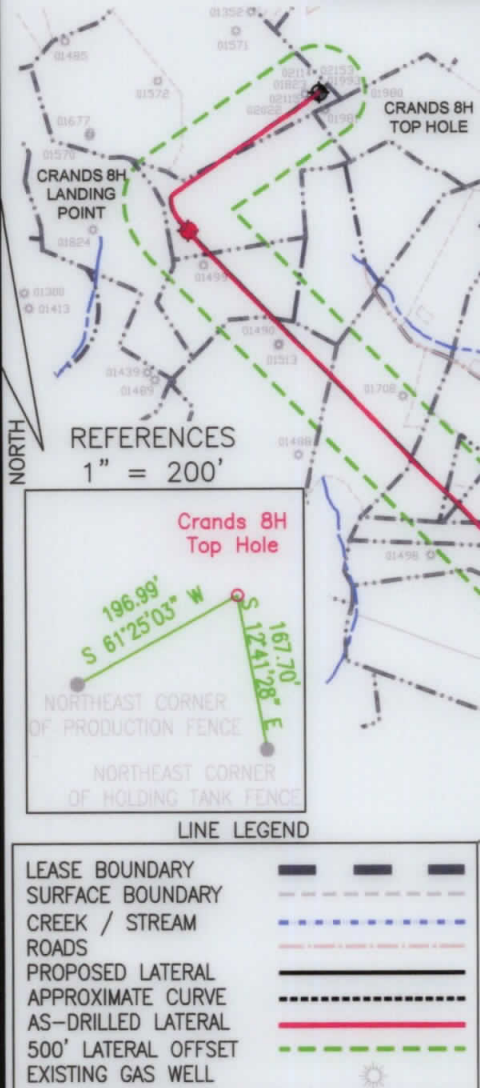
MAY 14 2020

WV Department of  
Environmental Protection

BOTTOM HOLE ← 7531' TOP HOLE → 2906'

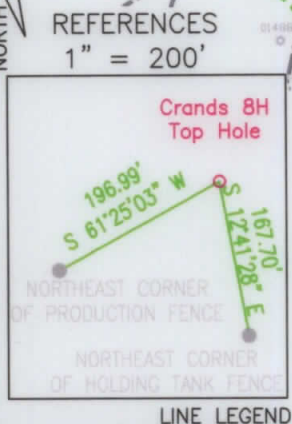
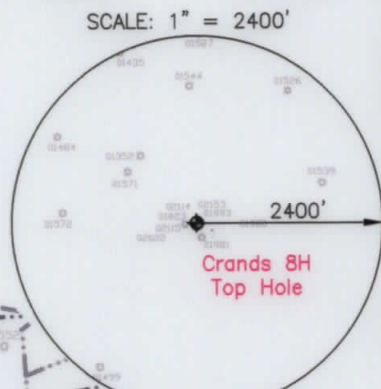
# CRANDS UNIT 8H

SCALE: 1" = 2000' LATITUDE: 39°30'00" (TOP HOLE)  
 SCALE: 1" = 2000' LATITUDE: 39°27'30" (BOTTOM HOLE)



PERMITTED  
State Plane Coordinate  
West Virginia North

Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353436.987	N: 344810.046
E: 1773553.652	E: 1772130.534	E: 1780607.078
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.379	N: 4366320.104
E: 560041.310	E: 559615.197	E: 562241.522
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675823	N 39.4441026
W 80.3021532	W 80.3071473	W 80.2768594



LINE LEGEND

LEASE BOUNDARY	---
SURFACE BOUNDARY	- - - -
CREEK / STREAM	~~~~~
ROADS	---
PROPOSED LATERAL	---
APPROXIMATE CURVE	- - - -
AS-DRILLED LATERAL	---
500' LATERAL OFFSET	---
EXISTING GAS WELL	☼

- NOTES ON SURVEY
1. NO DWELLINGS WITHIN 625' WERE FOUND.
  2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
  3. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD 83.
  4. WELL ELEVATION ESTABLISHED BY RTK GPS NAVD 88.
  5. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES PROVIDED BY XTO ENERGY INC.
  6. WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDEP AND SURVEYED LOCATIONS OF WELLS WITHIN 500' OF WELL BORE.

AS-DRILLED

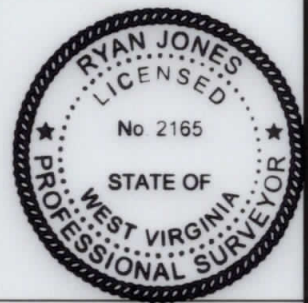
Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353438.100	N: 344804.876
E: 1773553.652	E: 1772135.950	E: 1780600.288
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.745	N: 4366318.494
E: 560041.310	E: 559616.842	E: 562239.480
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675855	N 39.4440883
W 80.3021532	W 80.3071281	W 80.2768833

2402 PENNSYLVANIA 66 DELMONT, PA 15626 www.jonesconsultant.com (724) 757 - 2417 SHEET 1 OF 2

FILE #: JC2018-78  
 DRAWING #: CRANDS 8H WELL AS-DRILLED  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1:2500  
 PROVEN SOURCE OF ELEVATION: RTK GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *[Signature]*  
 R.P.E.: \_\_\_\_\_ P.S.: 2165



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
 WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304



DATE: 4/30/2020  
 OPERATOR'S WELL #: CRANDS UNIT 8H  
 API WELL #: 47 049 02486  
 STATE COUNTY PERMIT

Well Type:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

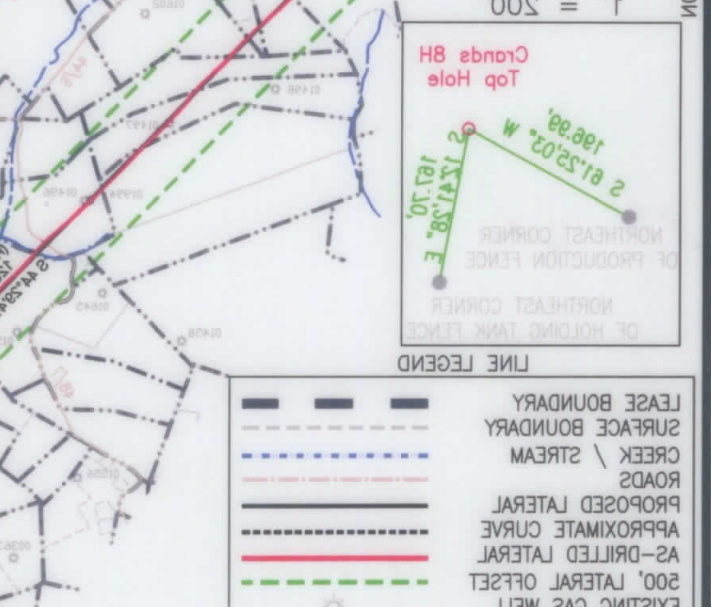
WATERSHED: LOWER WEST FORK RIVER (0502000206) ELEVATION: 1,221' (EXISTING FINISH GRADE)  
 COUNTY/DISTRICT: MARION / LINCOLN QUADRANGLE: SHINNSTON 7.5'  
 SURFACE OWNER: ROCHESTER & PITTSBURGH COAL COMPANY ACREAGE: 55±  
 OIL & GAS ROYALTY OWNER: LOUIS A. FERRARI, ET UX ACREAGE: 792.9±

