

12/21/2018



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Thursday, December 20, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for YOCUM MSH 5H
47-051-02024-00-00

Lateral Extension

SWN PRODUCTION COMPANY, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: YOCUM MSH 5H
Farm Name: JOSEPH LEE & MICHAEL D. YOCUM
U.S. WELL NUMBER: 47-051-02024-00-00
Horizontal 6A New Drill
Date Modification Issued: December 20, 2018

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 051-Marshall 07-Liberty 438-Littleton
Operator ID County District Quadrangle

2) Operator's Well Number: Yocum MSH 5H Well Pad Name: Yocum MSH Pad

3) Farm Name/Surface Owner: Joseph Lee & Michael D. Yocum Public Road Access: Amos Hollow Road

4) Elevation, current ground: 1052' Elevation, proposed post-construction: 1053.4'

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

(b) If Gas Shallow Deep _____
Horizontal _____

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip Well to the North, Target Top TVD- 7063', Target Base TVD- 7100', Anticipated Thickness- 37', Associated Pressure- 4615

8) Proposed Total Vertical Depth: 7081'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 18457'

11) Proposed Horizontal Leg Length: 10958.59'

12) Approximate Fresh Water Strata Depths: 438'

13) Method to Determine Fresh Water Depths: Deepest water well ID'd is Vellekoop, Peter V. (depth of 180.7', subsea elevation of 642'), equating to 438' TVD at the pad. Logs for salinity analysis planned.

14) Approximate Saltwater Depths: 895' Depth is based on mapping the elevations of the Pottsville sandstone in the surrounding area. logs will be run on the 1st well for salinity analysis.

15) Approximate Coal Seam Depths: 844'

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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WW-6B
(04/15)

API NO. 47-⁰⁵¹069 - ⁰²⁰12/21/2018
 OPERATOR WELL NO. Yocum MSH 5H
 Well Pad Name: Yocum MSH Pad

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	H-40	94#	100'	100'	CTS
Fresh Water	13 3/8"	New	H-40	48#	530'	530'	506 sx/CTS
Coal							
Intermediate	9 5/8"	New	J-55	36#	2422'	2422'	936 sx/CTS
Production	5 1/2"	New	HCP-110	20#	18457'	18457'	5944x/Tal 2994x/100 inside int
Tubing							
Liners							

10/31/18

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"	30"	0.25	2120	81	Class A	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	633	Class A	1.19/50% Excess
Coal							
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/50% Excess
Production	5 1/2"	8 3/4"	0.361	12360	9500	Class A	1.20/50% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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WW-6B
(10/14)

API NO. 47-~~069~~⁰⁵¹ - ~~02~~⁰² ~~12/21/2018~~
OPERATOR WELL NO. Yocum MSH 5H
Well Pad Name: Yocum MSH Pad

jm
10/31/18

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

Drill and stimulate any potential zones between and including the Benson to Marcellus. **If we should encounter a void place basket above and below void area- balance cement to bottom of void and grout from basket to surface or run external casing packer/cementing stage tool above void interval and perform 2 stage cementing operation dependent upon depth of void. Run casing not less than 20' below void nor more than 75' below void. (*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts.)

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. The well is produced through surface facilities consisting of high pressure production unites, horizontal separation units, water and oil storage tanks. Max press and anticipated max rate- 9000 lbs @ 100 barrels a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 27.93

22) Area to be disturbed for well pad only, less access road (acres): 16.97

23) Describe centralizer placement for each casing string:

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

24) Describe all cement additives associated with each cement type:

See Attachment ***

25) Proposed borehole conditioning procedures:

