

06/07/2019



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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Tuesday, June 4, 2019  
WELL WORK PERMIT  
Horizontal 6A / New Drill

XTO ENERGY, INC.  
810 HOUSTON STREET

FORT WORTH, TX 76102

Re: Permit approval for CRANDS UNIT 8H  
47-049-02486-00-00

This well work permit 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 any additional specific 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 of 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.

Per 35 CSR 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- 0450.

James A. Martin  
Chief

Operator's Well Number: CRANDS UNIT 8H  
Farm Name: ROCHESTER & PITTSBURGH  
U.S. WELL NUMBER: 47-049-02486-00-00  
Horizontal 6A New Drill  
Date Issued: 6/4/2019

Promoting a healthy environment.

# 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 one hundred (100) 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. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. 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.
10. 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.

API Number: 06/07/2019

**PERMIT CONDITIONS 4704902486**

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to [DEPOOGNotify@wv.gov](mailto:DEPOOGNotify@wv.gov).



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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
Fax: (304) 926-0452

Austin Caperton, Cabinet Secretary  
dep.wv.gov

**ORDER  
ISSUED UNDER  
WEST VIRGINIA CODE, CHAPTER 22, ARTICLE 6A**

TO: XTO Energy, Inc.  
810 Houston Street  
Fort Worth, TX 76102

DATE: May 28, 2019  
ORDER NO.: 2019-W-9

**INTRODUCTION**

This Order (hereinafter “Order”) is issued by the Office of Oil and Gas (hereinafter “OOG”), by and through its Chief, pursuant to the authority of W. Va. Code §§ 22-1-1, 22-6-1 and 22-6A-1 *et seq.* to XTO Energy, Inc. (hereinafter “XTO” or “Operator”), collectively the “Parties.”

**FINDINGS OF THE CHIEF**

In support of this Order, the Chief hereby finds the following:

1. OOG, an office within the West Virginia Department of Environmental Protection, is the agency with the duty and authority to execute and enforce W. Va. Code §22-6-1 and §22-6A-1 *et seq.*, and the rules and regulations promulgated thereunder.
2. XTO is a “person” as defined by W. Va. Code §22-6-1(n), with a corporate address as 810 Houston Street, Fort Worth, Texas 76102
3. On November 19, 2018, XTO submitted well work permit applications identified as API numbers 47-049-049-02486, 47-049-049-02487, 47-049-049-02488, 47-049-049-02489 and 47-049-049-02490. The proposed wells are to be located on the Sands Pad in Lincoln District of Marion County, West Virginia.
4. On November 19, 2018, XTO requested a waiver for wetlands A, B, C, D and F as outlined in Attachment 1, from well location restriction requirements in W. Va. Code §22-6A-12(b) for the well work permit applications identified as API numbers 47-049-049-02486, 47-049-049-02487, 47-049-049-02488, 47-049-049-02489 and 47-049-049-02490.

### CONCLUSIONS OF LAW

1. West Virginia Code §22-1-6(d) requires, in part, that “in addition to other powers, duties and responsibilities granted and assigned to the secretary by this chapter, the secretary is authorized and empowered to... (3) Enter private lands to make surveys and inspections for environmental protection purposes; to investigate for violations of statutes or rules which the Office of Oil and Gas is charged with enforcing; to serve and execute warrants and processes; to make arrests; issue orders, which for the purposes of this chapter include consent agreements; and to otherwise enforce the statutes or rules which the Office of Oil and Gas is charged with enforcing.”
2. West Virginia Code §22-6A-2(a)(6) requires, in part, that “Concomitant with the broad powers to condition the issuance of well work permits, the secretary should also have broad authority to waive certain minimum requirements of this article when, in his or her discretion, such waiver is appropriate: *Provided*, That the secretary shall submit a written report of the number of waivers granted to the Legislature commencing January 1, 2013, and each year thereafter.”
3. West Virginia Code §22-6A-12(b) requires, in part, that “no well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the Office of Oil and Gas shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The Office of Oil and Gas may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary.”

**ORDER**

West Virginia Code §22-6A-12(b) requires, in part, that “no well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland. The Office of Oil and Gas grants the request for a waiver for wetlands A, B, C, D and F from well location restriction requirements in W. Va. Code §22-6A-12(b) for the well work permit applications identified as API numbers 47-049-049-02486, 47-049-049-02487, 47-049-049-02488, 47-049-049-02489 and 47-049-049-02490. The Office of Oil and Gas hereby **ORDERS** that XTO shall meet the following site construction and operational requirements for the Crim Well Pad:

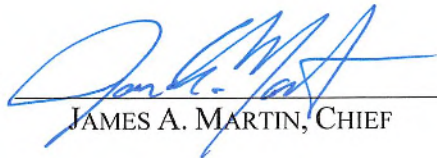
- a. A berm shall be constructed around the perimeter of the pad to contain any potential spills and storm water runoff. Berm is to be at least twenty-four inches (24”) in height;
- b. Erosion control blankets shall be installed on all slopes and down gradient locations of the pad as erosion and sediment controlling BMPs;
- c. Wetlands A, B, C, D and F are not at risk for sedimentation due to the location upslope of the well pad.
- d. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
- e. Drill cuttings and associated drilling mud shall be disposed of in a permitted landfill;
- f. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
- g. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
- h. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
- i. Inspections of the storm water and spill prevention measures shall be conducted after any major storm event defined as a half inch (½”) rain within any twenty-four (24) hour period;
- j. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
- k. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 28th day of May, 2019.

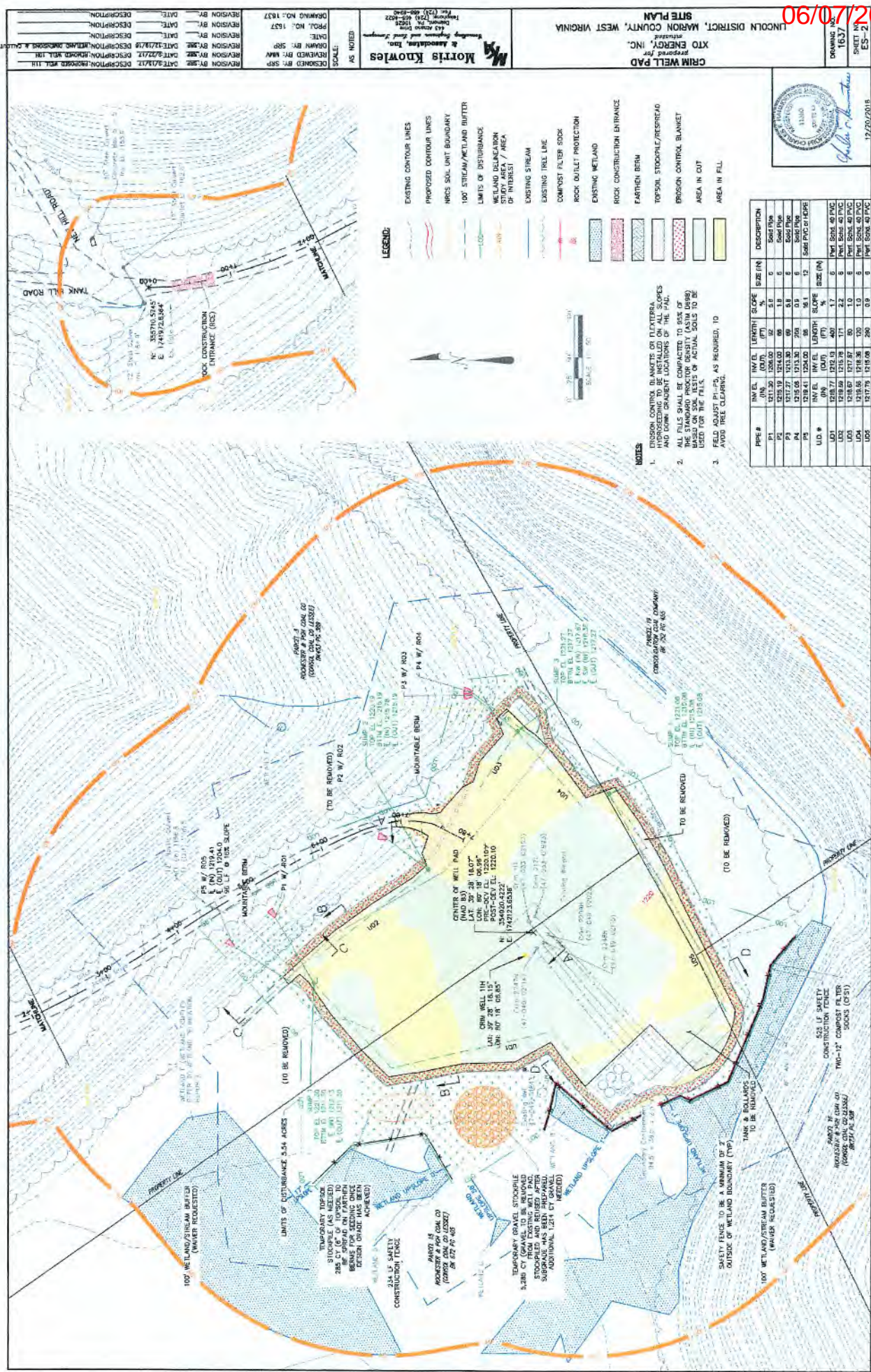
IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

By:



JAMES A. MARTIN, CHIEF



| REVISION BY:     | DATE:          | DESCRIPTION:                                 |
|------------------|----------------|--|
| REVISION BY: SRP | DATE: 12/12/18 | DESCRIPTION: REVISION TO WETLAND DELINEATION |
| REVISION BY: SRP | DATE: 12/12/18 | DESCRIPTION: REVISION TO WETLAND DELINEATION |
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**Morris Knowles**  
 Surveying, Engineering and Land Management  
 445 West 10th Street  
 Lincoln, NE 68502  
 Tel: (402) 466-8940

**CRIM WELL PAD**  
 SITED FOR  
 XTO ENERGY, INC.  
 MARION COUNTY, WEST VIRGINIA  
 LINCOLN DISTRICT, MARION COUNTY, WEST VIRGINIA

DRAWING NO. 1637  
 SHEET NO. ES-2  
 12/20/2018

| PIPE # | IN (IN) | IN (FT) | LENGTH (FT) | SLOPE (%) | SIZE (IN) | DESCRIPTION      |
|--------|---------|---------|-------------|-----------|-----------|------------------|
| P1     | 1211.50 | 1205.00 | 65          | 5.0       | 6         | SOIL PIPE        |
| P2     | 1217.37 | 1213.30 | 40          | 5.8       | 6         | SOIL PIPE        |
| P3     | 1215.05 | 1213.30 | 175         | 0.9       | 6         | SOIL PIPE        |
| P4     | 1215.05 | 1213.30 | 750         | 0.9       | 6         | SOIL PIPE        |
| P5     | 1219.41 | 1224.00 | 45          | 16.1      | 12        | SOIL PIPE        |
| U.D. # | INV EL. | LENGTH  | SLOPE       | SIZE (IN) |           |                  |
| U01    | 1210.77 | 1212.19 | 140         | 1.7       | 6         | PRECAST CONCRETE |
| U02    | 1218.89 | 1219.98 | 111         | 2.2       | 6         | PRECAST CONCRETE |
| U03    | 1218.87 | 1217.97 | 90          | 1.0       | 6         | PRECAST CONCRETE |
| U04    | 1218.86 | 1219.98 | 100         | 1.9       | 6         | PRECAST CONCRETE |
| U05    | 1217.73 | 1219.98 | 226         | 0.9       | 6         | PRECAST CONCRETE |

- NOTES**
- EROSION CONTROL BLANKETS OR PLUTERRA HYDROSEEDING TO BE INSTALLED ON ALL SLOPES AND SURROUNDING AREAS TO THE PAD. THE STANDARD PROCTOR RESIST (ASTM D698) BASED ON SOIL TESTS OF ACTUAL SOILS TO BE USED FOR THE FILL.
  - FIELD ADJUST PH-P5, AS REQUIRED, TO AVOID TREE CLIPPING.

- LEGEND:**
- EXISTING CONTOUR LINES
  - PROPOSED CONTOUR LINES
  - MRES SOIL UNIT BOUNDARY
  - 100' STREAM/WETLAND BUFFER
  - LIMITS OF DISTURBANCE
  - WETLAND DELINEATION STUDY AREA / AREA OF INTEREST
  - EXISTING STREAM
  - EXISTING TIRE LINE
  - COMPOST FILTER SOCK
  - ROCK OUTLET PROTECTION
  - EXISTING WETLAND
  - ROCK CONSTRUCTION ENTRANCE
  - FARTHEN BERM
  - TOPSOIL STOCKPILE/RESERVE/0
  - EROSION CONTROL BLANKET
  - AREA IN CUT
  - AREA IN FILL



TEMPORARY GRAVEL STOCKPILE  
 5,285 CY FROM EXISTING WELLS PAD  
 STOCKPILED AND RETIRED AFTER  
 SUSPENDED. TO BE REMOVED  
 ADDITIONAL 1,251 CY GRAVEL  
 (NEEDED)

525 LF SAFETY  
 CONSTRUCTION FENCE

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)

100' WETLAND/STREAM BUFFER  
 (WATER REQUESTED)



06/07/2019

11/3/14

Wetland and Perennial Stream Waiver Request

API Number: \_\_\_\_\_

Operator's Well Number: Crim

Well Operator: XTO Energy, Inc.

Well Number: Crim

Well Pad Name: Crim Well Pad

County, District, Quadrangle of Well Location: Marion County, Lincoln District, Shinnston Quadrangle

**Answer the questions below to request a waiver from West Virginia Department of Environmental Protection for any wetlands or perennial streams which lie within one hundred feet of proposed project Limit of Disturbance (LOD), which includes any erosion and sediment control devices to be used.**

**This waiver shall be requested pursuant to Chapter 22 Article 6A Section 12 of West Virginia Code, which states:**

§22-6A-12(b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows:

- (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir.
- (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake.
- (3) For a groundwater source, the distance shall be measured from the wellhead or spring.

The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary.

§22-6A-12(c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section.

Answer in the space provided, or use additional pages as necessary to fully answer the questions below:

1. Describe the proposed project location, including unique identifying names of all wetlands, and the names of perennial streams for which the waiver is sought.

The project is located at the site of an existing gravel drive and well pad south of the New Hill Road and Tank Hill Road intersection.

The disturbance proposed is for the purpose of enclosing the pad within an earthen berm and installing an underdrain system.

There are several wetlands located within the wetland delineation study area, all of which are located outside the limits of disturbance.

Wetlands could not be at risk of sedimentation or impact since they are located upslope of the well pad.

2. Justify the proposed activity by describing alternatives to this project that were considered.

- a. Include a No-Action Alternative as to show "the future without the project"
- b. Location Alternatives must be shown
- c. Must demonstrate why a one hundred foot buffer cannot be maintained
- d. Describe how the proposed project is the least environmentally damaging practicable alternative

The proposed pad was placed at the flattest part of the site. The drive and well pad are located on a parcel developed by XTO Energy, Inc. prior to the WVDEP 100' offset restrictions from wetlands and streams. There is no other viable design of the site within the property.

Due to the location of the existing well pad, work will be performed within the 100' buffer. Proposed slopes are 2:1 and will be protected with a combination of erosion control blanketing and compost filter sock until a permanent vegetated stabilization has been achieved. No streams or wetlands will be disturbed and they will be monitored to make sure the erosion and sedimentation controls are working as designed.

- 3. Identify sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. This description should include all additional erosion and sediment control measures and devices that will be used.**

The well site was designed with containment to prevent any contaminated water from leaving the well pad. Best Management Practices including compost filter sock, erosion control blanketing, riprap aprons, and temporary and permanent seeding has been designed to be implemented to prevent any sediment from leaving the site during construction. All BMPs will remain in place and maintained until the permanent seeding has reached 70% vegetated cover and is sufficient to prevent erosion.