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
 PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG & ABANDON   
 CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY): \_\_\_\_\_

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,598' (TVD), 20,115' (TMD) (AS-DRILLED)  
 WELL OPERATOR: XTO ENERGY INC. DESIGNATED AGENT: GARY BEALL  
 Address: 190 THORN HILL ROAD Address: P.O. BOX 1008  
 City: WARRENDALE State: PA Zip Code: 15086 City: JANE LEW State: WV Zip Code: 26378

2123' BOTTOM HOLE 10584' TOP HOLE

# GRANDS UNIT 8H



LINE LEGEND

- EXISTING GAS WELL
- 500' LATERAL OFFSET
- AS-DRILLED LATERAL
- APPROXIMATE CURVE
- PROPOSED LATERAL
- ROADS
- CREEK / STREAM
- SURFACE BOUNDARY
- LEASE BOUNDARY

Top Hole Location	Bottom Hole Location
NAD 23 Feet	NAD 23 Feet
N: 324807.681	N: 324807.681
E: 177323.652	E: 177323.652
UTM Zone 17 (2PC283) Meters	UTM Zone 17 (2PC283) Meters
N: 436930.669	N: 436930.669
E: 28041.310	E: 28041.310
NAD 23	NAD 23
N 39 47 28.2 E	N 39 47 28.2 E
W 80 30 21.2 S	W 80 30 21.2 S

2402 PENNSYLVANIA 66 DELMONT, PA 15626

www.jonesconsultant.com (724) 757-2417

SHEET 1 OF 2

PROVIDED BY XTO ENERGY INC.

WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP

COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES

SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND

WELL ELEVATION ESTABLISHED BY RTK GPS NAVD 88.

4. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH W

3. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.

1. NO DWELLINGS WITHIN 625' WERE FOUND.

NOTES ON SURVEY

GRANDS 8H BOTTOM HOLE

GRANDS 8H TOP HOLE

STATE PLANE COORDINATE WEST VIRGINIA NORTH

PERMITTED

SCALE: 1" = 2000' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 100' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 2400'

SCALE: 1" = 5000' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 5000' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 2400'

SCALE: 1" = 5000' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 5000' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 5000' (BOTTOM HOLE) (TOP HOLE)

SCALE: 1" = 5000' (BOTTOM HOLE) (TOP HOLE)



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS  
 PLAN 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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: \_\_\_\_\_  
 P.E.: \_\_\_\_\_  
 P.S.: \_\_\_\_\_

FILE #: JCS018-78  
 DRAWING #: GRANDS 8H WELL AS-DRILLED  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE  
 OF ACCURACY: 1:2500  
 PROVEN SOURCE  
 OF ELEVATION: RTK GPS

DATE: 4/30/2020  
 OPERATOR'S WELL #: GRANDS UNIT 8H  
 API WELL #: 47 049 02486  
 STATE COUNTY PERMIT  
 ACRES: 25.4  
 ACRES: 792.9  
 QUADRANGLE: SHINNSTON 7.5  
 ELEVATION: 1,221' (EXISTING FINISH GRADE)  
 WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP  
 COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES  
 SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND  
 WELL ELEVATION ESTABLISHED BY RTK GPS NAVD 88.  
 4. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH W  
 3. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.  
 1. NO DWELLINGS WITHIN 625' WERE FOUND.



WDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304

WATERSHED: LOWER WEST FORK RIVER (0502000206)  
 COUNTY/DISTRICT: MARION / LINCOLN  
 SURFACE OWNER: ROCHESTER & PITTSBURGH COAL COMPANY  
 OIL & GAS ROYALTY OWNER: LOUIS A. FERRARI, ET UX

WELL OPERATOR: XTO ENERGY INC.  
 ADDRESS: 190 THORN HILL ROAD  
 CITY: WARRENDALE State: PA Zip Code: 15086

TARGET FORMATION: MARCELLUS  
 ESTIMATED DEPTH: 7,598' (TVD), 20,112' (AS-DRILLED)  
 CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY):  
 PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG & ABANDON   
 DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE

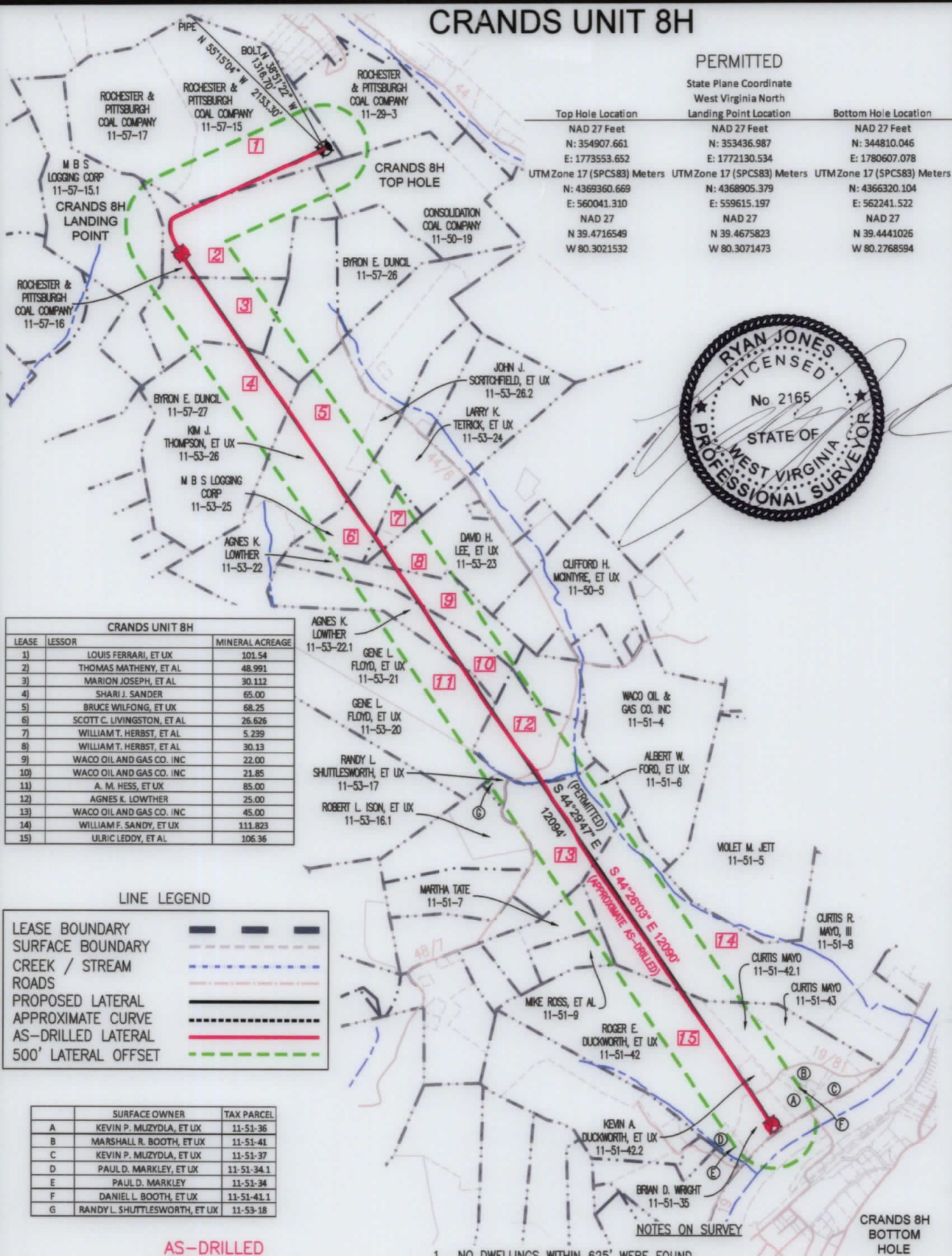
WELL TYPE:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