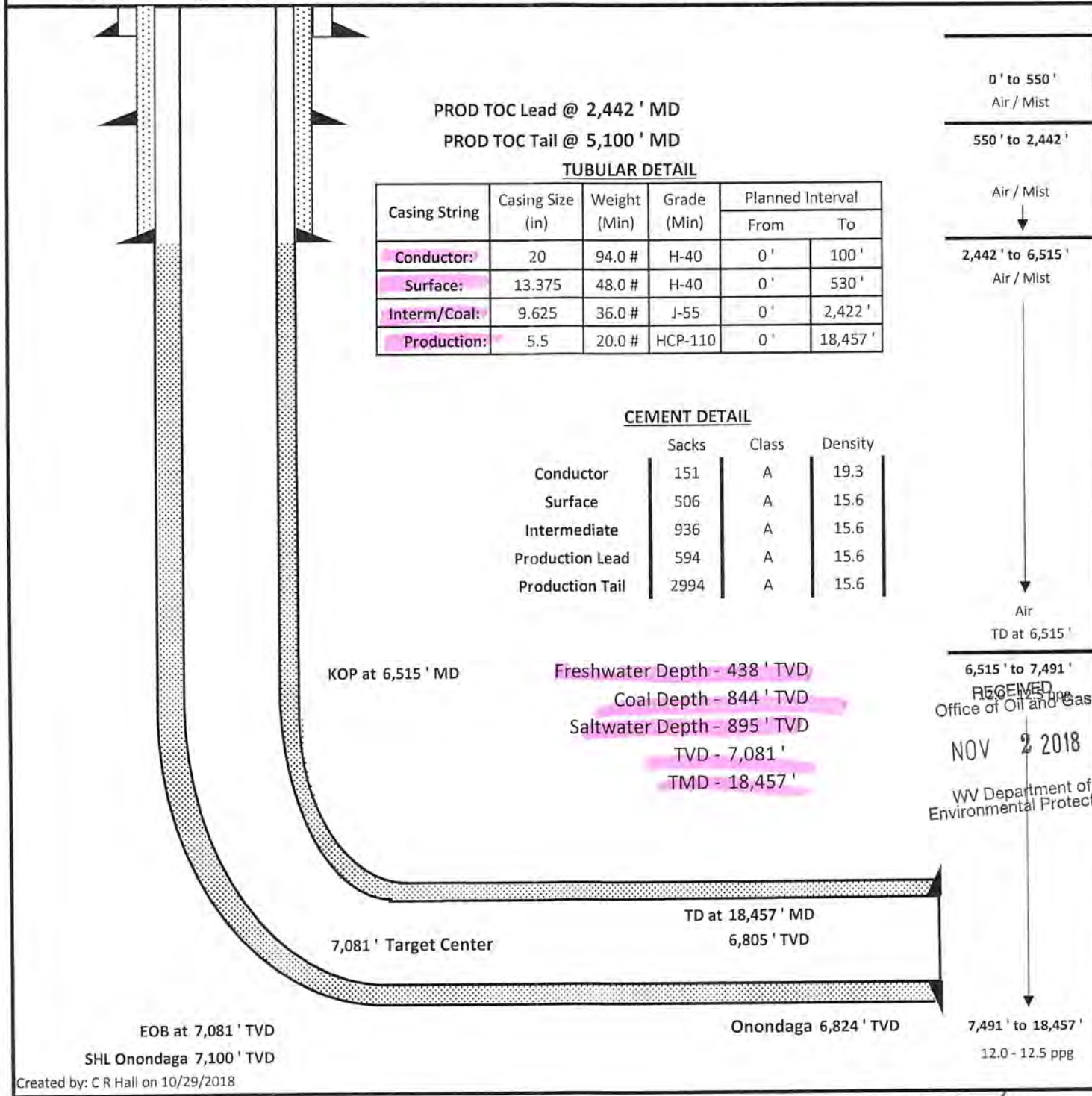
All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and down continuing until operator is satisfied with borehole conditions.

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*Note: Attach additional sheets as needed.

12/21/2018

Southwestern Energy Company			Proposed Drilling Program		
Well:	YOCUM MSH 5		Re-entry Rig:	TBD	
Field:	VICTORY FIELD WET		Prospect:	VICTORY	
County:	MARSHALL		State:	WV	
SHL:	39.7329 Latitude	-80.5835 Longitude			
BHL:	39.7548 Latitude	-80.6113 Longitude			
KB Elev:	1,080 ft MSL	KB: 26 ft AGL	GL Elev:	1,053 ft MSL	



PROD TOC Lead @ 2,442' MD
 PROD TOC Tail @ 5,100' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval	
				From	To
Conductor:	20	94.0 #	H-40	0'	100'
Surface:	13.375	48.0 #	H-40	0'	530'
Interm/Coal:	9.625	36.0 #	J-55	0'	2,422'
Production:	5.5	20.0 #	HCP-110	0'	18,457'

CEMENT DETAIL

	Sacks	Class	Density
Conductor	151	A	19.3
Surface	506	A	15.6
Intermediate	936	A	15.6
Production Lead	594	A	15.6
Production Tail	2994	A	15.6

Freshwater Depth - 438' TVD
 Coal Depth - 844' TVD
 Saltwater Depth - 895' TVD
 TVD - 7,081'
 TMD - 18,457'

KOP at 6,515' MD

TD at 18,457' MD
 6,805' TVD

7,081' Target Center

EOB at 7,081' TVD

SHL Onondaga 7,100' TVD

Onondaga 6,824' TVD

7,491' to 18,457'

