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

January 27, 2016

EQT PRODUCTION COMPANY
120 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330

Re: Permit Modification Approval for API Number 10303033, Well #: 515111

Changed Target Formation, 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,

For

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

January 26, 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 47-103-03033

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 and the formation from Geneseo to Marcellus. 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.

4701030333 MOD

WW - 6B
(4/15)

API NO. 47 - 103 - 03033
OPERATOR WELL NO. 515111
Well Pad Name: BIG360

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

1) Well Operator: EQT Production Company | 306686 (Operator ID) | 103 (County) | 4 (District) | 254 (Quadrangle)

2) Operator's Well Number: 515111 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 •

DMH
12-10-15

6) Existing Pad? Yes or No: No

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: 12176

11) Proposed Horizontal Leg Length: 4271

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: 1,961

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: _____

4701503033 MOD

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WW - 6B
(4/15)

API NO. 47 - 103 - 03033
OPERATOR WELL NO. 515111
Well Pad Name: BIG360

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	12,176	12,176	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							

Dmit 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)

4701703033 MOD

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WW - 6B
(10/14)

API NO. 47 - 103 - 03033
OPERATOR WELL NO. 515111
Well Pad Name: BIG360

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

Drill the vertical to an approximate depth of 5166'.

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): ± 16.03

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.

4701030333 MD

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.

the shakers every 15 minutes.

*Note: Attach additional sheets as needed.

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Charleston, WV 25304
(304) 926-0450
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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 by GCS

James Peterson
Environmental Resources Specialist / Permitting

4710303033 MOP

Promoting a healthy environment.

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west virginia department of environmental protection

Office of Oil and Gas
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Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
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

4701030333 MoP

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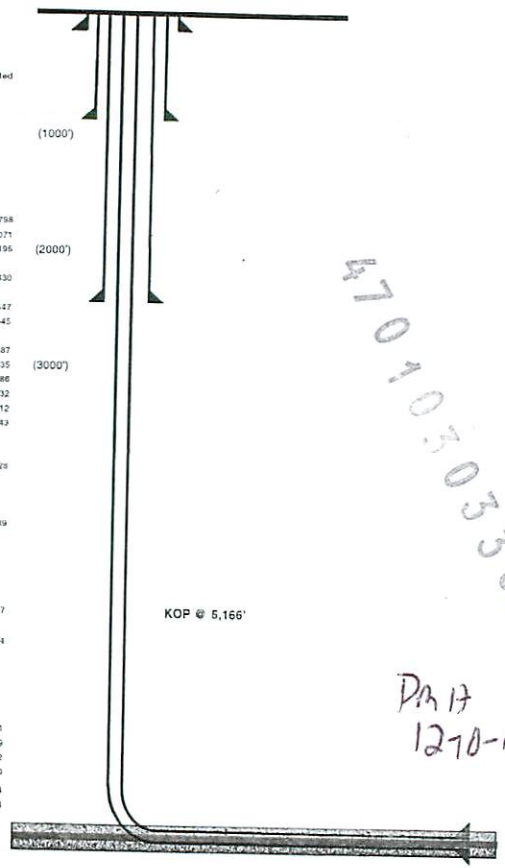
Well 515111 (BIG360H4)
EQT Production
Big Run
Wetzel West Virgina

Pad Name

Azimuth 346.5
Vertical Section 6711

TVD Depth (feet)	Formation Tops (TVD)		
0'			
250'			
500'	Base Fresh Water	None reported	
750'			
1,000'			(1000')
1,250'			
1,500'			
1,750'	Maxton	1781 - 1798	
2,000'	Big Lime	1932 - 2071	
	Big Injun	2094 - 2195	(2000')
2,250'	Weir	2361 - 2430	
	Inf. csg pt	2480	
2,500'	Gantz	2512 - 2547	
	Fifty foot	2617 - 2645	
2,750'	Base Red Rock	2721	
	Thirty foot	2773 - 2787	
3,000'	Gordon	2789 - 2835	(3000')
	Forth Sand	2875 - 2886	
3,250'	Bayard	3007 - 3032	
	Warren	3455 - 3512	
3,500'	Speechley	3609 - 3643	
3,750'			
	Balltown A	3962 - 4328	
4,000'			
4,250'			
	Riley	4450 - 4489	
4,500'			
4,750'			
5,000'			
	Benson	5105 - 5157	
5,250'			
	Alexander	5445 - 5484	
5,500'			
5,750'			
6,000'			
	Sonyea	6650 - 6801	
6,250'	Middlesex	6801 - 6849	
	Genesee	6849 - 6932	
6,500'	Geneseo	6932 - 6960	
	Tully	6960 - 6984	
6,750'	Hamilton	6984 - 7064	
	Marcellus top	7064	
7,000'	Target Inside Marcellus	7087	
	Marcellus Bottom	7115	
7,250'			
7,500'			
7,750'			