# CRANDS UNIT 8H

## PERMITTED

State Plane Coordinate  
West Virginia North  
Landing Point Location

Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353436.987	N: 344810.046
E: 1773553.652	E: 1772130.534	E: 1780607.078
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.379	N: 4366320.104
E: 560041.310	E: 559615.197	E: 562241.522
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675823	N 39.4441026
W 80.3021532	W 80.3071473	W 80.2768594



CRANDS UNIT 8H		
LEASE	LESSOR	MINERAL ACREAGE
1)	LOUIS FERRARI, ET UX	101.54
2)	THOMAS MATHENY, ET AL	48.991
3)	MARION JOSEPH, ET AL	30.112
4)	SHARI J. SANDER	65.00
5)	BRUCE WILFONG, ET UX	68.25
6)	SCOTT C. LIVINGSTON, ET AL	26.626
7)	WILLIAM T. HERBST, ET AL	5.239
8)	WILLIAM T. HERBST, ET AL	30.13
9)	WACO OIL AND GAS CO. INC	22.00
10)	WACO OIL AND GAS CO. INC	21.85
11)	A. M. HESS, ET UX	85.00
12)	AGNES K. LOWTHER	25.00
13)	WACO OIL AND GAS CO. INC	45.00
14)	WILLIAM F. SANDY, ET UX	111.823
15)	ULRIC LEDDY, ET AL	106.36

### LINE LEGEND

LEASE BOUNDARY	---
SURFACE BOUNDARY	- - - -
CREEK / STREAM	~ ~ ~ ~
ROADS	— — — —
PROPOSED LATERAL	— — — —
APPROXIMATE CURVE	- · - · -
AS-DRILLED LATERAL	— — — —
500' LATERAL OFFSET	- · - · -

	SURFACE OWNER	TAX PARCEL
A	KEVIN P. MUZYDLA, ET UX	11-51-36
B	MARSHALL R. BOOTH, ET UX	11-51-41
C	KEVIN P. MUZYDLA, ET UX	11-51-37
D	PAULD. MARKLEY, ET UX	11-51-34.1
E	PAULD. MARKLEY	11-51-34
F	DANIEL L. BOOTH, ET UX	11-51-41.1
G	RANDY L. SHUTTLESWORTH, ET UX	11-51-18

### AS-DRILLED

State Plane Coordinate  
West Virginia North

Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353438.100	N: 344804.876
E: 1773553.652	E: 1772135.950	E: 1780600.288
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.745	N: 4366318.494
E: 560041.310	E: 559616.842	E: 562239.480
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675855	N 39.4440883
W 80.3021532	W 80.3071281	W 80.2768833

- NOTES ON SURVEY
- NO DWELLINGS WITHIN 625' WERE FOUND.
  - NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
  - TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD 83.
  - WELL ELEVATION ESTABLISHED BY RTK GPS NAVD 88.
  - SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES PROVIDED BY XTO ENERGY INC.
  - WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP AND SURVEYED LOCATIONS OF WELLS WITHIN 500' OF WELL BORE.

## JONES CONSULTANTS, LLC

SURVEYING • MAPPING • LAND • GAS WELL • PIPELINE  
2402 PENNSYLVANIA 66 DELMONT, PA 15626  
(724) 757 - 2417 www.jonesconsultant.com

### SUPPLEMENTAL SURFACE AND LESSOR EXHIBIT

#### CRANDS UNIT 8H

Drawn By:	Date:	LINCOLN DISTRICT MARION COUNTY, WEST VIRGINIA
JRV	4/30/2020	
Scale:	1" = 1500'	Sheet:
AFE #	DD.2011.03362.CAP.DRL.01	File No.:
		SHEET 2 OF 2
		JC2018-78



190 THORN HILL ROAD  
WARRENDALE, PA 15086

0' 1500'



