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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](http://www.dep.wv.gov)

## PERMIT MODIFICATION APPROVAL

September 04, 2015

SWN PRODUCTION COMPANY, LLC  
POST OFFICE BOX 12359  
SPRING, TX 773914954

Re: Permit Modification Approval for API Number 5101832, Well #: BONNETTE MSH 406H

**Direction of Wellbore/No new leases**

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.**

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

- 1) Well Operator: SWN Production Co., LLC 494512924 51-Marshall 5-Meade 681- Wileyville  
Operator ID County District Quadrangle
- 2) Operator's Well Number: Bonnette MSH 406H Well Pad Name: Bonnette MSH Pad
- 3) Farm Name/Surface Owner: Robert and Linda Bonnette Public Road Access: Fish Creek
- 4) Elevation, current ground: 1429.6 Elevation, proposed post-construction: 1429.6
- 5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_  
Other \_\_\_\_\_  
(b) If Gas Shallow  Deep \_\_\_\_\_  
Horizontal
- 6) Existing Pad: Yes or No yes *JW 8/6/15*
- 7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Target Formation- Marcellus, Target Top TVD- 7074', Target Base TVD- 8024', Anticipated Thickness- 50', Associated Pressure- 4739
- 8) Proposed Total Vertical Depth: 7114'
- 9) Formation at Total Vertical Depth: Marcellus
- 10) Proposed Total Measured Depth: 12,712'
- 11) Proposed Horizontal Leg Length: 4662'
- 12) Approximate Fresh Water Strata Depths: 645'
- 13) Method to Determine Fresh Water Depths: from log analysis and nearby water wells
- 14) Approximate Saltwater Depths: 1104'
- 15) Approximate Coal Seam Depths: 1110'
- 16) Approximate Depth to Possible Void (coal mine, karst, other): None that we are aware of.
- 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: \_\_\_\_\_

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18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	122'	122'	CTS
Fresh Water	13 3/8"	New	J-55	54.5#	700'	700'	635 sx/CTS
Coal	9 5/8"	New	J-55	40#	2757'	2757'	1040 sx/CTS
Intermediate	7"	New	P-110	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	P-110	20#	12,712'	12,712'	1200 sx/CTS
Tubing	2 3/8"	New	P-110	4.7#	Approx. 8234'	Approx. 8234'	
Liners							

