



west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

August 10, 2015

EQT PRODUCTION COMPANY
120 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330

Re: Permit Modification Approval for API Number 8510195, Well #: 514082

Extend Lateral

Oil and Gas Operator:

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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,



Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

Promoting a healthy environment.

08//14/2015



July 8, 2015

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

Re: Modification of 085-10195

Dear Mr. Smith,

Enclosed is an updated WW-6B, schematics, WW-6A1, rec plan and mylar plat. EQT would like to modify the length of the lateral. The top hole has not changed.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Vicki Roark', written in a cursive style.

Vicki Roark
Permitting Supervisor-WV

Enc.

Received

JUL 22 2015

Office of Oil and Gas
WV Dept. of Environmental Protection

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

1) Well Operator: EQT Production Company

| | | | |
|-------------|--------|----------|------------|
| 306686 | 085 | 4 | 526 |
| Operator ID | County | District | Quadrangle |

2) Operator's Well Number: 514082 Well Pad Name OXF122

3) Farm Name/Surface Owner : Richard L & Sheryl A Ray Public Road Access: Co Rt 22/3

4) Elevation, current ground: 1,111.0 Elevation, proposed post-construction: 1,111.0

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 Thicknesses and Associated Pressure(s):
Target formation is Marcellus at a depth of 6494 with the anticipated thickness to be 54 feet and anticipated target pressure of 2190 PSI

8) Proposed Total Vertical Depth: 6494

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16306

11) Proposed Horizontal Leg Length 8,914

12) Approximate Fresh Water Strata Depths: 236

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

14) Approximate Saltwater Depths: N/A

15) Approximate Coal Seam Depths: 929

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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Office of Oil and Gas
WV Dept. of Environmental Protection

7-15-15
Dawson

CASING AND TUBING PROGRAM

18)

| 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.) |
|--------------|-----------|-------------|-------|------------------------|----------------------------|------------------------------|---|
| Conductor | 20 | New | MC-50 | 81 | 40 | 40 | 38 C.T.S. |
| Fresh Water | 13 3/8 | New | MC-50 | 54 | 1,056 | 1,056 | 915 C.T.S. |
| Coal | - | - | - | - | - | - | - |
| Intermediate | 9 5/8 | New | MC-50 | 40 | 2,940 | 2,940 | 1,146 C.T.S. |
| Production | 5 1/2 | New | P-110 | 20 | 15,175 | 15,175 | See Note 1 |
| Tubing | 2 3/8 | | J-55 | 4.6 | | | May not be run, if run will be set 100 less than TD |
| 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 | 0.375 | - | 18 | Construction | 1.18 |
| Fresh Water | 13 3/8 | 17 1/2 | 0.38 | 2,480 | 2,184 | * See Note 2 | 1.21 |
| Coal | | | | | | | |
| Intermediate | 9 5/8 | 12 3/8 | 0.395 | 3,590 | 3,160 | * See Note 2 | 1.21 |
| Production | 5 1/2 | 8 1/2 | 0.361 | 12,640 | 10,112 | - | 1.27/1.86 |
| Tubing | | | | | | | |
| Liners | | | | | | | |

Packers

| | | | | |
|-------------|-----|--|--|--|
| Kind: | N/A | | | |
| Sizes: | N/A | | | |
| Depths Set: | N/A | | | |

Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.

Note 2: Reference Variance 2014-17. (Attached)

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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. The vertical drill to go down to an approximate depth of 4898'.
Then kick off the horizontal leg into the formation using a slick water frac.

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 average approximately 8500 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): 29.51

22) Area to be disturbed for well pad only, less access road (acres): 18.14

- 23) Describe centralizer placement for each casing string.
- Surface: Bow spring centralizers – One at the shoe and one spaced every 500'.
 - Intermediate: Bow spring centralizers– One cent at the shoe and one spaced every 500'.
 - Production: One spaced every 1000' from KOP to Int csg shoe

24) Describe all cement additives associated with each cement type. Surface (Type 1 Cement): 0-3% Calcium Chloride

Used to speed the setting of cement slurries.
0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of the cement slurry to a thief zone.
Intermediate (Type 1 Cement): 0-3% Calcium Chloride. Salt is used in shallow, low temperature formations to speed the setting of cement slurries. 0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of whole drilling fluid or cement slurry (not filtrate) to a thief zone.

