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west virginia department of environmental protection

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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

January 27, 2016

EQT PRODUCTION COMPANY  
120 PROFESSIONAL PLACE  
BRIDGEPORT, WV 26330

Re: Permit Modification Approval for API Number 10303032, Well #: 515110

### Extend Lateral, Sub-surface Easement

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,

A handwritten signature in blue ink, appearing to read 'Gene Smith', with the word 'For' written below it.

Gene Smith  
Assistant Chief of Permitting  
Office of Oil and Gas

Promoting a healthy environment.

01/29/2016



December 11, 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 47-103-03034, 03033, 03032, 03031, 03030

Dear Mr. Smith,

Enclosed is an updated WW-6B, schematics, WW-6A1, rec plan, Site Safety plan and mylar plat. EQT would like to revise 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,

Vicki Roark  
Permitting Supervisor-WV

Enc.

4701030332 M&P

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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	103	4	254
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Operator ID      County      District      Quadrangle

2) Operator's Well Number: 515110      Well Pad Name BIG360

3) Farm Name/Surface Owner : Coastal Forest Resources      Public Road Access: Rt 76

4) Elevation, current ground: 1,008.0      Elevation, proposed post-construction: 998.0

5) Well Type: (a) Gas       Oil       Underground Storage   
 Other \_\_\_\_\_

(b) If Gas:      Shallow       Deep   
    Horizontal

6) Existing Pad? Yes or No:  No

*DWH*  
*12-10-15*

7) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):  
 Target formation is Marcellus at a depth of 7087 with the anticipated thickness to be 51 feet and anticipated target pressure of 2620 PSI  
Top of Marcellus: 7064

8) Proposed Total Vertical Depth: 7087

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 13475

11) Proposed Horizontal Leg Length: 5550

12) Approximate Fresh Water Strata Depths: No shows found in completion reports within 4000'

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

14) Approximate Saltwater Depths: 1961, , ,

15) Approximate Coal Seam Depths: 269, 429, 650, 752

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 \_\_\_\_\_

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

4701030330 *MOP* Page 1 of 3

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**CASING AND TUBING PROGRAM**

18)

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: for Drilling	INTERVALS: Left in Well	CEMENT: Fill- up (Cu.Ft.)
Conductor	20	New	A-500	78.6	40	40	60 C.T.S.
Fresh Water	13 3/8	New	J-55	54.5	856	856	790 C.T.S.
Coal	-	-	-	-	-	-	
Intermediate	9 5/8	New	A-500	40	2,480	2,480	971 C.T.S.
Production	5 1/2	New	P-110	20	13,475	13,475	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							

*DMH 12-10-15*

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	26	0.375	-	18	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,730	2,184	* See Note 2	1.19
Coal							
Intermediate	9 5/8	12 3/8	0.395	3,950	3,160	* See Note 2	1.19
Production	5 1/2	8 1/2	0.361	12,640	10,112	-	1.07/1.86
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 500' above the top producing zone.

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

*4701070332 MSP*

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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 4740'.

Kick off and drill curve. Drill 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 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): 16.3

22) Area to be disturbed for well pad only, less access road (acres): 5.02

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 joint from production casing shoe to KOP

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.

0.25% 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. 0.25% 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:

*DMH  
12-10-15*

**Lead (Type H 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 % Calcuim Carbonate. Acid solubility.

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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. 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.

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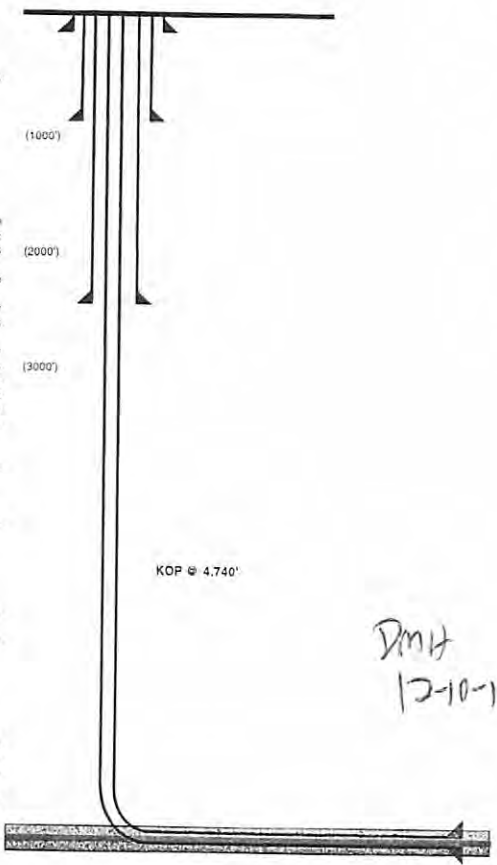
\*Note: Attach additional sheets as needed.

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Well 515110 (BIG360H3)  
 EQT Production  
 Big Run  
 Wetzel West Virginia

Pad Name  
 Azimuth 346.5  
 Vertical Section 5149

TVD Depth (feet) or	Formation	Formation Tops (TVD)
250'		
500'	Base Fresh Water	Name requested
750'		
1,000'		(1000')
1,250'		
1,500'		
1,750'	Mason	1781 - 1798
2,000'	Big Lime	1830 - 2071
	Big Inyan	2094 - 2195
		(2000')
2,250'	Wier	2381 - 2430
	Int. cong pt	- 2490
2,500'	Gantz	2512 - 2547
	Fifty foot	2617 - 2645
2,750'	Base Red Rock	2721
	Thirty foot	2773 - 2787
3,000'	Goodwin	2799 - 2835
	Forth Bend	2875 - 2886
3,250'	Mayerd	3007 - 3032
	Warren	3455 - 3517
3,500'	Speckley	3609 - 3642
3,750'		
4,000'	Balkin A	3902 - 4328
4,250'		
4,500'	Riley	4480 - 4489
4,750'		
5,000'		
5,250'	Haines	5162 - 5157
5,500'	Alexander	5445 - 5464
5,750'		
6,000'		
6,250'	Sonyka	5650 - 5801
	Midwest	6401 - 6449
6,500'	Genesee	6849 - 6832
	Carroll	6932 - 6900
6,750'	July	6960 - 6984
	Clinton	7064
7,000'	Top of Marcellus	7087
7,250'	Marcellus Bottom	7110
7,500'		
7,750'		



Hole Size (inches)	Type	Size (inches)	Wt (ppf)	Grade	Casing Wall Thickness	Depth (feet)	Top of Cement	Method
76	Conductor	20	78.8	A-500	0.312	40	Surface	Displacement
17 1/2	Surface	13 3/8	64.5	J-55	0.38	2480	Surface	Displacement
12 3/8	Intermediate	9 5/8	40	A-500	0.395	2480	Surface	Displacement
9 5/8	Production Casing	5 1/2	20	P-110	0.361	13475	500' above top Producing Zone	Displacement