12.0 - 12.5 ppg

Created by: C R Hall on 10/29/2018

Handwritten signature and date: 10/31/18

Schlumberger Cement Additives

	Product Name	Product Use	Chemical Name	CAS Number
Surface	S001	accelerator	calcium chloride <i>up to .3%</i>	10043-52-4
Intermediate	S001	accelerator	calcium chloride	10043-52-4
Kick Off Plug	D080	dispersant	sodium polynaphthalene sulfonate	9008-63-3
	D801	retarder	aromatic polymer derivative	proprietary
	D047	antifoam	polypropylene glycol	25322-69-4
Production-Loss	D167	fluid loss	aliphatic amide polymer	proprietary
	D154	extender	non-crystalline silica	7631-86-9
	D400	gas migration	boric acid	10043-35-3
	D046	antifoam	polypropylene glycol	25322-69-4
			fullers earth (attapulgate)	8031-18-3
	D201	retarder	chrystalline silica	14808-60-7
			metal oxide	proprietary
D202	dispersant	sulphonated synthetic polymer formaldehyde (impurity)	proprietary	
Production-Tail	D046	antifoam	polypropylene glycol	25322-69-4
			fullers earth (attapulgate)	8031-18-3
	D167	fluid loss	aliphatic amide polymer	proprietary
	D065	dispersant	sodium polynaphthalene sulfonate	9008-63-3
			sodium sulfate	7757-82-6
	D201	retarder	chrystalline silica	14808-60-7
metal oxide			proprietary	
D153	anti-settling	chrystalline silica	14808-60-7	

THRASHER

THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4108

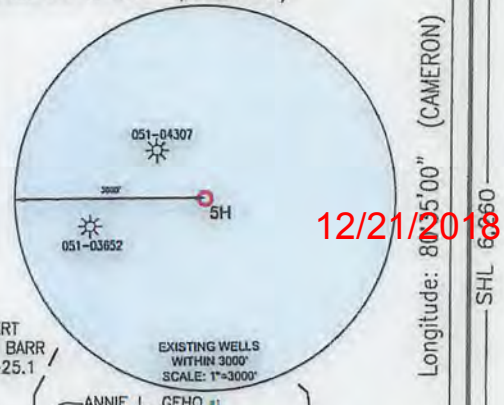
NOTES ON SURVEY

- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.

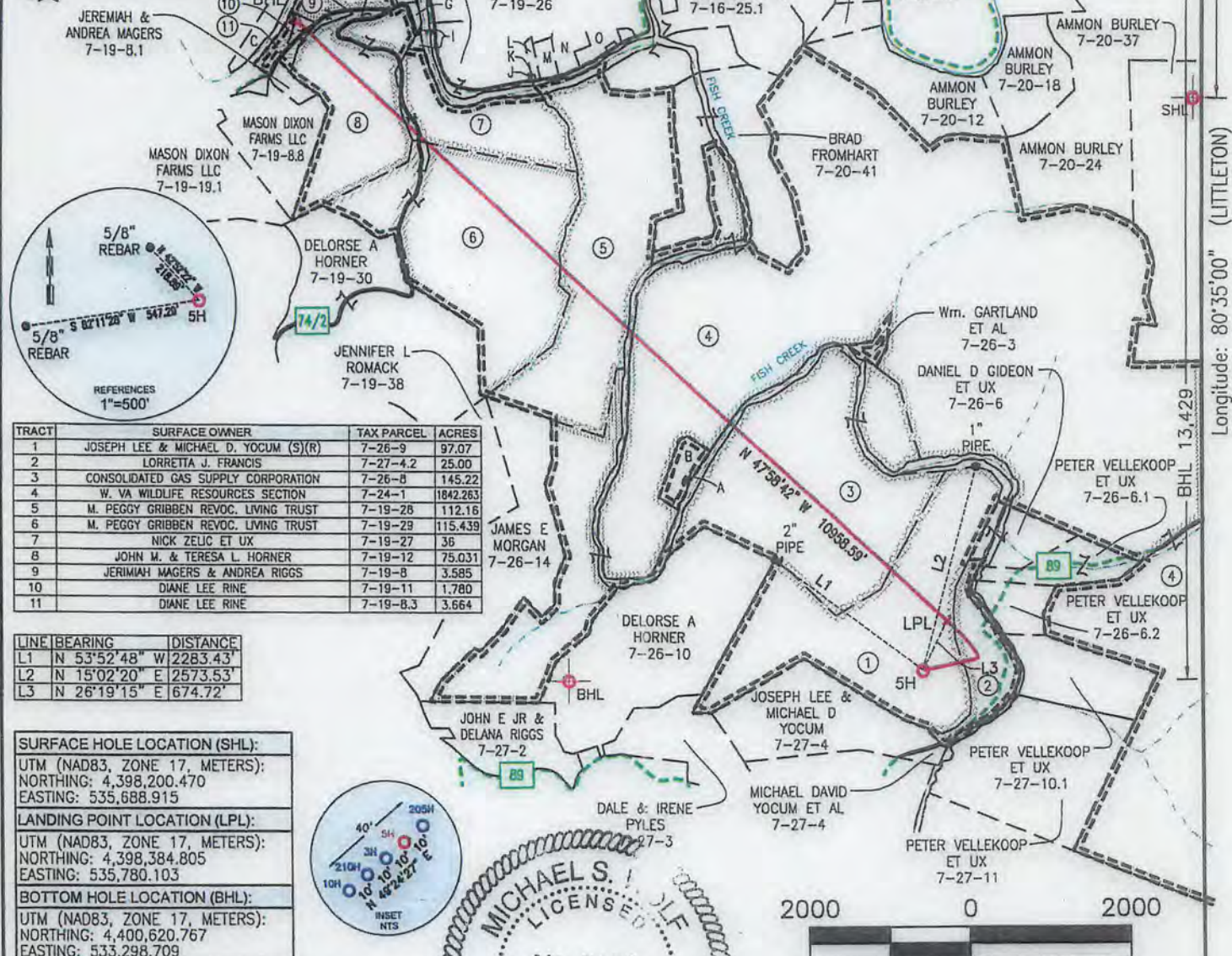
GRID NORTH
UTM, NAD83 DATUM, ZONE 17, US FT

