

# SWN

Southwestern Energy®

PO Box 1300  
Jane Lew, WV 26378  
PHONE: (832) 796-1610

December 30, 2015

Ms. Laura Cooper  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

**RE:** Betty Schafer MSH 201H and Betty Schafer MSH 210H WR-35 and 36 Forms

Dear Ms. Cooper:

Enclosed please find the Well Record reports and first production reports for the above captioned wells. The Frac Focus portion is missing and the person responsible is out of town until Monday. As soon as we sort out this issue I will send the frac reports in.

If you have any questions or desire additional information, please call me at 832-796-6215.

Thank you.

Sincerely,

*Cody Magby*

Cody Magby  
Regulatory Analyst  
10000 Energy Drive  
Houston, TX 77389

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$\frac{R^2}{A} \rightarrow V^+$

The Right People doing the Right Things,  
wisely Investing the cash flow from  
our underlying Assets, will create Value+

WSAX 02/23/16

*E. J. [Signature]*  
2-22-16

02/26/2016

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47-051-01776 County 51-Marshall District 6-Sand Hill  
Quad 486-Moundville Pad Name Betty Schafer MSH Pad1 Field/Pool Name Panhandle  
Farm name Betty Jane Schafer Well Number 201  
Operator (as registered with the OOG) SWN Production CO., LLC  
Address 10000 Energy Drive City Spring State TX Zip 77380

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4426803.45 Easting 531107.051  
Landing Point of Curve Northing 4426663.98 Easting 530562.89  
Bottom Hole Northing 4429309.27 Easting 529365.501

Elevation (ft) 849 GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
SOBM

Date permit issued 5/12/15 Date drilling commenced 6/23/15 Date drilling ceased 7/30/15  
Date completion activities began 8/24/15 Date completion activities ceased 10/5/15  
Verbal plugging (Y/N) N Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 710 Open mine(s) (Y/N) depths \_\_\_\_\_  
Salt water depth(s) ft 2000 Void(s) encountered (Y/N) depths \_\_\_\_\_  
Coal depth(s) ft 670 Cavern(s) encountered (Y/N) depths \_\_\_\_\_  
Is coal being mined in area (Y/N) Y

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Reviewed by: RB

02/26/2016

API 47-051 - 01776 Farm name Betty Jane Schafer Well number 201

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30	20	126	N	94/F-25		Y, GTS
Surface	17.5	13.375	302	N	54.50/J-55		Y
Coal	12.250	9.625	1628	N	40/J-55		Y
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	8.75	5.5	16058	N	20/HCP-110		N
Tubing	4.78	2.375	6772	N	4.7/P-110		
Packer type and depth set							

Comment Details 10K ARROW HEAD AS1-X 5.5'

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	120	120	1.19	143	SURFACE	TOP JOB, GTS
Surface	CLASS A	290	15.7	1.2	348	SURFACE	8
Coal	CLASS A	635	15.6	1.18	749	SURFACE	8
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	CLASS A	1173/2187	15.6/15.6	1.24/1.19	1455/5064		24
Tubing							

Drillers TD (ft) 16058 Loggers TD (ft) 16058  
 Deepest formation penetrated MARCELLUS Plug back to (ft) \_\_\_\_\_  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) 5700

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

1 In the middle and top of the shoe joint, then 1 on the top of the 3rd joint, and then 1 at the top of every 3rd joint to surface.  
 1 solid body centralizer locked in against the float collar, one solid body centralizer on each joint from the float collar to 30 degrees.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

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WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

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WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

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API 47- 051 - 01776 Farm name Betty Jane Schafer Well number 201

PRODUCING FORMATION(S)	DEPTHS		
MARCELLUS	5844	TVD	16556 MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 174 psi Bottom Hole    psi DURATION OF TEST NA hrs

OPEN FLOW Gas 1593 mcfpd Oil 120 bpd NGL    bpd Water 32 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
		SEE ATTACHED			

Please insert additional pages as applicable.

Drilling Contractor SWN DRILLING CO.  
Address 10000 Energy Drive City Spring State TX Zip 77389

Logging Company WEATHERFORD US LP  
Address 121 HILLPOINTE DR., SUITE 300 City Canonsburg State TX Zip 15317

Cementing Company SCHLUMBERGER OIL FIELD SERVICES and ALLIED OIL AND GAS  
Address 1325 S. DAIRY ASHFORD DRIVE City Houston State TX Zip 77077

Stimulating Company BAKER HUGHES  
Address 17021 ALDINE WESTFIELD ROAD City Houston State TX Zip 77073

Please insert additional pages as applicable.

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State TX Zip 77073

Completed by CODY MAGBY Telephone 832-796-6215  
Signature p.p. Brittany Woody Title SR. REGULATORY ANALYST Date 12/30/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

WV Department of Environmental Protection

02/26/2016



WR-36  
Rev. 5/08

Date: 12-30-2015  
Operators Well Number: 201H  
API Well No: 47-051 - 01776

**State of West Virginia  
Department of Environmental Protection  
Office of Oil and Gas**

**Well Operator's Report of  
Initial Gas-Oil Ratio**

Well Operator SWN PRODUCTION CO., LLC Designated Agent \_\_\_\_\_  
Address 10000 ENERGY DRIVE Address \_\_\_\_\_  
SPRING, TX 77389 \_\_\_\_\_  
\_\_\_\_\_

Geological Target Formation: MARCELLUS SHALE Depth 16,556' MD feet  
Perforation Interval 5,844' TYD-16,556' MD feet

Guidelines for testing:

1. A minimum of gas vented or flared.
2. A 24 hour pre-flow into pipelines or tanks.
3. Uniform producing rate during the 24 hour test per test period.
4. Measurement standards as for Form WR-39, "Report of Annual Production" (see 35CSR4-15)
5. Separate Form WR-36 for each producing formation in a multiple completion.