Land curve @ 7,087' ft TVD  
 7,925' ft MD  
 Est TD @ 7,087' ft TVD  
 13,475' ft MD  
 5,600' ft Lateral

*DMH  
 12-10-15*

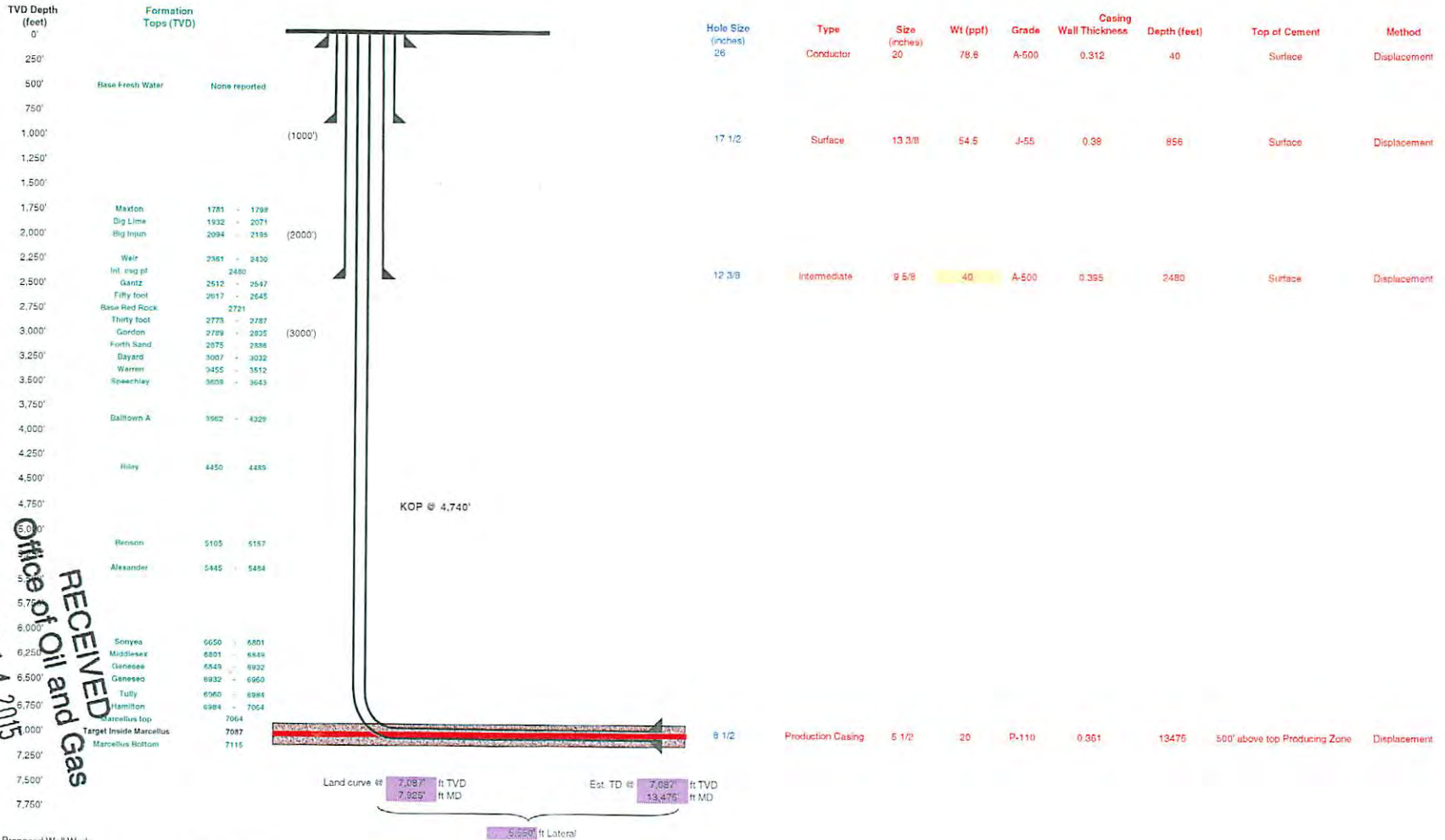
Proposed Well Work:  
 Drill and complete a new horizontal well in the Marcellus formation.  
 Drill the vertical to an approximate depth of 4740'.  
 Kick off and drill curve. Drill lateral in the Marcellus. Cement casing.

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Well 515110 (BIG360H3)  
 EQT Production  
 Big Run  
 Wetzel West Virginia

Pad Name  
 Azimuth 346.9  
 Vertical Section 5149



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 Drill the vertical to an approximate depth of 4740'.  
 Kick off and drill curve. Drill lateral in the Marcellus. Cement casing.

4710303032 Rev 0



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601 57<sup>th</sup> Street, SE  
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(304) 926-0450  
(304) 926-0452 fax

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

March 18, 2014

Nabors Completion & Production Services Company  
1380 Route 286 Hwy E #121  
Indiana PA 15701

Re: Cement Variance Request

Dear Sir or Madam,

This agency is approving a variance request for the cement blend listed below to be used on surface and coal protection strings for the drilling of oil and gas wells in the state of West Virginia. The variance cannot be used without requesting its use on a permit application and approval by this agency:

- Type 1 (2% Calcium Chloride-Accelerator, 0.25% Super Flake-Lost Circulation, 5.2% Water, 94% Type "1" Cement)

If you have any questions regarding this matter feel free to contact me at 304-926-0499, ext. 1653.

Sincerely,

James Peterson  
Environmental Resources Specialist / Permitting

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Randy C. Huffman, Cabinet Secretary  
dep.wv.gov

**BEFORE THE OFFICE OF OIL AND GAS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
STATE OF WEST VIRGINIA**

**IN THE MATTER OF A VARIANCE FROM ) ORDER NO. 2014 - 17**  
**REGULATION 35 CSR § 4-11.4/11.5/14.1 )**  
**AND 35 CSR § 8-9.2.h. 4/5/6/8 OF THE )**  
**THE OPERATIONAL )**  
**REGULATIONS OF CEMENTING OIL )**  
**AND GAS WELLS )**

**REPORT OF THE OFFICE**

Nabors Completion & Production Services Co. requests approval of a different cement blend for use in cementing surface and coal protection casing of oil and gas wells.

**FINDINGS OF FACT**

- 1.) Nabors Completion & Production Services Co. proposes the following cement blend:
  - 2% Calcium Chloride (Accelerator)
  - 0.25 % Super Flake (Lost Circulation)
  - 94% Type "1" Cement
  - 5.20 % Water
  
- 2.) Laboratory testing results indicate that the blend listed in Fact No.1 will achieve a 500 psi compressive strength within 6 hours and a 2,435 psi compressive strength within 24 hours.