Production:
Lead (Type 1 Cement): 0.2-0.7% Lignosulfonate (Retarder). Lengthens thickening time.

0.3% CFR (dispersant). Makes cement easier to mix.

Tail (Type H Cement): 0.25-0.40% Lignosulfonate (Retarder). Lengthens thickening time.

0.2-0.3% CFR (dispersant). This is to make the cement easier to mix.

60 % Calcium Carbonate. Acid solubility.

0.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.

25) Proposed borehole conditioning procedures. Surface: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. To ensure that there is no fill, short trip two stands with no circulation. If there is fill, bring compressors back on and circulate hole clean. A constant rate of higher than expected cuttings volume likely indicates washouts that will not clean up.

Intermediate: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. If foam drilling, to enhance hole cleaning use a soap sweep or increase injection rate & foam concentration.

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.

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WV Dept. of Environmental Protection

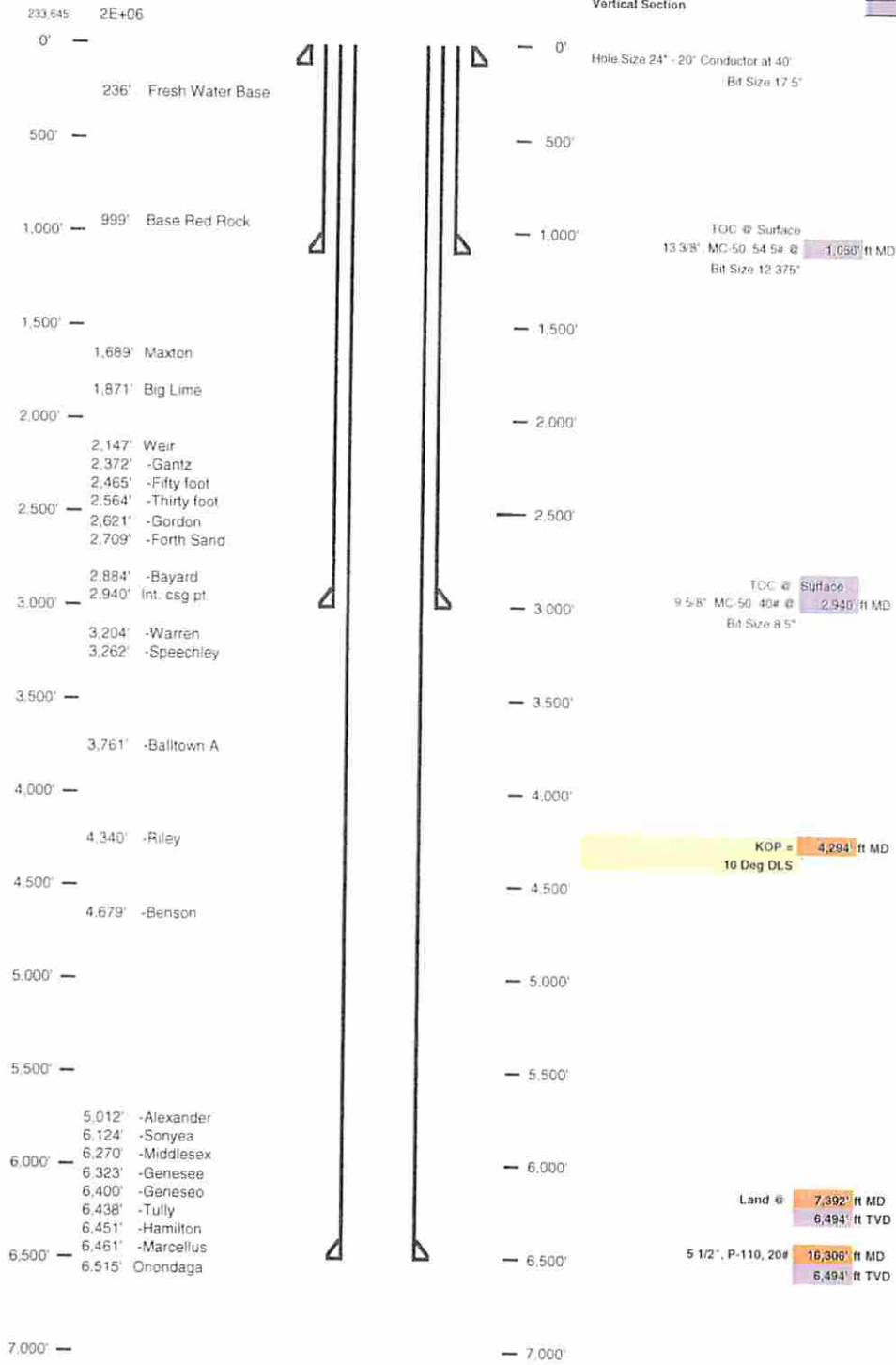


4708510195 MOD

Well Schematic
EQT Production

Well Name: 514082 (OXF12218)
County: Ritchie
State: West Virginia

Elevation KB: 1124
Target: Marcellus
Prospect: 161
Azimuth: 177
Vertical Section: 1777



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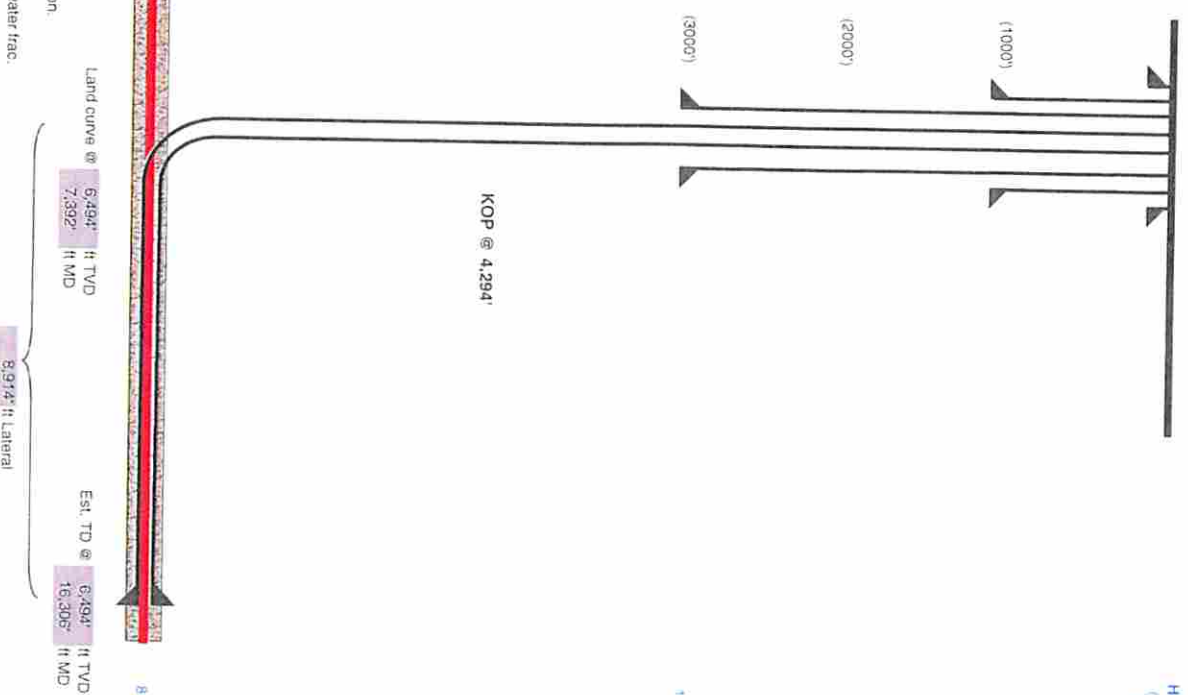
08/14/2015