# CRANDS UNIT 8H

PERMITTED

Top Hole Location		Bottom Hole Location	
NAD 27 Feet	W 80.302125	NAD 27 Feet	W 80.302125
N: 438902.669	E: 580041.310	N: 438902.669	E: 580041.310
N: 438902.379	E: 580121.157	N: 438902.379	E: 580121.157
N: 438902.104	E: 580241.222	N: 438902.104	E: 580241.222
NAD 27	W 80.302125	NAD 27	W 80.302125
N: 39442699	E: 1780607.078	N: 39442699	E: 1780607.078
N: 39442700	E: 1780607.078	N: 39442700	E: 1780607.078
N: 39442701	E: 1780607.078	N: 39442701	E: 1780607.078
N: 39442702	E: 1780607.078	N: 39442702	E: 1780607.078
N: 39442703	E: 1780607.078	N: 39442703	E: 1780607.078
N: 39442704	E: 1780607.078	N: 39442704	E: 1780607.078
N: 39442705	E: 1780607.078	N: 39442705	E: 1780607.078
N: 39442706	E: 1780607.078	N: 39442706	E: 1780607.078
N: 39442707	E: 1780607.078	N: 39442707	E: 1780607.078
N: 39442708	E: 1780607.078	N: 39442708	E: 1780607.078
N: 39442709	E: 1780607.078	N: 39442709	E: 1780607.078
N: 39442710	E: 1780607.078	N: 39442710	E: 1780607.078
N: 39442711	E: 1780607.078	N: 39442711	E: 1780607.078
N: 39442712	E: 1780607.078	N: 39442712	E: 1780607.078
N: 39442713	E: 1780607.078	N: 39442713	E: 1780607.078
N: 39442714	E: 1780607.078	N: 39442714	E: 1780607.078
N: 39442715	E: 1780607.078	N: 39442715	E: 1780607.078
N: 39442716	E: 1780607.078	N: 39442716	E: 1780607.078
N: 39442717	E: 1780607.078	N: 39442717	E: 1780607.078
N: 39442718	E: 1780607.078	N: 39442718	E: 1780607.078
N: 39442719	E: 1780607.078	N: 39442719	E: 1780607.078
N: 39442720	E: 1780607.078	N: 39442720	E: 1780607.078
N: 39442721	E: 1780607.078	N: 39442721	E: 1780607.078
N: 39442722	E: 1780607.078	N: 39442722	E: 1780607.078
N: 39442723	E: 1780607.078	N: 39442723	E: 1780607.078
N: 39442724	E: 1780607.078	N: 39442724	E: 1780607.078
N: 39442725	E: 1780607.078	N: 39442725	E: 1780607.078
N: 39442726	E: 1780607.078	N: 39442726	E: 1780607.078
N: 39442727	E: 1780607.078	N: 39442727	E: 1780607.078
N: 39442728	E: 1780607.078	N: 39442728	E: 1780607.078
N: 39442729	E: 1780607.078	N: 39442729	E: 1780607.078
N: 39442730	E: 1780607.078	N: 39442730	E: 1780607.078
N: 39442731	E: 1780607.078	N: 39442731	E: 1780607.078
N: 39442732	E: 1780607.078	N: 39442732	E: 1780607.078
N: 39442733	E: 1780607.078	N: 39442733	E: 1780607.078
N: 39442734	E: 1780607.078	N: 39442734	E: 1780607.078
N: 39442735	E: 1780607.078	N: 39442735	E: 1780607.078
N: 39442736	E: 1780607.078	N: 39442736	E: 1780607.078
N: 39442737	E: 1780607.078	N: 39442737	E: 1780607.078
N: 39442738	E: 1780607.078	N: 39442738	E: 1780607.078
N: 39442739	E: 1780607.078	N: 39442739	E: 1780607.078
N: 39442740	E: 1780607.078	N: 39442740	E: 1780607.078
N: 39442741	E: 1780607.078	N: 39442741	E: 1780607.078
N: 39442742	E: 1780607.078	N: 39442742	E: 1780607.078
N: 39442743	E: 1780607.078	N: 39442743	E: 1780607.078
N: 39442744	E: 1780607.078	N: 39442744	E: 1780607.078
N: 39442745	E: 1780607.078	N: 39442745	E: 1780607.078
N: 39442746	E: 1780607.078	N: 39442746	E: 1780607.078
N: 39442747	E: 1780607.078	N: 39442747	E: 1780607.078
N: 39442748	E: 1780607.078	N: 39442748	E: 1780607.078
N: 39442749	E: 1780607.078	N: 39442749	E: 1780607.078
N: 39442750	E: 1780607.078	N: 39442750	E: 1780607.078
N: 39442751	E: 1780607.078	N: 39442751	E: 1780607.078
N: 39442752	E: 1780607.078	N: 39442752	E: 1780607.078
N: 39442753	E: 1780607.078	N: 39442753	E: 1780607.078
N: 39442754	E: 1780607.078	N: 39442754	E: 1780607.078
N: 39442755	E: 1780607.078	N: 39442755	E: 1780607.078
N: 39442756	E: 1780607.078	N: 39442756	E: 1780607.078
N: 39442757	E: 1780607.078	N: 39442757	E: 1780607.078
N: 39442758	E: 1780607.078	N: 39442758	E: 1780607.078
N: 39442759	E: 1780607.078	N: 39442759	E: 1780607.078
N: 39442760	E: 1780607.078	N: 39442760	E: 1780607.078
N: 39442761	E: 1780607.078	N: 39442761	E: 1780607.078
N: 39442762	E: 1780607.078	N: 39442762	E: 1780607.078
N: 39442763	E: 1780607.078	N: 39442763	E: 1780607.078
N: 39442764	E: 1780607.078	N: 39442764	E: 1780607.078
N: 39442765	E: 1780607.078	N: 39442765	E: 1780607.078
N: 39442766	E: 1780607.078	N: 39442766	E: 1780607.078
N: 39442767	E: 1780607.078	N: 39442767	E: 1780607.078
N: 39442768	E: 1780607.078	N: 39442768	E: 1780607.078
N: 39442769	E: 1780607.078	N: 39442769	E: 1780607.078
N: 39442770	E: 1780607.078	N: 39442770	E: 1780607.078
N: 39442771	E: 1780607.078	N: 39442771	E: 1780607.078
N: 39442772	E: 1780607.078	N: 39442772	E: 1780607.078
N: 39442773	E: 1780607.078	N: 39442773	E: 1780607.078
N: 39442774	E: 1780607.078	N: 39442774	E: 1780607.078
N: 39442775	E: 1780607.078	N: 39442775	E: 1780607.078
N: 39442776	E: 1780607.078	N: 39442776	E: 1780607.078
N: 39442777	E: 1780607.078	N: 39442777	E: 1780607.078
N: 39442778	E: 1780607.078	N: 39442778	E: 1780607.078
N: 39442779	E: 1780607.078	N: 39442779	E: 1780607.078
N: 39442780	E: 1780607.078	N: 39442780	E: 1780607.078
N: 39442781	E: 1780607.078	N: 39442781	E: 1780607.078
N: 39442782	E: 1780607.078	N: 39442782	E: 1780607.078
N: 39442783	E: 1780607.078	N: 39442783	E: 1780607.078
N: 39442784	E: 1780607.078	N: 39442784	E: 1780607.078
N: 39442785	E: 1780607.078	N: 39442785	E: 1780607.078
N: 39442786	E: 1780607.078	N: 39442786	E: 1780607.078
N: 39442787	E: 1780607.078	N: 39442787	E: 1780607.078
N: 39442788	E: 1780607.078	N: 39442788	E: 1780607.078
N: 39442789	E: 1780607.078	N: 39442789	E: 1780607.078
N: 39442790	E: 1780607.078	N: 39442790	E: 1780607.078
N: 39442791	E: 1780607.078	N: 39442791	E: 1780607.078
N: 39442792	E: 1780607.078	N: 39442792	E: 1780607.078
N: 39442793	E: 1780607.078	N: 39442793	E: 1780607.078
N: 39442794	E: 1780607.078	N: 39442794	E: 1780607.078
N: 39442795	E: 1780607.078	N: 39442795	E: 1780607.078
N: 39442796	E: 1780607.078	N: 39442796	E: 1780607.078
N: 39442797	E: 1780607.078	N: 39442797	E: 1780607.078
N: 39442798	E: 1780607.078	N: 39442798	E: 1780607.078
N: 39442799	E: 1780607.078	N: 39442799	E: 1780607.078
N: 39442800	E: 1780607.078	N: 39442800	E: 1780607.078