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**CONCLUSIONS OF LAW**

Pursuant to Articles 6 and 6A, Chapter 22 of the Code of West Virginia, the Office of Oil and Gas has jurisdiction over the subject matter embraced in said notice, and the persons interested therein, and jurisdiction to promulgate the hereinafter prescribed Order.

Pursuant to 35 CSR § 4-11.5 and 35 CSR § 8-9.2.h.8 the Chief of the Office of Oil and Gas may approve different cement blends upon the well operator providing satisfactory proof that different cement types are adequate.

**ORDER**

It is ordered that Nabors Completion & Production Services Co. may use the cement blend listed in Findings of Fact No.1 for the cementing of surface and coal protection casing of oil and gas wells in the State as may be requested by oil and gas operators. The waiting time on the cement blend shall be 8 hours. The cement blend shall be mixed in strict accordance with the specifications for each blend and weight measurements made on-site to assure the cement slurries meet the minimum weight specifications. A sample shall be collected and, if after 8 hours the cement is not set up, additional time will be required. Nabors Completion & Production Services Co. shall keep a record of cement blend jobs in which the cement blend approved under this order is to be used and made available to the Office of Oil and Gas upon request.

Dated this, the 18th day of March, 2014.

IN THE NAME OF THE STATE OF WEST VIRGINIA

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

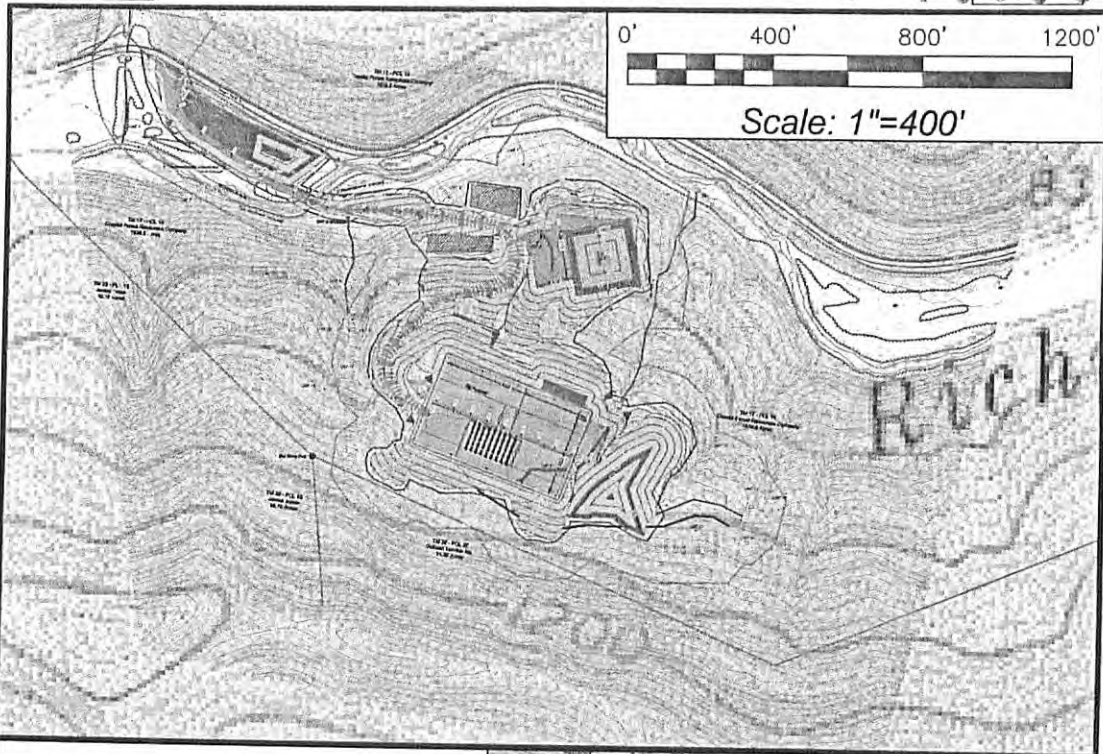
James Martin, Chief  
Office of Oil and Gas

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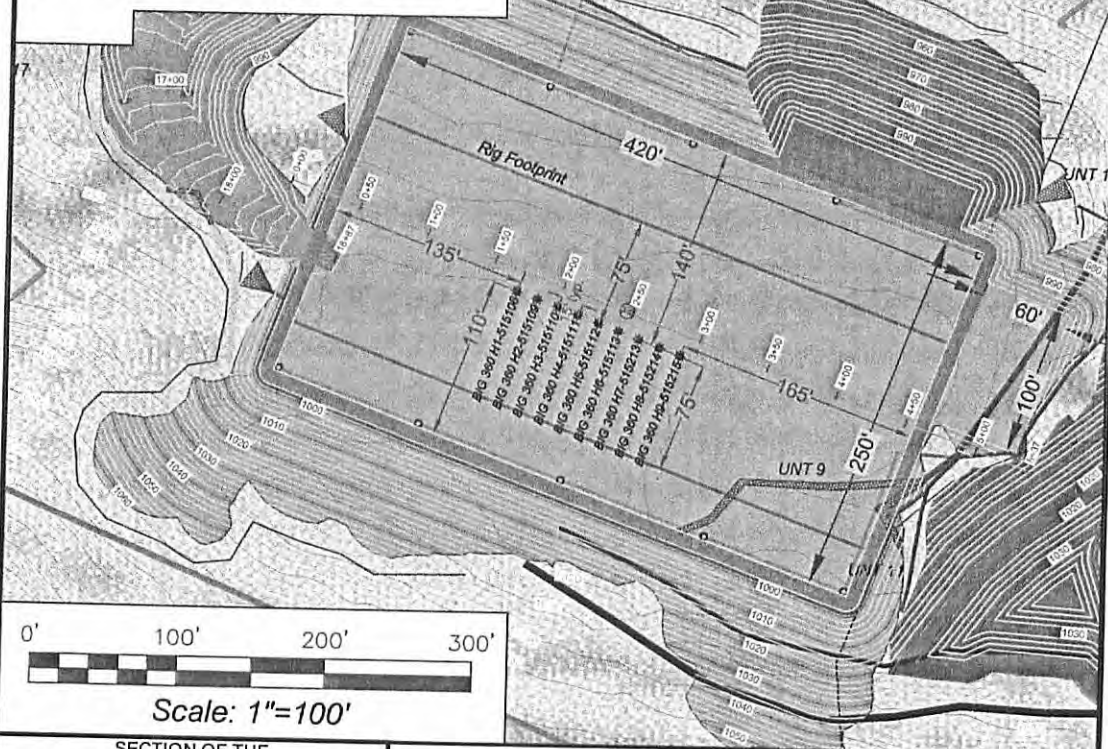
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Detail sketch for Big 360 Well Pad



SECTION OF THE Big Run 7.5' USGS QUADRANGLE		Proposed Disturbance Area	
Projected culvert inventory. (for bid purposes only)		Well Site Location	See Site Plan
15" minimum diameter culverts	See Site Plan	Proposed Access Road	See Site Plan
24" minimum diameter culverts	See Site Plan	Approximate Total Disturbance	See Site Plan
DRAWN BY: Dale Tomlin	DATE: July 31, 2014	FILE NO: 17413	DRAWING FILE NO: 17413 Rec Plan

Note: SEE SITE PLAN OF BIG 360 FOR COMPLETE GRADING & DRAINAGE CONSTRUCTION INCLUDING EROSION & SEDIMENT CONTROL DETAILS, ETC.

