



west virginia department of environmental protection

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

Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL
Horizontal 6A / Horizontal 6A Well - 1

EQT PRODUCTION COMPANY
120 PROFESSIONAL PLACE
BUILDING II
BRIDGEPORT, WV 26330

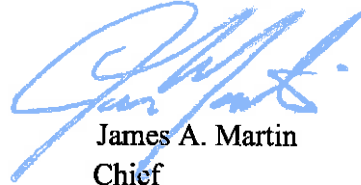
Re: Permit Modification Approval for 513758
47-085-10134-00-00

Subsurface Agreement for Additional Tract

EQT PRODUCTION COMPANY

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before 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: 513758
Farm Name: PIERCE, HAROLD K.
U.S. WELL NUMBER: 47-085-10134-00-00
Horizontal 6A / Horizontal 6A Well - 1
Date Issued: 1/20/2017

Promoting a healthy environment.

01/27/2017



June 8, 2016

Mr. Gene Smith
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: Modification of 47-085-10134

Dear Mr. Smith,

Please accept the attached updates for the above referenced permit. Upon inspection of our as-drilled plat, we noted the curve geometry crossed into an additional tract, for which EQT had acquired a subsurface agreement. Enclosed is an updated WW-6A1, WW-6B, mylar plat and rec plan reflecting corrections to update the permit file to be consistent with the as-drilled well bore.

If you have any questions, please do not hesitate to contact me at (304) 848-0076.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Vicki Roark'.

Vicki Roark
Permitting Supervisor-WV

Enc.

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

1) Well Operator: EQT Production Company 306686 Ritchie Union Oxford
Operator ID County District Quadrangle

2) Operator's Well Number: 513758 Well Pad Name: OXF163

3) Farm Name/Surface Owner: Pierce Public Road Access: CR 7/18

4) Elevation, current ground: 1158.4 Elevation, proposed post-construction: 1158.4

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Geneseo, 6480', 35', 2190 PSI

8) Proposed Total Vertical Depth: 6480

9) Formation at Total Vertical Depth: Geneseo

10) Proposed Total Measured Depth: 15400

11) Proposed Horizontal Leg Length: 7691

12) Approximate Fresh Water Strata Depths: 176, 453, 517

13) Method to Determine Fresh Water Depths: By offset wells

14) Approximate Saltwater Depths: 1156

15) Approximate Coal Seam Depths: None identified

16) Approximate Depth to Possible Void (coal mine, karst, other): None

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

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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	20	New	A-500	78.6	40	40	44.84 ft ³ / CTS
Fresh Water	13 3/8	New	J-55	54.5	1055	1055	981.8 ft ³ / CTS
Coal							
Intermediate	9 5/8	New	A-500	40	3039	3039	1660.3 ft ³ / CTS
Production	5 1/2	New	P-110	20	15397	15397	500' above top producing zone
Tubing	2 3/8		J-55	4.7		May not be run, if run set 40' above top perf or 80° inclination.	
Liners							

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	20	24	.375	1378	1102	Class A	1.18
Fresh Water	13 3/8	17 1/2	.38	2700	2160	Class A	1.18
Coal							
Intermediate	9 5/8	12 3/8	.395	3950	3160	Class A	1.18
Production	5 1/2	8 1/2	.361	12640	10112	Class A/H	1.23/1.95
Tubing	2 3/8	NA	.19	7700			
Liners							

PACKERS

Kind:				
Sizes:				Office of Oil and Gas
Depths Set:				JUN 10 2016

WV Department of Environmental Protection

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and complete a new horizontal well in the Geneseo Formation. Drill the vertical to an approximate depth of 3690'. Kick off and drill curve. Drill the lateral in the Geneseo. Cement casing.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Hydraulic fracturing is completed in accordance with state regulations using water recycled from previously fractured wells and obtained from freshwater sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid, gelling agent, gel breaker, friction reducer, biocide, and scale inhibitor), referred to in the industry as a "slickwater" completion. Maximum anticipated internal casing pressure is expected to be approximately 10000 psi, maximum anticipated treating rates are expected to average approximately 100 bpm. Stage lengths vary from 150 to 300 feet. Average approximately 200,000 barrels of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000 pounds of sand per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): no additional disturbance

