



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

Earl Ray Tomblin, Governor
Randy C. Huffman, 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 512428
47-085-10236-00-00

Adding Additional Lease

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: 512428
Farm Name: RAY, RICHARD L. & SHERYL A.
U.S. WELL NUMBER: 47-085-10236-00-00
Horizontal 6A / Horizontal 6A Well - 1
Date Issued: 1/10/2017

Promoting a healthy environment.

01/20/2017



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 47-085-10236

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 1 additional lease, #106136. 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: 512428 Well Pad Name: OXF122

3) Farm Name/Surface Owner: Richard L & Sheryl A. Ray Public Road Access: 7/18

4) Elevation, current ground: 1111.0 Elevation, proposed post-construction: 1111.0

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

(b) If Gas Shallow X Deep _____
Horizontal X

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 6485', 54', 2190 PSI

8) Proposed Total Vertical Depth: 6485

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15610

11) Proposed Horizontal Leg Length: 7724

12) Approximate Fresh Water Strata Depths: 246 & 190' fm

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

14) Approximate Saltwater Depths: None reported

15) Approximate Coal Seam Depths: 939 & 233' fm

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

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No X

(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	385	385	486 ft ³ / CTS
Coal							
Intermediate	9 5/8	New	A-500	40	2985	2985	1272.38 ft ³ / CTS
Production	5 1/2	New	P-110	20	15610	15610	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	1.20
Coal							
Intermediate	9 5/8	12 3/8	.395	3950	3160	Class A	1.18/1.20
Production	5 1/2	8 1/2	.361	12640	10112	Class A/H	1.76/1.84
Tubing	2 3/8	NA	.19	7700			
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

Drill and complete a new horizontal well in the Marcellus Formation. Drill the vertical to an approximate depth of 3274'. Kick off and drill curve. Drill the lateral in the Marcellus. 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 (Type 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 (Type 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.

*Note: Attach additional sheets as needed.

085-10236

WW-6A1
(5/13)

Operator's Well No. 512428

**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 attachment

**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.

Well Operator: EQT Production Company
 By: Victoria J. Roark
 Its: Permitting Supervisor

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085-10236

WW-6A1 attachment

Operator's Well No.

512428

Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page	
✓ 105953	<u>Haught Family Trust, et al (current royalty owner)</u> William Adams, et ux (original lessor) The Philadelphia Company of West Virginia Pittsburgh and West Virginia Gas Company Equitable Gas Company Equitrans, Inc. Equitable Production-Eastern States, Inc. Equitable Production Company	The Philadelphia Company of West Virginia Pittsburgh and West Virginia Gas Company Equitable Gas Company Equitrans, Inc. Equitable Production-Eastern States, Inc. Equitable Production Company EQT Production Company	***	LB29/244 LB55/362 LB126/473 LB201/253 LB234/830 DB281/346 DB281/346	Doddridge Doddridge
✓ 109481	<u>Adele McDougal et al (current royalty owner)</u> Jackson Leeson, et al (original lessor) The Philadelphia Co. of West Virginia Pittsburgh & West Virginia Gas Co. Equitable Gas Company Equitrans, Inc. Equitable Production-Eastern States, Inc. Equitable Production Company	The Philadelphia Co. of West Virginia Pittsburgh & West Virginia Gas Co. Equitable Gas Company Equitrans, Inc. Equitable Production-Eastern States, Inc. Equitable Production Company EQT Production Company	***	LB21/76 DB87/90 DB121/303 DB154/475 LB192/19 CB281/346 CB281/346	
✓ 987352	<u>Michael M. McKenzie, et al (current royalty owner)</u> Michael Marion McKenzie (original lessor)	EQT Production Company	min pd 1/8th	LB252/989	
✓ 987351	<u>Michael M. McKenzie, et al (current royalty owner)</u> Jenny Catherine Burbank (original lessor) Charles T. Reed James L. Reed Michael Marion McKenzie Donald E. Reed Jerry R. Reed	EQT Production Company EQT Production Company EQT Production Company EQT Production Company EQT Production Company EQT Production Company	min pd 1/8th	LB253/576 LB254/698 LB254/701 LB255/717 LB256/355 LB257/514	
✓ 106136	<u>Adele McDougal, et al (current royalty owner)</u> Thomas Watson, R. A. Watson and M. G. Zinn (original lessor) The Philadelphia Co. of West Virginia Pittsburgh & West Virginia Gas Co. Equitable Gas Company Equitrans, Inc. Equitable Production-Eastern States, Inc. Equitable Production Company	The Philadelphia Co. of West Virginia Pittsburgh & West Virginia Gas Co. Equitable Gas Company Equitrans, Inc. Equitable Production-Eastern States, Inc. Equitable Production Company EQT Production Company	***	LB30/161 LB55/362 DB126/473 LB201/253 LB192/19 CB6/443 CB6/443	