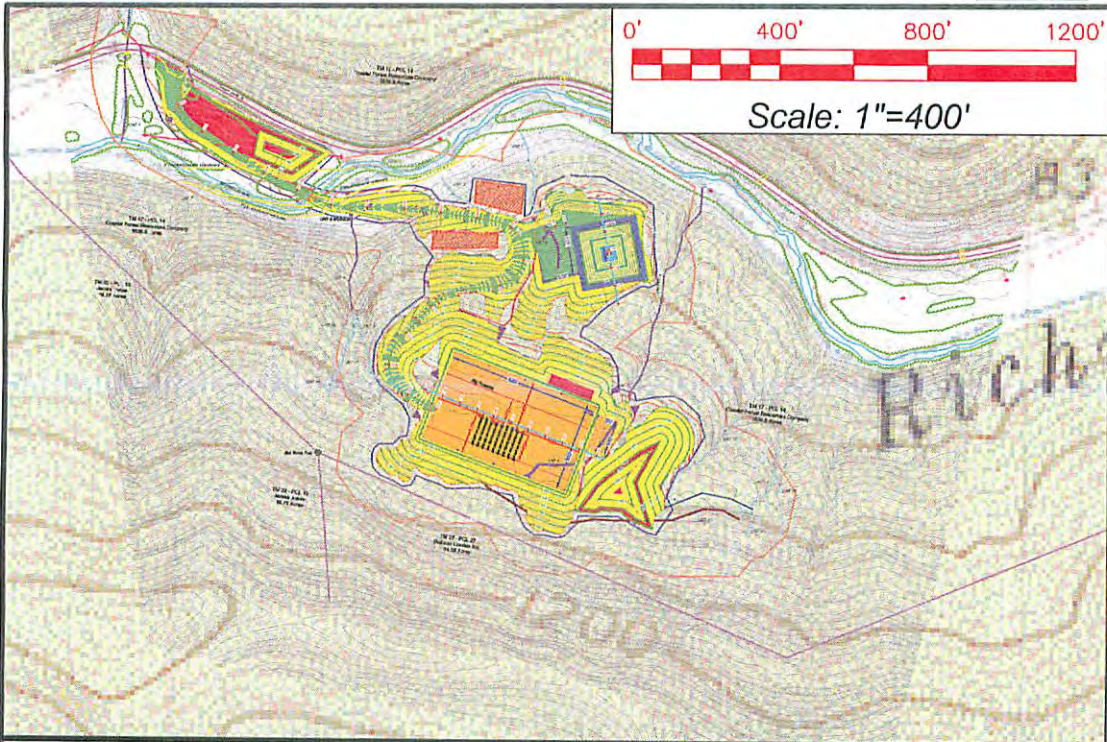


SURVEYING AND MAPPING SERVICES PERFORMED BY:  
**ALLEGHENY SURVEYS, INC.**  
 Birch River Office  
 Phone: (304) 649-8606  
 Fax: (304) 649-8608  
 1-800-482-8606  
 237 Birch River Road  
 P.O. Box 438  
 Birch River, WV 26610

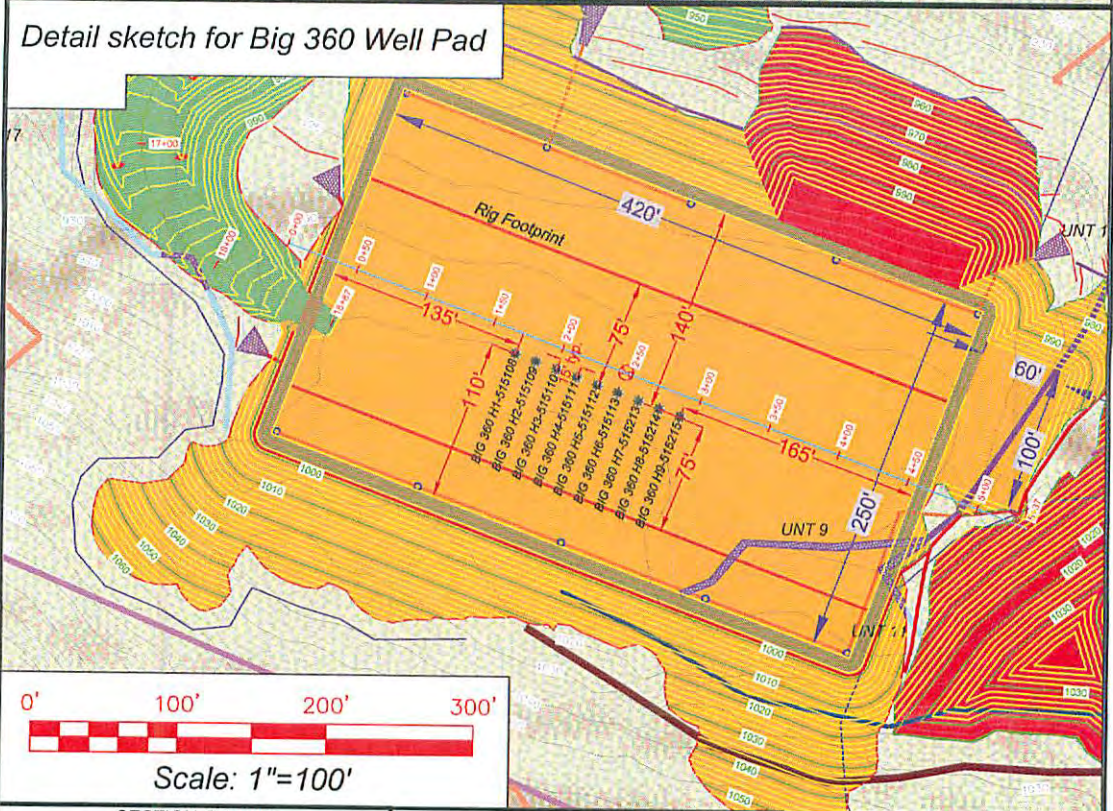
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Detail sketch for Big 360 Well Pad