Land curve @ 7,087' ft TVD
7,986' ft MD

Est. TD @ 7,087' ft TVD
12,176' ft MD

4,271 ft Lateral

Hole Size (inches)	Type	Size (inches)	Wt (ppf)	Grade	Casing Wall Thickness	Depth (feet)	Top of Cement	Method
26	Conductor	20	78.6	A-500	0.312	40	Surface	Displacement
17 1/2	Surface	13 3/8	54.5	J-55	0.38	856	Surface	Displacement
12 3/8	Intermediate	9 5/8	40	A-500	0.395	2480	Surface	Displacement
8 1/2	Production Casing	5 1/2	20	P-110	0.361	12176	500' above top Producing Zone	Displacement

Proposed Well Work:
Drill and complete a new horizontal well in the Marcellus formation.
Drill the vertical to an approximate depth of 5166'.
Kick off and drill curve. Drill lateral in the Marcellus. Cement casing.

47 10 30 33 MOD

PM 17
12-10-15

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Environmental Protection

47 10 30 30 33

Well 515111 (BIG360H4) Pad Name

EQT Production

Big Run

Wetzel West Virgina

Azimuth 348.5

Vertical Section 5711

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250'			
500'	Base Fresh Water	None reported	
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	Int. csg pt	2480	
2,500'	Gantz	2512 -	2547
	Fifty foot	2617 -	2645
2,750'	Base Red Rock	2721	
	Thirty foot	2773 -	2787
3,000'	Gordon	2789 -	2836
	Forth Sand	2875 -	2886
3,250'	Bayard	3007 -	3032
	Warren	3455 -	3512
3,500'	Speechley	3600 -	3643
3,750'			
	Balltown A	3962 -	4328
4,000'			
4,250'			
	Riley	4450 -	4489
4,500'			
4,750'			
5,000'			
	Benson	5105 -	5157
5,250'			
	Alexander	5445 -	5484
5,500'			
5,750'			
6,000'			
	Sonyea	6850 -	6901
6,250'	Middlesex	6901 -	6949
	Genesee	6949 -	6932
6,500'	Geneseo	6932 -	6960
	Tully	6960 -	6984
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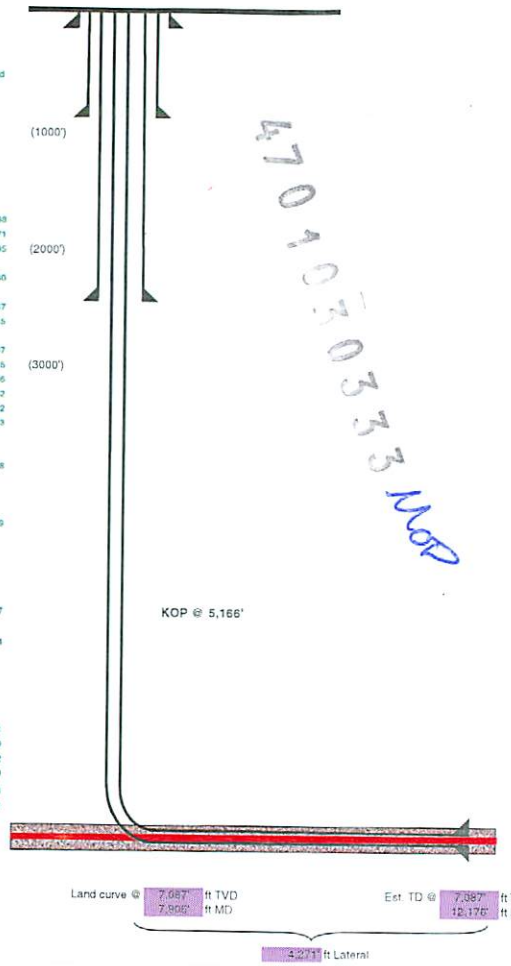
	Marcellus top	7064	
7,000'	Target Inside Marcellus	7087	
	Marcellus Bottom	7115	
7,250'			
7,500'			
7,750'			