*JNB/6/15*

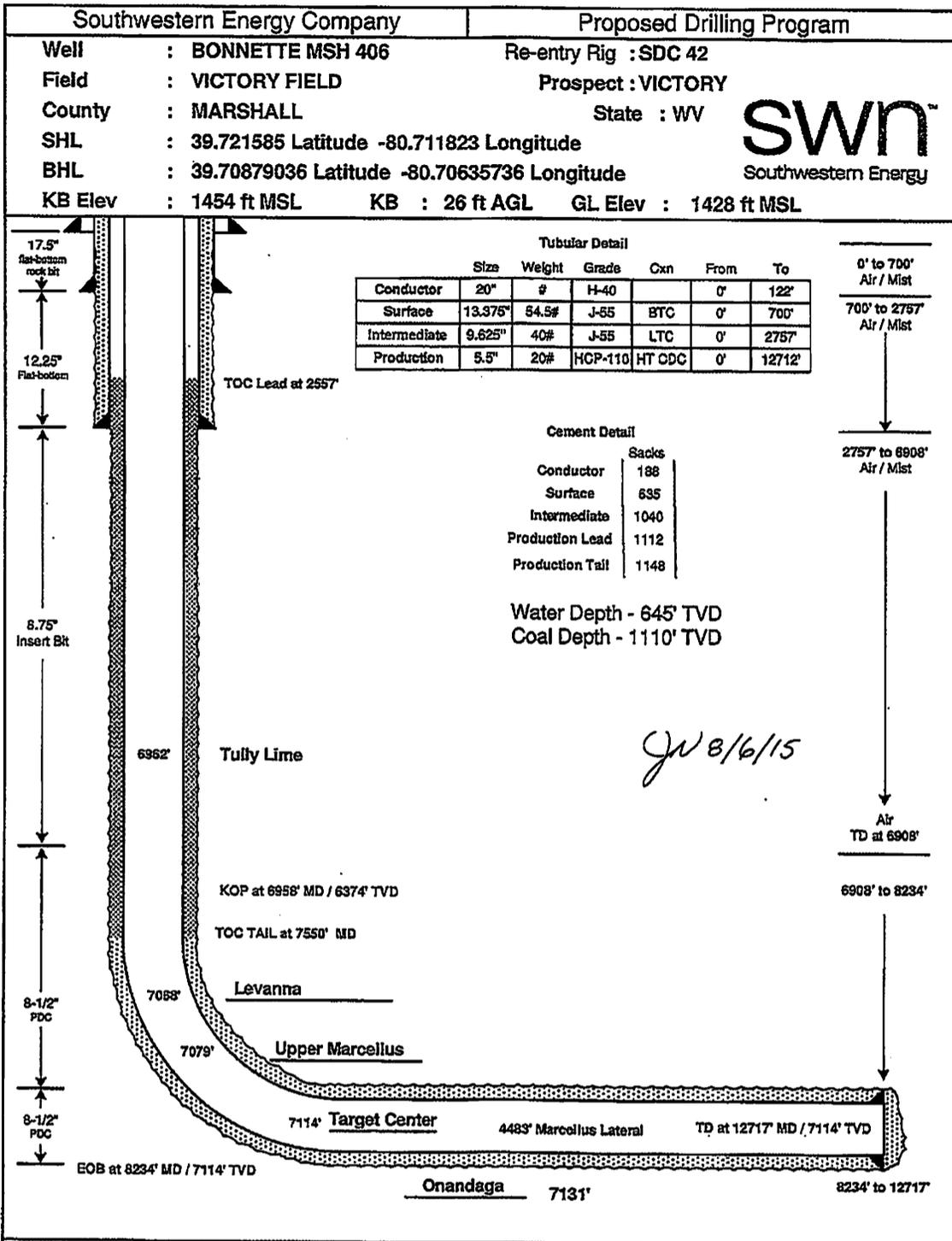
TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Max. Associated Surface Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	0.020	Class A	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	0.020	Class A	1.19/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	0.020	Class A	1.19/50% Excess
Intermediate	7"	8 3/4"	0.317	4360	0.020	Class A	1.20/15% Excess
Production	5 1/2"	8 3/4"	0.361	12360	0.020	Class A	1.20/15% Excess
Tubing	2 3/8"	4.778"	0.190				
Liners							

PACKERS

Kind:	10K Arrowset AS1-X			
Sizes:	5 1/2"			
Depth Set:				

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AUG - 6 2015



Data source: K:\EandP\WVD\Team Data\Drilling\Wells\Bonnette Pad\BONNETTE 406H\Drilling Program\Master SWN Well Input Sheet v E-O-1.xdm

NOTE: This drawing was created for the Roentry Rig. The depths and lengths shown in the plot are referenced to Roentry Rig KBL.