LEASEE	LESSOR	MINERAL ACREAGE
12) ULRIC LEODY, ET AL	WACO OIL AND GAS CO. INC.	106.98
11) WILLIAM F. SANDY, ET LUX	WACO OIL AND GAS CO. INC.	117.83
10) WILLIAM F. SANDY, ET LUX	WACO OIL AND GAS CO. INC.	48.00
9) A. M. HESS, ET LUX	WACO OIL AND GAS CO. INC.	25.00
8) WILLIAM T. HERBST, ET AL	WACO OIL AND GAS CO. INC.	82.00
7) WILLIAM T. HERBST, ET AL	WACO OIL AND GAS CO. INC.	33.00
6) SCOTT C. LIVINGSTON, ET AL	WACO OIL AND GAS CO. INC.	28.698
5) BRUCE WILSON, ET LUX	WACO OIL AND GAS CO. INC.	68.25
4) SHARIL SANDER	WACO OIL AND GAS CO. INC.	62.00
3) MARION JOSEPH, ET AL	WACO OIL AND GAS CO. INC.	30.113
2) THOMAS MATHEWY, ET AL	WACO OIL AND GAS CO. INC.	48.901
1) LOUIS FERRARI, ET LUX	WACO OIL AND GAS CO. INC.	101.24

**LINE LEGEND**

- LEASE BOUNDARY (Dashed line)
- SURFACE BOUNDARY (Dotted line)
- CREEK / STREAM (Blue line)
- ROADS (Red line)
- PROPOSED LATERAL (Red dashed line)
- APPROXIMATE CURVE (Red dashed line)
- A2-DRILLED LATERAL (Red solid line)
- 500' LATERAL OFFSET (Green dashed line)

TAX PARCEL	SURFACE OWNER
A	KEVIN P. MULDOJA, ET LUX
B	MARSHALL R. BOOTH, ET LUX
C	KEVIN P. MULDOJA, ET LUX
D	PAUL D. MARKLEY, ET LUX
E	PAUL D. MARKLEY, ET LUX
F	DANIEL J. BOOTH, ET LUX
G	RANDY L. SHUTTLEWORTH, ET LUX

**NOTES ON SURVEY**

- NO DWELLINGS WITHIN 65', WERE FOUND.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250', WERE FOUND.
- TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WZ NORTH ZONE NAD 83.
- WELL ELEVATION ESTABLISHED BY RTK GPS NAD 88.
- SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSessor AND COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES PROVIDED BY XTO ENERGY INC.
- WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP AND SURVEYED LOCATIONS OF WELLS WITHIN 500' OF WELL BORE.

## JONES CONSULTANTS, LLC

SURVEYING • MAPPING • LAND • GAS WELL • PIPELINE  
 2402 PENNSYLVANIA 66 DELMONT, PA 15826  
 (724) 751 - 2417 www.jonesconsultants.com

**SUPPLEMENTAL SURFACE AND LESSOR EXHIBIT**

**CRANDS UNIT 8H**

Drawn By: JRV Date: 4/30/2020  
 LINCOLN DISTRICT  
 MARION COUNTY, WEST VIRGINIA

Scale: 1" = 1500'  
 SHEET 2 OF 2 102018-78

**XTO ENERGY**

150 THORN HILL ROAD  
 WARRENDALE, PA 15086

0' 1500'



BOTTOM HOLE ← 7531' TOP HOLE ← 2906'

# CRANDS UNIT 8H

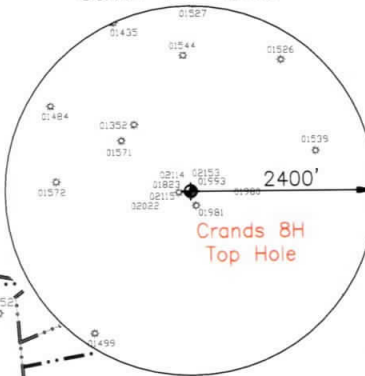
SCALE: 1" = 2000' LATITUDE: 39°30'00" (TOP HOLE)  
SCALE: 1" = 2000' LATITUDE: 39°27'30" (BOTTOM HOLE)

## PERMITTED

State Plane Coordinate  
West Virginia North

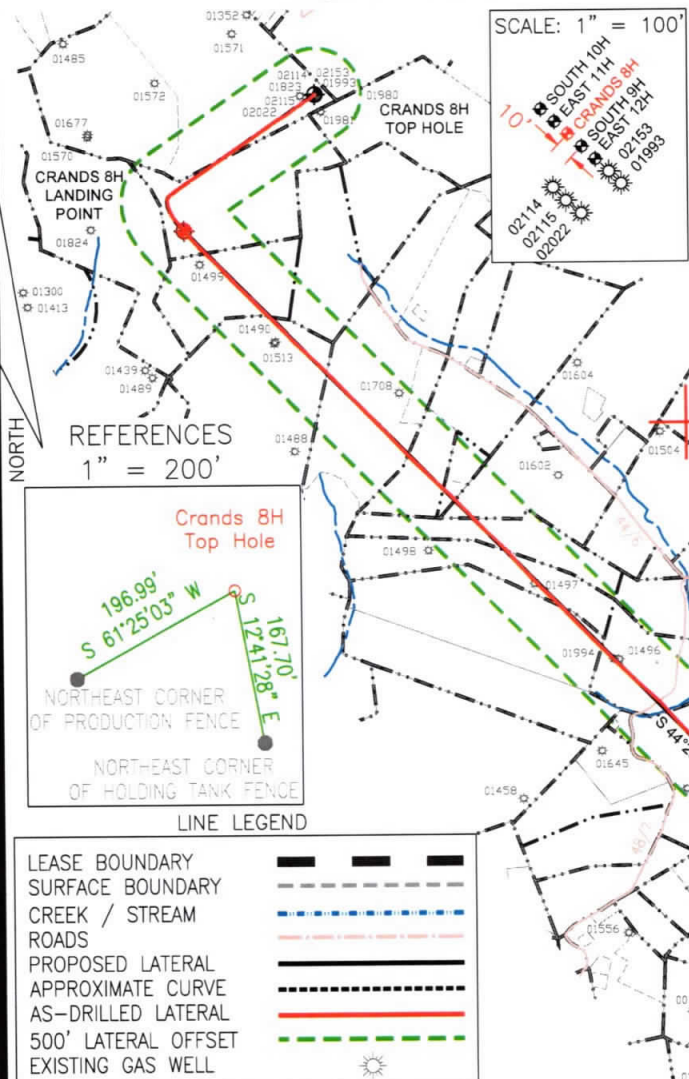
Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353436.987	N: 344810.046
E: 1773553.652	E: 1772130.534	E: 1780607.078
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.379	N: 4366320.104
E: 560041.310	E: 559615.197	E: 562241.522
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675823	N 39.4441026
W 80.3021532	W 80.3071473	W 80.2768594

SCALE: 1" = 2400'