- 4. Provide mapping, plans, specifications and design analysis for the preferred alternative to the project.**

- a. Specify in writing what additional controls, measures, devices, monitoring, etc. will be used to protect these wetlands and/or perennial streams for which the waiver is sought.

All erosion and sedimentation controls will be inspected weekly and after each storm event to ensure they are working properly. The surrounding streams and wetlands will be inspected visually for signs of sediment pollution. If any sediment pollution is observed, the source will be identified and additional BMPs will be installed to protect the resources.



WW-6B  
(04/15)

API NO. 47- \_\_\_\_\_ - **06/07/2019**  
 OPERATOR WELL NO. Grands Unit 8H  
 Well Pad Name: Crim Pad

18) **CASING AND TUBING PROGRAM**

| TYPE         | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|-----------|-------------|-------|------------------------|----------------------------|------------------------------|-------------------------------|
| Conductor    | 24        | New         | PE&B  | 95                     | 40                         | 40                           | 59 / CTS                      |
| Fresh Water  | 13.375    | New         | H40   | 48                     | 520                        | 520                          | 470 / CTS                     |
| Coal         |           |             |       |                        |                            |                              |                               |
| Intermediate | 9.625     | New         | J55   | 36                     | 3,150                      | 3,150                        | 1,283 / CTS                   |
| Production   | 5.5       | New         | P110  | 20                     | 20,202                     | 20,202                       | 4,126 / 6,347                 |
| Tubing       |           |             |       |                        |                            |                              |                               |
| Liners       |           |             |       |                        |                            |                              |                               |

*SDW  
11/15/2018*

| TYPE         | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type              | Cement Yield (cu. ft./k) |
|--------------|-----------|------------------------|---------------------|----------------------|--|--------------------------|--------------------------|
| Conductor    | 24        | 28                     | 0.375               | 940                  | 40                                       | Standard                 | 1.19                     |
| Fresh Water  | 13.375    | 17.5                   | 0.33                | 1,730                | 430                                      | Standard                 | 1.19                     |
| Coal         |           |                        |                     |                      |  |                          |                          |
| Intermediate | 9.625     | 12.25                  | 0.352               | 3,520                | 2,560                                    | Standard                 | 1.19                     |
| Production   | 5.5       | 8.5                    | 0.361               | 12,640               | 6,140                                    | 35.65 POZ / Class H Tail | 1.13 / 1.18              |
| Tubing       |           |                        |                     |                      |  |                          |                          |
| Liners       |           |                        |                     |                      |  |                          |                          |

**PACKERS**

|             |  |  |  |  |
|-------------|--|--|--|--|
| Kind:       |  |  |  |  |
| Sizes:      |  |  |  |  |
| Depths Set: |  |  |  |  |

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Office of Oil and Gas

NOV 19 2018

WV Department of  
Environmental Protection

WW-6B  
(10/14)

API NO. 47- \_\_\_\_\_ - **06/07/2019**  
 OPERATOR WELL NO. Crands Unit 8H  
 Well Pad Name: Crim Pad

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.  
 2. Sand / Proppant Stages - Several stages of pumping water combined with sand at a targeted 80 bpm rate. The highest pressure and rate anticipated is 9,500 psig and 100 bpm. The sand size may vary from 100 mesh to 30/50 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 1,190 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): 5.47+/-

22) Area to be disturbed for well pad only, less access road (acres): 3.5+/-

23) Describe centralizer placement for each casing string:

Conductor: None  
 Fresh Water: Every 3rd joint from shoe to surface  
 Mine: Every 3rd joint from shoe to surface (if applicable)  
 Intermediate: Every 3rd joint from shoe to surface  
 Production: Every 3rd joint from shoe to 1,000' above the kick-off point

24) Describe all cement additives associated with each cement type:

Conductor: None  
 Fresh Water: Calcium Chloride and super flake  
 Mine: Calcium Chloride and super flake (if applicable)  
 Intermediate: Calcium Chloride and super flake  
 Production: Calcium Chloride, Bentonite, super flake, Air-Out, CR-1, FL-300, SEC10

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 Office of Oil and Gas  
 NOV 19 2018  
 WV Department of  
 Environmental Protection

25) Proposed borehole conditioning procedures:

Conductor: Hole is auger drilled: No conditioning required.  
 Fresh Water: Condition hole with air at TD until visibly clean, run casing, circulate and clear 1.5x pipe volume with fresh water before cementing.  
 Mine: Condition hole with air at TD until visibly clean, run casing, circulate and clear 1.5x pipe volume with water before cementing (if applicable).  
 Intermediate: Condition hole with air at TD until visibly clean, run casing, circulate and clear 1.5x pipe volume with water before cementing.  
 Production: Circulate hole with synthetic based drilling fluid at TD (1 bottoms up for each 2,000' of lateral drilled). TOOH and circulate minimum of 1 bottoms up and until returns are minimal at the base of the curve. Run casing, circulate and ensure good returns before cementing.

\*Note: Attach additional sheets as needed.

4704902486

**Crands 8H – Mine Void Encounter Plan**

Per communications with the WV Geology and Economic Survey there is a possible mine void in the Pittsburgh Coal seam under the Crim Pad in Marion County, WV. In preparation for drilling through a mine void, we will nipple up an annular preventer to be able to handle any flow should the void actually be encountered. We expect it to come in around 466' TVD from GL. We plan to set 13 3/8" casing as a surface/coal protective string ~50' below the base of this void. 06/07/2019

A cement basket will be run as close as possible to the top of the void.

A cement balance job will be performed to cement the shoe and the annulus below the mine if circulation cannot be established. A grout cement job will be performed on the annulus to cement above the mine.

Once cemented in place, we will continue on with our normal casing design, which would be to set 9 5/8" intermediate casing at ~3,150'.

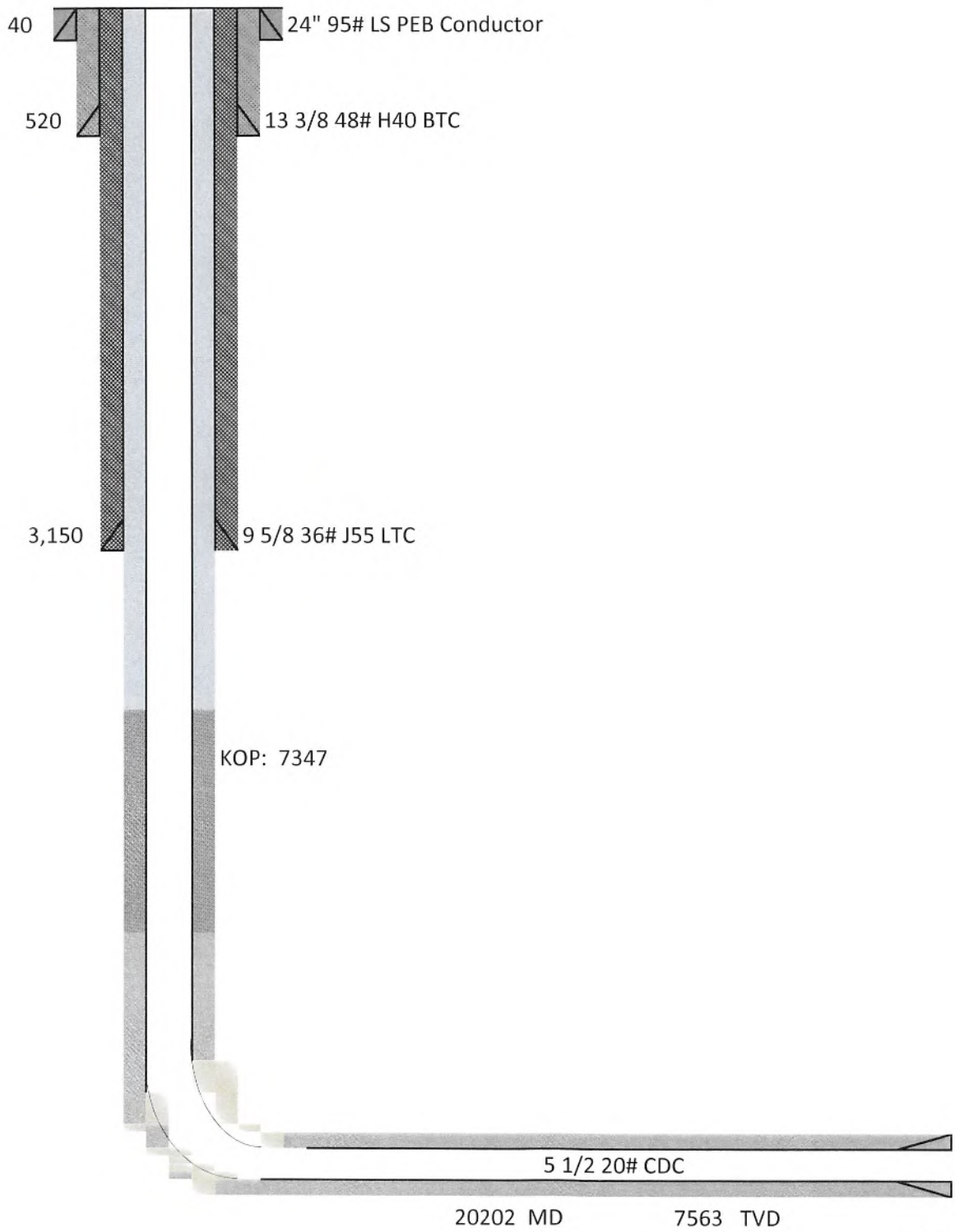
Derek Ridgway  
Drilling Engineer  
XTO Appalachia  
Cell: 878-208-3446  
Derek\_Ridgway@xtoenergy.com

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NOV 19 2018  
WV Department of  
Environmental Protection

Crands 8H  
Marion County, West Virginia



06/07/2019



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WV Department of  
Environmental Protection



Crands Unit 8H

| Operator                 | API#       | Elevation | Total Depth | Producing Zones   | Perforated Depths   | Producing Zone Depths | Producing Zones Not Perforated | Known or reasonably expected to penetrate a depth that could be within the range of the fracture propagation? |
|--------------------------|------------|-----------|-------------|---|---------------------|-----------------------|--------------------------------|---|
| XTO Energy Inc.          | 4704902153 | 1,221'    | 7,521'      | Marcellus   | 9,512' - 10,467' MD | 9,512' - 10,467' MD   | NA                             | XTO operates and will monitor   |
| XTO Energy Inc.          | 4704901993 | 1,221'    | 7,568'      | Marcellus   | 7,508' - 7,544'     | 7,508' - 7,544'       | NA                             | XTO operates and will monitor   |
| XTO Energy Inc.          | 4704901980 | NA        | NA          | Plugged   | Plugged             | Plugged               | Plugged                        | Plugged   |
| XTO Energy Inc.          | 4704901981 | NA        | NA          | Never Drilled   | Never Drilled       | Never Drilled         | Never Drilled                  | Never Drilled   |
| XTO Energy Inc.          | 4704902114 | 1,220'    | 7,464'      | Marcellus   | 8,910' - 11,274' MD | 8,910' - 11,274' MD   | NA                             | XTO operates and will monitor   |
| XTO Energy Inc.          | 4704901823 | 1,225'    | 4,206'      | Big Injun, 30/50 Foot, Gordon, 5th Sand, U. Balltown, L. Bradford | 1,896' - 3,919'     | 1,896' - 3,919'       | NA                             | No  |
| XTO Energy Inc.          | 4704902115 | 1,220'    | 7,422'      | Marcellus   | 8,657' - 11,044' MD | 8,657' - 11,044' MD   | NA                             | XTO operates and will monitor   |
| XTO Energy Inc.          | 4704902022 | 1,221'    | 7,428'      | Marcellus   | 7,814' - 10,564' MD | 7,814' - 10,564' MD   | NA                             | XTO operates and will monitor   |
| Waco Oil & Gas Co., Inc. | 4704901499 | 1,461'    | 4,236'      | 5th Sand, 30', 50', Big Injun                                     | 2,083' - 3,076'     | 2,083' - 3,076'       | NA                             | No  |
| XTO Energy Inc.          | 4704901490 | 1,317'    | 4,459'      | BF, BA, TF, FF, BI  | 1,986' - 4,240'     | 1,986' - 4,240'       | NA                             | No  |
| XTO Energy Inc.          | 4704901513 | 1,333'    | 3,158'      | Fifth Sand  | 2,954' - 2,960'     | 2,954' - 2,960'       | NA                             | No  |
| Waco Oil & Gas Co., Inc. | 4704901708 | 1,277'    | 4,352'      | TF, BA, BF  | 2,500' - 4,310'     | 2,500' - 4,310'       | NA                             | No  |
| Waco Oil & Gas Co., Inc. | 4704901497 | 1,284'    | 5,259'      | BN, BD, BT, SL, FM, TF, FF  | 2,906' - 5,046'     | 2,906' - 5,046'       | NA                             | No  |
| Waco Oil & Gas Co., Inc. | 4704901994 | NA        | NA          | Never Drilled   | Never Drilled       | Never Drilled         | Never Drilled                  | Never Drilled   |
| Waco Oil & Gas Co., Inc. | 4704901496 | 1,273'    | 4,445'      | BD, BT, FM, TF, GA, BI  | 1,942' - 4,230'     | 1,942' - 4,230'       | NA                             | No  |
| Waco Oil & Gas Co., Inc. | 4704901583 | 1,305'    | 4,174'      | BT, SL, FM, 30', 50', BI  | 1,898' - 3,932'     | 1,898' - 3,932'       | NA                             | No  |
| Waco Oil & Gas Co., Inc. | 4704901500 | 1,128'    | 4,173'      | BD, BT, SY, 4th Sand, FF, TF                                      | 2,222' - 4,004'     | 2,222' - 4,004'       | NA                             | No  |

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Environmental Protection

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WW-9  
(4/16)

API Number 47 - \_\_\_\_\_ - \_\_\_\_\_  
Operator's Well No. Grands Unit 8H

**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) Lower West Fork River (0502000206) Quadrangle Shinnston

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: \_\_\_\_\_

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? NA

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number 4708509721, 4708505151, 3416729577, 3412124086, 3412123995 )
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

*See 11/15/18*

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 well (vertical and horizontal)? Air, freshwater, oil based, etc. Air/water to 7100', then switch to synthetic

-If oil based, what type? Synthetic, petroleum, etc. Synthetic

Additives to be used in drilling medium? See additional page

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) NA

-Landfill or offsite name/permit number? Meadowbrook Landfill - #SWF 1032

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature *Tim Sands*  
Company Official (Typed Name) Tim Sands  
Company Official Title Regulatory Coordinator

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NOV 19 2018  
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Environmental Protection

Subscribed and sworn before me this 14<sup>th</sup> day of November, 2018

*Yvonne A. Dutchess* Notary Public

My commission expires July 09, 2023



06/07/2019

Form WW-9

Operator's Well No. Crands Unit 8H

XTO Energy Inc.

Proposed Revegetation Treatment: Acres Disturbed 5.47+/- Prevegetation pH

Lime 2 Tons/acre or to correct to pH

Fertilizer type 10-20-10

Fertilizer amount 1000 lbs/acre

Mulch 2 Tons/acre

Seed Mixtures

Temporary

Permanent

| Seed Type       | lbs/acre |
|-----------------|----------|
| Annual Ryegrass | 40       |
|                 |          |
|                 |          |

| Seed Type       | lbs/acre |
|-----------------|----------|
| Ryegrass Ladino | 50       |
| Clover          | 5        |
| Redtop          | 5        |

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: Pre-seed/mulch all disturbed areas as soon as reasonably possible per regulation. Upgrade E&S as necessary per WV DEP E&S manual.