22) Area to be disturbed for well pad only, less access road (acres): no additional disturbance

23) Describe centralizer placement for each casing string:

- Surface: Bow spring centralizers – One centralizer at the shoe and one spaced every 500'.
- Intermediate: Bow spring centralizers– One centralizer at the shoe and one spaced every 500'.
- Production: One solid body centralizer spaced every other joint from production casing shoe to KOP

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

Conductor: Class A no additives
 Surface (Class A Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries
 Intermediate (Class A Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries.
 Production:
 Lead (Class A Cement): 0.2% CD-20 (dispersant makes cement easier to mix). .15% SuperFL-300 (fluid loss/lengthens thickening time) .15% SEC-10 (fluid loss) 50:50 POZ (extender)
 Tail (Class H Cement): 0.2% Super CR-1 (Retarder). Lengthens thickening time. .3% Super FL-200 (fluid loss) .2% SEC-10 (Fluid loss). .2% SuperFL-350 (fluid loss) Reduces amount of water lost to formation. 60 % Calcium Carbonate. Acid solubility.

25) Proposed borehole conditioning procedures:

Surface: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
 Intermediate: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
 Production: Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume. Perform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across the shakers every 15 minutes.

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*Note: Attach additional sheets as needed.

085-10134

WW-6A1
(5/13)

Operator's Well No. 513758

**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
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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 needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Office of Oil and Gas

Well Operator: EQT Production Company

By: Victoria J Roark JUN 10 2016

Its: Permitting Supervisor

WV Department of
Environmental Protection

01/27/2017

085-10134

WW-6A1 attachment

Operator's Well No.

513758

Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Lease 118212</u>	<u>J.E. Pierce, et al (current royalty owner)</u> J. E. Pierce, L. L. Pierce & Felsie Pierce (original lessor) Pittsburg & WV Gas Co. Equitable Gas Company Equitrans, Inc. Equitable Production Company	Pittsburgh & WV Gas. Co. Equitable Gas Company Equitrans, Inc. Equitable Production Company EQT Production Co.	***	LB 45/257 DB 126/473 LB 201/253 LB 192/19 DB 281/346
TMP 27-23	Jon Mathew and Sherri L. Bonnell	EQT Production Company	n/a	330/273 Subsurface
<u>Lease 987447</u>	<u>Craig H. Williams (current royalty owner)</u> Craig H. Williams & Amy L. Williams (original lessor)	EQT Production Co.	Min pd 1/8	DB 257/115
<u>Lease 107857</u>	<u>J.P. Smith, et ux (current royalty owner)</u> Betty Jean Nutter (original lessor) Jerry Allen Riddle	EQT Production Co. EQT Production Co.	Min pd 1/8	LB 255/510 LB 255/516
<u>Lease 988339</u>	<u>Donald Sheets, et al (current royalty owner)</u> Whittle Corporation Antero Resources Corp.	Antero Resources Corp. EQT Production Co.	Min pd 1/8	LB254/1024 LB273/865

*** We will pay one-eighth of the total amount paid to or received by or allowed to the owner of the working interest at the wellhead for the oil or gas so extracted, produced, or marketed before deducting the amount to be paid to or set aside for the owner of the oil or gas in place, on all such oil or gas to be extracted, produced, or marketed from the well.

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EQT Production Company
2400 Zenith Ridge Rd.
Suite 200
Canonsburg, PA 15317
www.eqt.com

Todd Klaner
Manager, Permitting
tklaner@eqt.com

Via E-Mail

June 1, 2016

WV DEP Reviewer

**RE: EQT Production Company
PAD ID – OXF163
Well# - 513758
Ritchie County**

Dear Reviewer,

This well indicated by this permit application contains a Subsurface Easement Agreement for non-productive portions of the well bore. Attached is a Memorandum of Subsurface Use Agreement which gives EQT the right to drill below the surface of the tracts 27-23 shown on the well plat.