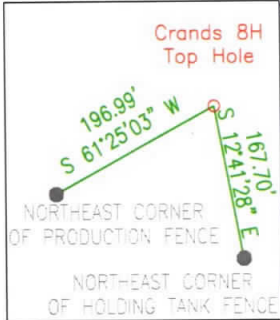


SCALE: 1" = 2000' LONGITUDE: 80°17'30" (TOP HOLE)  
SCALE: 1" = 2000' LONGITUDE: 80°15'00" (BOTTOM HOLE)

5153'  
BOTTOM HOLE ← 10294' ← TOP HOLE



REFERENCES  
1" = 200'



LINE LEGEND

LEASE BOUNDARY	---
SURFACE BOUNDARY	----
CREEK / STREAM	~~~~~
ROADS	----
PROPOSED LATERAL	---
APPROXIMATE CURVE	----
AS-DRILLED LATERAL	---
500' LATERAL OFFSET	----
EXISTING GAS WELL	☀

### AS-DRILLED

State Plane Coordinate  
West Virginia North

Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353438.100	N: 344804.876
E: 1773553.652	E: 1772135.950	E: 1780600.288
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.745	N: 4366318.494
E: 560041.310	E: 559616.842	E: 562239.480
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675855	N 39.4440883
W 80.3021532	W 80.3071281	W 80.2768833

1. NO DWELLINGS WITHIN 625' WERE FOUND.
2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
3. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD 83.
4. WELL ELEVATION ESTABLISHED BY RTK GPS NAVD 88.
5. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES PROVIDED BY XTO ENERGY INC.
6. WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDEP AND SURVEYED LOCATIONS OF WELLS WITHIN 500' OF WELL BORE.



2402 PENNSYLVANIA 66 DELMONT, PA 15626 www.jonesconsultant.com (724) 757-2417 SHEET 1 OF 2

FILE #: JC2018-78  
DRAWING #: CRANDS 8H WELL AS-DRILLED  
SCALE: 1" = 2000'  
MINIMUM DEGREE OF ACCURACY: 1:2500  
PROVEN SOURCE OF ELEVATION: RTK GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: Ryan Jones  
R.P.E.: \_\_\_\_\_ P.S.: 2165



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25304



DATE: 4/30/2020  
OPERATOR'S WELL #: CRANDS UNIT 8H  
API WELL #: 47 049 02486  
STATE COUNTY PERMIT

Well Type:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

WATERSHED: LOWER WEST FORK RIVER (0502000206)  
COUNTY/DISTRICT: MARION / LINCOLN  
SURFACE OWNER: ROCHESTER & PITTSBURGH COAL COMPANY  
OIL & GAS ROYALTY OWNER: LOUIS A. FERRARI, ET UX

ELEVATION: 1,221' (EXISTING FINISH GRADE)  
QUADRANGLE: SHINSTON 7.5'  
ACREAGE: 55±  
ACREAGE: 792.9±

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG & ABANDON   
CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY): \_\_\_\_\_

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,598' (TVD), 20,115' (TMD) (AS-DRILLED)  
WELL OPERATOR: XTO ENERGY INC. Address: 190 THORN HILL ROAD City: WARRENDALE State: PA Zip Code: 15086  
DESIGNATED AGENT: GARY BEALL Address: P.O. BOX 1008 City: JANE LEW State: WV Zip Code: 26378

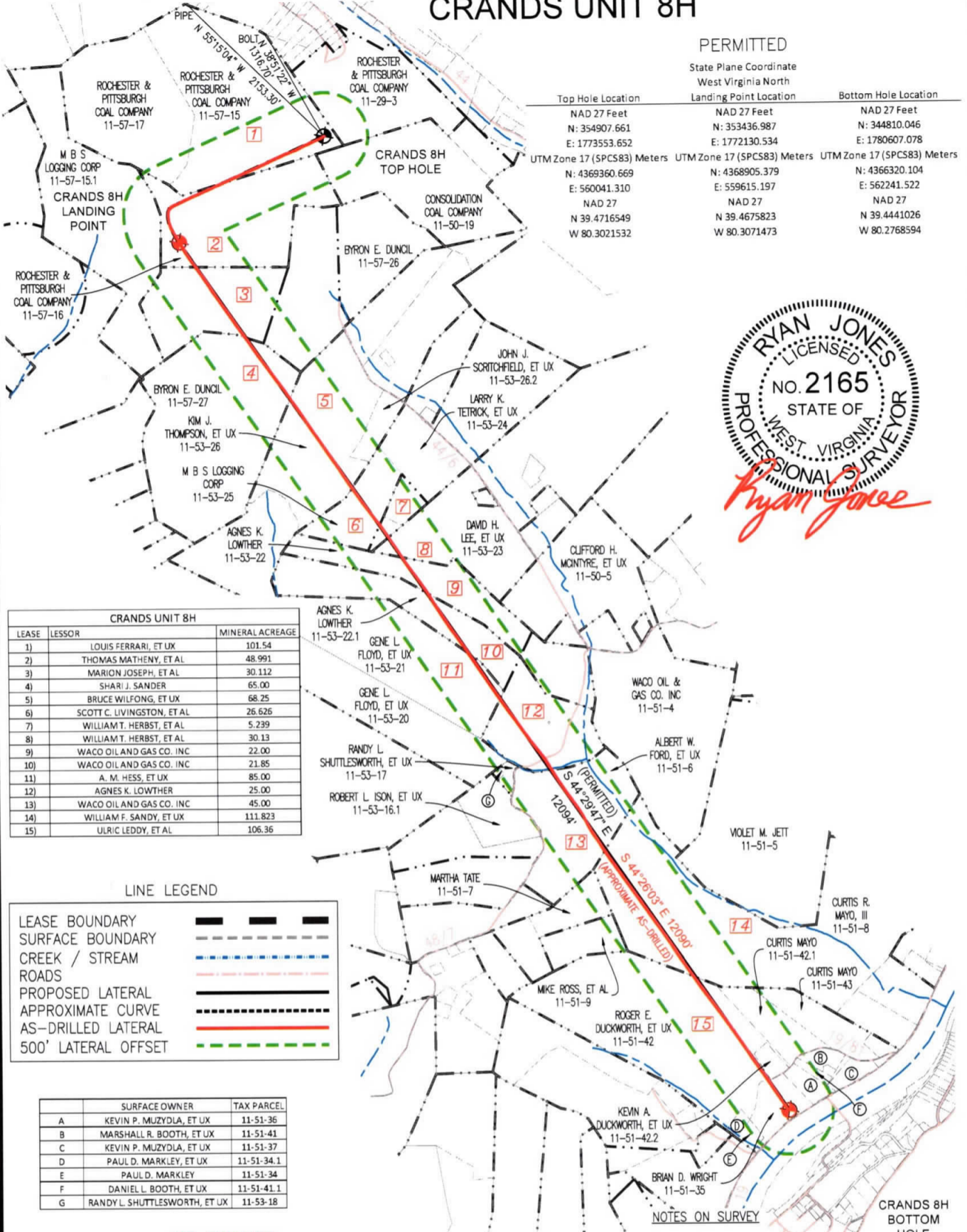
RECEIVED  
Office of Oil and Gas  
MAY 14 2020  
WV Department of Environmental Protection