Title: BOG Inspector

Date: 11/15/2018

Field Reviewed? (X) Yes ( ) No

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**XTO Drilling Additives**

06/07/2019

| Product Name             | CAS#                 |
|--------------------------|----------------------|
| Anco Mul XL              | 8002-43-5            |
| Kensol 48H               | 64742-47-8           |
| ANCO BAR (Barite)        | 7727-43-7            |
| ANCO Drill (A, N)        | 25083-02-03          |
| Anco Mul Ow              | 68442-77-3           |
| Anco Mul P               | 70321-73-2           |
| Anco Mul S               | 71.36-3 & 64742-95-6 |
| Anco Mul Thin            | 111-76-2             |
|                          | 112-34-5             |
|                          | 104-76-7             |
|                          | 84989-14-0           |
|                          | 57-55-6              |
| ANCO Phalt S             | NA                   |
| ANCO Trol                | NA                   |
| Calcium Carbonate        | 14808-60-7           |
|                          | 1317-65-3            |
| Calcium Chloride         | 10043-52-4           |
| Cedar Fiber              | 11132-73-3           |
| CI-300A                  | NA                   |
| Graphite                 | 7782-42-5            |
|                          | 14808-60-7           |
| GSX-602 Petrogel 100     | 14808-60-7           |
|                          | 67-63-0              |
| Lime                     | 1305-62-0            |
|                          | 1305-78-8            |
|                          | 7631-86-9            |
|                          | 1309-48-4            |
| Mica (F,C)               | 12001-26-2           |
|                          | 14808-60-7           |
| Oil Dry                  | 12174-11-7           |
|                          | 14808-60-7           |
| Potassium Chloride (KCl) | 7447-40-7            |
| Salt                     | 7647-14-5            |
| Synthetic Based Mud      |                      |
| Thunder Plug             |                      |
| Walnut ( F,M & C)        | NA                   |
| Claytone II              |                      |

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06/07/2019

Revised (3/15)

## Site Safety Plan Table of Contents

### For H6A Well Work Permits and Deep Well Work Permits

Please prepare a Site Safety Plan to accompany each applicable H6A and/or Deep well work permit, adhering to the following organizational and informational structure. Plans submitted must contain an index of the content entirety including page-number references.

#### 1. Contacts, Schedules, and Meetings

- A. Emergency point of contact for the well operator covering all phases of activities and including 24 hour contact information (35-8 5.7.b.4)
- B. List of telephone numbers for (35-8 5.6.4):
  - 1) Operator
  - 2) Contractors
  - 3) DEP office and oil/gas inspector
  - 4) Local emergency response units
  - 5) Local ER personnel
  - 6) All schools and public facilities within a one mile radius of proposed well site (35-8 5.7.b.5)
- C. Method of notification of public of H<sub>2</sub>S gas presence and how access will be controlled. (applicable horizontal wells include all residents and emergency response personnel who may be affected by an event. Such events may include the presence of H<sub>2</sub>S, blow-outs, and flaring) (35-8 5.7.f.1)
- D. Pre-spud meeting held prior to drilling operations, including (35-8 5.7.h):
  - 1) Attendance log, including personnel to be employed and involved in drilling operations
  - 2) Notification of County oil and gas inspector or other designated Office of Oil and Gas representative
- E. Describe schedule for conducting regular well site safety meetings. Log attendance at all meetings and also initiate check in check out during drilling, completion, and workover phases. (35-8 5.7.h)

#### 2. Maps and Diagrams

- A. Plan view map of location, access road, pit(s), flare lines, nearby dwellings, note the north direction and the prevailing wind direction (35-8 5.7.b.1)
- B. Topographic map of well location, including
  - 1) 1 mile radius of well location
  - 2) UTM NAD 83 coordinates of well site entrance (35-8 5.7.b.2)
  - 3) UTM NAD 83 coordinates of the point the access road intersects the public route (35-8 5.7.b.2)
  - 4) Identify public route number and/or route name (35-8 5.7.b.2)
- C. Evacuation plan for the removal of personnel from the drilling location and residents in the surrounding area who have the potential to be affected by an emergency. (35-8 5.7.b.3)

#### 3. Well Work

- A. Detailed written descriptions of well work and procedure to be used during the drilling, completion, and production phases, including schematic plan views of each (35-8 5.7.a)
- B. Statement detailing how a copy of the plan will be provided to the local emergency planning committee or county emergency services office within at least 7 days from land disturbance or well work. (35-8 5.7.a)




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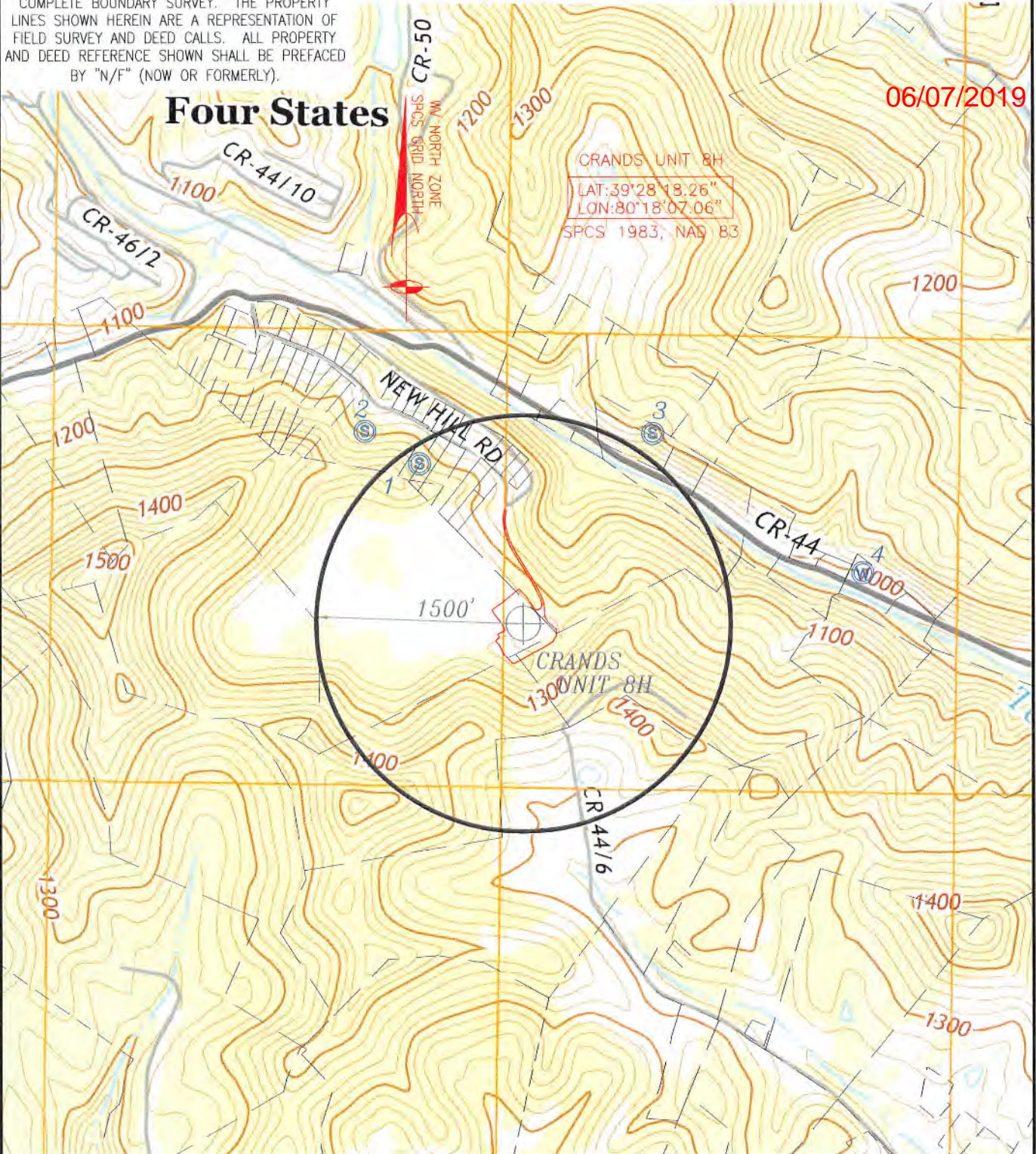
SDW  
 11/15/2018

FORM W-9

NOTE: THIS PLAT IS FOR WELL LOCATION PURPOSES ONLY AND DOES NOT REPRESENT A COMPLETE BOUNDARY SURVEY. THE PROPERTY LINES SHOWN HEREIN ARE A REPRESENTATION OF FIELD SURVEY AND DEED CALLS. ALL PROPERTY AND DEED REFERENCE SHOWN SHALL BE PREFACED BY "N/F" (NOW OR FORMERLY).

LEGEND

-  WATER WELL
-  SPRING/POND/STREAM
-  SURFACE BOUNDARY



06/07/2019


| POINT | NAME                   | ADDRESS              | CITY        | STATE | ZIP CODE | DISTANCE | BEARING       | PARCEL I.D.               |
|-------|------------------------|----------------------|-------------|-------|----------|----------|---------------|---------------------------|
| 1     | Perry E. Heflin        | P.O. Box 155         | Four States | WV    | 26572    | 1376'    | N 32°56'24" W | Tax Map 11-54, Parcel 29  |
| 2     | Jimmie & Betty Garrett | P.O. Box 54          | Four States | WV    | 26572    | 1798'    | N 39°28'32" W | Tax Map 11-54, Parcel 30  |
| 3     | Douglas Moyer          | 78 Dora Lane         | Worthington | WV    | 26591    | 1664'    | N 34°17'48" E | Tax Map 11-29, Parcel 9.2 |
| 4     | Gary A. Eagle          | 868 Four States Road | Worthington | WV    | 26591    | 2483'    | N 81°30'56" E | Tax Map 11-29, Parcel 10  |

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CRANDS UNIT 8H WATER OVERALL

LINCOLN DISTRICT, MARION COUNTY, WEST VIRGINIA | 9/12/2018 | JC2018-78 | SHEET 1 OF 2

**JONES**  
CONSULTANTS  
2402 PENNSYLVANIA 66  
DELMONT, PA 15626  
(724) 757 - 2417  
www.jonesconsultant.com

Shinnston Quad (2014)  
Marion County, WV  
Scale: 1" = 1000'  
0' 1000'  


**XTO**  
ENERGY  
190 THORN HILL ROAD  
WARRENDALE, PA 15086

BOTTOM HOLE 7531' TOP HOLE 2806'

# CRANDS UNIT 8H

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

State Plane Coordinate  
 West Virginia North

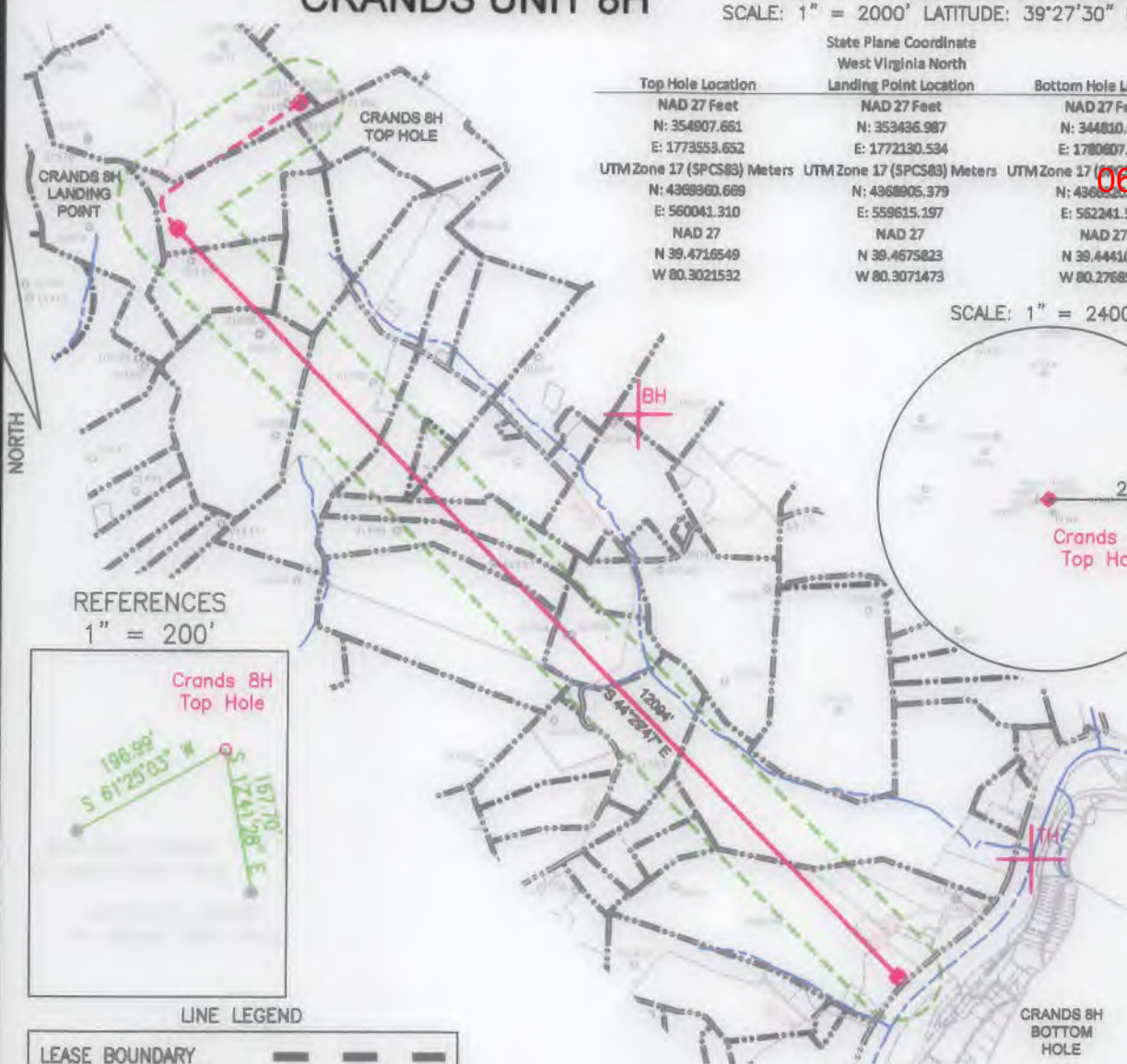
| Top Hole Location  | Landing Point Location   | Bottom Hole Location   |
|--|--|--|
| NAD 27 Feet<br>N: 354907.661<br>E: 1773553.652                 | NAD 27 Feet<br>N: 353436.987<br>E: 1772130.534                 | NAD 27 Feet<br>N: 344810.046<br>E: 1780607.078                 |
| UTM Zone 17 (SPCS83) Meters<br>N: 4368960.669<br>E: 560041.310 | UTM Zone 17 (SPCS83) Meters<br>N: 4368905.379<br>E: 559615.197 | UTM Zone 17 (SPCS83) Meters<br>N: 4368845.204<br>E: 562241.522 |
| NAD 27<br>N 39.4716549<br>W 80.3021532                         | NAD 27<br>N 39.4675823<br>W 80.3071473                         | NAD 27<br>N 39.4441026<br>W 80.2768594                         |

06/07/2019

SCALE: 1" = 2400'



5153'  
 10294'  
 SCALE: 1" = 2000' LONGITUDE: 80°17'30" (TOP HOLE)  
 SCALE: 1" = 2000' LONGITUDE: 80°15'00" (BOTTOM HOLE)



REFERENCES  
 1" = 200'



LINE LEGEND

|                     |           |
|---------------------|-----------|
| LEASE BOUNDARY      | ---       |
| SURFACE BOUNDARY    | - - - -   |
| CREEK / STREAM      | ~~~~~     |
| ROADS               | — — — —   |
| PROPOSED LATERAL    | —————     |
| APPROXIMATE CURVE   | - · - · - |
| 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 OCTOBER 2018 AND FILES PROVIDED BY XTO ENERGY INC.
6. WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP AND SURVEYED LOCATIONS OF WELLS WITHIN 500' OF WELL BORE.