TRACT	SURFACE OWNER	TAX PARCEL
A	JOHN M & USA A BUTLER	7-26-11.1
B	HUNTER RESOURCES INC	7-26-11
C	MARY ESIMER GRIMM	7-19-10.1
D	ROBERT L MCKEY	7-16-9
E	RICHARD H KESTEL & EDWARD J SILCOX	7-16-12
F	LARRY H MYER ET UX	7-16-15
G	JOHN C & SONIA M RICHARDS	7-19-13
H	JOHN C & SONIA M RICHARDS	7-9-14
I	JOHN M & TERESA L HORNER	7-19-17
J	CHURCH OF CHRIST TRUSTEES	7-19-25
K	JAMES REGIEC SR ET AL	7-19-24
L	JAMES REGIEC SR ET AL	7-19-23.1
M	JAMES E JR & GINGER REGIEC	7-19-23.2
N	JAMES F & JAMIE ANH DRUSCHEL ET AL	7-19-23
O	GAIL CUMPTON	7-19-20

Latitude: 39°45'00" (LITTLETON) SHL 119'
BHL 7,924'
Latitude: 39°47'30" (CAMERON)



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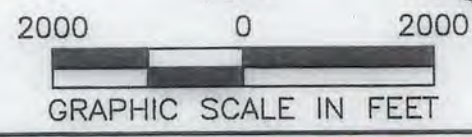
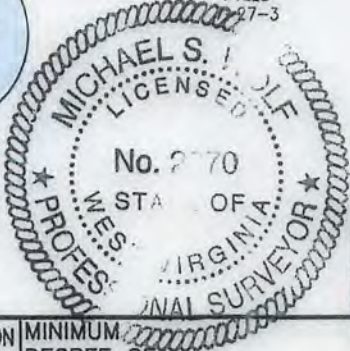
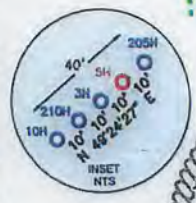
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	JOSEPH LEE & MICHAEL D. YOCUM (S)(R)	7-26-9	97.07
2	LORRETTA J. FRANCIS	7-27-4.2	25.00
3	CONSOLIDATED GAS SUPPLY CORPORATION	7-26-8	145.22
4	W. VA WILDLIFE RESOURCES SECTION	7-24-1	1842.263
5	M. PEGGY GRIBBEN REVOC. LIVING TRUST	7-19-26	112.16
6	M. PEGGY GRIBBEN REVOC. LIVING TRUST	7-19-29	115.439
7	NICK ZELUC ET UX	7-19-27	36
8	JOHN M. & TERESA L. HORNER	7-19-12	75.031
9	JERIMAH MAGERS & ANDREA RIGGS	7-19-8	3.585
10	DIANE LEE RINE	7-19-11	1.780
11	DIANE LEE RINE	7-19-8.3	3.664

LINE	BEARING	DISTANCE
L1	N 53°52'48" W	2283.43'
L2	N 15°02'20" E	2573.53'
L3	N 26°19'15" E	674.72'

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,398,200.470
EASTING: 535,688.915

LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,398,384.805
EASTING: 535,780.103

BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,400,620.767
EASTING: 533,298.709



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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