# CRANDS UNIT 8H

## PERMITTED

State Plane Coordinate  
West Virginia North

Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353436.987	N: 344810.046
E: 1773553.652	E: 1772130.534	E: 1780607.078
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.379	N: 4366320.104
E: 560041.310	E: 559615.197	E: 562241.522
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675823	N 39.4441026
W 80.3021532	W 80.3071473	W 80.2768594



LEASE	LESSOR	MINERAL ACREAGE
1)	LOUIS FERRARI, ET UX	101.54
2)	THOMAS MATHENY, ET AL	48.991
3)	MARION JOSEPH, ET AL	30.112
4)	SHARI J. SANDER	65.00
5)	BRUCE WILFONG, ET UX	68.25
6)	SCOTT C. LIVINGSTON, ET AL	26.626
7)	WILLIAM T. HERBST, ET AL	5.239
8)	WILLIAM T. HERBST, ET AL	30.13
9)	WACO OIL AND GAS CO., INC	22.00
10)	WACO OIL AND GAS CO., INC	21.85
11)	A. M. HESS, ET UX	85.00
12)	AGNES K. LOWTHER	25.00
13)	WACO OIL AND GAS CO., INC	45.00
14)	WILLIAM F. SANDY, ET UX	111.823
15)	ULRIC LEDDY, ET AL	106.36

### LINE LEGEND

LEASE BOUNDARY	— — — — —
SURFACE BOUNDARY	- - - - -
CREEK / STREAM	~~~~~
ROADS	— — — — —
PROPOSED LATERAL	— — — — —
APPROXIMATE CURVE	- - - - -
AS-DRILLED LATERAL	— — — — —
500' LATERAL OFFSET	— — — — —

	SURFACE OWNER	TAX PARCEL
A	KEVIN P. MUZYDLA, ET UX	11-51-36
B	MARSHALL R. BOOTH, ET UX	11-51-41
C	KEVIN P. MUZYDLA, ET UX	11-51-37
D	PAUL D. MARKLEY, ET UX	11-51-34.1
E	PAUL D. MARKLEY	11-51-34
F	DANIEL L. BOOTH, ET UX	11-51-41.1
G	RANDY L. SHUTTLESWORTH, ET UX	11-53-18

### AS-DRILLED

State Plane Coordinate  
West Virginia North

Top Hole Location	Landing Point Location	Bottom Hole Location
NAD 27 Feet	NAD 27 Feet	NAD 27 Feet
N: 354907.661	N: 353438.100	N: 344804.876
E: 1773553.652	E: 1772135.950	E: 1780600.288
UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters	UTM Zone 17 (SPCS83) Meters
N: 4369360.669	N: 4368905.745	N: 4366318.494
E: 560041.310	E: 559616.842	E: 562239.480
NAD 27	NAD 27	NAD 27
N 39.4716549	N 39.4675855	N 39.4440883
W 80.3021532	W 80.3071281	W 80.2768833

- NOTES ON SURVEY
- NO DWELLINGS WITHIN 625' WERE FOUND.
  - NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
  - TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD 83.
  - WELL ELEVATION ESTABLISHED BY RTK GPS NAVD 88.
  - SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY IN APRIL 2020 AND FILES PROVIDED BY XTO ENERGY INC.
  - WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDEP AND SURVEYED LOCATIONS OF WELLS WITHIN 500' OF WELL BORE.

## JONES CONSULTANTS, LLC

SURVEYING • MAPPING • LAND • GAS WELL • PIPELINE  
2402 PENNSYLVANIA 66 DELMONT, PA 15626  
(724) 757 - 2417 www.jonesconsultant.com



### SUPPLEMENTAL SURFACE AND LESSOR EXHIBIT

### CRANDS UNIT 8H

Drawn By: JRV	Date: 4/30/2020	LINCOLN DISTRICT MARION COUNTY, WEST VIRGINIA
Scale: 1" = 1500'	Sheet: SHEET 2 OF 2	File No.: JC2018-78
AFE # DD.2011.03362.CAP.DRL01		

RECEIVED  
MAY 14 2020  
WV Department of Environmental Protection

# XTO ENERGY INC

Location: Marion County, WV  
 Field: Marion  
 Facility: Crim Pad

Slot: Slot #08  
 Well: Crands Unit 8H  
 Wellbore: Crands Unit 8H PWB



API: 47-049-02486-0000  
 BHI Job #: 11002.3640A  
 Rig: Patterson 579  
 Duration: 09/11/2019-09/17/2019



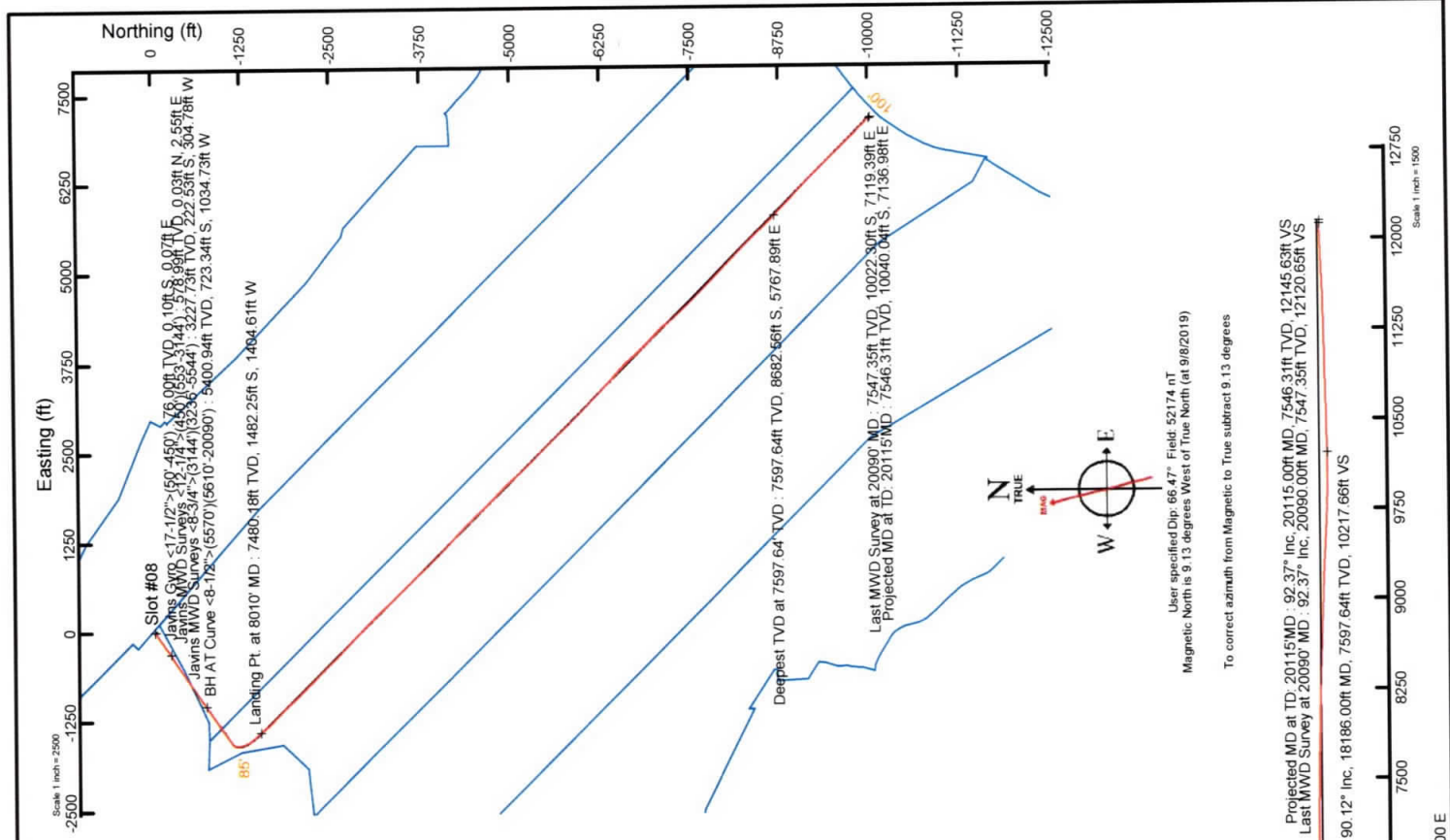
Well reference weight in Crands Unit 8H PWB (Rev. A.1)	Grid System: NAD83 / Lambert West Virginia Spheroid Zone (4213), US Feet
True vertical depth as referenced to Patterson 579 (RKB)	North Reference: True North
Reference weight measured depths as referenced to Patterson 579 (RKB)	Scale: True distance
Patterson 579 (RKB) to Mean Sea Level: 1247 feet	Coordinates are in feet referenced to Slot
Mean Sea Level to Ground level (At Slot - Slot #08): 1271 feet	Depths are in feet
Other weight MDs are referenced to each path's default MD datum.	Created by: dlester on 2020.03.31, Database: WA, WPA, EastmanUS Data