2402 PENNSYLVANIA 66 DELMONT, PA 15626  
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SHEET 1 OF 2

FILE #: JC2018-78  
 DRAWING #: CRANDS UNIT 8H WELL  
 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  
 WDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304



DATE: 11/12/2018  
 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: 7,563' (TVD), 20,202' (TMD)

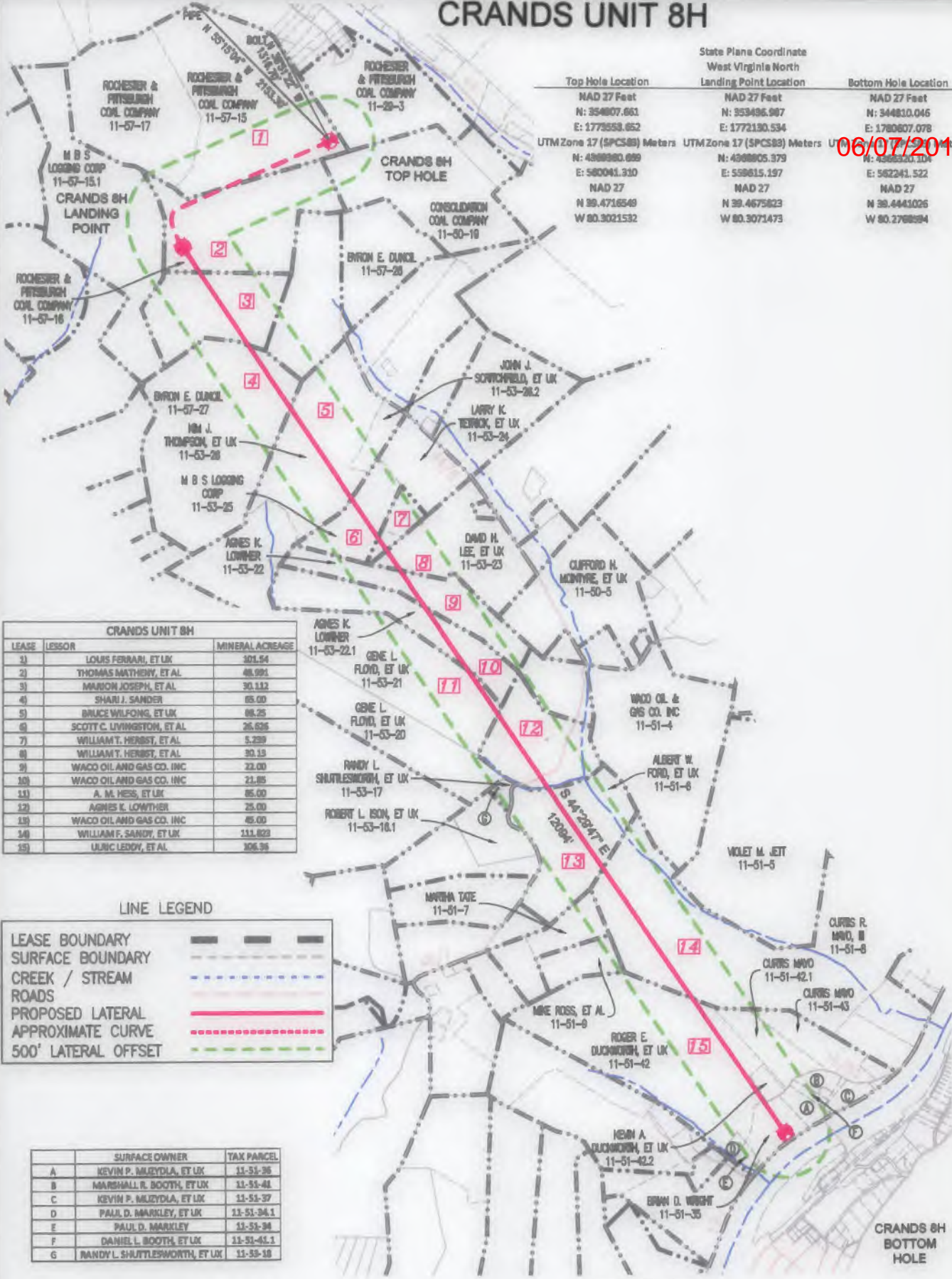
WELL OPERATOR: XTO ENERGY INC. DESIGNATED AGENT: GARY BEALL  
 Address: 190 THORN HILL ROAD Address: P.O. BOX 1008  
 City: WARRENDALE State: PA Zip Code: 15086 City: JANE LEW State: WV Zip Code: 26378

# CRANDS UNIT 8H

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: 354807.661               | N: 353496.987               | N: 344810.046               |
| E: 1779559.652              | E: 1772190.534              | E: 1780607.078              |
| UTM Zone 17 (SPCS83) Meters | UTM Zone 17 (SPCS83) Meters | UTM Zone 17 (SPCS83) Meters |
| N: 4988980.659              | N: 4988905.379              | N: 4988320.104              |
| E: 580041.910               | E: 559815.197               | E: 562241.522               |
| NAD 27                      | NAD 27                      | NAD 27                      |
| N 39.4716549                | N 39.4675823                | N 39.4441026                |
| W 80.9021532                | W 80.9071473                | W 80.2768994                |

06/07/2019



| CRANDS UNIT 8H |                            |                 |
|----------------|----------------------------|-----------------|
| LEASE          | LESSOR                     | MINERAL ACREAGE |
| 31             | LOUIS FERRARI, ET UX       | 301.54          |
| 2              | THOMAS MATHEW, ET AL       | 48.991          |
| 3              | MARION JOSEPH, ET AL       | 30.132          |
| 4              | SHARI J. SANDER            | 85.00           |
| 5              | BRUCE WILFONG, ET UX       | 88.25           |
| 6              | SCOTT C. LIVINGSTON, ET AL | 26.625          |
| 7              | WILLIAM T. HERBST, ET AL   | 5.239           |
| 8              | WILLIAM T. HERBST, ET AL   | 30.15           |
| 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. LOWMYER           | 25.00           |
| 13             | WACO OIL AND GAS CO. INC   | 45.00           |
| 14             | WILLIAM F. SANDY, ET UX    | 111.823         |
| 15             | ULBIC LEDDY, ET AL         | 306.36          |

### LINE LEGEND

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

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

### NOTES ON SURVEY

1. NO DWELLINGS WITHIN 625' WERE FOUND.
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**JONES CONSULTANTS, LLC**

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(724) 757 - 2417 www.jonesconsultant.com

### SUPPLEMENTAL SURFACE AND LESSOR EXHIBIT

### CRANDS UNIT 8H

|           |            |                              |           |
|-----------|------------|------------------------------|-----------|
| Drawn By: | Date:      | LINCOLN DISTRICT             |           |
| JRV       | 11/12/18   | MARION COUNTY, WEST VIRGINIA |           |
| Scale:    | 1" = 1500' | Sheet:                       | File No.: |
| APL #     | 1103362    | SHEET 2 OF 2                 | JC2018-78 |



**XTO ENERGY**  
190 THORN HILL ROAD  
WARRENDALE, PA 15066

0' 1500'





06/07/2019

WW-6A1  
(5/13)

Operator's Well No. Crands Unit 8H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|----------------------|-----------------------|-----------------------|---------|-----------|
|----------------------|-----------------------|-----------------------|---------|-----------|

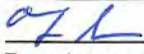
See attached

**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all other permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: XTO Energy Inc.  
 By:   
 Its: Regulatory Coordinator

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| Crands 8H Lease Ref | Lessor   | Lessee   | Royalty  | Book/Page |
|---------------------|--|--|----------|-----------|
| 1                   | Louis A. Ferrari and Patricia V. Ferarri (his wife)  | Exploration Partners, LLC to Linn Energy LLC - AB 32-151. Linn Energy LLC to XTO Energy Inc. - AB 33-200.  | Min. 1/8 | 991-100   |
| 2                   | XTO Energy Inc.  | XTO Energy Inc.  | Min. 1/8 |           |
| 2                   | Thomas Charles Matheny and Leslie Rose Matheny, his wife   | XTO Energy Inc.  | Min. 1/8 | 1055-629  |
| 2                   | Wilda C. Kelly (Widow)   | Exploration Partners, LLC to Linn Energy LLC - AB 32-151. Linn Energy LLC to XTO Energy Inc. - AB 33-200.  | Min. 1/8 | 1020-54   |
| 2                   | Louis A. Ferrari   | Exploration Partners, LLC to Linn Energy LLC - AB 32-151. Linn Energy LLC to XTO Energy Inc. - AB 33-200.  | Min. 1/8 | 1020-54   |
| 3                   | Marian Joseph  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 992-830   |
| 3                   | Marian Joseph, as Attorney-in-Fact on behalf of Josephine Joseph   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 992-832   |
| 3                   | Edna Joseph Espel  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 991-454   |
| 3                   | Margaret Joseph Doyle  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 992-834   |
| 3                   | Ronald Raad  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 993-156   |
| 3                   | David Joseph   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 993-228   |
| 3                   | Deborah Locke  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 992-54    |
| 4                   | Shari J. Sander, as Adminstratrix with the Will annexed in the Estate of Addie M. Simpson and as Power of Attorney for Edgar W. Rice | Waco Oil and Gas Co., Inc. to Linn Energy LLC - AB 25-638. Linn Energy LLC to XTO Energy Inc. - AB 33-200. | Min. 1/8 | 986-461   |
| 5                   | Bruce Wilfong and Jeanie Wilfong   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 1010-1007 |
| 6                   | Scott Clark Livingston, a single man   | XTO Energy Inc.  | Min. 1/8 | 1110-484  |
| 6                   | Kelly Marie Duncanson and Vance Duncanson, wife and husband  | XTO Energy Inc.  | Min. 1/8 | 1110-487  |
| 6                   | Rachel Jean Livingston, a single woman   | XTO Energy Inc.  | Min. 1/8 | 1110-478  |
| 6                   | Dennis Jay Livingston and Lou Jean Livingston, husband and wife  | XTO Energy Inc.  | Min. 1/8 | 1110-481  |
| 7                   | William Tracy Herbst   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 995-607   |
| 7                   | Lloyd Tetrick, Attorney-in-Fact on behalf of Clifford M. Tetrick   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 994-286   |
| 7                   | Sandra Saunders  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 996-136   |
| 7                   | Clarice Manera   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 991-58    |
| 7                   | Gary Morris, Special Commissioner, in Case Number 04-C-340   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 1003-429  |
| 7                   | April Munday   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 997-724   |
| 7                   | Melody Vincent   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 996-785   |
| 7                   | Perry Munday   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 996-427   |
| 7                   | Lois Moore   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 996-423   |
| 7                   | Judy Maley   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 995-605   |
| 7                   | G. Irene Munday  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37   | Min. 1/8 | 995-368   |

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|   |  |  |          |          |
|---|--|--|----------|----------|
| 7 | Roger Harbert  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 994-853  |
| 7 | Ronald Tetrick   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 994-851  |
| 7 | Barry Munday   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 994-1    |
| 7 | Donna Valero   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 993-967  |
| 7 | Rick J. Herbst   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 993-971  |
| 7 | Diana Winters  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-478  |
| 7 | Randy Tetrick  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-476  |
| 7 | Donna Herrmann   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-474  |
| 7 | Dr. Billy Gaskill  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-321  |
| 7 | Regena Brainard  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-179  |
| 7 | Judy Prichard  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-40   |
| 7 | Christopher Gaskill  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-891  |
| 7 | Patricia Sharp   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-520  |
| 7 | Michael Gaskill  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-518  |
| 7 | Peggy Sautter  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-409  |
| 7 | Pamela Young   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-182  |
| 7 | Prudence Funk  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-128  |
| 7 | Penny Delovich   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-126  |
| 7 | Velma Eloise Lowe  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 997-150  |
| 8 | William Tracy Herbst   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 995-607  |
| 8 | Lloyd Tetrick, Attorney-in-Fact on behalf of Clifford M. Tetrick | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 994-286  |
| 8 | Sandra Saunders  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 996-136  |
| 8 | Clarice Manera   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 991-58   |
| 8 | Gary Morris, Special Commissioner, in Case Number 04-C-340       | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 1003-429 |
| 8 | April Munday   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 997-724  |
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| 8 | Perry Munday   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 996-427  |
| 8 | Lois Moore   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 996-423  |
| 8 | Judy Maley   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 995-605  |
| 8 | G. Irene Munday  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 995-368  |
| 8 | Roger Harbert  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 994-853  |
| 8 | Ronald Tetrick   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 994-851  |
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| 8 | Donna Valero   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 993-967  |
| 8 | Rick J. Herbst   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 993-971  |
| 8 | Diana Winters  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-478  |
| 8 | Randy Tetrick  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37 | Min. 1/8 | 992-476  |

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|----|--|---|----------|----------|
| 8  | Donna Herrmann                             | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 992-474  |
| 8  | Dr. Billy Gaskill                          | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 992-321  |
| 8  | Regena Brainard                            | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 992-179  |
| 8  | Judy Prichard                              | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 992-40   |
| 8  | Christopher Gaskill                        | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-891  |
| 8  | Patricia Sharp                             | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-520  |
| 8  | Michael Gaskill                            | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-518  |
| 8  | Peggy Sautter                              | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-409  |
| 8  | Pamela Young                               | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-182  |
| 8  | Prudence Funk                              | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-128  |
| 8  | Penny Delovich                             | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-126  |
| 8  | Velma Eloise Lowe                          | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 997-150  |
| 8  | David H. and Nancy J. Lee                  | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 997-586  |
| 9  | Waco Oil & Gas Co., Inc.                   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 993-858  |
| 10 | Waco Oil & Gas Co., Inc.                   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 993-858  |
| 11 | A. M. Hess and Sallie M. Hess, his wife    | The Philadelphia Company of West Virginia to The Pittsburgh & WV Gas Co. - DB 236-111. The Pittsburgh & WV Gas Co. to Equitable Gas Company - DB 511-539. EQT Production Company to XTO Energy Inc. - AB 48-232.  | Min. 1/8 | 200-46   |
| 12 | Agnes K. Lowther                           | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 991-437  |
| 13 | Waco Oil & Gas Co., Inc.                   | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 1002-203 |
| 14 | William F. Sandy and J. L. Sandy, his wife | Hope Natural Gas Company to Consolidated Gas Supply Corp. - DB 680-35. Consolidated Gas Supply Corp. to Consolidated Gas Transmission Corp. - AB 9-912. Consolidated Gas Transmission Corporation changed to CNG Transmission Corporation - B 65-196. CNG Transmission Corporation to Eastern States Oil & Gas, Inc. - AB 16-993. Through Articles of Merger Eastern States Oil & Gas, Inc. becomes EQT Production Company. 61-558. See attached <u>EOT Production Company/XTO Energy Inc. agreement.</u> | Min. 1/8 | 140-276  |
| 15 | Ulric Leddy                                | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 984-375  |
| 15 | Wanda J. Benner and Murray Benner          | Waco Oil and Gas Co., Inc. to XTO Energy Inc. AB 42-37  | Min. 1/8 | 983-522  |

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**MEMORANDUM OF AGREEMENT**

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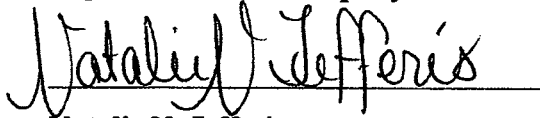
**This Memorandum of Agreement** is entered into this **15th** day of **May, 2019**, between **EQT Production Company**, a Pennsylvania corporation, with a mailing address of 625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222, ("EQT") and **XTO Energy Inc.**, a Delaware Corporation, with a mailing address of 22777 Springwoods Village Parkway, Spring, TX 77389 ("XTO").

1. **PARTIES AND AGREEMENT REFERENCE:** EQT and XTO entered into a letter agreement ("Letter Agreement") dated **May 15, 2019**, (the "Commencement Date") allowing XTO to permit, drill, extract, and produce those certain tracts of land identified on **Exhibit "A"** attached hereto and made a part hereof. The subject properties are located in Lincoln District, Marion County, West Virginia.