EQT Production understands that the WVDEP will issue the permit in the normal process subject to the completeness of the requirements of the Office of Oil and Gas and does not take a position with regards to the property rights under this agreement.

EQT Production agrees that the WVDEP's issuance of the permit is in no way an affirmation or validation of EQT Production's claimed rights.

Regards,

Todd Klaner
Manager, Permitting
EQT Production Company

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01/27/2017

201400003962
Filed for Record in
RITCHIE COUNTY, WV
TRACIE D. MCDONALD, COUNTY CLERK
07-22-2014 At 12:01 pm.
RW/EASEMENT 163.00
Book 330 Page 273 - 274

201400003962
ST TAX \$ 99.00
CNTY TAX \$ 33.00
Date Paid 07-22-2014

SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

This SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT ("Agreement") is made the 20th day of May, 2014, between **Jon Mathew Bonnell and Sherri L. Bonnell**, his wife, (hereinafter "Grantor" whether one or more), whose address is 9 Crystal Lake Road West Union, WV 26456 and **EQT PRODUCTION COMPANY**, (hereinafter "EQT"), whose corporate headquarters are located at 625 Liberty Avenue, Suite 1700, Pittsburgh, PA, 15222.

Property. Grantor owns that certain tract of land located in Union District, Ritchie County, West Virginia containing 133.42 acres, more or less, and conveyed to Grantor in Deed Book 268, at page 129. Map 27 Parcel 23

1. **Subsurface.** For purposes of this Agreement, the subsurface shall be limited to the subsurface region and underground lying below the deepest economically mineable and merchantable coal seam.

2. **Grant.** In consideration of Ten Dollars and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Grantor grants to EQT a non-exclusive, perpetual right of way and subsurface easement within and underlying the Land for the purpose of locating and maintaining a total of three wellbores (513756 / 513757 / 513758) for the production of hydrocarbons by EQT from EQT's adjacent mineral tracts and leases. This right of way and easement shall run with the land and shall remain in force and effect until released and relinquished by EQT back to the Grantor, in writing.

3. **Wellbores.** Upon completion of any wellbore within the subsurface underlying the Land (the "Subsurface Land"), the subsurface easement in the area of the wellbore and the one hundred (100') feet on each side of the wellbore that parallels it shall become an *exclusive* right of way and easement in that area. The wellbore locations are generally described in the plat(s) filed with the West Virginia Department of Environmental Protection (the "DEP") for well(s): If an as-built plat is not available from the DEP for a wellbore located within the Subsurface Land, any third-party with the right to operate within the Subsurface Land may contact EQT's land department for a copy of such as-built plat. After the date of this Agreement, EQT shall provide notice of additional wellbores located within the remaining Subsurface Land by filing an amendment, affidavit or other appropriate document.

4. **No Surface Operations.** This Agreement does not grant EQT the right to conduct any operations on the surface of the Land. No surface operations shall be conducted on the Land by EQT unless the parties enter into a separate agreement.

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5. **Miscellaneous Provisions**

(a) This instrument may be executed in one or more counterparts, each of which will be deemed to be an original copy of this instrument and all of which will be deemed to comprise one single instrument.

①

- (b) The parties agree that this Agreement shall be filed of record together with all exhibits thereto.
- (c) For no additional consideration, Grantor shall execute such further documents as may be reasonably requested by EQT from time to time to effectuate the intent of this Agreement.

IN WITNESS WHEREOF, effective as of the date first above written. This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors, assigns, heirs and administrators and executors.