*** 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.

01/20/2017



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: OXF122, 512428, 47-08510236

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,

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

Vicki Roark
Permitting Supervisor-WV

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JUN 10 2016

WV Department of
Environmental Protection

**EQT PRODUCTION COMPANY
W.M. ADAMS LEASE
402 ACRES±
WELL NO. WV 512428
(OXF122 H3)**

AS DRILLED COORDINATES

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

NAD'27 S.P.C.(FT)	N. 233,074.50	E. 1,622,411.30
NAD'27 GEO.	LAT-(N) 39.132246	LONG-(W) 80.831096
NAD'83 UTM (M)	N. 4,331,475.36	E. 514,613.39
LANDING POINT		
NAD'27 S.P.C.(FT)	N. 234,622.47	E. 1,623,824.85
NAD'27 GEO.	LAT-(N) 39.136553	LONG-(W) 80.826194
NAD'83 UTM (M)	N. 4,331,954.13	E. 515,036.15
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 234,675.50	E. 1,626,875.81
NAD'27 GEO.	LAT-(N) 39.114892	LONG-(W) 80.815030
NAD'83 UTM (M)	N. 4,329,552.33	E. 516,005.94

NAD 27 GRID NORTH

A	MALAKI SPENCER	7.204 ACRES±
B	ZAVADA & SUNRAK SPENCER	7.202 ACRES±
C	MELVIN & MARY BRITTON	7.226 ACRES±
D	CAZJUN SPENCER	2.278 ACRES±
E	CHIARA RUMMEL	7.204 ACRES±
F	CEMETERY	0.467 ACRES±
G	MELVIN BRITTON	3.57 ACRES±
H	RANDALL & DEBBY FARLEY	42.92 ACRES±
I	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	145.192 ACRES±
J	JEFFREY A. SPERRY	72.86 ACRES±
K	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	416.61 ACRES±
L	EQUITRANS INC	0.632 ACRES±
M	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	3.51 ACRES±
N	JIMMIE & EILEEN BURKE	9.68 ACRES±
O	MARVIN EDWARDS JR	1 ACRE±

ROYALTY OWNERS		
ADELE McDUGAL ET AL	2000 AC.±	LEASE NO. 109481
MICHAEL M. MCKENZIE ET AL	57 AC.±	LEASE NO. 987352
MICHAEL M. MCKENZIE ET AL	199.75 AC.±	LEASE NO. 987351
ADELE McDUGAL ET AL	53 AC.±	LEASE NO. 109136

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



**SURVEYORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT.**

(304) 462-5834 WWW.SLSURVEYS.COM

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.

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	○
RITCHIE COUNTY UNION DISTRICT TAX MAP-PARCEL	TM U-00-00
DODDRIDGE COUNTY SOUTHWEST DISTRICT TAX MAP-PARCEL	TM SW-00-00

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 JANUARY 13, 20 14
REVISED 07/10/15, 03/02/16, 05/16/16 & 06/08/16
OPERATORS WELL NO. WV 512428
API WELL NO. 47 - 085 - 10236H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 6811AD512428R2
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 1,111' WATERSHED STRAIGHT FORK
DISTRICT UNION COUNTY RITCHIE QUADRANGLE OXFORD 7.5'

SURFACE OWNER RICHARD L. & SHERYL A. RAY ACREAGE 255.50±
ROYALTY OWNER HAUGHT FAMILY TRUST ET AL ACREAGE 402±

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 MARCELLUS
ESTIMATED DEPTH 6,461'