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Drill the vertical to approximate depth of 5166'.
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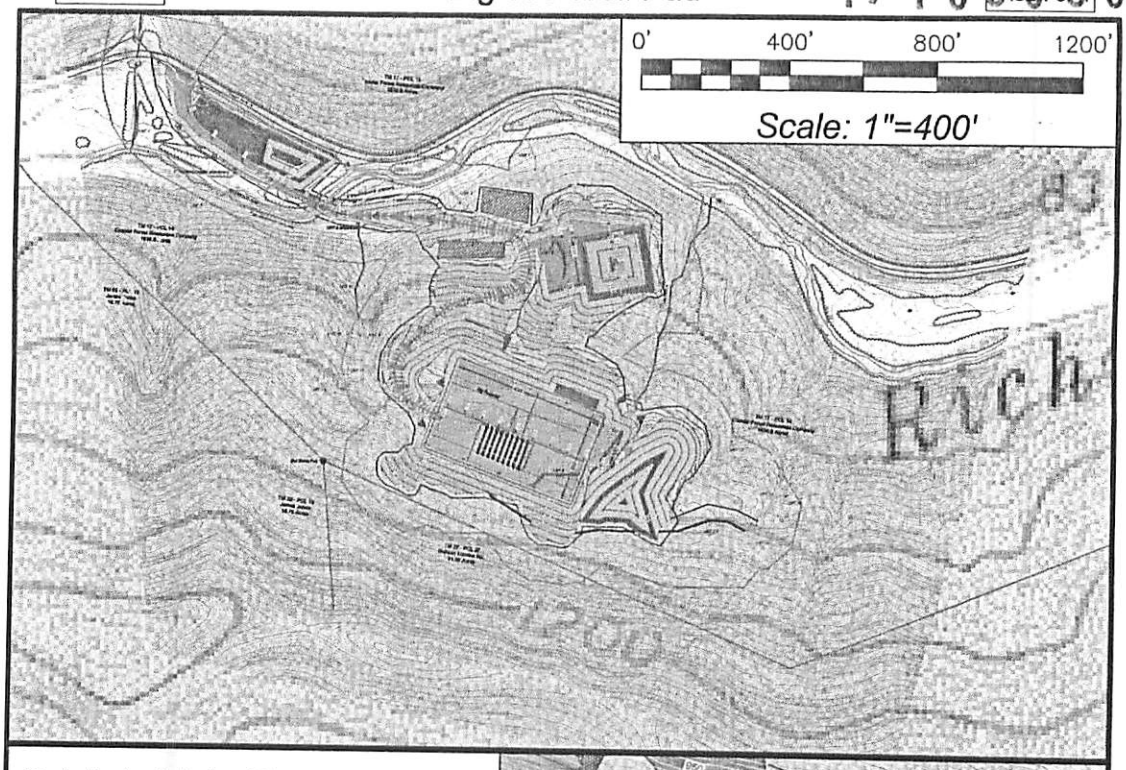
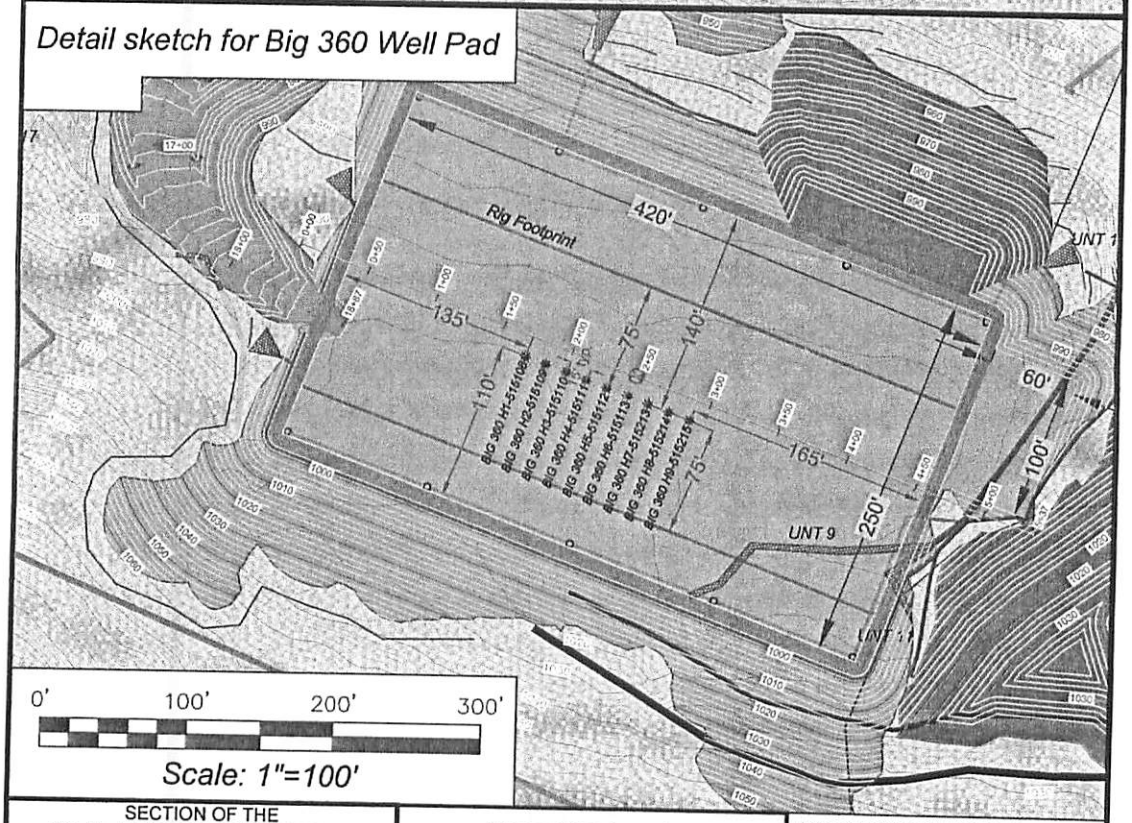
WW-9