4708510195 MOD

Well 514082 (OXF122H8)
 EOT Production
 Oxford Quad
 Ritchie
 West Virginia

Asmuth 161
 Vertical Section 7777

| TVD Depth (feet) | Formation Tops (TVD) |
|------------------|----------------------|
| 0 | |
| 250 | Base Fresh Water |
| 500 | |
| 750 | |
| 1,000 | Base Reef Rock |
| 1,250 | |
| 1,500 | |
| 1,750 | Maxton |
| 2,000 | Big Linn |
| 2,250 | Waco |
| 2,500 | Clinton |
| | Forty foot |
| | Twenty foot |
| | Cardon |
| | Forty Sand |
| | Dayva Int. 549 pl |
| | Warren |
| | Speerchley |
| | Balltown A |
| | Riley |
| | Benson |
| | Alexander |
| | Sonyea |
| | Middlesex |
| | Zandrew |
| | Carsonia |
| | Tully |
| | Hamburn |
| | Marcellus top |
| | Marcellus Bottom |



| Depth (ft) | Hole Size (inches) | Casing Type | Casing Size (inches) | WT (ppg)/Grade |
|--------------------|--------------------|-------------------|----------------------|----------------|
| 0 - 1,000 | 24 | Conductor | 20 | |
| 1,000 - 13,908 | 17 1/2 | Surface | 13 9/8 | 54#/MC-50 |
| 13,908 - 16,305 | 12 3/8 | Intermediate | 9 5/8 | 40#/MC-50 |
| 16,305 - 20# P-110 | 8 1/2 | Production Casing | 5 1/2 | |

Proposed Well Work:
 Drill and complete a new horizontal well in the Marcellus formation.
 The vertical drill to go down to an approximate depth of 4,294'.
 Then kick off the horizontal leg into the formation using a slick water frac.

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W.M. ADAMS LEASE OXF122 WELLS

4708510195 MOD

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



Oil Well

Gas Well

1210

MATCH LINE

1231

1265

TRAIL

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Office of Oil and Gas
WV Dept. of Environmental Protection

Professional Energy Consultants
DIVISION OF SOUTH-WESTERN ENERGY INC.



SUPERVISORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT

SHEET 1 OF 2
SCALE: 1"=500'



TOPO SECTIONS OF OXFORD 7.5"
TOPO QUADRANGLE

| | | | |
|--------------------|-----------------|------------------|----------------------------|
| DRAWN BY K.D.W. | FILE NO 6811 | DATE 07-02-15 | CADD FILE 6811EPLAN.dwg |
|--------------------|-----------------|------------------|----------------------------|

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W.M. ADAMS LEASE OXF122 WELLS

47 08 51 01 95 MOD

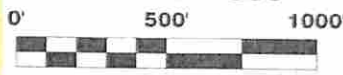
NOTE: SEE SITE PLAN
OXF122 FOR COMPLETE
CONSTRUCTION &
EROSION & SEDIMENT
CONTROL DETAILS.