[NAME OF GRANTOR]

Jon Matthew Bonnell *Jon M. Bonnell*

Sherri L. Bonnell *Sherri L. Bonnell*

EQT PRODUCTION COMPANY

John Tamato
Name: John Tamato
Title: Attorney-in-fact

01/27/2017

085-10134

STATE/ OF West Virginia ;
COUNTY OF Doddridge :

Before me, Rex K. Bumgardner II, a Notary Public, on this day personally appeared Jon Mathew Bonnell and Sherri Bonnell, his wife, known to me and acknowledged to me that he/she executed the instrument for the purposes and consideration therein expressed as his/her free act and deed. Given under my hand and seal of office this 20th day of May, 2014

My Commission expires: 6/13/2014



[Handwritten Signature]
Notary Public

STATE OF West Virginia ;
COUNTY OF Harrison :

Before me, Rex K. Bumgardner II, a Notary Public, on this day personally appeared, known to me to be the John Damato of EQT PRODUCTION COMPANY, subscribed to the foregoing instrument, and acknowledged to me that he/she executed the instrument for the purposes and consideration therein expressed as his/her free act and deed. Given under my hand and seal of office this 20th day of May, 2014

My Commission expires: 6/13/2014



[Handwritten Signature]
Notary Public

Prepared by: EQT Production Company, 625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222

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May 20, 2016

Mr. James Martin
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: OXF 163, 513758, 47-08510134

Dear Mr. Martin,

EQT Production Company is submitting an application for a new well work permit for the above well number. Upon information and belief, Operator's lease and/ or other real property rights permit it to conduct drilling operations for the subject well in the location shown on the plat, including under any public roads that the well lateral crosses.

Sincerely,

Vicki Roark
Permitting Supervisor-WV

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EQT Production | 115 Professional Place | P.O. Box 280 | Bridgeport, WV 26330
T 304.848.0000 | F 304.848.0040 | www.eqt.com

01/27/2017

ROYALTY OWNERS		
CRAIG H. WILLIAMS	243.88 AC.±	LEASE NO. 067447
J.P. SMITH ET UX	130 AC.±	LEASE NO. 107067
DONALD SHEETS ET AL	82.10 AC.±	LEASE NO. 088339

NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. AS DRILLED INFORMATION PROVIDED BY EQT.
3. NONPRODUCTIVE SUBSURFACE RIGHT OF WAY.