Big 360 Well Pad

47 10 3 0 3 0 3 3 Mod

PAGE 1 OF 1





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:	DATE:	FILE NO.	DRAWING FILE NO.
Dale Tomlin	July 31, 2014	17413	17413 Rec Plan

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

DMH 12-10-15

SURVEYING AND MAPPING SERVICES PERFORMED BY:

ALLEGHENY SURVEYS, INC.

1-800-482-8606

Birch River Office
Phone: (304) 649-8606
Fax: (304) 649-8608

237 Birch River Road
P.O. Box 438
Birch River, WV 26610

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Big 360 Well Pad

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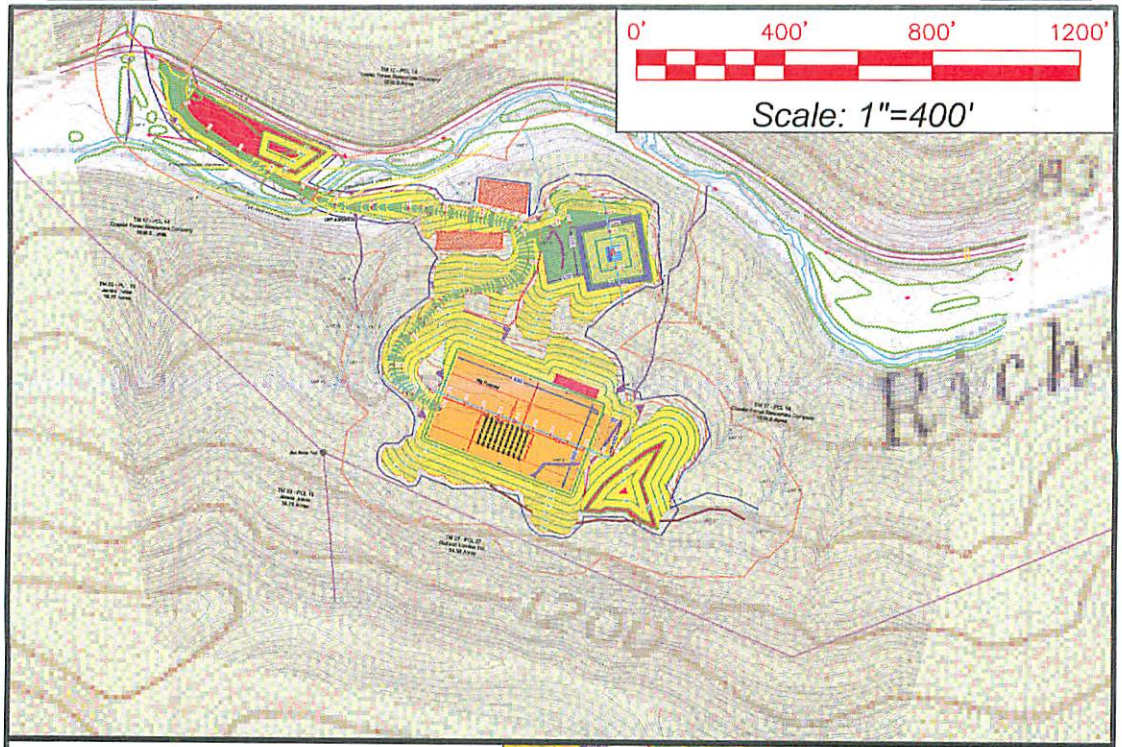