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

01/20/2017

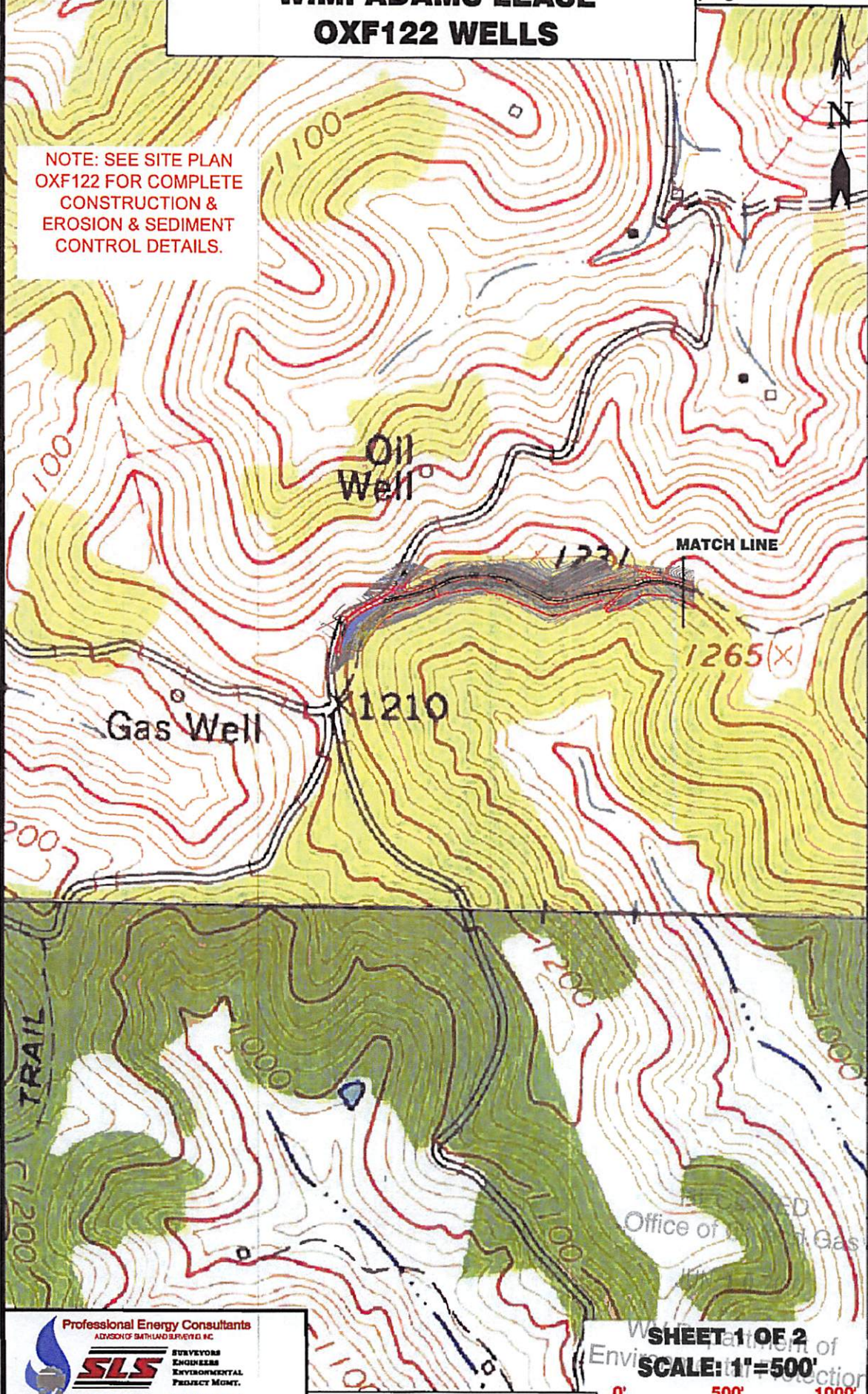
COUNTY NAME

PERMIT

W.M. ADAMS LEASE OXF122 WELLS

NOTE: SEE SITE PLAN
OXF122 FOR COMPLETE
CONSTRUCTION &
EROSION & SEDIMENT
CONTROL DETAILS.