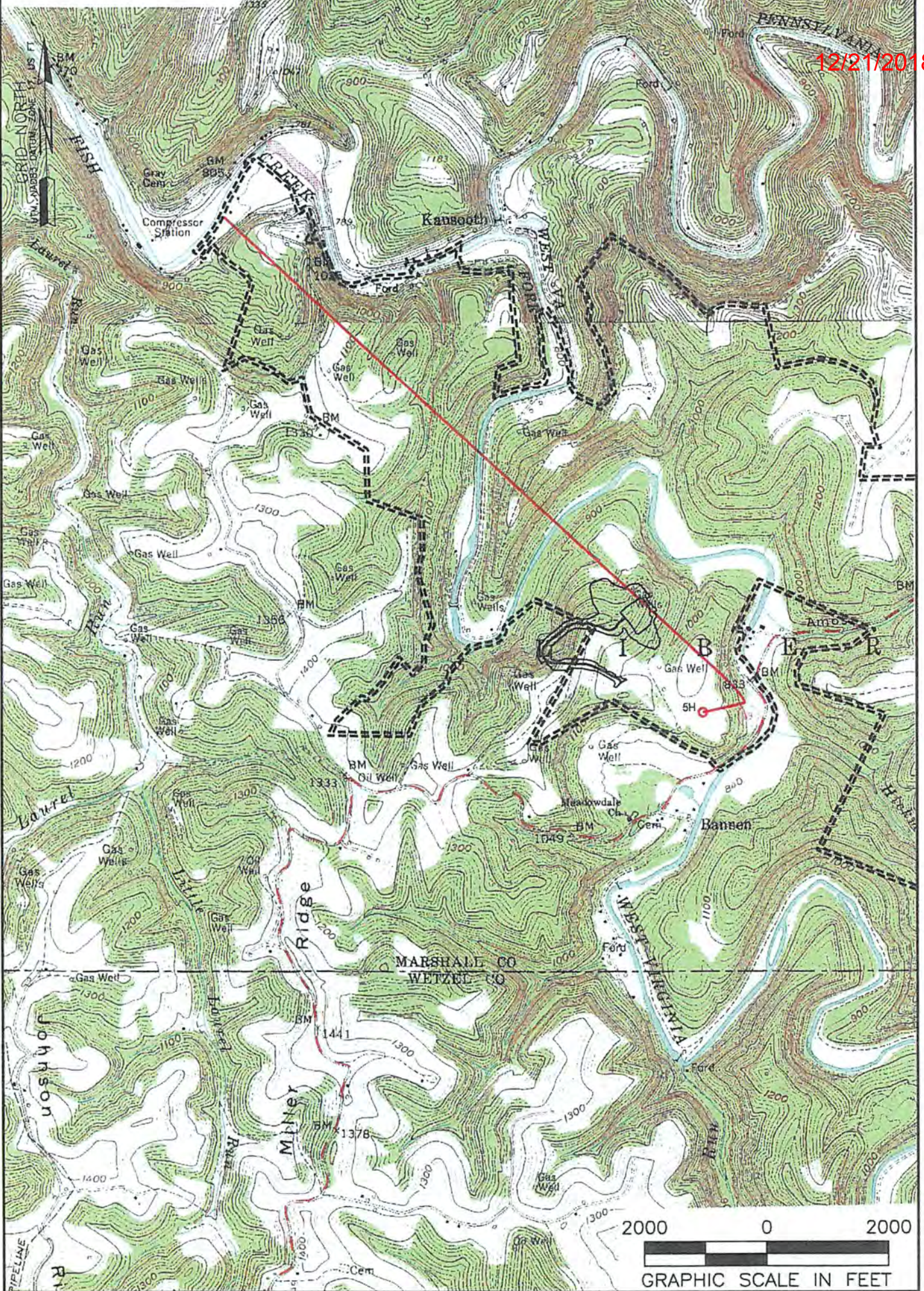
P.S. 2270 *[Signature]* 10/4/18

<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034</p>	<p>MINIMUM DEGREE OF ACCURACY: 1/200</p> <p>PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)</p>	<p>COMPANY: SWN Production Company, LLC</p> <p>OPERATOR'S WELL #: 5H</p> <p>API WELL #: 47 STATE 051 COUNTY 02024 PERMIT</p>
	<p>WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/></p> <p>WATERSHED: FISH CREEK</p> <p>DISTRICT: LIBERTY COUNTY: MARSHALL</p> <p>SURFACE OWNER: JOSEPH LEE AND MICHAEL D. YOCUM</p> <p>OIL & GAS ROYALTY OWNER: JOSEPH LEE AND MICHAEL D. YOCUM</p> <p>DRILL <input checked="" type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input checked="" type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/></p> <p>CONVERT <input type="checkbox"/> PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/> OTHER CHANGE <input type="checkbox"/> (SPECIFY)</p> <p>TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,081 TVD 18,457 MD</p>	<p>YOCUM MSH</p> <p>ELEVATION: 1053.4' (DESIGN)</p> <p>QUADRANGLE: LITTLETON, WV</p> <p>ACREAGE: ± 97.07</p> <p>ACREAGE: ± 97.07</p>
<p>WELL OPERATOR: SWN PRODUCTION COMPANY, LLC</p> <p>ADDRESS: P.O. BOX 1300</p> <p>CITY: JANE LEW STATE: WV ZIP CODE: 26378</p>	<p>DESIGNATED AGENT: BRITTANY WOODY</p> <p>ADDRESS: P.O. BOX 1300</p> <p>CITY: JANE LEW STATE: WV ZIP CODE: 26378</p>	<p>LEGEND:</p> <ul style="list-style-type: none"> ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ⊙ EXISTING / PRODUCING WELLHEAD LPL* LANDING POINT LOCATION ⊙ EXISTING WATER WELL ⊙ EXISTING SPRING — SURVEYED BOUNDARY — DRILLING UNIT ===== LEASE BOUNDARY — PROPOSED PATH
<p>REVISIONS:</p>		<p>DATE: 10-04-2018</p> <p>DRAWN BY: K. POTH</p> <p>SCALE: 1" = 2000'</p> <p>DRAWING NO: 030-3170</p> <p>WELL LOCATION PLAT</p>