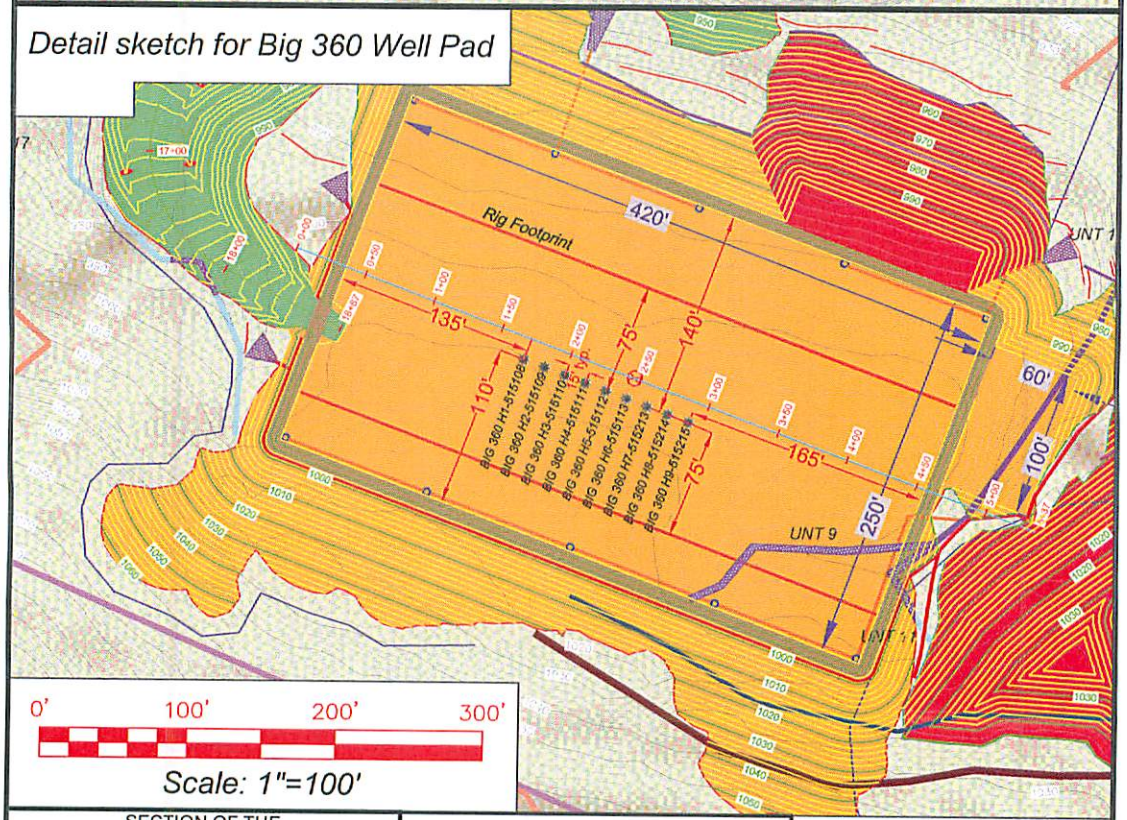

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DRAWN BY: Dale Tomlin	DATE: July 31, 2014	FILE NO. 17413	DRAWING FILE NO. 17413 Rec Plan

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.