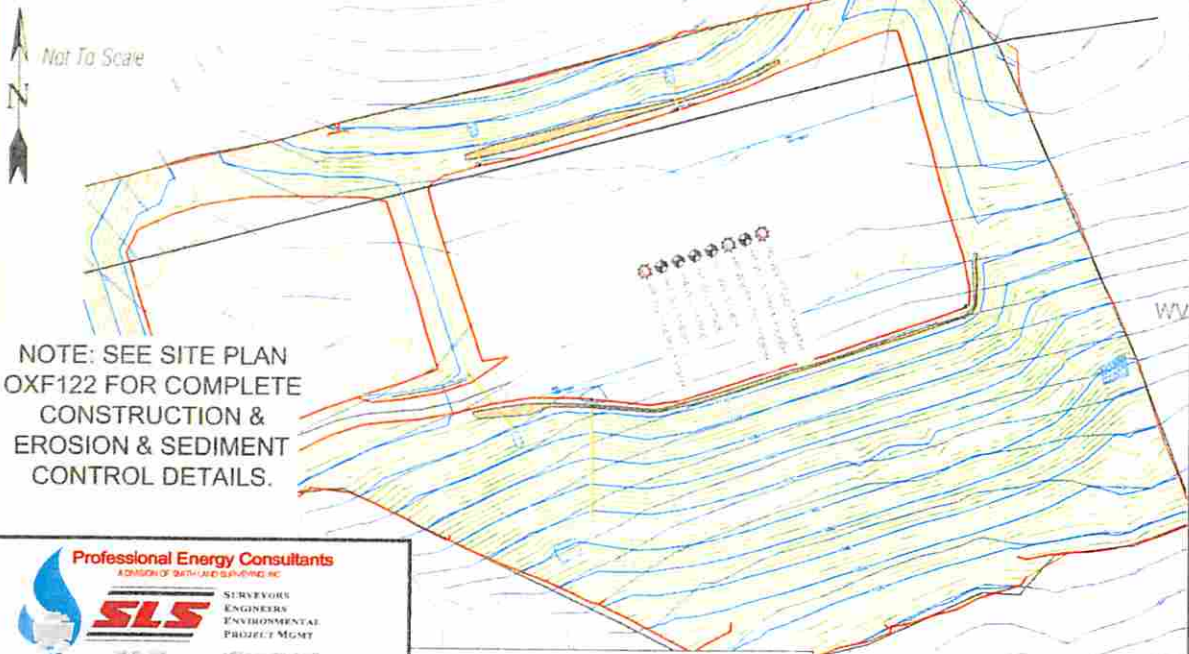
**DRIDGE-
RITCHIE
CO**

MATCH LINE

**SHEET 2 OF 2
SCALE: 1"=500'**



Detail Sketch for Proposed OXF122 Well Nos WV 512426, WV 512427, WV 512428, WV 512500, WV 512501, WV 513762, WV 514081 & WV 514082



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

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WV Dept. of Environmental Protection

Professional Energy Consultants
A DIVISION OF QUALITY ASSURANCE, INC.



SLS
SURVEYORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT

| | | | |
|--------------------|------------------|------------------|------------------------------|
| DRAWN BY K.D.W. | FILE NO. 6811 | DATE 07-02-15 | CADD FILE 6811RCPPLAN.dwg |
|--------------------|------------------|------------------|------------------------------|

TOPO SECTIONS OF OXFORD 7.5'
TOPO QUADRANGLE

08/14/2015

WW-6A1
(5/13)