SECTION OF THE Big Run 7.5' USGS QUADRANGLE		Proposed Disturbance Area	
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4710303032<sup>M67</sup>

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# Site Specific Safety Plan

EQT BIG 360 Pad

Jacksonburg

Wetzel County, WV

For Wells: 515108 515109 515110 515111 515112 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Date Prepared: August 7, 2014

Date Reviewed: December 3, 2015

[Signature]  
EQT Production

[Signature]  
WV Oil and Gas Inspector

Permitting Supervisor  
Title

Oil & Gas Inspector  
Title

12-8-15  
Date

12-10-15  
Date

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<p>1. Article Addressed to:            CNX Gas Company, Attn: Ryan Arp            Engineering &amp; Operations Support Dept. Coal            CNX Center, 1000 Consol Energy Drive            Canonsburg, PA 15317            IG360 MOD</p>	<p>3. Service Type  <input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express®  <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™  <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery  <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise  <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™  <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery  <small>(Insured Mail over \$500)</small></p>
<p>Article Number (Transfer from service label)            015 0640 0003 3473 3141</p>	
Form 3811, April 2015 PSN 7530-02-000-9053	Domestic Return Receipt

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<p>1. Article Addressed to:            CNX Land LLC, Attn: Ryan Arp            Engineering &amp; Operations Support Dept. Coal            CNX Center, 1000 Consol Energy Drive            Canonsburg, PA 15317            G360 MOD</p>	<p>3. Service Type  <input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express®  <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™  <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery  <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise  <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™  <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery  <small>(Insured Mail over \$500)</small></p>
<p>Article Number (Transfer from service label)            015 0640 0003 3473 3134</p>	
Form 3811, April 2015 PSN 7530-02-000-9053	Domestic Return Receipt

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<p>Mills Wetzel Lands, Inc.            Suite 2400, 222 N. LaSalle Street            Chicago, IL 60601            BIG360 MOD</p>	<p>3. Service Type  <input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express®  <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™  <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery  <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise  <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™  <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery  <small>(Insured Mail over \$500)</small></p>
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<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$
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CNX Gas Company, Attn: Ryan Arp  
Engineering & Operations Support Dept. Coal  
CNX Center, 1000 Consol Energy Drive  
Canonsburg, PA 15317  
BIG360 MOD

Instructions

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Certified Mail Fee	\$
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$
Postage	\$

Postmark  
Here

CNX Land LLC, Attn: Ryan Arp  
Engineering & Operations Support Dept. Coal  
CNX Center, 1000 Consol Energy Drive  
Canonsburg, PA 15317  
BIG360 MOD

Instructions

470 1070330 MCD

7015 0640 0003 3473 3158

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

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OFFICIAL USE

Certified Mail Fee	\$
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$
Postage	\$

Postmark  
Here

Mills Wetzel Lands, Inc.  
Suite 2400, 222 N. LaSalle Street  
Chicago, IL 60601  
BIG360 MOD

Instructions

**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>Lease 988530</u>	Mills Wetzel Lands, Inc.	EQT Production Company	Min 1/8 pd	O&G 126A/288
<u>4-22-27</u>	Dallison Lumber Inc.	EQT Production Company	N/A Subsurface Easement (see attached)	O&G 115/903
<u>4-23-01</u>	Billy Dewayne Arnolds, Jr.	EQT Production Company	N/A Subsurface Easement (see attached)	O&G 115/906
<u>1.1187216222</u>	Georgia H. Jones, et al.	H.S. Grayson	Min 1/8 pd	DB 53/169
	H.S. Grayson (50% assigned)	South Penn Oil Company		DB 49/154
	South Penn Oil Company	South Penn Natural Gas Company		O&G 33A/455
	South Penn Natural Gas Company	South Penn Oil Company		DB 215/478
	South Penn Oil Company	Pennzoil Company		Unrecorded Merger - See attached
	Pennzoil Company	Pennzoil United Inc.		DB 246/491
	Pennzoil United Inc.	Pennzoil Company		Unrecorded Name Change - See attached
	Pennzoil Company	Pennzoil Products Company		DB 319/397
	Pennzoil Products Company	Pennzoil Exploration and Production Company		DB 363/384
	Pennzoil Exploration and Production Company	Pennzenergy Exploration and Pr		CB 12/178
	Pennzenergy Exploration and Production Company L.P.	Devon Energy Production Company L.P.		CB 12/278
	Devon Energy Production Company L.P.	East Resources, Inc.		CB 370/580
	East Resources, Inc.	HG Energy, LLC		LB 118A/253
	HG Energy, LLC	American Energy - Marcellus, LLC		DB 153/238
	American Energy - Marcellus, LLC	Ascent Resources - Marcellus, LLC		MB 114/619
	Ascent Resources - Marcellus, LLC	EQT Production Company		O&G 166A/663
	Georgia H. Jones, et al.	H.S. Grayson		DB 53/169
	H.S. Grayson (25% assigned)	Woodland Oil Company		DB 53/257
	Woodland Oil Company	South Penn Oil Company		DB 53/259
	South Penn Oil Company	Pennzoil Company		Unrecorded Merger - See attached
	Pennzoil Company	Pennzoil United Inc.		DB 246/491
	Pennzoil United Inc.	Pennzoil Company		Unrecorded Name Change - See attached
	Pennzoil Company	Pennzoil Products Company		DB 319/397

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Pennzoil Products Company	Pennzoil Exploration and Production Company	DB 363/384
Pennzoil Exploration and Production Company	Pennzenergy Exploration and Production Company LLC	CB 12/178
Pennzenergy Exploration and Production Company L	Devon Energy Production Company L.P.	CB 12/278
Devon Energy Production Company L.P.	East Resources, Inc.	CB 370/580
East Resources, Inc.	HG Energy, LLC	LB 118A/253
HG Energy, LLC	American Energy - Marcellus, LLC	DB 153/238
American Energy - Marcellus, LLC	Ascent Resources - Marcellus, LLC	MB 114/619
Ascent Resources - Marcellus, LLC	EQT Production Company	O&G 166A/663
Georgia H. Jones, et al.	H.S. Grayson	DB 53/169
H.S. Grayson (25% assigned)	W. H. Hearne	DB 48/86 & 49/185
W. H. Hearne	Pennzoil Products Company	LB 71A/584
Pennzoil Products Company	Pennzoil Exploration and Production Company	DB 363/384
Pennzoil Exploration and Production Company	Pennzenergy Exploration and Production Company LLC	CB 12/178
Pennzenergy Exploration and Production Company L	Devon Energy Production Company L.P.	CB 12/278
Devon Energy Production Company L.P.	East Resources, Inc.	CB 370/580
East Resources, Inc.	HG Energy, LLC	LB 118A/253
HG Energy, LLC	American Energy - Marcellus, LLC	DB 153/238
American Energy - Marcellus, LLC	Ascent Resources - Marcellus, LLC	MB 114/619
Ascent Resources - Marcellus, LLC	EQT Production Company	O&G 166A/663

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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Where energy meets innovation.™

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

Todd Klaner  
Manager, Permitting  
tklaner@eqt.com

December 8, 2015

WV DEP Reviewer

RE: **EQT Production Company**  
**PAD ID – BIG360**  
**Well# - 515110**  
**Wetzel 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 22/27, 23/1, 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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4710303032

Carol S Haupt  
Wetzel County 11:22:00 AM  
Instrument No 192162  
Date Recorded 12/07/2015  
Document Type R/W  
Pages Recorded 3  
Book-Page 115-903  
Recording Fee \$5.00  
Transfer Tax \$99.00  
Additional \$26.00

MEMORANDUM OF  
SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

County Clerk please also index under the following: Shiben Estates Inc.