2. **MEMORANDUM FOR RECORDING PURPOSES ONLY:** This Memorandum is for recording purposes only and does not supplement or supercede the parties' respective rights set forth in the Letter Agreement.

**IN WITNESS WHEREOF**, the parties have signed their names hereto as of the date first above written.

**EQT Production Company**



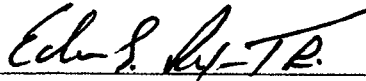
**Natalie N. Jefferis**  
**Vice President, Land & Title**

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MAY 22 2019

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**XTO ENERGY INC.**



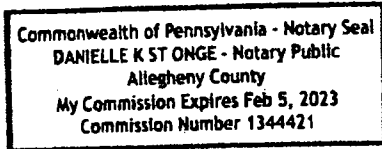
**Edwin S. Ryan, Jr.**  
**Agent and Attorney-in-Fact** *KB*

**4704902486**

**COMMONWEALTH OF PENNSYLVANIA §**  
**§**  
**COUNTY OF ALLEGHENY §**

On this 17<sup>th</sup> day of May, 2019, before me, a Notary Public, the undersigned officer, personally appeared Natalie N. Jefferis, and acknowledged herself to be the Vice President, Land & Title of EQT Production Company, a Pennsylvania corporation, and that she as such Vice President, Land & Title, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.



*Danielle K St Onge*

Notary Public, Commonwealth of Pennsylvania

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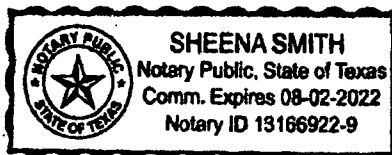
**MAY 22 2019**

WV Department of  
Environmental Protection

**STATE OF TEXAS §**  
**§**  
**COUNTY OF HARRIS §**

On this 21<sup>st</sup> day of May, 2019, before me, a Notary Public, the undersigned officer, personally appeared Edwin S. Ryan, Jr., and acknowledged himself to be the Agent and Attorney-in-Fact of XTO Energy Inc., a Delaware corporation, and that he as such Agent and Attorney-in-Fact of XTO Energy Inc., being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.



*Sheena Smith*  
Notary Public, State of Texas

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**EXHIBIT "A"**

Addendum to Letter Agreement dated the 15th day of May, 2019, between **EQT Production Company**, a Pennsylvania corporation, with a mailing address of 625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222, ("EQT") and **XTO Energy Inc.**, a Delaware Corporation, with a mailing address of 22777 Springwoods Village Parkway, Spring, TX 77389 ("XTO").

DESCRIPTION: Being the same lands described, nor or formerly, as follows:

| Lessor/Grantor                                      | District | County | Tax Map Parcel(s)   | Gross Acres | Book | Page | Date      |
|---|----------|--------|---|-------------|------|------|-----------|
| William F. Sandy and J.L. Sandy, husband and wife   | Lincoln  | Marion | 11-51-8<br>11-51-46<br>11-51-47<br>11-51-48<br>11-51-48.1<br>11-51-48.2<br>11-51-48.3<br>11-51-48.4<br>11-51-49 | 133.00      | 140  | 276  | 7/10/1905 |
| Sallie Plaster and W. Benjamin Plaster, her husband | Lincoln  | Marion | P/O 11-51-1   | 15.00       | 177  | 382  | 11/9/1909 |

**END OF EXHIBIT "A"**

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201900006315  
Filed for Record in  
MARION COUNTY, WV  
JANICE COSCO, COUNTY CLERK  
05-22-2019 At 10:42 am.  
AGREE DEED 11.00  
STATE TAX .00  
COUNTY TAX .00  
Book 1248 Page 745 - 747

Prepared by: XTO Energy  
When Recorded Return to:  
Bryson Kuba, LP  
714 Venture Dr. #187  
Morgantown, WV 26508

06/07/2019



**XTO Energy, Inc.**  
22777 Springwoods  
Village Pkwy  
Spring, TX 77389-1425

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November 6, 2018

Office of Oil & Gas  
WVDEP  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Re: Rights to Drill under Roads – Crands Unit 8H

To Whom It May Concern:

Based on research by XTO Energy's Land Department, our contractor's and 3<sup>rd</sup> party title attorneys, we have all necessary mineral rights under Marion County Routes 48/7 in the location of our planned well-bore for the Crands Unit 8H.

Sincerely,

A handwritten signature in blue ink that reads 'Brent Evans'.

Brent Evans  
Senior Landman  
22777 Springwoods Village Pkwy.  
Spring, TX 77389-1425

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WW-6AC  
(1/12)

06/07/2019

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE CERTIFICATION**

Date of Notice Certification: 11/16/18

API No. 47- \_\_\_\_\_ - \_\_\_\_\_  
Operator's Well No. Grands Unit 8H  
Well Pad Name: Crim Pad

**Notice has been given:**

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

|  |  |
|--|--|
| State: <u>West Virginia</u>                          | UTM NAD 83 Easting: <u>560041.310</u>                                    |
| County: <u>Marion</u>                                | Northing: <u>4369360.669</u>   |
| District: <u>Lincoln</u>                             | Public Road Access: <u>Marion County Rt. 44/6</u>                        |
| Quadrangle: <u>Shinnston</u>                         | Generally used farm name: <u>Rochester &amp; Pittsburgh Coal Company</u> |
| Watershed: <u>Lower West Fork River (0502000206)</u> |  |

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

|   |   |
|---|---|
| <p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p> | <p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/<br/>NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/<br/>NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> |
|---|---|

**Required Attachments:**

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

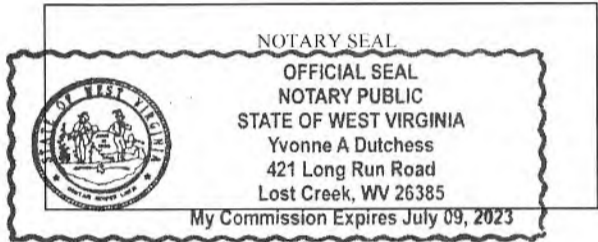
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WV Department of  
Environmental Protection

06/07/2019

**Certification of Notice is hereby given:**

THEREFORE, I Tim Sands, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

|                |                               |            |                           |
|----------------|-------------------------------|------------|---------------------------|
| Well Operator: | <u>XTO Energy Inc.</u>        | Address:   | <u>PO Box 1008</u>        |
| By:            | <u><i>Tim Sands</i></u>       |            | <u>Jane Lew, WV 26378</u> |
| Its:           | <u>Regulatory Coordinator</u> | Facsimile: | <u>304-884-6809</u>       |
| Telephone:     | <u>304-884-6000</u>           | Email:     | <u></u>                   |



Subscribed and sworn before me this 16<sup>th</sup> day of November 2018  
Yvonne A Dutchess Notary Public  
 My Commission Expires July 9, 2023

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).

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WV Department of  
Environmental Protection

WW-6A  
(9-13)

API NO. 47- - 06/07/2019  
OPERATOR WELL NO. Crands Unit 8H  
Well Pad Name: Crim Pad

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION**

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 11/16/18 **Date Permit Application Filed:** 11/16/18

**Notice of:**

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

**Delivery method pursuant to West Virginia Code § 22-6A-10(b)**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice  WSSP Notice  E&S Plan Notice  Well Plat Notice is hereby provided to:

SURFACE OWNER(s)

Name: Rochester & Pittsburgh Coal Company c/o Consol Energy Inc  
Address: 1000 Consol Energy Drive - Suite 100  
Canonsburg, PA 15317

Name: Consolidation Coal Company  
Address: 1000 Consol Energy Drive - Suite 100  
Canonsburg, PA 15317

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE

Name: See attached  
Address: \_\_\_\_\_

COAL OPERATOR

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)

Name: Perry E. Heflin  
Address: P.O. Box 155  
Four States, WV 26572

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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(8-13)

API NO. 47- \_\_\_\_\_ - **06/07/2019**  
 OPERATOR WELL NO. Crands Unit 8H  
 Well Pad Name: Crim Pad

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

**This Notice Shall Include:**

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

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API NO. 47-\_\_\_\_\_ - 06/07/2019  
OPERATOR WELL NO. Crands Unit 8H  
Well Pad Name: Crim Pad

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

**Water Well Testing:**

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

**Water Testing Laboratories:**

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

**Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:**

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

**Written Comment:**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

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Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

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(8-13)

API NO. 47- \_\_\_\_\_ - **06/07/2019**  
 OPERATOR WELL NO. Crands Unit 8H  
 Well Pad Name: Crim Pad

**Time Limits and Methods for Filing Comments.**

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

**Comment Requirements**

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

**Permit Denial or Condition**

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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WW-6A  
(8-13)

API NO. 47- \_\_\_\_\_ - **06/07/2019**  
OPERATOR WELL NO. Crands Unit 8H  
Well Pad Name: Crim Pad

**Notice is hereby given by:**

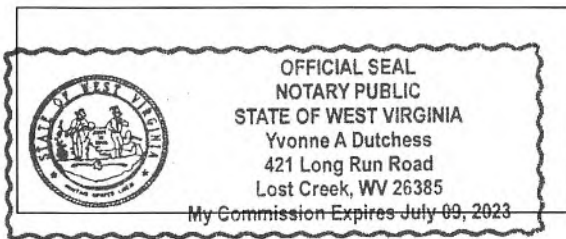
Well Operator: XTO Energy, Inc.  
Telephone: 304-884-6000  
Email: \_\_\_\_\_

Address: PO Box 1008  
Jane Lew, WV 26378  
Facsimile: 304-884-6809

*Tim Sands*  
Tim Sands

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).



Subscribed and sworn before me this 16<sup>th</sup> day of November 2018  
Yvonne A Dutchess Notary Public  
My Commission Expires July 09, 2023

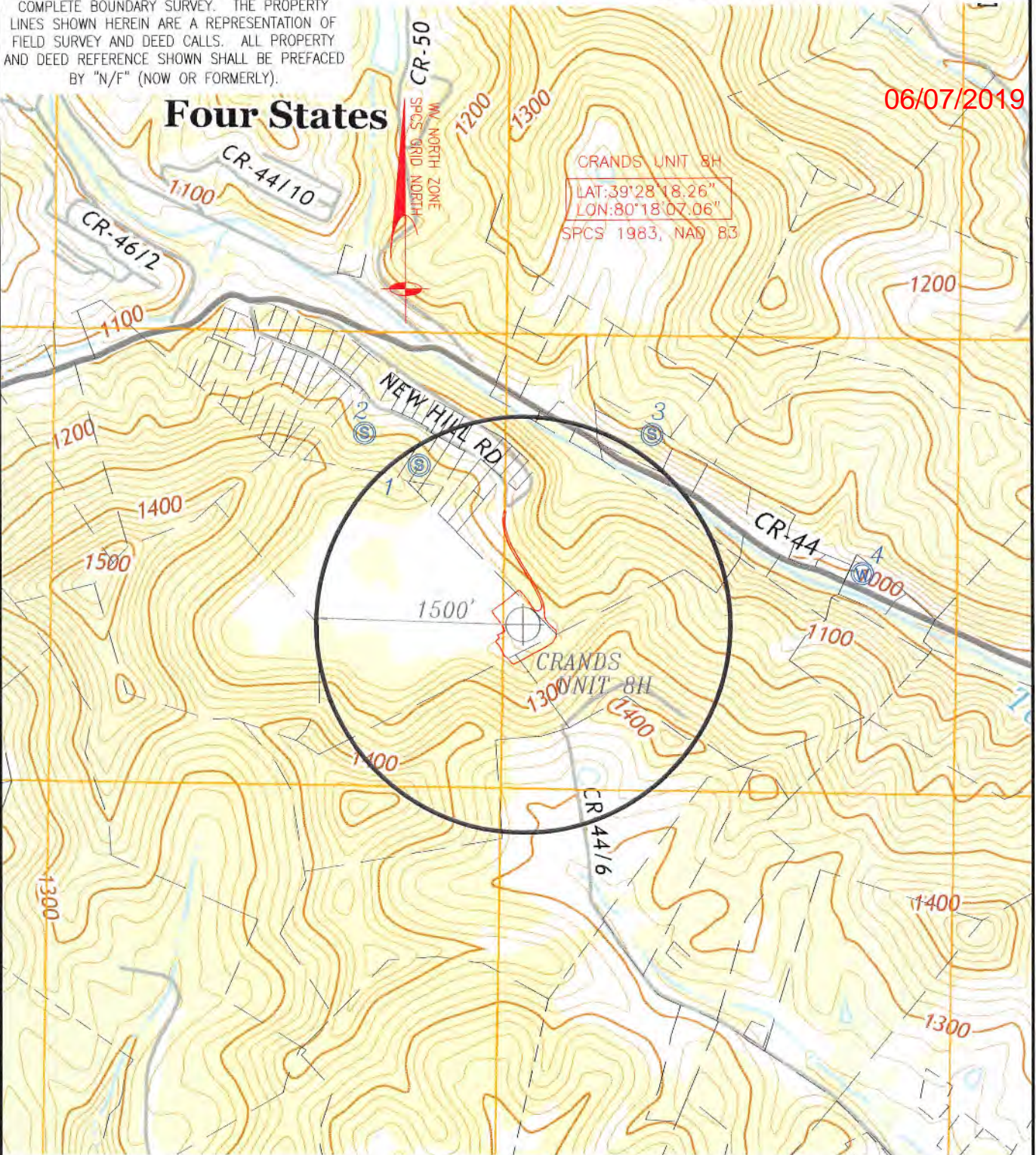
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Environmental Protection

FORM W-9

NOTE: THIS PLAT IS FOR WELL LOCATION PURPOSES ONLY AND DOES NOT REPRESENT A COMPLETE BOUNDARY SURVEY. THE PROPERTY LINES SHOWN HEREIN ARE A REPRESENTATION OF FIELD SURVEY AND DEED CALLS. ALL PROPERTY AND DEED REFERENCE SHOWN SHALL BE PREFACED BY "N/F" (NOW OR FORMERLY).