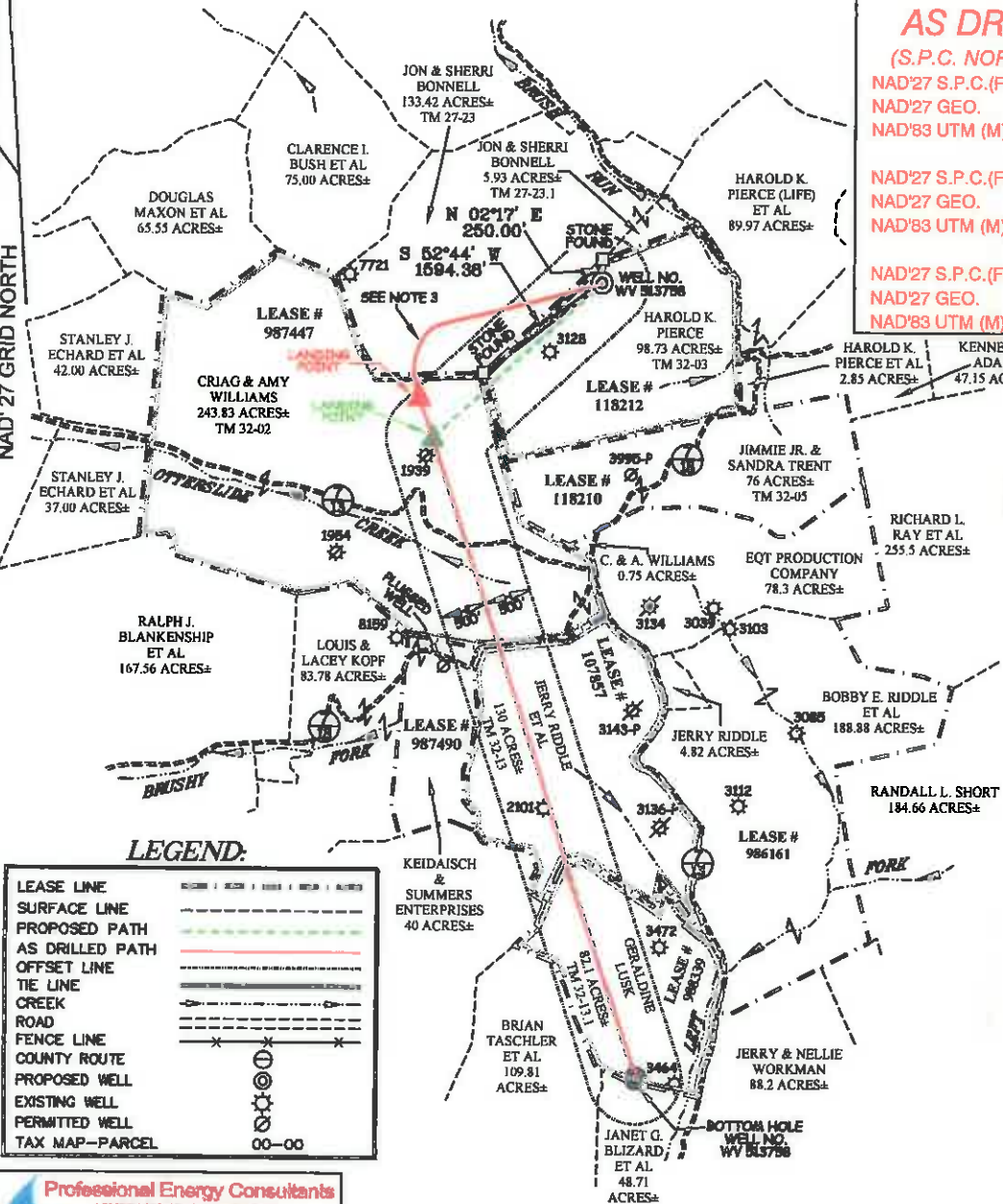
LATITUDE 39°10'00"

**EQT PRODUCTION COMPANY
J.E. PIERCE ET AL LEASE
108 (98.73±) ACRES±
WELL NO. WV 513758
(OXF163 H3)**

AS DRILLED COORDINATES

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

	NAD'27 S.P.C.(FT)	N. 234,477.3	E. 1,619,107.1
NAD'27 GEO.	LAT-(N) 39.135962	LONG-(W) 80.842816	
NAD'83 UTM (M)	N. 4,331,885.9	E. 513,599.6	
LANDING POINT			
NAD'27 S.P.C.(FT)	N. 233,256.5	E. 1,617,148.8	
NAD'27 GEO.	LAT-(N) 39.132530	LONG-(W) 80.849654	
NAD'83 UTM (M)	N. 4,331,504.0	E. 513,009.3	
BOTTOM HOLE			
NAD'27 S.P.C.(FT)	N. 225,958.7	E. 1,619,564.7	
NAD'27 GEO.	LAT-(N) 39.112594	LONG-(W) 80.840755	
NAD'83 UTM (M)	N. 4,329,293.1	E. 513,782.4	



SUBSURFACE AGREEMENT		
JOHN M. & SHERRI L. BONNELL	133.42 AC.±	TM 27-23

LEGEND:

LEASE LINE	---
SURFACE LINE	---
PROPOSED PATH	---
AS DRILLED PATH	---
OFFSET LINE	---
TIE LINE	---
CREEK	---
ROAD	---
FENCE LINE	---
COUNTY ROUTE	---
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
TAX MAP-PARCEL	00-00

Professional Energy Consultants
A DIVISION OF BROWN LAND SURVEYING, INC.

SLS
SURVEYORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT.