1-800-482-8606

Birch River Office
Phone: (304) 649-8606
Fax: (304) 649-8608

237 Birch River Road
P.O. Box 438
Birch River, WV 26610

47103033 MOD

Where energy meets innovation.SM

Site Specific Safety Plan

EQT BIG 360 Pad

Jacksonburg

Wetzel County, WV

For Wells:

_515108__ __515109__ __515110__ __515111__ _515112___ _____ _____

_____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____

Date Prepared: **August 7, 2014**

EQT Production

Permitting Supervisor

Title

12-8-15

Date

Date Reviewed: December 3, 2015

WV Oil and Gas Inspector

OOG + 6cr Inspector

Title

12-10-15

Date

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

CNX Gas Company, Attn: Ryan Arp
Engineering & Operations Support Dept. Coal
CNX Center, 1000 Consol Energy Drive
Canonsburg, PA 15317
IG360 MOD

9590 9403 0752 5196 3274 15

Article Number *(Transfer from service label)*

7015 0640 0003 3473 3141

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* [illegible] C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

DEC 14 2015

3. Service Type

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- ☐ Adult Signature Restricted Delivery
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- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
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- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

47010303

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1. Article Addressed to:

CNX Land LLC, Attn: Ryan Arp
Engineering & Operations Support Dept. Coal
NX Center, 1000 Consol Energy Drive
anonsburg, PA 15317
G360 MOD

9590 9403 0752 5196 3274 22

Article Number *(Transfer from service label)*

7015 0640 0003 3473 3134

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* [illegible] C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ ured Mail
- ☐ ured Mail Restricted Delivery er $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

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- Attach this card to the back of the mailpiece, or on the front if space permits.

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

9590 9403 0673 5196 9830 97

2. Article Number *(Transfer from service label)*

7015 0640 0003 3473 3158

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* [illegible] C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ ısured Mail
- ☐ ısured Mail Restricted Delivery over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

7015 0640 0003 3473 3141

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Certified Mail Fee
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Extra Services & Fees (check box, add fee as appropriate)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Postmark Here

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

RW

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- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ 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

RW

0 1 0 3 0 3 3 MOP

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- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Postmark Here

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

RW

47 1 0 3 0 3 0 3 3 MOD

WW-6A1
(5/13)

Operator's Well No. 515111

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
Lease 988530			Min 1/8 pd	
	Mills Wetzel Lands, Inc.	EQT Production Company		O&G 126A/288
1.1187216222			Min 1/8 pd	
	Georgia H. Jones, et al.	H.S. Grayson		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 LI	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
	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 LI	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

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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 LL	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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WV Department of
Environmental Protection

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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, 1933, P. L. 364, 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 908 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 112,850 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 1,761,642 shares of common stock, there having been voted against the same 29,680 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:

Name	Address
D. D. Bovaird	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. Gammell	"Innerwick" Kilrenny Road Edinburgh 12, Scotland
R. B. Gilpatrick, Jr.	Mellon National Bank and Trust Company Fifth Avenue Pittsburgh 19, Pennsylvania
R.W. Grunert	Drake Building 106 Duncomb Street Oil City, Pennsylvania
L. F. Johnson	2405½ W. 10th Los Angeles, California
J. High 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. Suhr	P. O. Box 601 Oil City, Pennsylvania
J. Z. VanTine	30 Harlow Street Bradford, Pennsylvania
W. S. Zehring	115 Wyllis Oil City, Pennsylvania

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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:

By J. Huon Liebke
President
(Corporate Seal)

J. H. Young
Secretary

ZAPATA PETROLEUM CORPORATION

Attest:

By W. A. Hover
President
(Corporate Seal)

W. M. Brumley, Jr.
Secretary

STETCO PETROLEUM CORPORATION

Attest:

By William C. Liebke, Jr.
President
(Corporate Seal)