LEGEND

- WATER WELL
- SPRING/POND/STREAM
- SURFACE BOUNDARY



06/07/2019

| POINT | NAME                   | ADDRESS              | CITY        | STATE | ZIP CODE | DISTANCE | BEARING       | PARCEL I.D.               |
|-------|------------------------|----------------------|-------------|-------|----------|----------|---------------|---------------------------|
| 1     | Perry E. Heflin        | P.O. Box 155         | Four States | WV    | 26572    | 1376'    | N 32°56'24" W | Tax Map 11-54, Parcel 29  |
| 2     | Jimmie & Betty Garrett | P.O. Box 54          | Four States | WV    | 26572    | 1798'    | N 39°28'32" W | Tax Map 11-54, Parcel 30  |
| 3     | Douglas Moyer          | 78 Dora Lane         | Worthington | WV    | 26591    | 1664'    | N 34°17'48" E | Tax Map 11-29, Parcel 9.2 |
| 4     | Gary A. Eagle          | 868 Four States Road | Worthington | WV    | 26591    | 2483'    | N 81°30'56" E | Tax Map 11-29, Parcel 10  |

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CRANDS UNIT 8H WATER OVERALL

LINCOLN DISTRICT, MARION COUNTY, WEST VIRGINIA | 9/12/2018 | JC2018-78 | SHEET 1 OF 2



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

Shinnston Quad (2014)  
Marion County, WV  
Scale: 1" = 1000'



190 THORN HILL ROAD  
WARRENDALE, PA 15086



**Surface Owner**

|  |  |
|--|--|
| Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc.<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 | Consolidation Coal Company<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317-6506 |
|--|--|

4704902486

**Coal Owner or Lessee**

|  |  |
|--|--|
| Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc.<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 | Consolidation Coal Company<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317-6506 |
|--|--|

06/07/2019

|   |   |
|---|---|
| Elwood E. Glover<br>112 Stiff Road<br>Addison, PA 15411 | Consolidated Coal Company<br>c/o Land Dept.<br>46226 National Road<br>St. Clairsville, OH 43950 |
|---|---|

|  |  |
|--|--|
| Elwood E. Glover d/b/a G & G Coal Co.<br>112 Stiff Road<br>Addison, PA 15411 | Kelly B. Moran<br>2870 Wild Turkey Run<br>Christiansburg, VA 24073 |
|--|--|

|  |  |
|--|--|
| XTO Energy Inc.<br>PO Box 1008<br>Jane Lew, WV 26378 | Belva A. Brown<br>203 Johnson Ave.<br>Bridgeport, WV 26630 |
|--|--|

|  |  |
|--|--|
| Thomas Matheny & Leslie Matheny<br>2606 Crabapple Lane<br>Fairmont, WV 26554 | Robert Horner<br>153 Haywood Road<br>Shinnston, WV 26431 |
|--|--|

|   |   |
|---|---|
| Renate L. Brown<br>404 Seneca Avenue<br>Oakland, MD 21550 | Ferrari VI OG, LLC<br>c/o Gaddy Engineering Company<br>303 Washington St. W<br>Charleston, WV 25302 |
|---|---|

|  |  |
|--|--|
| Bradley W. Thomas<br>4115 Cove Point Drive<br>Morgantown, WV 26508 | Jacob G. Ford<br>115 Oak Drive<br>Staunton, VA 24401 |
|--|--|

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Environmental Protection

WW-6A3  
(1/12)

Operator Well No. Crane 06/07/2019

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF ENTRY FOR PLAT SURVEY**

**Notice Time Requirement:** Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

**Date of Notice:** 8/31/18      **Date of Planned Entry:** 9/12/18

**Delivery method pursuant to West Virginia Code § 22-6A-10a:**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

**Notice is hereby provided to:**

SURFACE OWNER(s) ✓  
 Name: Rochester & Pittsburgh Coal Company  
 Address: c/o Consol Energy Inc.  
1000 Consol Energy Drive, Suite 100, Canonsburg, PA 15317  
 Name: Consolidation Coal Company ✓  
 Address: 1000 Consol Energy Dr.  
Canonsburg, PA 15317-6506  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
 Name: See attached  
 Address: \_\_\_\_\_  
 \_\_\_\_\_  
 MINERAL OWNER(s)  
 Name: See attached  
 Address: \_\_\_\_\_  
 \_\_\_\_\_

\*please attach additional forms if necessary

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

|                              |  |
|------------------------------|--|
| State: <u>West Virginia</u>  | Approx. Latitude & Longitude: <u>39.471768, -80.302120</u>               |
| County: <u>Marion</u>        | Public Road Access: <u>Marion County Rt. 44/6</u>                        |
| District: <u>Lincoln</u>     | Watershed: <u>Lower West Fork River (0502000206)</u>                     |
| Quadrangle: <u>Shinnston</u> | Generally used farm name: <u>Rochester &amp; Pittsburgh Coal Company</u> |

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: XTO Energy Inc.  
 Telephone: 304-884-6000  
 Email: \_\_\_\_\_

Address: PO Box 1008  
Jane Lew, WV 26378  
 Facsimile: 304-884-6809

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 Environmental Protection

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

**Surface Owner**

| TMP 11-57-15   | TMP 11-57-16   | TMP 11-50-19   | TMP 11-29-3  |
|--|--|--|--|
| Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc.<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 | Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc.<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 | Consolidation Coal Company<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317-6506 | Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc.<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 |

**Coal Owner or Lessee**

| TMP 11-57-15   | TMP 11-57-16  | TMP 11-50-19  | TMP 11-29-3  |
|--|---|---|--|
| Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc. ✓<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 | Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc. ✓<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317  | Rochester & Pittsburgh Coal Company<br>c/o Consol Energy Inc. ✓<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317  | Rochester & Pittsburgh Coal Company ✓<br>c/o Consol Energy Inc.<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317 |
| Elwood E. Glover ✓<br>112 Stiff Road<br>Addison, PA 15411  | Consolidated Coal Company<br>c/o Land Dept. ✓<br>46226 National Road<br>St. Clairsville, OH 43950<br><br>XTO Energy Inc.<br>PO Box 1008<br>Jane Lew, WV 26378<br><br>Thomas Matheny & Leslie Matheny<br>2606 Crabapple Lane ✓<br>Fairmont, WV 26554<br><br>Renate L. Brown ✓<br>404 Seneca Avenue<br>Oakland, MD 21550<br><br>Kelly B. Moran ✓<br>2870 Wild Turkey Run<br>Christiansburg, VA 24073<br><br>Belva A. Brown ✓<br>203 Johnson Ave.<br>Bridgeport, WV 26630<br><br>Robert Horner ✓<br>153 Haywood Road<br>Shinnston, WV 26431<br><br>Ferrari VI OG, LLC ✓<br>c/o Gaddy Engineering Company<br>303 Washington St. W<br>Charleston, WV 25302<br><br>Bradley W. Thomas ✓<br>4115 Cove Point Drive<br>Morgantown, WV 26508<br><br>Jacob G. Ford ✓<br>115 Oak Drive<br>Staunton, VA 24401 | Consolidated Coal Company ✓<br>c/o Land Dept.<br>46226 National Road<br>St. Clairsville, OH 43950<br><br>Elwood E. Glover d/b/a G & G Coal Co. ✓<br>112 Stiff Road<br>Addison, PA 15411<br><br>Consolidation Coal Company ✓<br>1000 Consol Energy Drive, Suite 100<br>Canonsburg, PA 15317-6506 | 06/07/2019   |

**Mineral Owners**

| TMP 11-57-15  | TMP 11-57-16  | TMP 11-50-19  | TMP 11-29-3  |
|---|---|---|--|
| Robert Horner ✓<br>153 Haywood Road<br>Shinnston, WV 26431  | XTO Energy Inc.<br>PO Box 1008<br>Jane Lew, WV 26378  | XTO Energy Inc.<br>PO Box 1008<br>Jane Lew, WV 26378  | Waco Oil & Gas Co. Inc & Mike Ross, Inc. ✓<br>PO Box 397<br>Glennville, WV 26351 |
| Ferrari VI OG, LLC ✓<br>c/o First National Trust Co.<br>4220 William Penn Hwy, 2nd Floor<br>Monroeville, PA 15416 | Thomas Matheny & Leslie Matheny ✓<br>2606 Crabapple Lane<br>Fairmont, WV 26554                        | Vivian McIntire ✓<br>4037 NW 61st Street<br>Oklahoma City, OK 73112   | XTO Energy Inc.<br>PO Box 1008<br>Jane Lew, WV 26378                             |
| Bradley W. Thomas ✓<br>4115 Cove Point Drive<br>Morgantown, WV 26508  | Renate L. Brown ✓<br>404 Seneca Avenue<br>Oakland, MD 21550   | Charles D. McIntire ✓<br>11490 W 90 Lot 137<br>Del Rio, TX 78840  |  |
| Jacob G. Ford ✓<br>115 Oak Drive<br>Staunton, VA 24401  | Kelly B. Moran ✓<br>2870 Wild Turkey Run<br>Christiansburg, VA 24073                                  | Gary E. McIntire ✓<br>305 Windsong Street<br>Granite Shoals, TX 78654   |  |
| Virginia Exploration ✓<br>PO Box 21145<br>Winston-Salem, NC 27120   | Belva A. Brown ✓<br>203 Johnson Ave.<br>Bridgeport, WV 26630  | James M. McIntire ✓<br>3704 Highway 1431<br>Kingsland, TX 78639   |  |
|   | Robert Horner ✓<br>153 Haywood Road<br>Shinnston, WV 26431  | Crippled Children's Foundation ✓<br>Thomas Lowder - President<br>2019 4th Avenue North, Suite 101<br>Birmingham, AL 35203 |  |
|   | Ferrari VI OG, LLC ✓<br>c/o Gaddy Engineering Company<br>303 Washington St. W<br>Charleston, WV 25302 | Sueleslie Clemens ✓<br>112 Reeves Street<br>Fairmont, WV 26554  |  |
|   | Bradley W. Thomas ✓<br>4115 Cove Point Drive<br>Morgantown, WV 26508                                  | David A. Clemens ✓<br>1720 Redwood Drive<br>Fairmont, WV 26554  |  |
|   | Jacob G. Ford ✓<br>115 Oak Drive<br>Staunton, VA 24401  | Paul L. Clemens ✓<br>700 Arch Street<br>Fairmont, WV 26554  |  |
|   |   | Sandra K. Schnopp ✓<br>2634 Smithtown Road<br>Morgantown, WV 26508  |  |

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Donna R. Stalnaker ✓  
2805 15th Avenue  
Vienna, WV 26105

Ronald L. Linn ✓  
Route 8, Box 167  
Fairmont, WV 26554

Rose M. Hefty ✓  
3254 Blue Jay Drive  
Valparaiso, IN 46383

Mildred Shaffer ✓  
218 Roberts Street  
Fairmont, WV 26554

Mary Dicken ✓  
1531 Tulip Lane  
Fairmont, WV 26554

Jean Meeks ✓  
7048 East 71st Place  
Tulsa, OK 74133

Bernice Leshner ✓  
1605 East 61st Street  
Tulsa, OK 74136

Wanda Anderson ✓  
235 Mill Fall Run Road  
Fairmont, WV 26554

Larry H. Martin ✓  
107 Royal Troon Loop  
Davenport, FL 33837

American Heart Association Inc. ✓  
PO Box 22035  
St. Petersburg, FL 33742

Central Christian Church ✓  
1640 Big Tree Drive  
Fairmont, WV 26554

Mavis E. Martin ✓  
29 Rock Lake Road  
Fairmont, WV 26554

Marcella Wood ✓  
807 Benoni Avenue  
Fairmont, WV 26554

John W. Teate ✓  
4120 NW 9th Court  
Coconut Creek, FL 33066

Barbara G. Loh ✓  
3917 Commander Drive  
Hyattsville, MD 20782

Board of Trustees of the Grand Lodge of ✓  
Ancient, Free and Accepted Masons of WV  
127 Grosscup Avenue  
Dunbar, WV 25064

Jeffery D. Taylor - Special Commissioner ✓  
c/o Constance Haun  
1615 Columbia Street  
Fairmont, WV 26554

470 490 2486

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WW-6A5  
(1/12)

Operator Well No. 06/07/2019

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF PLANNED OPERATION**

**Notice Time Requirement:** notice shall be provided no later than the filing date of permit application.  
**Date of Notice:** 11/16/18 **Date Permit Application Filed:** 11/16/18

**Delivery method pursuant to West Virginia Code § 22-6A-16(c)**

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

HAND  
DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

**Notice is hereby provided to the SURFACE OWNER(s)**  
(at the address listed in the records of the sheriff at the time of notice):

Name: Rochester & Pittsburgh Coal Company c/o Consol Energy Inc.  
Address: 1000 Consol Energy Drive - Suite 100  
Canonsburg, PA 15317

Name: Consolidation Coal Company  
Address: 1000 Consol Energy Drive - Suite 100  
Canonsburg, PA 15317

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

|             |   |                           |  |                    |
|-------------|---|---------------------------|--|--------------------|
| State:      | <u>West Virginia</u>                      | UTM NAD 83                | Easting:                                       | <u>560041.310</u>  |
| County:     | <u>Marion</u>                             |                           | Northing:                                      | <u>4369360.669</u> |
| District:   | <u>Lincoln</u>                            | Public Road Access:       | <u>Marion County Rt. 44/6</u>                  |                    |
| Quadrangle: | <u>Shinnston</u>                          | Generally used farm name: | <u>Rochester &amp; Pittsburgh Coal Company</u> |                    |
| Watershed:  | <u>Lower West Fork River (0502000206)</u> |                           |  |                    |

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: XTO Energy Inc.  
Telephone: 304-884-6000  
Email: \_\_\_\_\_

Address: PO Box 1008  
Jane Lew, WV 26378  
Facsimile: 304-884-6809

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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

06/07/2019



## WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

**Division of Highways**1900 Kanawha Boulevard East • Building Five • Room 110  
Charleston, West Virginia 25305-0430 • (304) 558-3505Thomas J. Smith, P. E.  
Secretary of Transportation/  
Commissioner of Highways

August 22, 2018

Jill M. Newman  
Deputy CommissionerJames A. Martin, Chief  
Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304Subject: DOH Permit for the Crim Well Pad, Marion County  
Crands Unit 8H

Dear Mr. Martin,

This well site will be accessed from Permit #04-2011-0871 issued to XTO Energy, Inc. for access to the State Road for a well site located off of Marion County Route 44/6 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.  
Regional Maintenance Engineer  
Central Office O&G CoordinatorCc: Tim Sands  
XTO Energy, Inc.  
CH, OM, D-4  
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| 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 Energy/ExxonMobil | Carrier Fluid              | Water       | 7732-18-5                                | 100  | 90.3211  |   |
| FR-16          | C&J Energy Services   | Friction Reducer           |             | Listed Below                             |  |  | RECEIVED<br>Office of Oil and Gas<br>NOV 19 2018<br>WV Department of Environmental Protection |
| Sand           | C&J Energy Services   | Sand - Bulk - Penns        |             | Listed Below                             |  |  |   |
| CI-3           | C&J Energy Services   | Acid Corrosion Inhibitors  |             | Listed Below                             |  |  |   |
| BIO-CLEAR 2000 | C&J Energy Services   | Biocides                   |             | Listed Below                             |  |  |   |
| HC-7.5         | C&J Energy Services   | Bulk Acid                  |             | Listed Below                             |  |  |   |
| Sand           | C&J Energy Services   | Sand - Bulk - Penns        |             | Listed Below                             |  |  |   |
| SI-6           | C&J Energy Services   | Paraffin & Scale Additives |             | Listed Below                             |  |  |   |

Items above are Trade Names with the exception of Base Water. Items below are the individual ingredients.