(304) 482-5934
WWW.SLSURVEYL.COM

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 REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S.
2288 *Earl N. Thompson*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE MAY 27, 20 14
REVISED 08/22/14, 10/27/14, 10/31/14, 12/02/14, 12/05/14, 04/14/15, 12/03/15, 05/16/16 & 06/06/16

OPERATORS WELL NO. WV 513758
API WELL NO. 47 - 085 - 10134H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7698AD513758R2
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: PAD ELEVATION 1,158.4' WATERSHED BRUSH RUN OF MIDDLE FORK
DISTRICT UNION COUNTY RITCHIE QUADRANGLE OXFORD 7.5'

SURFACE OWNER HAROLD K. PIERCE ACREAGE 98.73±
ROYALTY OWNER J.E. PIERCE ET AL ACREAGE 108± (98.73±)

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION GENESE0
ESTIMATED DEPTH 6,434'

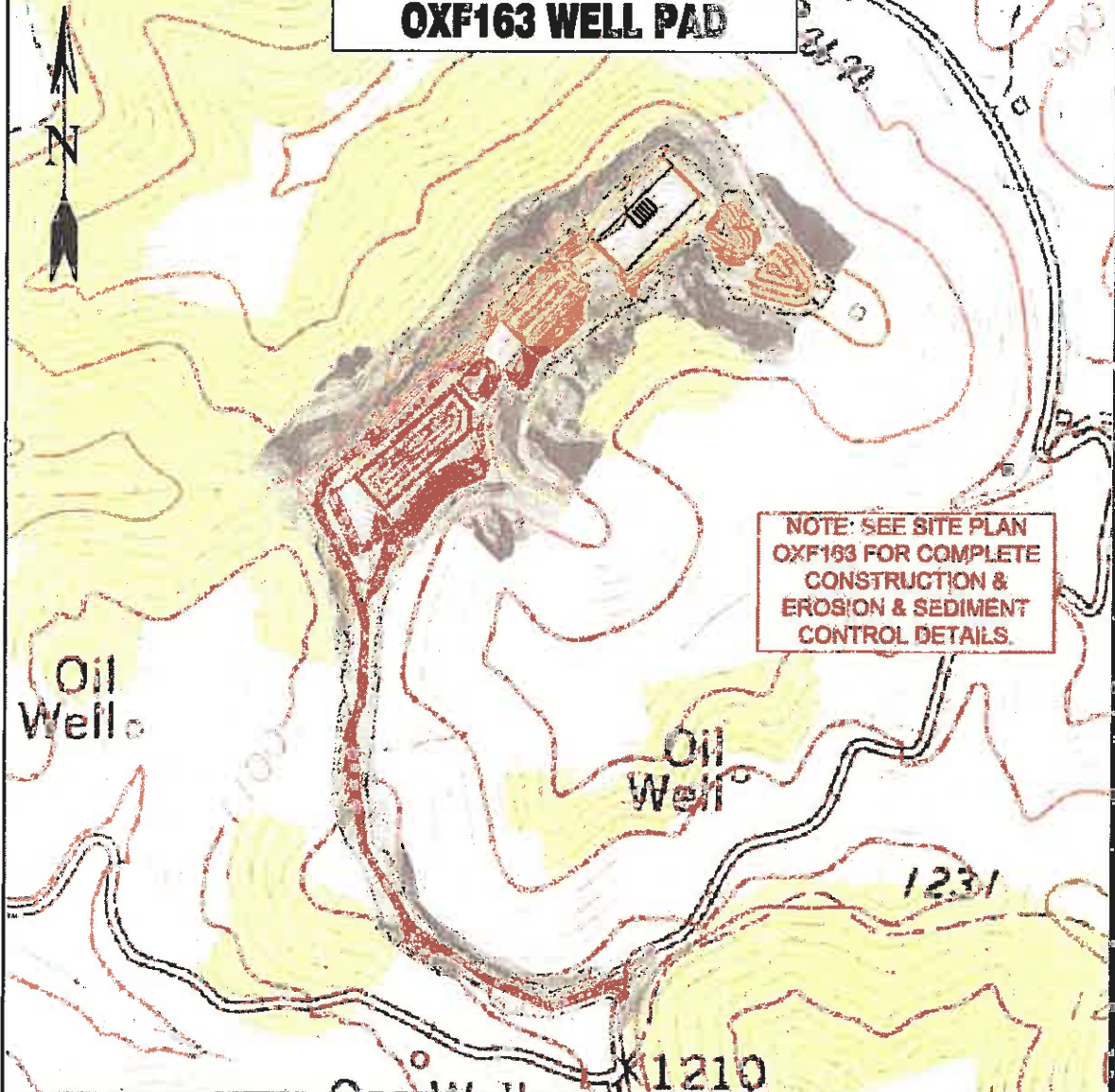
WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT