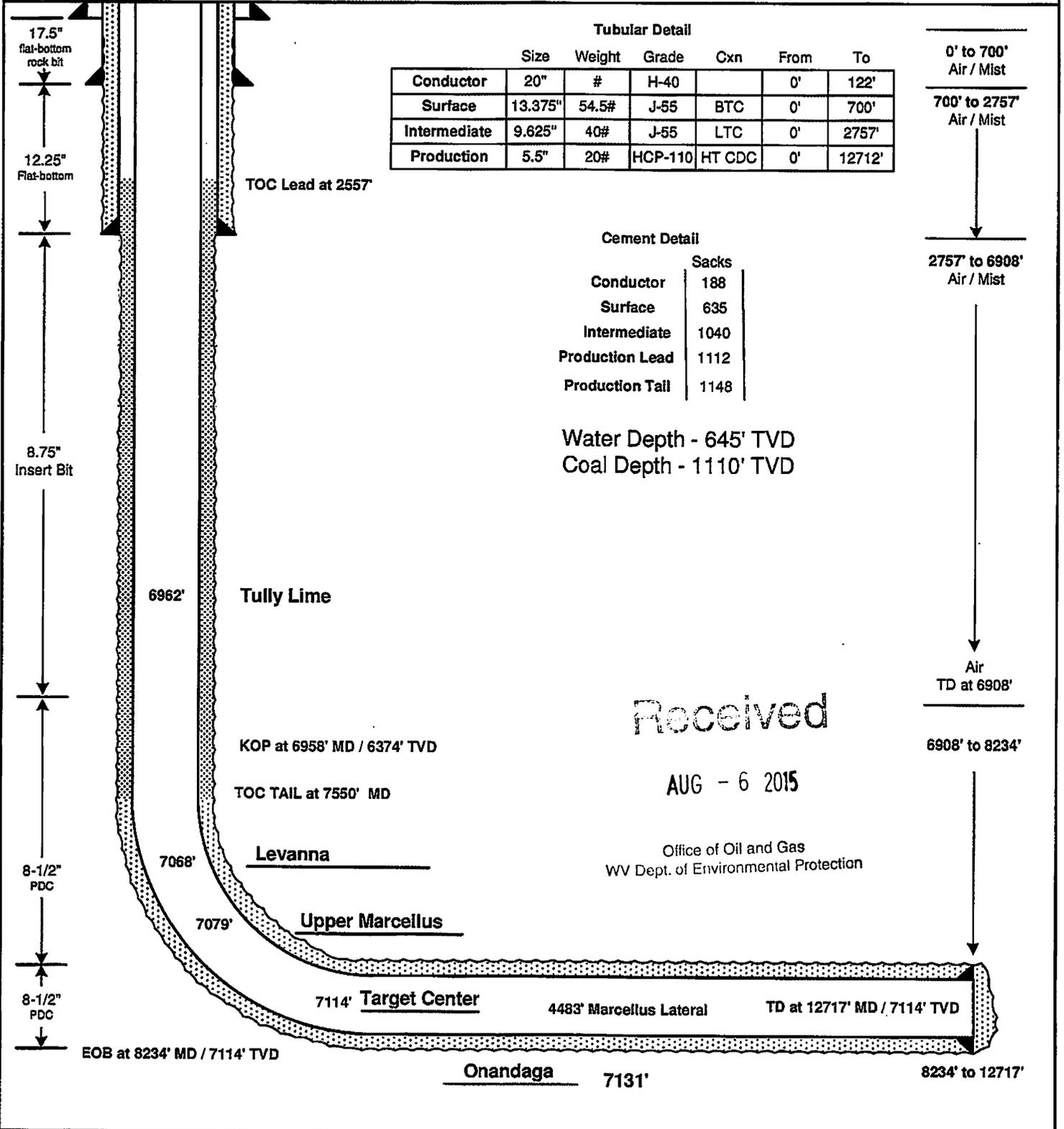
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Office of Oil and Gas  
WV Dept. of Environmental Protection

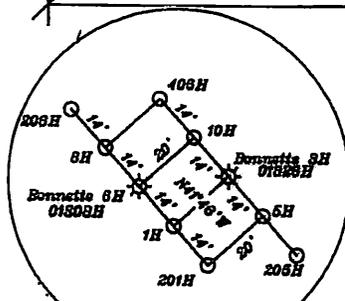
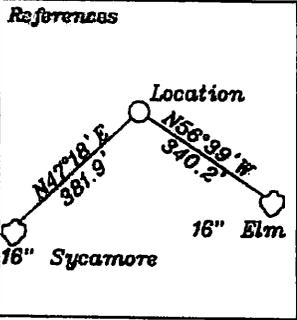
Southwestern Energy Company Proposed Drilling Program