|  |  |  |  |             |      |         |  |
|--|--|--|--|-------------|------|---------|--|
|  |  |  | Crystalline Silica, quartz   | 14808-60-7  | 99.9 | 7.93235 |  |
|  |  |  | Crystalline Silica, quartz   | 14808-60-7  | 99.9 | 0.96377 |  |
|  |  |  | Water  | 7732-18-5   | 92.5 | 0.61264 |  |
|  |  |  | Aluminum Oxide   | 1344-28-1   | 1.1  | 0.08734 |  |
|  |  |  | Hydrochloric Acid  | 7647-01-0   | 7.5  | 0.04967 |  |
|  |  |  | Water  | 7732-18-5   | 96   | 0.02312 |  |
|  |  |  | Distillates (Petroleum), Hydrotreated Light                              | 64742-47-8  | 35   | 0.0191  |  |
|  |  |  | Water  | 7732-18-5   | 30   | 0.01637 |  |
|  |  |  | 2-Propenoic acid, polymer with 2- propenamide, sodium salt               | 25987-30-8  | 30   | 0.01637 |  |
|  |  |  | Polyethylene glycol  | 25322-68-3  | 50   | 0.01586 |  |
|  |  |  | Aluminum Oxide   | 1344-28-1   | 1.1  | 0.01061 |  |
|  |  |  | 2,2-Dibromo-3-nitrilo- propionamide (DBNPA)                              | 10222-01-2  | 30   | 0.00952 |  |
|  |  |  | Water  | 7732-18-5   | 28.5 | 0.00904 |  |
|  |  |  | Titanium Oxide   | 13463-67-7  | 0.1  | 0.00794 |  |
|  |  |  | Iron Oxide   | 1309-37-1   | 0.1  | 0.00794 |  |
|  |  |  | Ethylene Glycol  | 107-21-1    | 5    | 0.00273 |  |
|  |  |  | Sodium Acetate   | 127-09-3    | 3    | 0.00164 |  |
|  |  |  | Phosphonic Acid Salt   | Proprietary | 6    | 0.00145 |  |
|  |  |  | Poly(oxy-1,2-ethandiyl), alpha-isodecyl-omega- hydroxy-phosphate         | 108818-88-8 | 2    | 0.00109 |  |
|  |  |  | Sorbitan Monooleate  | 1338-43-8   | 2    | 0.00109 |  |
|  |  |  | Alcohols, C12-15- branched and linear, ethoxylated propoxylated          | 120313-48-6 | 2    | 0.00109 |  |
|  |  |  | Iron Oxide   | 1309-37-1   | 0.1  | 0.00097 |  |
|  |  |  | Titanium Oxide   | 13463-67-7  | 0.1  | 0.00097 |  |
|  |  |  | Ethoxylated Sorbitan   | 9005-65-6   | 1    | 0.00055 |  |
|  |  |  | Ammonium Chloride  | 12125-02-9  | 2    | 0.00048 |  |
|  |  |  | Monoethanolamine hydrochloride   | 2002-24-6   | 2    | 0.00048 |  |
|  |  |  | Ethylene Glycol  | 107-21-1    | 40   | 0.00048 |  |
|  |  |  | Water  | 7732-18-5   | 30   | 0.00036 |  |
|  |  |  | Methanol   | 67-56-1     | 1    | 0.00024 |  |
|  |  |  | Dimethylformamide  | 68-12-2     | 20   | 0.00024 |  |
|  |  |  | Tar bases, quinoline derivs, benzyl chloride- quaternized                | 72480-70-7  | 15   | 0.00018 |  |
|  |  |  | Cinnamaldehyde   | 104-55-2    | 15   | 0.00018 |  |
|  |  |  | 2-Butoxyethanol  | 111-76-2    | 15   | 0.00018 |  |
|  |  |  | 1-DECANOL  | 112-30-1    | 5    | 0.00006 |  |
|  |  |  | Poly(oxy-1,2- ethandiyl),alpha-(4- nonylphenyl)-omega hydroxy-, branched | 127087-87-0 | 5    | 0.00006 |  |
|  |  |  | 2-Propenamide as residual  | 79-06-1     | 0.1  | 0.00006 |  |
|  |  |  | 1-OCTANOL  | 111-87-5    | 2.5  | 0.00003 |  |
|  |  |  | Isopropanol  | 67-63-0     | 2.5  | 0.00003 |  |
|  |  |  | Triethyl Phosphate   | 78-40-0     | 2.5  | 0.00003 |  |
|  |  |  | Tar Bases, Quinoline   | 68513-87-1  | 1    | 0.00001 |  |

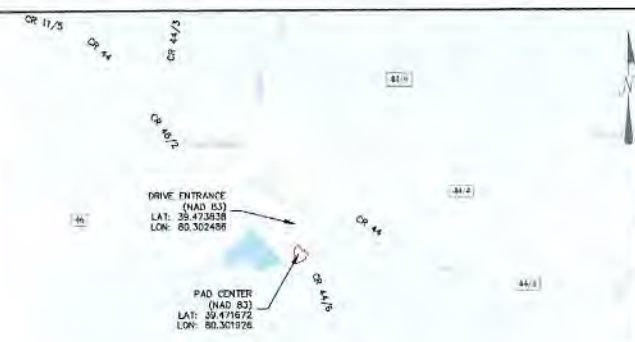
# EROSION & SEDIMENT CONTROL PLAN CRIM WELL PAD

LINCOLN DISTRICT, MARION COUNTY, WEST VIRGINIA

JULY, 2017

**WVDEP OOG  
ACCEPTED AS-BUILT**

WJL 5/28/2019



### SITE STABILIZATION, RESTORATION AND MAINTENANCE (TEMPORARY AND PERMANENT)

- TILL SOIL TO DEPTH OF 3" TO REMOVE ALL OBJECTS 2" OR LARGER.
- BUILD COMMERCIAL FERTILIZER INTO THE SOIL TO A DEPTH OF 3". FERTILIZER MAY BE BLENDED DURING TILLING.
- SOIL REQUIRED TO BE MIXED THOROUGHLY ON THE PREPARED AREA BY HYDRAULIC SEEDING EQUIPMENT, HAND SEEDING, OR ANY OTHER APPROPRIATE METHOD.
- AFTER SEEDING, ROLL TOWARD AREAS THAT ARE TO BE MOVED. USE A ROLLER TO COMPACT SOIL TO A DEPTH OF 1" TO 2".
- FOR PERMANENT SITE STABILIZATION, APPLY SLOW RELEASE NITROGEN FERTILIZER TO THE SURFACE OF RESTORED AREA.
- PLACE MULCH IMMEDIATELY AFTER SEEDING ON WITHIN 48 HOURS AFTER SEEDING IS COMPLETED. PLACE MULCH IN A STRIP ORIENTATION, IN A CONTINUOUS BLANKET AT THE MINIMUM RATE SPECIFIED ABOVE. AN ACCEPTABLE MECHANICAL BLANKET MAY BE USED TO APPLY MULCH. MULCHES MUST BE PLACED INTO STRIP PATTERNS THAT WILL NOT BE SUBJECTS.
- MAINTENANCE - SPECIFICALLY MENTIONED AREAS WITHIN SPECIFIED LIMITS UNTIL THE ENTIRE PROJECT HAS BEEN COMPLETED. WORK AS INDICATED AND WHEN COMPLETED, PROMPTLY AND THOROUGHLY MAINTAIN BY HYDRAULIC SEEDING OR CUTTING, AFTER THE SEEDING AND SOIL STABILIZATION WORK IS COMPLETE. ALL MAINTENANCE WORK SHALL BE COMPLETED WITHIN THE TIME FRAME SPECIFIED IN THE CONTRACT. MAINTENANCE WORK SHALL BE COMPLETED WITHIN THE TIME FRAME SPECIFIED IN THE CONTRACT. MAINTENANCE WORK SHALL BE COMPLETED WITHIN THE TIME FRAME SPECIFIED IN THE CONTRACT.
- A SITE WILL BE CONSIDERED TO BE PERMANENTLY STABILIZED WHEN ALL PERMANENT CONTROL MEASURES AND FACILITIES HAVE BEEN COMPLETED AND ARE OPERATIONAL. TEMPORARY CONTROL MEASURES AND FACILITIES REMOVED, AND MAINTENANCE WORK COMPLETED. RESTORATION WORK IS CONSIDERED TO BE COMPLETE WHEN THE SURFACE SOIL IS CAPABLE OF SUPPORTING VEGETATION BEARING BURNOUT TESTS. THE STANDARD FOR THIS RESTORATION WORK SHALL BE A RESTORATION OF QUALITY OF SOIL TO THE DISTURBED AREA.
- THE CONTRACTOR SHALL MAINTAIN THE SITE FOR THE PROVISIONS OF THIS PLAN UNTIL PERMANENT STABILIZATION IS ESTABLISHED.

### PERMANENT STABILIZATION

- SPECIES: PERENNIAL, BERMUDA GRASS, CLOVER, REDTOP  
SPURGE LIME SOIL FOR APPLICATION RATE: 30 LBS/ACRE, 5 LBS/ACRE, AND 5 LBS/ACRE, RESPECTIVELY  
FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-20-10  
LIME RATE: 1 TON/ACRE  
MULCH TYPE: 2" STRAW  
MULCHING RATE: 2 TONS/ACRE  
ANCHOR MATERIAL: RECYCLED CELLULOSE FIBER/WOOD PINE MIXTURE  
ANCHORING METHOD: INTERNAL SCHEDING EQUIPMENT  
RATE OF ANCHOR MATERIAL APPLICATION: 100 LBS/1000 TO 150 SEEDING SEASON DATES YEAR AROUND

### TEMPORARY STABILIZATION

- SPECIES: ANNUAL WHEATGRASS  
SPURGE LIME SOIL FOR APPLICATION RATE: 40 LBS/ACRE  
FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-20-10  
LIME RATE: 3 TONS/ACRE  
MULCH TYPE: 2" STRAW  
MULCHING RATE: 2 TONS/ACRE

### PERMANENT-VEGETATION

- SPECIES: PERENNIAL, BERMUDA GRASS, CLOVER, REDTOP  
SPURGE LIME SOIL FOR APPLICATION RATE: 30 LBS/ACRE, 5 LBS/ACRE, AND 5 LBS/ACRE, RESPECTIVELY  
FERTILIZER TYPE: COMMERCIAL FERTILIZER 10-20-10  
LIME RATE: 1 TON/ACRE  
MULCH TYPE: 2" STRAW  
MULCHING RATE: 2 TONS/ACRE  
ANCHOR MATERIAL: RECYCLED CELLULOSE FIBER/WOOD PINE MIXTURE  
ANCHORING METHOD: INTERNAL SCHEDING EQUIPMENT  
RATE OF ANCHOR MATERIAL APPLICATION: 100 LBS/1000 TO 150 SEEDING SEASON DATES YEAR AROUND

### GENERAL NOTES

- THE GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED IN THE SITE NO MORE THAN TEN DAYS BEFORE THE PROJECT BEGINS AND ADVANCE BY CONSTRUCTION DISTURBANCE NOTIFICATION, BURNING AND FEDERAL OR STATE REGULATORY (BY CHAPTER 24C-1-3, UNDERGROUND FACILITY DAMAGE PREVENTION ACT).
- UTILITY SHALL BE MAINTAINED ON ALL ADJACENT STREETS AND DRIVES AT ALL TIMES. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH STATE REQUIREMENTS.
- CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES WITH PROPOSED CONSTRUCTION AND REPORT TO CONSTRUCTION AND GROUNDING OF THE SITE.

### EROSION CONTROL BLANKETS

- EROSION CONTROL BLANKETING IS TO BE INSTALLED ON ALL SLOPES AND DOWN GRADIENT LOCATIONS OF THE PAD.
- PROPERLY PREPARE SOIL BEFORE INSTALLING BLANKETS.
- ANCHOR BLANKETS IN A TRENCH AT THE TOP OF SLOPE USING A ROW OF STAPLES/STAKES.
- BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- APPLY GEL TO COMPACTED SOIL AND FILL REMAINING 1" (20%) PORTION OF BLANKET BACK OVER SETS AND COMPACTED SOIL.
- REPLACE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES ACROSS THE WIDTH OF THE BLANKET.
- ALL BLANKETS MUST BE CORRECTLY FASTENED TO SOIL SURFACE.
- DESIGN: PARALLEL BLANKETS.
- IN LOOSE SOIL CONDITIONS, THE USE OF STAPLES OR STAKE LENGTHS GREATER THAN 6" (16cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

### GRADING NOTES

- THE CONTRACTOR SHALL REMOVE ALL EXISTING ASPHALT PAVEMENT AND CONCRETE SLABS FROM THE SITE.
- AREAS TO BE FILLED SHOULD BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, LOGS, BRUSH, WEEDS AND OTHER OBSTRUCTIBLE MATERIAL.
- THE CONTRACTOR SHALL REPLACE ALL CURB, SIDEWALKS, DRIVEWAYS, AND PAVEMENT WHICH HAS BEEN CUT AND DISTURBED UNDER THE PROVISIONS OF THIS PLAN WITH BEST PRACTICE DEPARTMENT OF TRANSPORTATION STANDARD MATERIALS.
- THE CONTRACTOR SHALL ADJUST TO GRADE ALL WATER AND GAS VALVES.
- THE CONTRACTOR SHALL CONTRACT ALL FILL MATERIALS TO NOT LESS THAN 90% OF THE STANDARD PROCTOR DENSITY (ASTM D998) BASED ON SOIL TESTS OF THE ACTUAL SOILS TO BE USED FOR THE FILL AT 95% OPTIMUM MOISTURE CONTENT. LISTS SHALL BE PLACED WITH A MINIMUM INTERVAL OF 12 INCHES.
- FILL MATERIALS SHOULD BE FREE OF EXCESS AMOUNTS OF WATER, FROZEN MATERIALS, BRUSH, ROOTS, STUMPS OR OTHER OBSTRUCTIBLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SUBSEQUENT FILL.
- FROZEN MATERIALS OR SOFT MUDS, OR HIGHLY COMPRESSIBLE MATERIALS SHOULD NOT BE INCORPORATED INTO FILL.
- FILL SHOULD NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
- FILL MATERIALS SHALL BE FREE OF OBSTRUCTIBLE MATERIAL WITH NO IMPURE MATERIALS THIN 8" THICK. ROCK LOTS SHALL BE LIMITED TO A MAXIMUM OF 20 PERCENT.
- ALL CUT AND FILL OPERATIONS SHALL FOLLOW THE "WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL."
- THE CONTRACTOR SHALL USE THE MINIMUM VOLUMES OF FILLING MATERIALS NECESSARY TO CONSTRUCT THE WORK.

### EROSION AND SEDIMENTATION CONTROL PLAN NOTES

- ONLY LIMITED DISTURBANCE SHALL BE PERMITTED TO PROVIDE ACCESS TO CHANNELS OF COMPLETION AS APPROPRIATE FOR GROUND AND ACQUIRING BORROW TO CONSTRUCT THESE CHANNELS.
- WITHIN AND SURROUNDING CHANNELS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE WITHIN THE TYPICAL AREA OF THESE CHANNELS.
- AFTER SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE REMOVED AREAS DISTURBED DURING REMOVAL OF THE CONTROLS MUST BE STABILIZED.
- STORM WATER RUNOFF WHICH DOES NOT DISCHARGE TO SEDIMENT TRAPS OR BASINS, MUST BE PREVENTED UNDER THE TYPICAL AREAS ARE STABILIZED.
- SEDIMENT MUST BE REMOVED FROM INLET PROTECTION AFTER EACH STORM EVENT.
- SEDIMENT HEIGHTS MUST NOT EXCEED 30 FEET. SLOPE SLOPES MUST BE 2:1 OR FLATTER.
- ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 30 DAYS MUST BE STABILIZED IMMEDIATELY IN ACCORDANCE WITH THE WVDEP OOG EROSION AND SEDIMENTATION CONTROL MANUAL. EXPOSED NON-VEGETATED AREAS MUST BE STABILIZED IMMEDIATELY. DISTURBED AREAS WHICH ARE NOT AT PRESCRIBED HEIGHTS AND WHICH WILL BE RECONSTRUCTED WITHIN ONE YEAR MAY BE STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. DISTURBED AREAS WHICH ARE NOT AT PRESCRIBED GRADE OR WILL NOT BE RECONSTRUCTED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS.
- STOCKPILES MUST BE STABILIZED IMMEDIATELY.
- MAY OR STRAW MULCH MUST BE APPLIED AT RATES OF AT LEAST 3.0 TONS PER ACRE.
- THE CONTRACTOR SHALL RECYCLE MATERIALS WHENEVER APPROPRIATE AND WHEN IN ACCORDANCE WITH LOCAL, STATE, & FEDERAL REGULATIONS. ALL MATERIAL REMOVED FROM THE SITE, INCLUDING PAVED CURBSIDES AND DRIVES, MUST BE RECYCLED OR REUSED. ALL NON-VEGETATED AREAS MUST BE RECYCLED OR REUSED. WASTE GENERATED BY FLOWMAY SHALL BE TAKEN OFF SITE FOR DISPOSAL. RECYCLED MATERIALS OR CLEAN FILL MATERIALS IS REMOVED FROM THE SITE. IT SHALL BE TAKEN TO AN APPROVED C&D LANDFILL OR IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AN APPROVED C&D PLAN IF OVER 5000 SQUARE FEET OF AREA IS DISTURBED.