THRASHER

THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4108

12/21/2018



NOTES ON SURVEY

1. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

LEGEND:

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- ★ EXISTING / PRODUCING WELLHEAD
- LPL* LANDING POINT LOCATION
- FLOOD PLAIN
- ACCESS ROAD
- PUBLIC ROAD
- ACCESS ROAD TO PREV. SITE
- ===== LEASE BOUNDARY
- PROPOSED PATH

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC	WELL (FARM) NAME: YOCUM MSH	WELL # 5H	SERIAL # XXXX
ADDRESS: P.O. BOX 1300 JANE LEW, WV 26378	COUNTY - CODE MARSHALL - 051	DISTRICT; PROCTOR	
SURFACE OWNER: JOSEPH LEE & MICHAEL D. YOCUM	USGS 7 1/2 QUADRANGLE MAP NAME LITTLETON, WV		

EXHIBIT "A"

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, L.L.C., Operator
Yocum SH
Marshall County, West Virginia

Tract #	Tax Parcel	Lessor	Lessee	Royalty	BK/PG	Interest Not Leased by Southwestern Production Company, LLC
1	7-26-9	W.E. Franklin, Ira M. Franklin & Emma Franklin, husband and wife, John A. Franklin & Mollie Franklin, husband and wife, Mary S. Franklin, widow, M.J. Brooks & Clint Brooks, wife and husband, Edith White & J.F. White, wife and husband, and Laura Franklin, widow	L.F. Burley	12.50%	186/284	0.0000%
		L.F. Burley	The Manufacturers Light and Heat Company		2/369	
		The Manufacturers Light and Heat Company	Columbia Gas Transmission Corporation		422/204	
		Columbia Gas Transmission Corporation	Columbia Natural Resources, LLC		642/281	
		Columbia Natural Resources, LLC	Chesapeake Appalachia, L.L.C.		650/63	
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		36/422	
2	7-26-9	I.D. Franklin and Bessie J. Franklin, husband and wife	The Manufacturers Light and Heat Company	12.50%	209/168	0.0000%
		The Manufacturers Light and Heat Company	Columbia Gas Transmission Corporation		422/204	
		Columbia Gas Transmission Corporation	Columbia Natural Resources, LLC		642/281	
		Columbia Natural Resources, LLC	Chesapeake Appalachia, L.L.C.		650/63	
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
3	7-26-8	Roger G. Rulong, Sr., aka Roger G. Rulong and Jane Unknown Rulong aka Jane K. Rulong, his wife	Chesapeake Appalachia, L.L.C.	12.50%	694/477	0.0000%
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Nancy Wallace Shuman aka Nancy W. Shuman, a married woman dealing in her sole and separate property	Chesapeake Appalachia, L.L.C.	12.50%	633/606	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Edward Strausser, a married man dealing in his sole and separate property	Chesapeake Appalachia, L.L.C.	12.50%	694/341	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Roger G. Rulong, Jr.	Chesapeake Appalachia, L.L.C.	12.50%	694/475	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Shirley Redd and James Redd, her husband	Chesapeake Appalachia, L.L.C.	17.00%	730/198	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Joan Marling aka Jo Ann Marling, a widow	Chesapeake Appalachia, L.L.C.	17.00%	730/208	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Jeanette Lilley, a widow	Chesapeake Appalachia, L.L.C.	17.00%	730/213	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Evelyn Bane, a married woman dealing in her sole and separate property	Chesapeake Appalachia, L.L.C.	17.00%	730/218	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Sharon Hodorowski, aka Sharon Facello, and Frank Hodorowski, her husband	Chesapeake Appalachia, L.L.C.	17.00%	732/385	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		William E. Phillips and Nancy G. Phillips, his wife	Chesapeake Appalachia, L.L.C.	17.00%	733/610	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Kathy L. Pierce, a married woman dealing in her sole and separate property	Chesapeake Appalachia, L.L.C.	17.00%	740/5	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	
		Amber D. Colvin, a single woman	Chesapeake Appalachia, L.L.C.	17.00%	740/85	
		Chesapeake Appalachia, L.L.C.	SWN Production Company, LLC		33/110	