085
10236



Professional Energy Consultants
ADVISOR OF SMITHLAND SERVICES INC.

SLS
SURVEYORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT.

TELEPHONE: 601-827-5254
WWW.PECCONSULTING.COM

DRAWN BY: K.D.W. FILE NO. 6811 DATE 03-31-16 CADD FILE: 6811ECPPLAN.dwg

TOPO SECTIONS OF OXFORD 7.5'
TOPO QUADRANGLE

W.M. ADAMS LEASE
Office of Environmental Protection

SHEET 1 OF 2
SCALE: 1" = 500'

0' 500' 1000'

W.M. ADAMS LEASE OXF122 WELLS

NOTE: SEE SITE PLAN
OXF122 FOR COMPLETE
CONSTRUCTION &
EROSION & SEDIMENT
CONTROL DETAILS.

MATCH LINE

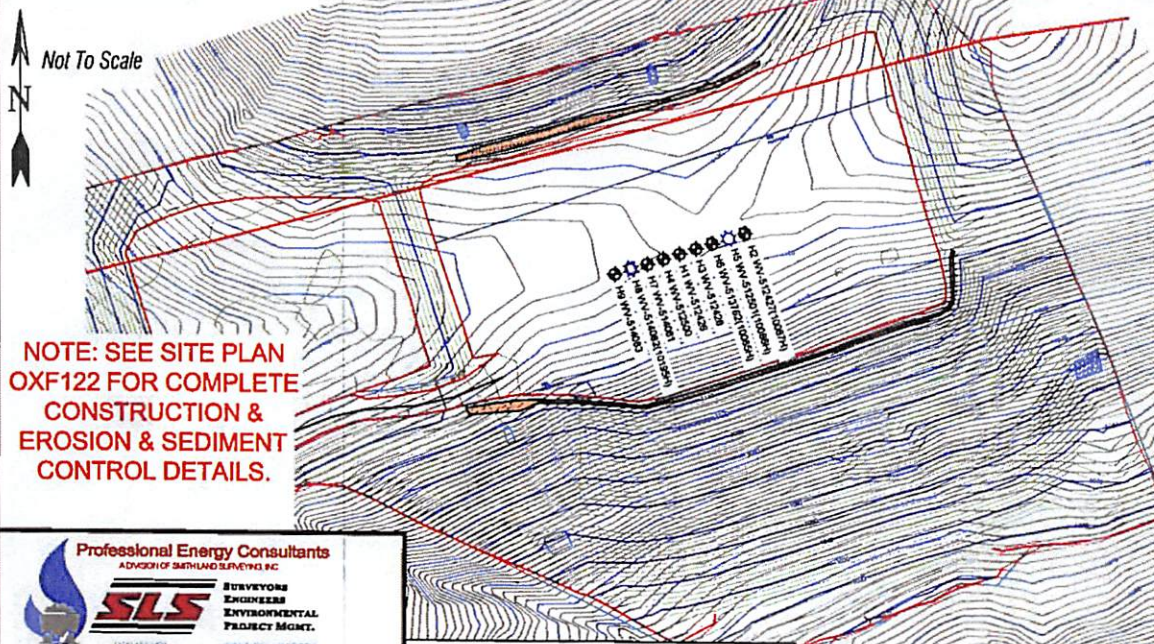
DRIDGE-
RITCHE

085-
10236

SHEET 2 OF 2
SCALE: 1"=500'



Detail Sketch for Proposed OXF122 Well No.s WV 512426, WV 512427, WV 512428, WV 512500, WV 512501, WV 513762, WV 514081, WV 514082 & WV514083



NOTE: SEE SITE PLAN
OXF122 FOR COMPLETE
CONSTRUCTION &
EROSION & SEDIMENT
CONTROL DETAILS.



TOPO SECTIONS OF OXFORD 7.5'
TOPO QUADRANGLE

DRAWN BY: K.D.W. FILE NO. 6811 DATE 03-31-16 CADD FILE: 6811WZPLAN.dwg

01/20/2017