1. NAME AND ADDRESS OF GRANTOR:

Dallison Lumber Inc.  
P.O. Box 159  
Jacksonburg, WV 26377

2. NAME AND ADDRESS OF GRANTEE:

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

3. SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT REFERENCE:

A SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT ("Agreement") dated the 22nd day of October, 2015, was entered into for good and valuable consideration by and between Dallison Lumber Inc. ("Grantor", whether one or more) and EQT Production Company ("Grantee"). Upon completion of any wellbore within the subsurface area underlying the Property (as defined in Section 4), this 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 final wellbore locations are as described in a final, as-built map(s) to be filed as a part of an affidavit in the aforesaid Clerk's Office following the completion of the planned well(s) located on Grantee's BIG360 well pad. If an as-built map is not available for a wellbore within the subsurface area underlying the Property, any third-party with the right to operate within such area may contact Grantee's land department for a copy of such as-built map. Grantee shall provide notice of additional wellbores located within the subsurface area underlying the Property by filing an amendment, affidavit or other appropriate document.

4. DESCRIPTION OF PREMISES: That certain tract or parcel of land containing 31.35 acres, more or less, located in Grant District in Wetzel County, West Virginia, being the same lands conveyed to Grantor by Deed dated the 24th day of January, 1989, of record in the Office of the Clerk of the County Commission of Wetzel County, West Virginia in Deed Book 330, at Page 577 ("the Property").

5. TERM: The Agreement shall run with the land and shall remain in full force and effect until released and relinquished by the Grantee back to the Grantor, in writing.

(REMAINDER OF PAGE LEFT BLANK INTENTIONALLY)

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IN WITNESS WHEREOF, the parties have signed their names hereto as of the date of the Agreement referenced in Section 3 above.

**GRANTOR:**  
Dallison Lumber Inc.

**GRANTEE:**  
EQT Production Company

[Signature]  
By: Ed Dallison  
Its: President

[Signature] BWSH  
By: John W. Damato  
Its: Attorney-In-Fact

STATE OF WEST VIRGINIA

COUNTY OF WETZEL

I, BRYSON J. KARP, a Notary Public, in and for said State and County, do hereby certify that Ed Dallison, personally known to be the same persons whose name is subscribed to the foregoing instrument and the President of Dallison Lumber Inc., appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth.

Given under my hand this 22<sup>nd</sup> day of October, 2015.

My Commission expires: JAN. 1, 2021

OFFICIAL SEAL  
COMMISSIONER FOR WEST VIRGINIA  
Bryson J. Karp  
Weston, WV  
My Commission Expires January 1, 2021

[Signature]  
Notary Public

STATE OF WEST VIRGINIA

COUNTY OF HARRISON

I, KATELYN LISTON, a Notary Public, in and for said State and County, do hereby certify that John W. Damato, personally known to be the same person whose name is subscribed to the foregoing instrument and the Attorney-In-Fact of EQT Production Company, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth on behalf of said company.

Given under my hand this 29<sup>th</sup> day of October, 2015.

My Commission expires: May 16, 2024

OFFICIAL SEAL  
Notary Public, State of West Virginia  
KATELYN L LISTON  
1308 Sereno Drive  
Fairmont, WV 26554  
My commission expires May 16, 2024

[Signature]  
Notary Public

This instrument was prepared by EQT Production Company, 625 Liberty Avenue, Pittsburgh, PA 15222

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Environmental Protection 01/29/2016

Declaration of Consideration of Value

The Grantee hereby declares that the consideration being paid to Grantor for the transfer of real estate is \$                     .

Given under my hand this 4th day of December, 2015.

  
EQT PRODUCTION COMPANY  
John W. Damato  
Attorney-In-Fact

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4710303032 Map

Carol S Haught  
WETZEL County 11:24:13 AM  
Instrument No 192164  
Date Recorded 12/07/2015  
Document Type R/W  
Pages Recorded 3  
Book-Page 115-906  
Recording Fee \$5.00  
Transfer Tax \$98.00  
Additional \$26.00

MEMORANDUM OF  
SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

County Clerk please also index under the following: Shlben Estates, Inc.

1. NAME AND ADDRESS OF GRANTOR:

Billy Dewayne Arnolds Jr.  
312 Richwood Run Rd.  
Jacksonburg, WV 26377

2. NAME AND ADDRESS OF GRANTEE:

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

3. SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT REFERENCE:

A SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT ("Agreement") dated the 23rd day of September, 2015, was entered into for good and valuable consideration by and between Billy Dewayne Arnolds Jr. ("Grantor", whether one or more) and EQT Production Company ("Grantee"). Upon completion of any wellbore within the subsurface area underlying the Property (as defined in Section 4), this 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 final wellbore locations are as described in a final, as-built map(s) to be filed as a part of an affidavit in the aforesaid Clerk's Office following the completion of the following well(s) located on Grantee's BIG 360 well pad. If an as-built map is not available for a wellbore within the subsurface area underlying the Property, any third-party with the right to operate within such area may contact Grantee's land department for a copy of such as-built map. Grantee shall provide notice of additional wellbores located within the subsurface area underlying the Property by filing an amendment, affidavit or other appropriate document.

4. DESCRIPTION OF PREMISES: That certain tract or parcel of land containing 16.5 acres, more or less, located in Grant District in Wetzel County, West Virginia, being the same lands conveyed to Grantor by Deed dated the 11th day of December, 2002, of record in the Office of the Clerk of the County Commission of Wetzel County, West Virginia in Deed Book 384, at Page 627 ("the Property").

5. TERM: The Agreement shall run with the land and shall remain in full force and effect until released and relinquished by the Grantee back to the Grantor, in writing.

(REMAINDER OF PAGE LEFT BLANK INTENTIONALLY)

01/29/2016

IN WITNESS WHEREOF, the parties have signed their names hereto as of the date of the Agreement referenced in Section 3 above.