Well : BONNETTE MSH 406 Re-entry Rig : SDC 42  
 Field : VICTORY FIELD Prospect : VICTORY  
 County : MARSHALL State : WV  
 SHL : 39.721585 Latitude -80.711823 Longitude  
 BHL : 39.70879036 Latitude -80.70635736 Longitude  
 KB Elev : 1454 ft MSL KB : 26 ft AGL GL Elev : 1428 ft MSL



Data source: K:\EandP\WVD\Team Data\Drilling\Wells\Bonnette Pad\BONNETTE 406\Drilling Program\Master SWN Well Input Sheet v E-0-1.xism

NOTE: This drawing was created for the Reentry Rig. The depths and lengths shown in the plot are referenced to Reentry Rig RKB.



Bottom Hole 11,160'  
 LATITUDE 39-45-00 N

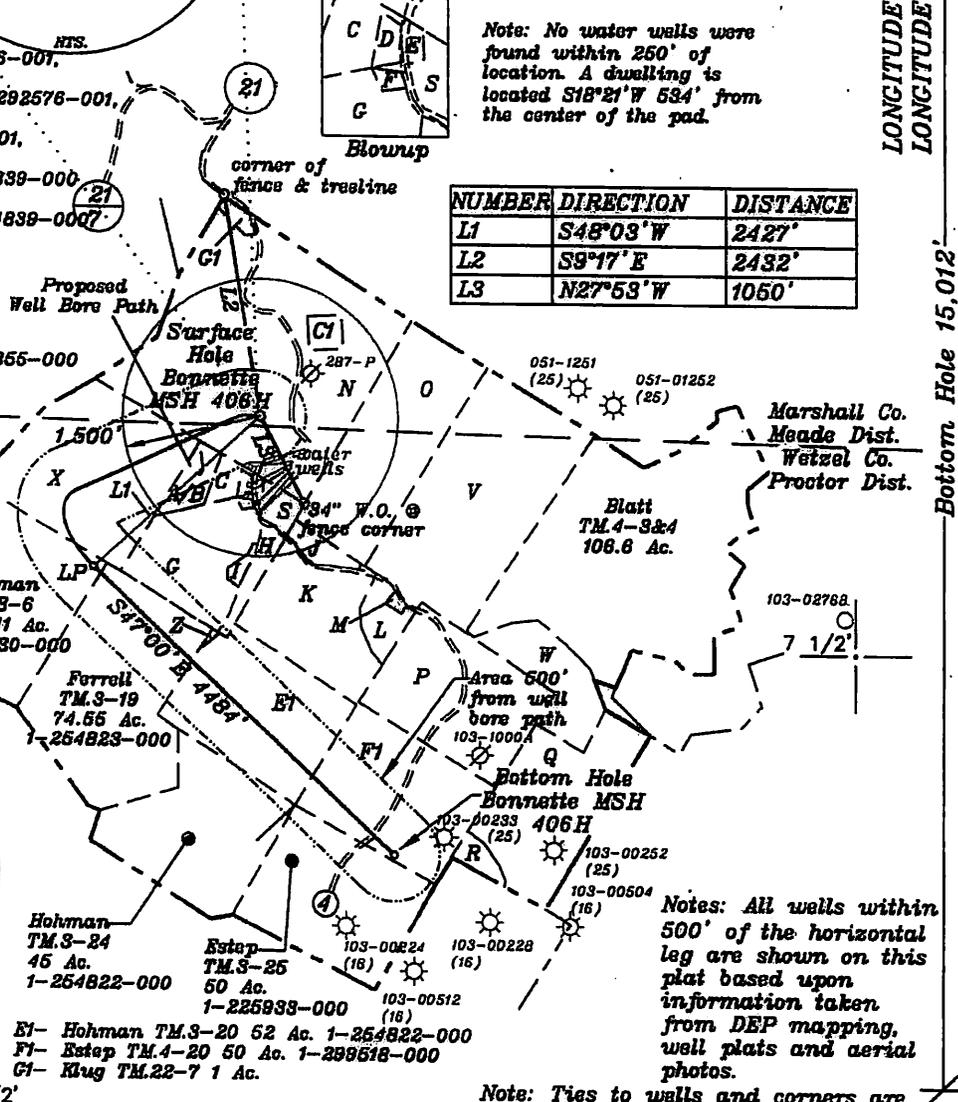
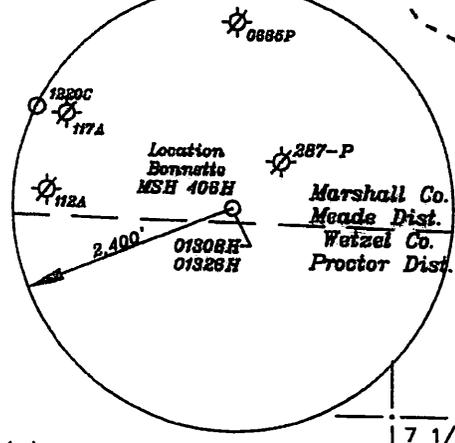
Surface Hole	UTM NAD 83(meters)-4396896.213 N. 524698.409 E
LP	UTM NAD 83(meters)-4396392.847 N. 524156.711 E
Bottom Hole	UTM NAD 83(meters)-4395477.778 N. 525171.481 E