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Crim Pad	1773568.370	354894.110	80°18'7.5922"W
Slot	Local E (ft)	Local N (ft)	Latitude
Slot #08	13.42	-14.84	39°28'17.9577"N
Comment	Crands Unit 8H		80°18'7.514"W
Patterson 579 (RKB) to Ground level (At Slot - Slot #08)	26ft		
Mean Sea Level to Ground level (At Slot - Slot #08)	-1271ft		
Patterson 579 (RKB) to Mean Sea Level	1247ft		

Well Profile Data					
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	VS (ft)
Top On	5570.00	22.220	235.460	5363.93	-217.81
Proj. To Bottom	5639.00	22.220	235.460	5427.81	-222.55
End of 3D Arc	5659.34	22.822	235.198	5446.00	-334.73
Curve KOP	7270.89	22.822	235.198	6931.99	-1060.22
70 Deg	8025.72	70.000	134.992	7492.45	-1483.39
Landing Pt.	8225.72	90.000	134.992	7527.00	-1621.94
BHL	20124.92	90.000	134.992	7527.00	-10094.81
					7143.72
					0.00
					12146.70

As Drilled Target Details					
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	VS (ft)
Landing Pt.	8010.00	67.66	138.49	7480.18	-1482.25
Deepest TVD	18186.00	90.12	134.07	7597.64	-6682.56
Last MWD Survey	20090.00	92.37	135.26	7547.35	-10022.30
Projection to TD	20115.00	92.37	135.26	7546.31	-10040.04
					7136.98
					12145.63

Well Data		
Slot	Well	Wellbore
Slot #08	Crands Unit 8H	Crands Unit 8H PWB
Slot #08	Crands Unit 8H	Crands Unit 8H PWB
		Crands Unit 8H PWB Proj. 20115'



RECEIVED  
 Office of Oil and Gas  
 MAY 14 2020  
 WV Department of  
 Environmental Protection



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/12/2020
Job End Date:	3/10/2020
State:	West Virginia
County:	Marion
API Number:	47-049-02486-00-00
Operator Name:	XTO Energy/ExxonMobil
Well Name and Number:	Crands Unit 8H
Latitude:	39.47644100
Longitude:	-80.30617600
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,546
Total Base Water Volume (gal):	22,042,650
Total Base Non Water Volume:	0



## 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	7732-18-5	100.00000	87.91933	None
Sand	JPP	Proppant	Crystalline Silica in the form of Quartz	14808-60-7	99.90000	11.37312	None
HCL Acid (15%)	JPP	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.08879	None
K-BAC 1005	JPP	Biocide	Polyethylene glycol	25322-68-3	50.00000	0.00990	None
			Water	7732-18-5	44.30000	0.00877	None
			2,2-Dibromo-3-nitropropionamide	10222-01-2	5.80000	0.00114	None
FR-3	JPP	Friction reducer	Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01267	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.50000	0.00095	None
			Oleic Acid Diethanolamide	93-83-4	1.50000	0.00095	None
			Alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00063	None
Scale Hib PE-18	JPP	Scale Inhibitor					

RECEIVED  
Office of Oil and Gas  
MAY 14 2020  
WV Department of  
Environmental Protection

			Ethylene glycol	107-21-1	40.00000	0.00758	None
			Proprietary Scale Inhibitor	Proprietary	30.00000	0.00568	None
PlexLube G	UPP	Friction Reducer	Graphite	7782-42-5	40.00000	0.00066	None
			Quartz (SiO2)	14808-60-7	1.00000	0.00002	None
Unihib G	UPP	Acid inhibitor	Butyl diglycol	112-34-5	75.00000	0.00034	None
			Alcohols, C10-16, ethoxylated	68002-97-1	50.00000	0.00023	None
			Methanol	67-56-1	5.00000	0.00002	None
			Thiourea	62-56-6	1.00000	0.00000	None
			Formaldehyde	50-00-0	1.00000	0.00000	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.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Polyethylene glycol	25322-68-3	50.00000	0.00990	
			Water	7732-18-5	44.30000	0.00877	
			Ethylene glycol	107-21-1	40.00000	0.00758	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.50000	0.00095	
			Oleic Acid Diethanolamide	93-83-4	1.50000	0.00095	
			Alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00063	
			Alcohols, C10-16, ethoxylated	68002-97-1	50.00000	0.00023	
			Methanol	67-56-1	5.00000	0.00002	
			Quartz (SiO2)	14808-60-7	1.00000	0.00002	
			Thiourea	62-56-6	1.00000	0.00000	
			Formaldehyde	50-00-0	1.00000	0.00000	

\* 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 and Gas  
MAY 14 2020  
WV Department of  
Environmental Protection