### MAINTENANCE AND INSPECTION SCHEDULE

- UNTIL THE SITE IS STABILIZED WITH YOUR PERSONAL WEATHER POWER, ALL EROSION AND SEDIMENTATION AND STORM WATER MANAGEMENT CONTROLS MUST BE MAINTAINED PERMANENTLY.
- WEEKLY SITE INSPECTIONS SHALL BE CONDUCTED TO MONITOR AND MAINTAIN THE INTEGRITY OF THE BMP STORM WATER CONTROLS.
- WEEKLY VISUAL INSPECTION AND SPILL PREVENTION INSPECTIONS SHALL BE CONDUCTED TO MONITOR AND MAINTAIN THE INTEGRITY OF THE BMP STORM WATER CONTROLS AND MAINTENANCE OF THESE BMPs.
- INSPECTIONS OF THE STORM WATER AND SPILL PREVENTION MEASURES SHALL BE CONDUCTED AFTER ANY MAJOR STORM EVENT AS DEFINED AS HALF INCH (1/2") RAIN WITHIN ANY TWENTY-FOUR (24) HOUR PERIOD.
- NO INSPECTIONS SHALL BE CONDUCTED NO LESS THAN ONCE PER WEEK TO VERIFY AND RECORD POTENTIAL DEFICIENCIES.
- ALL RECORDS FROM INSPECTIONS SHALL BE MAINTAINED ON SITE FOR THE LIFE OF THE PROJECT AND BE AVAILABLE UPON REQUEST.
- THE ROCK CONSTRUCTION DEFICIENCIES ARE TO BE INSPECTED AT THE END OF EACH MORNING SHIFT AND REPAIRED IMMEDIATELY.
- THE DEFICIENCIES OF THE ROCK CONSTRUCTION DEFICIENCIES SHALL BE CORRECTED IMMEDIATELY AT THE END OF EACH MORNING SHIFT.
- A ROCK RECORDS IS TO BE READY AVAILABLE ON THE SITE AT ALL TIMES FOR INSPECTION PURPOSES.
- MULTIPLE FILLING SHALL BE PLACED OVER OTHER AREA PRIOR TO PLACEMENT OF STONE.

### COMPOST FILTER SOCKS

- COMPOST FILTER SOCKS MUST BE INSTALLED AT LEAST ONE EACH END OF EACH CONDUIT FILTER SOCK SYSTEM MUST BE AT LEAST 12 FEET UPLIFE AT 40 DEGREES TO THE MAIN CONDUIT FILTER SOCK ASSEMBLY.
- THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTER SOCK IN A FUNCTIONAL CONDITION AT ALL TIMES AND IT SHALL BE REPAIRED IMMEDIATELY.
- WHERE THE SOCK HEIGHTS RETURN IT WILL BE REPAIRED IMMEDIATELY.
- THE CONTRACTOR SHALL REMOVE SEDIMENT COLLECTED AT THE END OF THE SOCK WHEN IT REACHES 1/3 OF THE EXPOSED HEIGHT OF THE SOCK OR AS DIRECTED BY THE ENGINEER.
- THE COMPOST FROM THE FILTER SOCK WILL BE DEPOSITED ON THE SITE WHEN SITE REACHED THE VEGGING COVER.

### VEGETATION

- THE CONTRACTOR SHALL PROTECT VEGETATED AREAS NEARBY AND AFTER EACH STORM (SHOULDER) EVENT.
- THE CONTRACTOR SHALL PROTECT THE SITE FOR HELLS OR GULLIES ON CUT OR FILL SLOPES. THE CONTRACTOR SHALL FILL GULLIES AND GULLIES, REMOVED DISTURBED AREAS TO PROVIDE A UNIFORM SLOPE, THEN RESEED/MULCH AND REPAIR/REPLACE AREAS TO ORIGINAL SPECIFICATIONS.
- THE REPAIRS SHALL BE MADE WITHIN 2 DAYS OF DISCOVERING PROBLEM.

### TEMPORARY AND PERMANENT CHANNELS

- THE CONTRACTOR SHALL INSPECT CHANNELS WEEKLY AND AFTER EACH STORM (SHOULDER) EVENT AND REPAIRS IMMEDIATELY.
- EROSION CONTROL MATS SHALL BE INSPECTED FOR ANY TARS OR MUDS. THE CONTRACTOR SHALL REMOVE ADDITIONAL STAPLES AS REQUIRED TO INSURE THAT THE MAT IS SECURELY ANCHORED TO THE CHANNEL.
- THE CONTRACTOR SHALL RESEED, MULCH AND REPAIR ANY BARE AREAS.
- THE CONTRACTOR SHALL MONITOR CHANNELS WHERE CHANNEL FLOW CAPACITY HAS BEEN REDUCED BY EXCESSIVE VEGETATIVE GROWTH.
- WHERE EXCESSIVE SEDIMENT DEPOSITS OCCUR IN SEDIMENT CHANNELS, THE CONTRACTOR SHALL REMOVE THE SEDIMENT DEPOSITS, REPAIR THE CHANNEL FOR OBSTRUCTIONS, THEN RESEED AND REPAIR THE CHANNELS. THE CONTRACTOR SHALL REMOVE MULCH, MULCH AND REPAIR THE CHANNELS.



Know what's below dig  
Call before you dig

CALL BEFORE YOU DIG  
IN WEST VIRGINIA  
1-800-245-4948  
WV STATE LAW REQUIRES  
2 WORKING DAYS NOTICE

THE GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED IN THE SITE NO MORE THAN TEN DAYS AND NO LESS THAN 48 HOURS IN ADVANCE OF EXCAVATION (BY CHAPTER 24C-1-3, UNDERGROUND FACILITY DAMAGE PREVENTION ACT).

### SITE DESCRIPTION

LOCATED AT THE SOUTH END OF TANK HILL ROAD AND NEW HILL ROAD  
TOTAL AREA OF PAD - 5.47 ACRES  
AREA OF ACCESS ROAD(S) - 0.28 ACRES  
AREA OF PAD - 3.52 ACRES  
AREA OF SITE TO UNDERGO EXCAVATION - 2.92 ACRES  
AREA OF DISTURBANCE PER PARCEL CONSOLIDATION COAL COMPANY - 5.47 ACRES

### PRE-CONSTRUCTION RUNOFF VOLUME

POST-CONSTRUCTION RUNOFF VOLUME - 11,487 CF  
COMPLETION - 7,109 CF

### SCHEDULE OF MAJOR CONSTRUCTION

COMPLETION - SUMMER 2017  
COMPLETION - SUMMER 2019

### RECEIVING STREAM & SURFACE WATER

ON-SITE DRAINAGE FLOWS TO UNITS TO TVEBAUGH CREEK

### SITE INFO

### SHEET INDEX

- ES-1 TITLE SHEET
- ES-2 SITE PLAN
- ES-3 SECTIONS AND DETAILS
- ES-4 ACCESS DRIVE PROFILE
- ES-5 DETAILS

### PREPARED FOR:

**XTO ENERGY, INC.**  
480 INDUSTRIAL PARK ROAD  
JANE LEW, WV 26378  
TELEPHONE: (304) 884-6042

### PREPARED BY:

**Morris Knowles & Associates, Inc.**  
443 ATHENA DRIVE DELMONT, PA 15626  
TELEPHONE: (724) 488-4622 FAX: (724) 488-8940

CHARLES T. RAMMONTREE, REGISTERED PROFESSIONAL ENGINEER  
12/20/2018

- NOTES:
- MORRIS KNOWLES & ASSOCIATES, INC. EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND ALL RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR MANIPULATED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT PERMISSION AND CONSENT OF MORRIS KNOWLES & ASSOCIATES, INC.
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  - THE LOCATION OF EXISTING UTILITIES WERE TAKEN FROM RECORDS AND MARKING PROVIDED BY OTHERS AND LISTED THEREON. THE LOCATIONS SHOWN MAY BE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS, DEPTHS AND BIRTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL EXERCISE CARE TO AVOID DAMAGE TO ALL EXISTING UTILITIES.



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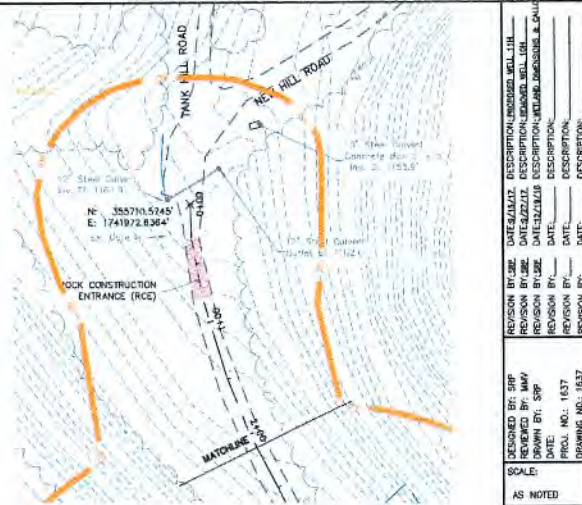
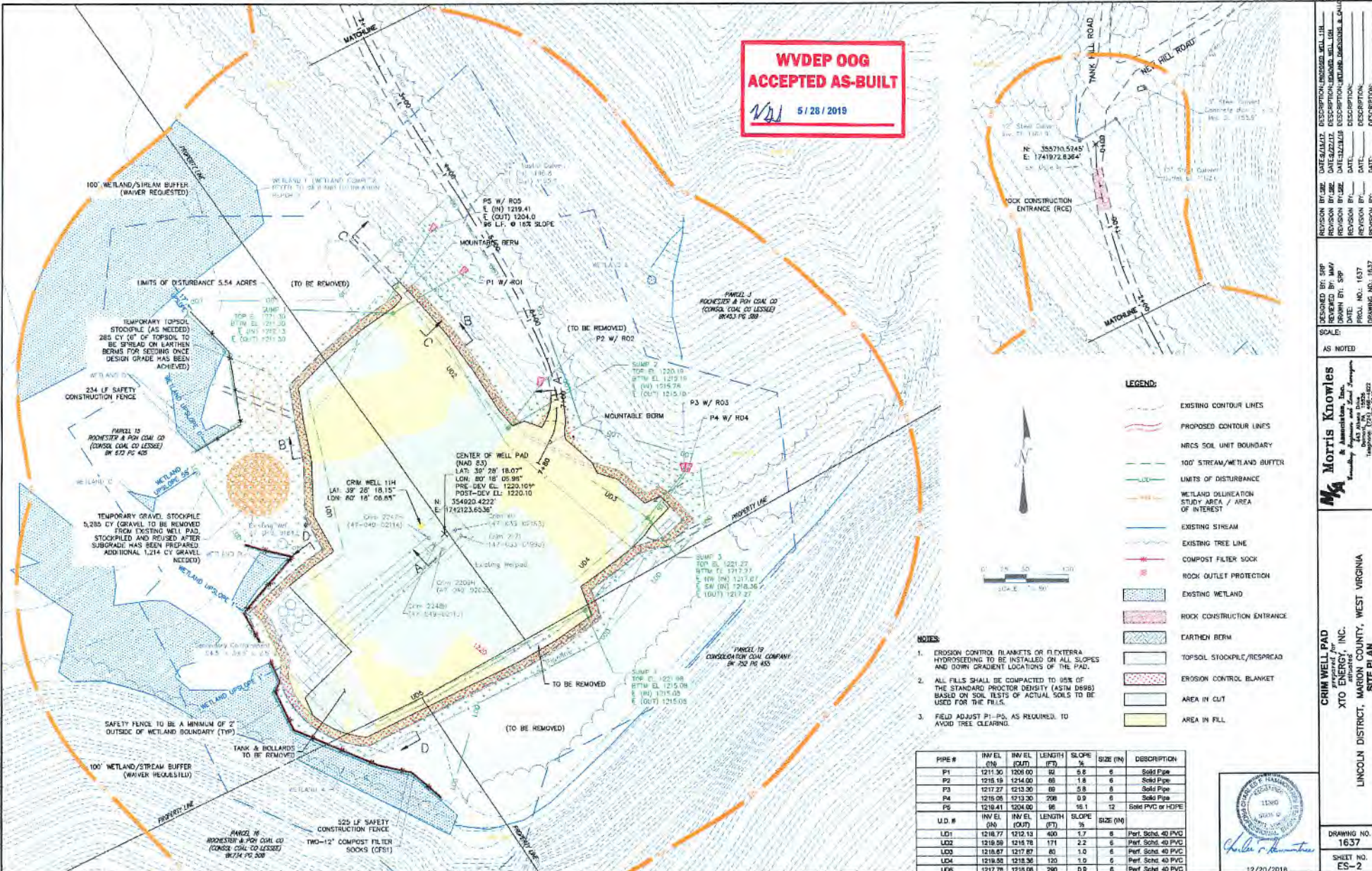
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SCALE: N/A  
Morris Knowles & Associates, Inc.  
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CRIM WELL PAD prepared by: XTO Energy, Inc.  
XTO Energy, Inc.  
LINCOLN DISTRICT, MARION COUNTY, WEST VIRGINIA  
TITLE SHEET  
DRAWING NO. 1637  
SHEET NO. ES-1



**WVDEP OOG  
ACCEPTED AS-BUILT**  
5/28/2019



- LEGEND:**
- EXISTING CONTOUR LINES
  - PROPOSED CONTOUR LINES
  - NRCS SOIL UNIT BOUNDARY
  - 100' STREAM/WETLAND BUFFER
  - LIMITS OF DISTURBANCE
  - WETLAND DELINEATION STUDY AREA / AREA OF INTEREST
  - EXISTING STREAM
  - EXISTING TREE LINE
  - COMPOST FILTER SOCK
  - ROCK OUTLET PROTECTION
  - EXISTING WETLAND
  - ROCK CONSTRUCTION ENTRANCE
  - EARTHEN BERM
  - TOPSOIL STOCKPILE/RESPIRAD
  - EROSION CONTROL BLANKET
  - AREA IN CUT
  - AREA IN FILL

- NOTES:**
1. EROSION CONTROL BLANKETS OR FLEXITERA HYDROSEEDING TO BE INSTALLED ON ALL SLOPES AND DOWN GRADIENT LOCATIONS OF THE PAD.
  2. ALL FILLS SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY (ASTM D998) BASED ON SOIL TESTS OF ACTUAL SOILS TO BE USED FOR THE FILLS.
  3. FIELD ADJUST P1-P5, AS REQUIRED, TO AVOID TREE CLEARING.

| PIPE # | INV EL (IN) | INV EL (FT) | LENGTH (FT) | SLOPE % | SIZE (IN) | DESCRIPTION         |
|--------|-------------|-------------|-------------|---------|-----------|---------------------|
| P1     | 1211.30     | 1208.00     | 92          | 0.8     | 6         | Solid Pipe          |
| P2     | 1215.19     | 1214.00     | 69          | 1.8     | 6         | Solid Pipe          |
| P3     | 1217.27     | 1213.30     | 69          | 5.8     | 6         | Solid Pipe          |
| P4     | 1216.05     | 1213.30     | 206         | 0.9     | 6         | Solid Pipe          |
| PS     | 1218.41     | 1204.00     | 66          | 18.1    | 12        | Solid PVC or HDPE   |
| U.D. # | INV EL (IN) | INV EL (FT) | LENGTH (FT) | SLOPE % | SIZE (IN) | DESCRIPTION         |
| UD1    | 1218.77     | 1213.13     | 400         | 1.7     | 6         | Perf. Sched. 40 PVC |
| UD2    | 1218.59     | 1215.78     | 171         | 2.2     | 6         | Perf. Sched. 40 PVC |
| UD3    | 1218.87     | 1217.87     | 80          | 1.0     | 6         | Perf. Sched. 40 PVC |
| UD4    | 1218.55     | 1218.36     | 120         | 1.0     | 6         | Perf. Sched. 40 PVC |
| UD5    | 1217.75     | 1218.08     | 290         | 0.9     | 6         | Perf. Sched. 40 PVC |



DESIGNED BY: SWP  
 CHECKED BY: SWP  
 DRAWN BY: SWP  
 DATE: 10/13/17  
 PROJECT NO.: 1637  
 DRAWING NO.: 1637

**Morris Knowles & Associates, Inc.**  
 1400 West Virginia Ave., Suite 200  
 Charleston, WV 25302  
 Phone: (304) 265-8822  
 Fax: (304) 265-8860

**CRM WELL PAD**  
 prepared for  
**XTO ENERGY, INC.**  
 LINCOLN DISTRICT, MARION COUNTY, WEST VIRGINIA  
**SITE PLAN**

DRAWING NO. 1637  
 SHEET NO. ES-2  
 12/20/2018