LONGITUDE 80-42-30 W (TH)  
 LONGITUDE 80-40-00 W (BH)

- A- Bias 3 Ac. TM.3-8 1-292576-001, 1-254767-000
- B- Hohman 4.07 Ac. TM.3-8.3 1-292576-001, 1-254767-000
- C- Hohman 4.12 Ac. TM.3-8.1 & 8.2 1-292576-001, 1-254767-000
- D- B. Ferrell 1 Ac. TM.3-9 1-292576-001, 1-254916-000
- E- B. Ferrell 0.54 Ac. TM.3-10.1 1-254839-000
- F- B. Ferrell 0.33 Ac. TM.3-10.5
- G- J. Ferrell 28.97 Ac. TM.3-10.3 1-254839-000
- H- Miller 5.02 Ac. TM.3-10.2
- I- Ferrell 1.29 Ac. TM.3-10.4
- J- Zombotti 4.34 Ac. TM.3-11.2
- K- R. Yoho et al 38.59 Ac. TM.3-11
- L- Blatt 7.42 Ac. TM.3-11.3
- M- Harrick 0.65 Ac. TM.3-11.1
- N- Bonnette 126.53 Ac. TM.22-8 1-254855-000
- O- Fox 56 Ac. TM.4-1
- P- Dukaney 52 Ac. TM.4-12
- Q- Klug 48 Ac. TM.4-22
- R- Estep 3.45 Ac. TM.4-21
- S- Zombotti 4.15 Ac. TM.3-10 1-254839-000
- V- Fox 74.7 Ac. TM.4-2
- W- Blatt TM.4-13 22.14 Ac.
- X- Bias TM.3-7 82.32 Ac. 1-255028-000
- Z- Ferrell TM.3-20.1 1 Ac.
- C1- The Co. Comm.' of Marshall Co. 3.143 Ac. TM.22-8.1

Note: No water walls were found within 250' of location. A dwelling is located S18°21'W 534' from the center of the pad.

NUMBER	DIRECTION	DISTANCE
L1	S48°03'W	2427'
L2	S9°47'E	2432'
L3	N27°53'W	1050'



Notes: All walls within 500' of the horizontal leg are shown on this plat based upon information taken from DEP mapping, well plats and aerial photos.