GRANTOR:

GRANTEE:

EQT Production Company

Billy Dewayne Arnolds Jr.  
Billy Dewayne Arnolds Jr.

John W. Damato  
By: John W. Damato  
Its Attorney in fact

STATE OF WEST VIRGINIA

COUNTY OF WETZEL

I, Bryson J. Karp, a Notary Public, in and for said State and County, do hereby certify that Billy Dewayne Arnolds Jr., personally known to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be their free act and deeds for uses and purposes therein set forth.

Given under my hand this 23<sup>rd</sup> day of SEPTEMBER, 2015.

My Commission expires: Jan 1 2021.

OFFICIAL SEAL  
COMMISSIONER FOR WEST VIRGINIA  
Bryson J. Karp  
Weston, WV  
My Commission Expires January 1, 2021

Bryson J. Karp  
Notary Public

STATE OF WEST VIRGINIA;

COUNTY OF HARRISON:

I, Katelyn L. Liston, a Notary Public, in and for said State and County, do hereby certify that John W. Damato, personally known to be the same person whose name is subscribed to the foregoing instrument and the Attorney in fact of EQT Production Company, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth on behalf of said company.

Given under my hand this 21<sup>st</sup> day of September, 2015.

My Commission expires: May 16, 2024.



Katelyn L. Liston  
Notary Public

This instrument was prepared by EQT Production Company, 625 Liberty Avenue, Pittsburgh, PA 15222.

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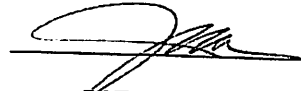
DEC 14 2015

WV Department of  
Environmental Protection 01/29/2016

**Declaration of Consideration of Value**

The Grantee hereby declares that the consideration being paid to Grantor for the transfer of real estate is \$ \_\_\_\_\_.

Given under my hand this 4<sup>th</sup> day of December, 2015.

  
BWBTF  
EQT PRODUCTION COMPANY  
John W. Damato  
Attorney-In-Fact

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01/29/2016



3-1-63.18 120

ARTICLES OF MERGER  
OF  
ZAPATA PETROLEUM CORPORATION  
AND  
STETCO PETROLEUM CORPORATION  
INTO  
SOUTH PENN OIL COMPANY

In compliance with the requirements of Article IX of the Act of the General Assembly of the Commonwealth of Pennsylvania, known as the Business Corporation Law, approved May 5, 1913, P. L. 361, and amendments thereto, providing for the merger and consolidation of corporations, SOUTH PENN OIL COMPANY, a Pennsylvania corporation, ZAPATA PETROLEUM CORPORATION, a Delaware corporation, and STETCO PETROLEUM CORPORATION, a Delaware corporation, hereby certify under their respective corporate seals:

1. That it is proposed that Zapata Petroleum Corporation and Stetco Petroleum Corporation be merged into South Penn Oil Company in accordance with the provisions of a joint plan of merger entitled "Joint Plan and Agreement of Merger" and dated May 7, 1963, a copy of which is attached hereto and made a part hereof.

2. That the surviving corporation is South Penn Oil Company, that the name of the surviving corporation be changed to Pennzoil Company and that the location of its registered office is Drake Building, 106 Duncomb Street, Oil City, Pennsylvania.

3. That a special meeting of shareholders of South Penn Oil Company to take action upon the proposed merger was held at 10:00 o'clock A.M. on July 2, 1963, at the registered office of said corporation, Drake Building, 106 Duncomb Street, Oil City, Pennsylvania; that written notice, stating the place, day, hour and purposes of the meeting, together with a copy of said joint plan of merger and a copy of subsection A of section 903 and of subsections A, B, C and D of section 515 (Rights of dissenting shareholders) of the said Pennsylvania Business Corporation Law, was mailed on June 11, 1963, to all shareholders of said corporation of record on May 28, 1963, which was fixed as the record date for determining the shareholders entitled to vote at said meeting.

4. That at the time of the special meeting of shareholders of South Penn Oil Company on July 2, 1963, the authorized number of all shares of the capital stock of said corporation was 1,715,000 shares of common stock of the par value of \$12.50 each, of which 1,589,750 shares were outstanding and were entitled to be voted at the meeting and 112,530 shares were held in the treasury of said corporation and were not entitled to be voted at the meeting; and that at said meeting said joint plan of merger was adopted and approved by the affirmative vote of the holders of 1,715,000 shares of common stock, there having been voted against the same 24,680 shares of common stock.

5. That the Joint Plan and Agreement of Merger was duly authorized, adopted and approved by Zapata Petroleum Corporation and Stetco Petroleum Corporation in accordance with the laws of the State of Delaware, the jurisdiction in which they were formed.

6. That, as provided in Section 5 of said joint plan of merger, the Articles of Incorporation of South Penn Oil Company, as heretofore amended, shall be amended and restated in their entirety by revising same to read in full as set forth in Exhibit A to said joint plan of merger.

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3-1-63.18 121

Henceforth the "Articles" as defined in Article I of the Business Corporation Law of the Commonwealth of Pennsylvania shall not include any prior documents.

7. That the following are the names and addresses of the sixteen persons who shall constitute the first Board of Directors of the Surviving Corporation:

<u>Name</u>	<u>Address</u>
D. D. Boyard	P. O. Box 2590 Tulsa, Oklahoma
Edward P. Boyle	205 Maple Avenue Oil City, Pennsylvania
George L. Coleman	1137 West Jackson Boulevard Chicago, Illinois
James G. S. Gannell	"Imberwick" Hiersley Road Edinburgh 12, Scotland
R. B. Gilpatrick, Jr.	Mellon National Bank and Trust Company Fifth Avenue Pittsburgh 19, Pennsylvania
R.W. Grunert	Drake Building 100 Duncannon Street Oil City, Pennsylvania
L. F. Johnson	21054 N. 10th Los Angeles, California
J. Hugh Liedtke	Room 410, Four Gateway Center Pittsburgh, Pennsylvania
William C. Liedtke, Jr.	First National Bank Building Midland, Texas
T. L. McDowell	McDowell, McDowell, Wick & Daly 50 Boylston Street Bradford, Pennsylvania
John B. Mitchell	12 South Kendall Avenue Bradford, Pennsylvania
Thomas O'D. Murray	Room 410, Four Gateway Center Pittsburgh, Pennsylvania
A. J. Saxe	Drake Building 20 Parkway Lane Bradford, Pennsylvania
Charles L. Sühr	P. O. Box 604 Oil City, Pennsylvania
J. Z. VanThine	50 Harbour Street Bradford, Pennsylvania
W. S. Zehring	115 Wyllys Oil City, Pennsylvania

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3-1-63.18 122

IN TESTIMONY WHEREOF, South Penn Oil Company, Zapata Petroleum Corporation and Stetco Petroleum Corporation have caused these Articles of Merger to be executed under the seal of each corporation and to be signed by two duly authorized officers of each corporation, this 2nd day of July, 1963.