Maxine Mitchell
Secretary

3

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47103033 MOD

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	8

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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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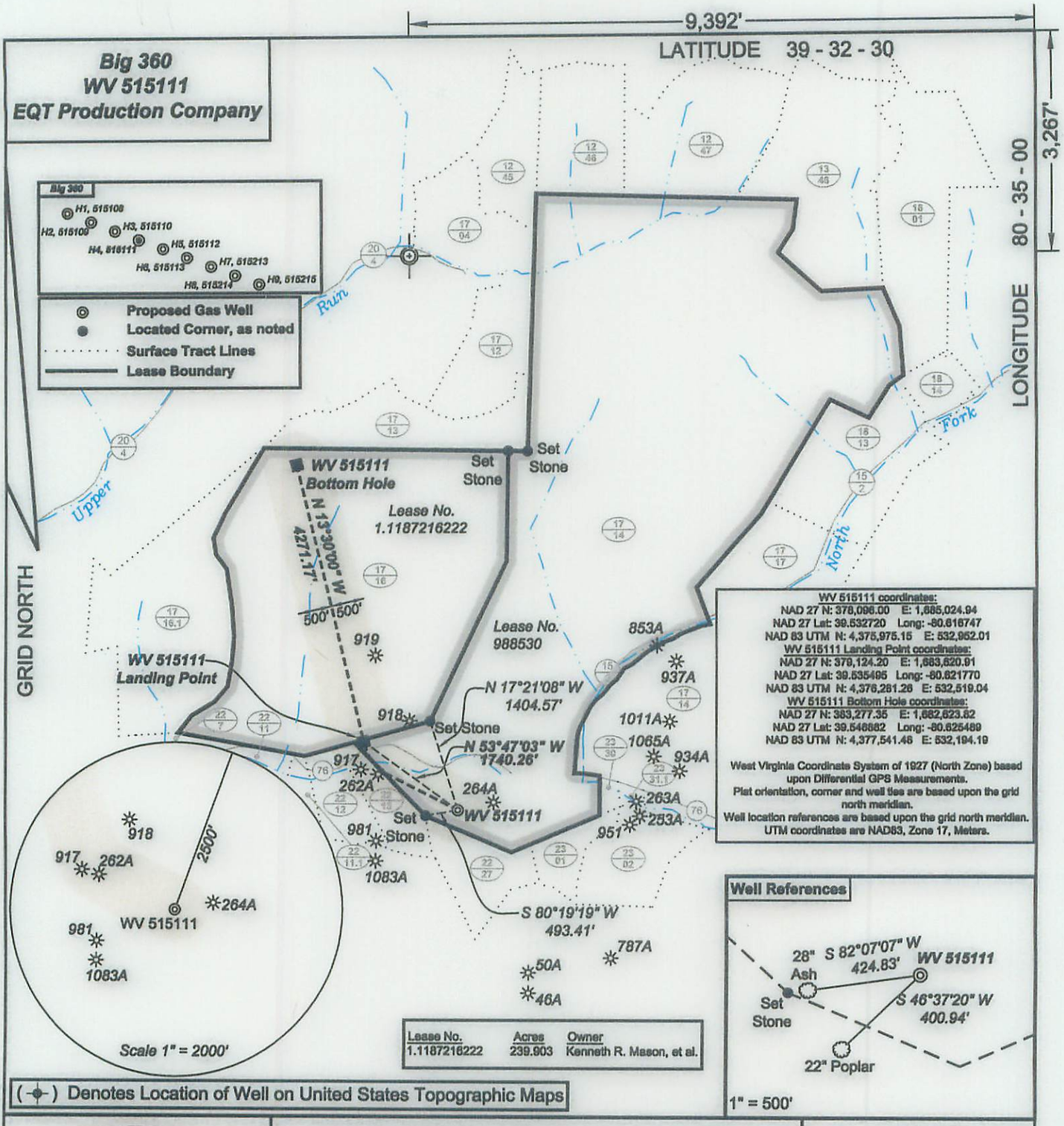
Environmental Protection



ALLEGHENY SURVEYS, INC.

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

Ben R. Singleton LICENSED NO. 2092 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