Operator's Well No. _____

514082

**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 |
|-----------------------|---|---|--------------|--------------|
| <u>105953</u> ✓ | William Adams, et ux | The Philadelphia Company of West Virginia | min pd 1/8th | LB29/244 |
| | The Philadelphia Company of West Virginia | Pittsburgh and West Virginia Gas Company | | LB55/362 |
| | Pittsburgh and West Virginia Gas Company | Equitable Gas Company | | LB126/473 |
| | Equitable Gas Company | Equitrans, Inc. | | LB201/253 |
| | Equitrans, Inc. | Equitable Production-Eastern States, Inc. | | LB234/830 |
| | Equitable Production-Eastern States, Inc. | Equitable Production Company | | DB281/346 |
| | Equitable Production Company | EQT Production Company | | DB281/346 |
| | | | | Doddridge |
| | | | | Doddridge |
| <u>1005925</u> ✓ | Jackson Leeson, et al | The Philadelphia Co. of West Virginia | min pd 1/8th | LB21/76 |
| | The Philadelphia Co. of West Virginia | Pittsburgh & West Virginia Gas Co. | | DB87/90 |
| | Pittsburgh & West Virginia Gas Co. | Equitable Gas Company | | DB121/303 |
| | Equitable Gas Company | Equitrans, Inc. | | LB154/475 |
| | Equitrans, Inc. | Equitable Production-Eastern States, Inc. | | LB192/19 |
| | Equitable Production-Eastern States, Inc. | Equitable Production Company | | CB281/346 |
| | Equitable Production Company | EQT Production Company | | CB281/346 |
| | | | | Doddridge |
| | | | | Doddridge |
| <u>987352</u> ✓ | Michael Marion McKenzie | EQT Production Company | min pd 1/8th | LB252/989 |
| <u>987351</u> ✓ | Jenny Catherine Burbank | EQT Production Company | min pd 1/8th | LB253/576 |
| | Charles T. Reed | EQT Production Company | | LB254/698 |
| | James L. Reed | EQT Production Company | | LB254/701 |
| | Michael Marion McKenzie | EQT Production Company | | LB255/717 |
| | Donald E. Reed | EQT Production Company | | LB256/355 |
| | Jerry R. Reed | EQT Production Company | | LB257/514 |
| <u>1.1893533367</u> ✓ | W. M. Lipscomb, et ux | Carnegie Natural Gas Company | min pd 1/8th | LB46/187 |
| | Carnegie Natural Gas Company | Carnegie Production Company | | LB228/859 |
| | Carnegie Production | Equitable Resources Inc. | | See attached |
| | Equitable Resources Inc. | Equitable Production Co. | | DB274/471 |
| | Equitable Production Co. | EQT Production Company | | DB281/346 |
| | | | | Doddridge |

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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.

**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: 
 Its: Permitting Supervisor

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Office of Oil and Gas
WV Dept. of Environmental Protection

08/14/2015

PURCHASE AND SALE AGREEMENT

PURCHASE AND SALE AGREEMENT, dated as of May 27, 1999 (this "Agreement"), by and between USX CORPORATION, a Delaware corporation, ("USX") and EQUITABLE RESOURCES, INC., a Pennsylvania corporation (hereinafter referred to as "Buyer").

WHEREAS, USX owns directly or indirectly all of the outstanding capital stock or other evidence of an equity interest of the following companies (each a "Carnegie Company" and collectively the "Carnegie Companies"), which are involved in one or more of the production, gathering, transportation, treatment, distribution and sale of natural gas: (i) Carnegie Natural Gas Company, a Pennsylvania corporation, ("Carnegie"), (ii) Carnegie Interstate Pipeline Company, a Delaware corporation, ("CIPCO"), (iii) Carnegie Production Company, a Pennsylvania corporation, ("CPC"), (iv) Carnegie Natural Gas Sales, Inc., a Delaware corporation, ("CNGS") and (v) Carnegie Gas Storage, LLC, a Delaware limited liability company, ("CGS"); and

WHEREAS, USX desires to sell to Buyer and Buyer desires either for itself and/or one or more designated subsidiaries to purchase from USX one hundred percent (100%) of the capital stock and other evidence of equity interest in the Carnegie Companies;

NOW, THEREFORE, for and in consideration of the premises and the representations, warranties, covenants and agreements herein set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, agree as follows:

ARTICLE I
DEFINITIONS

Unless otherwise specifically stated in the text of this Agreement, the following terms shall have the following meanings:

Section 1.1 The "1935 Act" shall mean the Public Utility Holding Company Act of 1935, as amended.

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Section 12.6 Names, Trademarks, Etc. USX and its Affiliates will discontinue use of the Carnegie and Apollo Names as promptly as practicable after the Closing.

IN WITNESS WHEREOF, the undersigned have cause this Agreement to be subscribed by their respective representatives duly authorized as of the date first above written.

USX CORPORATION

By: [Signature]
Typed Name: V. G. Bighini
Title: Vice Chairman - Marathon Group

APPROVED
AS TO FORM
[Signature]

EQUITABLE RESOURCES, INC.

By: [Signature]
Typed Name: David L. Forges
Title: Senior Vice President and Chief Financial Officer

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