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EXHIBIT "A"

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, L.L.C., Operator
Yocum 5H
Marshall County, West Virginia

Tract #	Tax Parcel	Lessor	Lessee	Royalty	BK/PG	Interest Not Leased by Southwestern Production Company, LLC
7-26-8		Chestnut Holdings, Inc., a Florida Corporation Chesapeake Appalachia, L.L.C.	Chesapeake Appalachia, LLC SWN Production Company, LLC	17.00%	766/605 33/110	
7-26-8		Hundred Resources Inc. Chesapeake Appalachia, L.L.C.	Chesapeake Appalachia, LLC SWN Production Company, LLC	17.00%	769/581 33/110	
7-26-8		Loran William Wallace, a married man dealing in his sole and separate property Chesapeake Appalachia, L.L.C.	Chesapeake Appalachia, LLC SWN Production Company, LLC	12.50%	692/345 33/110	
7-26-8		Clifford Rulong, a single man	SWN Production Company, LLC	16.00%	953/423	
7-26-8		Shelia V. Rulong, a widow	SWN Production Company, LLC	16.00%	953/592	
4	7-24-1.6	Raymond Burge and Alma Burge, his wife Edna Whitlatch and J. B. Whitlatch, her husband The Manufacturers Light and Heat Company Columbia Gas Transmission Corporation Columbia Natural Resources, LLC Chesapeake Appalachia, L.L.C.	Manufacturers Light and Heat Company Columbia Gas Transmission Corporation Columbia Natural Resources, LLC Chesapeake Appalachia, L.L.C.	12.50%	326/515 422/204 642/281 650/63 33/110	0.0000%
4	7-24-1.7	W.J. Booher and Virginia H. Booher, his wife The Manufacturers Light and Heat Company Columbia Gas Transmission Corporation Columbia Natural Resources, LLC Chesapeake Appalachia, L.L.C.	Manufacturers Light and Heat Company Columbia Gas Transmission Corporation Columbia Natural Resources, LLC Chesapeake Appalachia, L.L.C.	12.50%	659/591 422/204 642/281 650/63 33/110	0.0000%
5	7-19-28	James W. Whipkey, single Chesapeake Appalachia, LLC	Chesapeake Appalachia, LLC SWN Production Company, LLC	12.50%	655/5 35/32	0.0000%
	7-19-28	O. E. Burge, a married man dealing in his sole and separate property Chesapeake Appalachia, LLC	Chesapeake Appalachia, LLC SWN Production Company, LLC	12.50%	654/382 33/110	0.0000%
6	7-19-29	Kinsey A. Kiger and Carole E. Kiger, his wife Chesapeake Appalachia, LLC	Chesapeake Appalachia, LLC SWN Production Company, LLC	12.50%	660/36 33/110	0.0000%
7	7-19-27	Royalty Owners	n/a			2.5012%
	7-19-27	Marie Howard, widow; Maud Johnston, widow The Manufacturers Light and Heat Company Columbia Gas Transmission Corporation Columbia Natural Resources, LLC Chesapeake Appalachia, LLC	The Manufacturers Light and Heat Company Columbia Gas Transmission Corporation Columbia Natural Resources, LLC Chesapeake Appalachia, L.L.C. SWN Production Company, LLC	12.50%	363/367 422/204 642/281 650/63 33/110	
	7-19-27	Robert Patrick McGuire	SWN Production Company, LLC	17.00%	961/208	
	7-19-27	Thomas Michael McGuire, a married man dealing in his sole and separate property	SWN Production Company, LLC	15.00%	919/153	
	7-19-27	Marie Jean McGuire, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/555	
	7-19-27	Linda P. King, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/546	
	7-19-27	Donna M. Long, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/544	
	7-19-27	Sandra Witcombe, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/565	
	7-19-27	Laura L. Wozniack, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/557	
	7-19-27	Robin Clover Ventura, a single man	SWN Production Company, LLC	15.00%	933/308	
	7-19-27	Linda Hunt, single	SWN Production Company, LLC	15.00%	925/548	
	7-19-27	Cynthia Gregoire, single	SWN Production Company, LLC	15.00%	931/417	
	7-19-27	John Ellis, a widower	SWN Production Company, LLC	15.00%	955/559	

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EXHIBIT "A"

Attached to and made a part of the State of West Virginia Oil and Gas Permit Form, WW-6A1, by SWN Production Company, L.L.C., Operator
Yocum 5H
Marshall County, West Virginia