SEAL

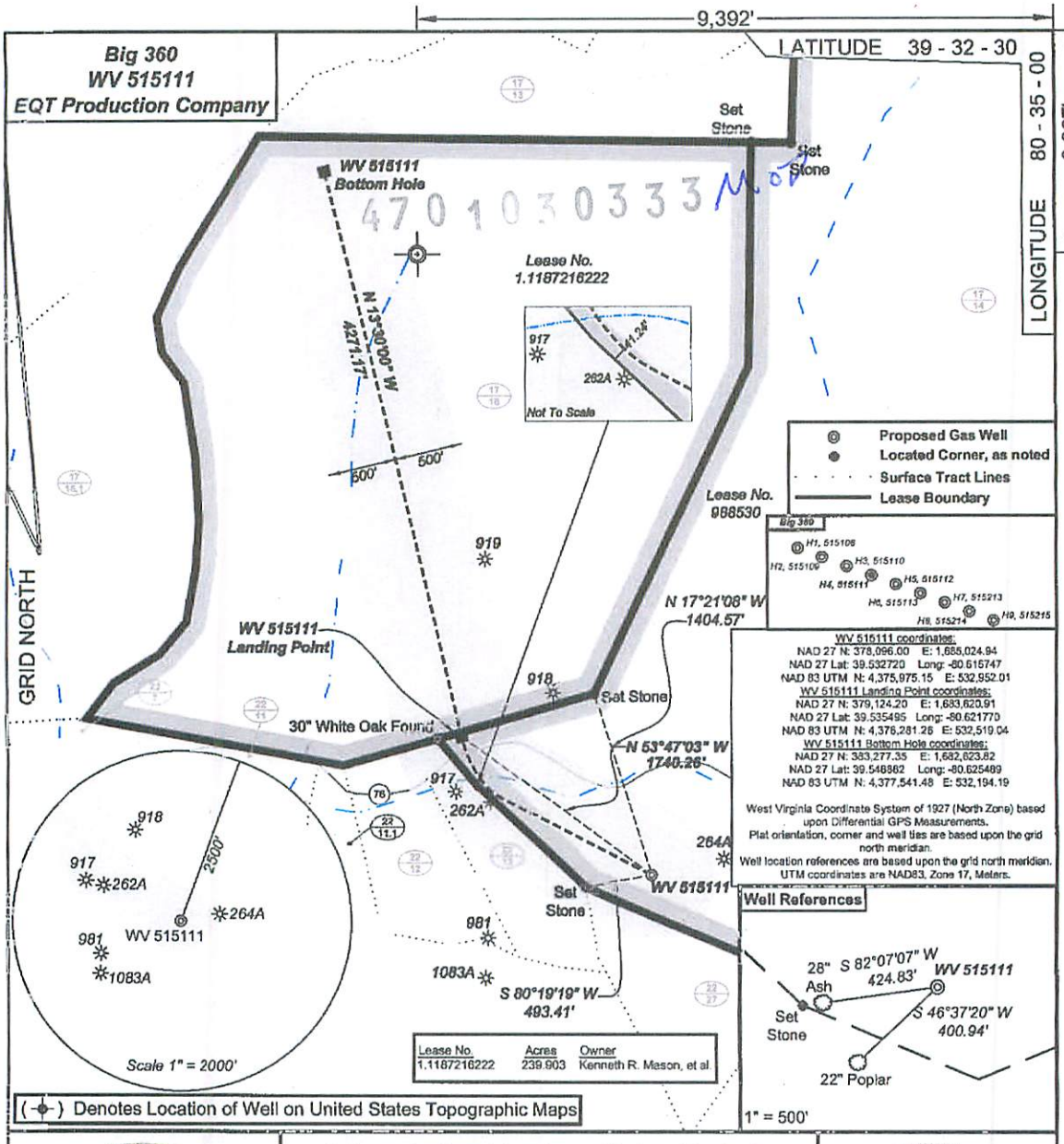
FILE NO: 174-13
DRAWING NO: 174-13 Big 360 H4
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1:2500
PROVEN SOURCE OF ELEVATION: NGS CORS Station

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

DATE: December 4 20 15
OPERATOR'S WELL NO. 515111
API WELL NO
47 - 103 - Q3033 H6A
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: 7,064'

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



ALLEGHENY SURVEYS, INC.

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

Ben R. Singleton LICENSED NO. 2092 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

SEAL

FILE NO: 174-13
DRAWING NO: 174-13 Big 360 H4
SCALE: 1" = 1000'
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: January 25 20 16
OPERATOR'S WELL NO. 515111
API WELL NO
47 - 103 - ____
STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION : ☐ STORAGE ☐ DEEP ☒ SHALLOW
LOCATION: ELEVATION: Original Ground = 1008' Proposed Ground = 996' WATERSHED Richwood Run QUADRANGLE: Big Run
DISTRICT: Grant COUNTY: Wetzel
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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: 7,064'

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