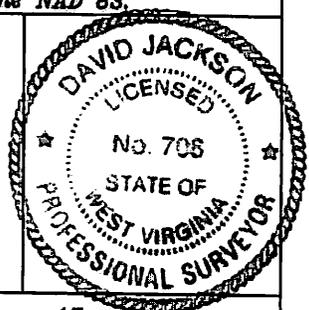
Note: Ties to walls and corners are based on State Plane Grid North-WV North Zone NAD 83.

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FILE NO. \_\_\_\_\_  
 DRAWING NO. 1  
 SCALE 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY 1 in 200  
 PROVEN SOURCE OF ELEVATION GPS  
submeter unit

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

(SIGNED) David Jackson  
 R.P.E. \_\_\_\_\_ L.L.S. 708



STATE OF WEST VIRGINIA  
 Division of Environmental Protection  
 OFFICE OF OIL AND GAS

DATE August 27, 2015  
 OPERATOR'S WELL NO. Bonnette MSH 406H  
 API WELL NO. \_\_\_\_\_

WELL TYPE: OIL GAS LIQUID INJECTION X WASTE DISPOSAL \_\_\_\_\_  
 (IF "GAS") PRODUCTION X STORAGE \_\_\_\_\_ DEEP \_\_\_\_\_ SHALLOW X

LOCATION: ELEVATION 1,427.6' WATER SHED Whetstone Creek  
 DISTRICT Meade COUNTY Marshall  
 QUADRANGLE Wileyville 7 1/2'

SURFACE OWNER Robert and Linda Bonnette ACREAGE 126.53 ac.  
 OIL & GAS ROYALTY OWNER Robert and Linda Bonnette, Robert and Barbara Bias, & Larry and Glenda Kress LEASE ACREAGE 576.49 ac.

LEASE NO. \_\_\_\_\_

PROPOSED WORK: DRILL X CONVERT \_\_\_\_\_ DRILL DEEPER \_\_\_\_\_ REDRILL \_\_\_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_\_\_ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_

PLUG AND ABANDON \_\_\_\_\_ CLEAN OUT AND REPLUG \_\_\_\_\_

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD=7,114'; TMD=12,717'

WELL OPERATOR SWN Production Co. LLC DESIGNATED AGENT Dee Southall  
 ADDRESS P.O. Box 1300 Jane Lew, WV 26378 ADDRESS P.O. Box 1300 Jane Lew, WV 26378

Bottom Hole 15,012'  
 Top Hole 10,364'

**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**VOLUNTARY STATEMENT OF NO OBJECTION**

**Instructions to Persons Named on Page WW-6A**

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

**Comment and Waiver Provisions**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

**VOLUNTARY STATEMENT OF NO OBJECTION**

I, James Amos, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	<u>wv</u>	UTM NAD 83	Easting:	<u>624698.4</u>
County:	<u>81-Marshall</u>		Northing:	<u>624698.4</u>
District:	<u>6-Moada</u>	Public Road Access:	<u>Fish Creek</u>	
Quadrangle:	<u>681-Wayville</u>	Generally used farm name:	<u>Bonnetta</u>	
Watershed:	<u>Whetstone Creek</u>			

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

<p>*Please check the box that applies</p> <p><input type="checkbox"/> SURFACE OWNER</p> <p><input type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input type="checkbox"/> COAL OPERATOR</p> <p><input type="checkbox"/> WATER PURVEYOR</p> <p><input checked="" type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p><b>FOR EXECUTION BY A NATURAL PERSON</b></p> <p>Signature: _____</p> <p>Print Name: _____</p> <p>Date: _____</p> <p><b>FOR EXECUTION BY A CORPORATION, ETC.</b></p> <p>Company: <u>Columbia Gas Transmission</u></p> <p>By: <u>James Amos</u></p> <p>Its: <u>Senior Well Services Engineer</u></p> <p>Signature: <u>James E Amos</u></p> <p>Date: <u>9/2/15</u></p>
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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).