Tract #	Tax Parcel	Lessor	Lessee	Royalty	BK/PG	Interest Not Leased by Southwestern Production Company, LLC
7-19-27		William J. Mason, a married man dealing in his sole and separate property	SWN Production Company, LLC	15.00%	934/214	
7-19-27		Tracy L. Mason, single	SWN Production Company, LLC	15.00%	934/224	
7-19-27		Terry A. Aperula, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	945/421	
7-19-27		Susan G. Taber, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	945/413	
7-19-27		Robert Borhard, a married man dealing in his sole and separate property	SWN Production Company, LLC	15.00%	925/569	
7-19-27		Mary Margaret Cooper, f/a Mary Margaret Reid, a widow	SWN Production Company, LLC	15.00%	925/553	
7-19-27		Ralph H. Quarterston, Jr., a married man dealing in his sole and separate property	SWN Production Company, LLC	15.00%	925/562	
7-19-27		Janice K. Quarterston, Attorney in Fact for David A. Quarterston	SWN Production Company, LLC	15.00%	933/305	
7-19-27		Linda Jean Phillips, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/567	
7-19-27		Susan G. Cruise, a/k/a Susan G. Cruz, a married woman dealing in her sole and separate property	SWN Production Company, LLC	15.00%	925/551	
7-19-27		Daniel Howard Lambert, a single man	SWN Production Company, LLC	15.00%	932/79	
7-19-27		Lindsey M. Lambert, a single woman	SWN Production Company, LLC	15.00%	925/560	
8	7-19-12	J.P. Reid, guardian of Elsie Alvarena Miller, a minor, Albert Miller and Anna M. Miller, his wife, George M. Miller and Otta Miller, his wife, Edward Bowl and Myrtle Rowlands, his wife, and Albert Beebe and Della Beebe, his wife	The Manufacturers Light and Heat Company	12.50%	160/360	0.0000%
		The Manufacturers Light and Heat Company	Columbia Gas Transmission Corporation		422/204	
		Columbia Gas Transmission Corporation	Columbia Natural Resources, LLC		642/281	
		Columbia Natural Resources, LLC	Chesapeake Appalachia, L.L.C.		650/63	
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
9	7-19-8	John C. Richards and Sonia M. Richards, his wife	Chesapeake Appalachia, LLC	12.50%	659/591	0.0000%
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
	7-19-8	Stephen W. Burge and Judith A. Burge, his wife	Chesapeake Appalachia, LLC	12.50%	659/203	
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
10	7-19-11	John C. Richards and Sonia M. Richards, his wife	Chesapeake Appalachia, LLC	12.50%	659/591	0.0000%
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
	7-19-11	Stephen W. Burge and Judith A. Burge, his wife	Chesapeake Appalachia, LLC	12.50%	659/203	
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
11	7-19-8.3	John C. Richards and Sonia M. Richards, his wife	Chesapeake Appalachia, LLC	12.50%	659/591	0.0000%
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	
	7-19-8.3	Stephen W. Burge and Judith A. Burge, his wife	Chesapeake Appalachia, LLC	12.50%	659/203	
		Chesapeake Appalachia, LLC	SWN Production Company, LLC		33/110	

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12/21/2018



SWN Production Company, LLC
P O Box 12359
Spring, Texas 77391-2359
www.swn.com

October 4, 2018

Ms. Laura Adkins
WV DEP Office of Oil & Gas
601 57th St., SE
Charleston, WV 25304


RE: SWN's proposed New Well: Yocum MSH 5H in Marshall County, West Virginia, Drilling under Co Hwy 74/2.

Dear Ms. Adkins:

SWN Production Company, LLC ("SWN") is applying for a drilling permit for the above referenced well. The State of West Virginia has raised some concern as to SWN's right to drill under Co Hwy 74/2. Please be advised that SWN has leased all mineral owners under said route as it relates to the above-referenced well and unit.

Thank you.

Sincerely,


Brandi Williams, JD, CPL
Staff Landman
SWN Production Company, LLC
PO Box 12359
Spring, TX 77391-2359

10000 Energy Drive
Spring, TX 77389-4854



The Right People doing the Right Things.
Wiseley Investing the cash flow from our
underlying Assets, will create Value.SM

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Environmental Protection

November 1, 2018

Ms. Laura Adkins
Office of Oil & Gas
601 57th Street
Charleston, WV 25304

RE: Modification: Yocum MSH 5H


Dear Ms. Adkins

Enclosed please find the updated 6B, WBD, Mylar & 6A1 for the above captioned well. We updated the BOFW depths & method to determine the BOFW. We also revised the TOSW method. In addition to these changes, a modification was previously sent on 10/5 converting this vertical well to a horizontal. For your convenience, I combined both modifications into one for easier review.

If you have any questions or desire additional information, please me at 304-884-1613

Thank you.

Sincerely,



Brittany Woody
Regulatory Analyst
Southwestern Energy Production Company, LLC

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