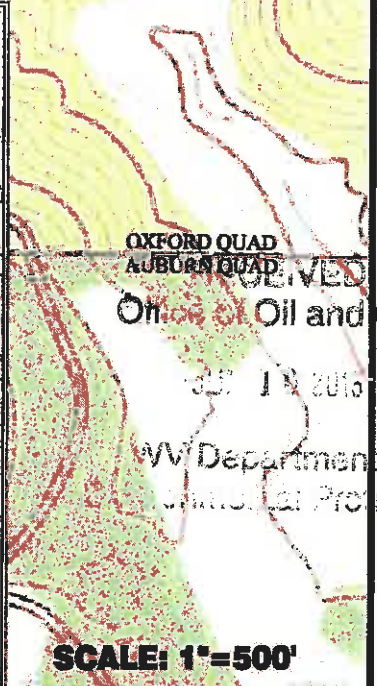
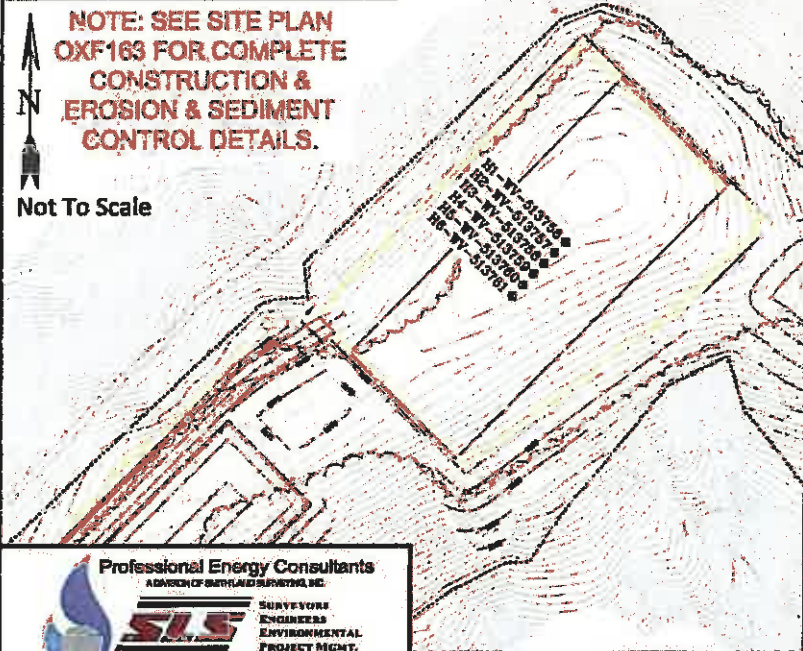
01/27/2017

J.E. PIERCE ET AL LEASE OXF163 WELL PAD

085-
10134



Detail Sketch for Proposed OXF163 Wells



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A DIVISION OF SLS SURVEYS, INC.

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DRAWN BY K.G.M.	FILE NO. 7698	DATE 05-23-14	CADD FILE: 7698REC163.dwg
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TOPO SECTION OF OXFORD 7.5' AND
AUBURN 7.5' USGS TOPO QUADRANGLE