SOUTH PENN OIL COMPANY

Attest:

J. H. Youn

Secretary

By J. Hugh LITTLE

President

(Corporate Seal)

Attest:

W. M. Brunick, Jr.

Secretary

ZAPATA PETROLEUM CORPORATION

By W. A. Hoven

President

(Corporate Seal)

Attest:

Maxine Mitchell

Secretary

STETCO PETROLEUM CORPORATION

By William C. Lintner, Jr.

President

(Corporate Seal)

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CARD TO BE REPLACED ONLY BY FILING CLERK

Name PENNZOIL UNITED, INC.  
 Foreign Corporation Delaware  
 Address 900 Southwest Tower  
Houston, Texas  
 Admitted April 1, 1968  
 Book ROLL 10 Page \_\_\_\_\_

AMENDMENT: Certificate of Incorporation; filed September 27, 1968; Roll 15.

AMENDMENT: Certificate of Incorporation; filed February 11, 1969; Roll 20.

AMENDMENT: Certificate of Incorporation; filed May 19, 1969; Roll 23.

MERGER: Elk Refining Company, a W. Va. corp., merged with and into Pennzoil United, Inc., the survivor; filed December 31, 1969; ROLL 30.

MERGER: Wolf's Head Oil Refining Company, incorporated, a Dela. corp., and Elk Refining Co. (See above), merged with and into Pennzoil United, Inc., the survivor; filed January 20, 1970; Roll 31.

(OVER)

Column 1	5	5	4
Column 2	5	9	3
Column 3	1	3	6
Column 4	4	6	3

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AMENDMENT: Change of Name from PENNZOIL UNITED  
INC., to PENNZOIL COMPANY: Filed June 6, 1972;  
ROLL 60.

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WV Department of Environmental Protection  
01/29/2016

**Big 360**  
**WV 515110**  
**EQT Production Company**

9,406'  
 LATITUDE 39 - 32 - 30

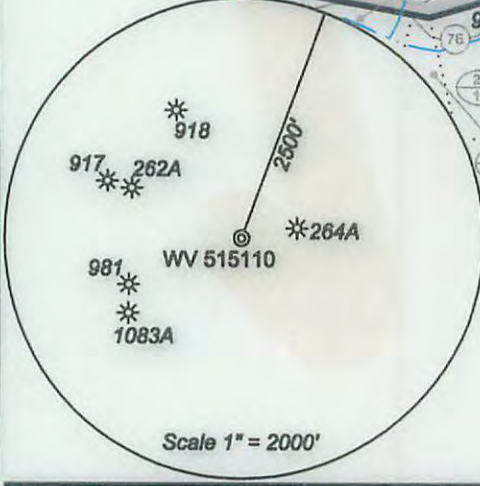
3,261'  
 LONGITUDE 80 - 35 - 00

**Big 360**

- ⊙ H1, 515108
- ⊙ H2, 515109
- ⊙ H3, 515110
- ⊙ H4, 515111
- ⊙ H5, 515112
- ⊙ H6, 515113
- ⊙ H7, 515213
- ⊙ H8, 515214
- ⊙ H9, 515215

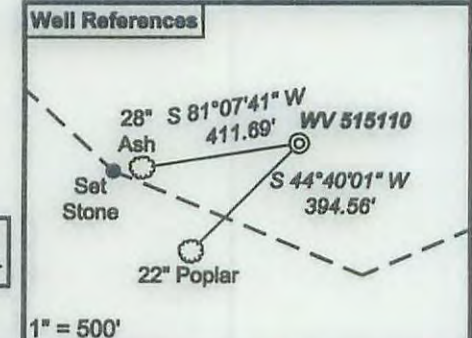
- ⊙ Proposed Gas Well
- Located Corner, as noted
- ⋯ Surface Tract Lines
- Lease Boundary

GRID NORTH



**WV 515110 coordinates:**  
 NAD 27 N: 376,101.25 E: 1,685,010.89  
 NAD 27 Lat: 39.532734 Long: -80.616797  
 NAD 83 UTM N: 4,375,976.68 E: 632,947.70  
**WV 515110 Landing Point coordinates:**  
 NAD 27 N: 377,849.49 E: 1,685,066.61  
 NAD 27 Lat: 39.532080 Long: -80.612972  
 NAD 83 UTM N: 4,375,905.46 E: 533,276.71  
**WV 515110 Bottom Hole coordinates:**  
 NAD 27 N: 383,245.61 E: 1,684,761.12  
 NAD 27 Lat: 39.546849 Long: -80.617803  
 NAD 83 UTM N: 4,377,542.85 E: 532,854.65

West Virginia Coordinate System of 1927 (North Zone) based upon Differential GPS Measurements.  
 Plat orientation, corner and well ties are based upon the grid north meridian.  
 Well location references are based upon the grid north meridian.  
 UTM coordinates are NAD83, Zone 17, Meters.



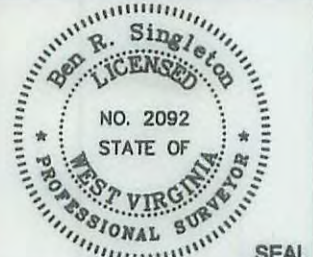
Lease No.	Acres	Owner
1.1187216222	239.903	Kenneth R. Mason, et al.

(⊙) Denotes Location of Well on United States Topographic Maps



*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 Department of Environmental Protection.*

*Ben R. Singleton*  
 P.S. 2092



FILE NO: 174-13  
 DRAWING NO: 174-13 Big 360 H3  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1:2500  
 PROVEN SOURCE OF ELEVATION: NGS CORS Station

**STATE OF WEST VIRGINIA**  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

DATE: December 4 20 15  
 OPERATOR'S WELL NO. 515110  
 API WELL NO 47 - 103 - 03032  
 STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
 LOCATION: ELEVATION: Original Ground = 1008' Proposed Ground = 998' WATERSHED Richwood Run QUADRANGLE: Big Run  
 DISTRICT: Grant COUNTY: Wetzel  
 SURFACE OWNER: Coastal Forest Resources Co. f/k/a Coastal Lumber Company ACREAGE: 1,636.5  
 ROYALTY OWNER: Mills-Wetzel Land, Inc., LEASE NO: 988530, ACREAGE: 659  
 PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus ESTIMATED DEPTH: 7,084'

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Ray  
 ADDRESS: 115 Professional Place PO Box 280 ADDRESS: 115 Professional Place PO Box 280  
 Bridgeport, WV 26330 Bridgeport, WV 26330

01/29/2016