**TEST DATA**

Start of Test Date	Time	End of Test Date	Time	Duration of Test
Tubing Pressure	Casing Pressure	Separator Pressure	Separator Temperature	
Oil Production During Test	Gas Production During Test	Water Production During Test		
BBLS	MCF	BBls	-Salinity	
Oil Gravity	Producing Method (flowing, pumping, gas lift etc.)			
API				

**GAS PRODUCTION**

Measurement Method Flange Tap <input type="checkbox"/> Pipe Tap <input type="checkbox"/> L-10 <input type="checkbox"/>		Positive Choke <input type="checkbox"/>
		Positive flow prover <input type="checkbox"/>
Orifice diameter	Pipe Diameter (inside)	Nominal Choke Size inches
Differential Pressure range	Max. Static pressure range	Prover and Orifice diameter - inches
Differential		Static
Gas Gravity (Air = 1.0)	Flowing Temperature	Gas Temperature
Measured	Estimated	
24 Hour Coefficient	24 Hour coefficient pressure PSIA	

**TEST RESULTS**

Daily Oil	Daily Water	Daily Gas	Gas-Oil Ratio
120	32	1593	13.275 MCF/BBL

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SWN PRODUCTION CO., LLC  
Office of Oil and Gas  
Well Operator  
BY: CODY MAGBY  
JAN 04 2016  
ITS: STAFF REGULATORY ANALYST

API # 4705101776			STIMULATION INFORMATION PER STAGE						
WELL NAME	STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/other
BETTY SCHAFFER MSH 201	1	8/31/2015	97	8,163	9,031	3,693	703,382	11,680	
BETTY SCHAFFER MSH 201	2	9/1/2015	100	8,213	9,042	4,344	702,369	10,871	
BETTY SCHAFFER MSH 201	3	9/1/2015	99	8,399	9,081	4,146	700,732	11,036	
BETTY SCHAFFER MSH 201	4	9/1/2015	100	8,203	8,863	4,156	704,592	10,806	
BETTY SCHAFFER MSH 201	5	9/2/2015	91	8,055	8,894	4,155	695,063	11,134	
BETTY SCHAFFER MSH 201	6	9/2/2015	89	8,153	9,234	4,267	700,171	10,999	
BETTY SCHAFFER MSH 201	7	9/2/2015	100	8,123	9,118	4,681	700,263	10,804	
BETTY SCHAFFER MSH 201	8	9/3/2015	101	8,068	8,468	4,386	701,313	10,117	
BETTY SCHAFFER MSH 201	9	9/3/2015	100	8,119	8,713	4,400	698,785	10,974	
BETTY SCHAFFER MSH 201	10	9/4/2015	101	8,175	8,869	4,574	702,451	10,760	
BETTY SCHAFFER MSH 201	11	9/4/2015	99	8,044	9,200	4,928	700,938	10,857	
BETTY SCHAFFER MSH 201	12	9/4/2015	99	7,867	8,970	4,649	700,317	10,716	
BETTY SCHAFFER MSH 201	13	9/4/2015	101	7,994	8,844	4,393	553,765	9,250	
BETTY SCHAFFER MSH 201	14	9/5/2015	86	8,040	9,097	4,294	703,432	11,953	
BETTY SCHAFFER MSH 201	15	9/5/2015	98	7,503	9,219	4,263	700,079	10,649	
BETTY SCHAFFER MSH 201	16	9/5/2015	99	7,627	9,068	4,335	699,751	10,522	
BETTY SCHAFFER MSH 201	17	9/6/2015	94	7,624	8,949	4,419	697,939	12,040	
BETTY SCHAFFER MSH 201	18	9/6/2015	98	7,450	8,519	4,688	701,991	10,285	
BETTY SCHAFFER MSH 201	19	9/7/2015	102	7,528	8,900	4,412	702,072	10,376	
BETTY SCHAFFER MSH 201	20	9/7/2015	97	7,547	9,069	4,213	699,469	10,298	
BETTY SCHAFFER MSH 201	21	9/7/2015	100	7,508	8,699	4,335	699,088	10,363	
BETTY SCHAFFER MSH 201	22	9/7/2015	100	7,235	8,555	4,545	693,511	10,399	
BETTY SCHAFFER MSH 201	23	9/8/2015	76	8,835	9,550	1,985	8,933	2,690	
BETTY SCHAFFER MSH 201	24	9/8/2015	101	7,191	7,517	4,316	700,206	10,266	
BETTY SCHAFFER MSH 201	25	9/9/2015	83	8,404	8,974	5,200	10,300	3,911	
BETTY SCHAFFER MSH 201	26	9/9/2015	102	7,596	8,711	4,238	704,759	11,287	
BETTY SCHAFFER MSH 201	27	9/10/2015	102	7,272	8,721	4,509	703,910	10,799	
BETTY SCHAFFER MSH 201	28	9/10/2015	101	7,237	8,330	4,646	701,678	10,456	
BETTY SCHAFFER MSH 201	29	9/10/2015	104	7,039	8,323	4,639	702,497	10,433	
BETTY SCHAFFER MSH 201	30	9/11/2015	101	7,000	8,098	4,586	701,967	10,406	
BETTY SCHAFFER MSH 201	31	9/11/2015	96	6,832	8,552	4,331	622,614	10,023	
BETTY SCHAFFER MSH 201	32	9/11/2015	49	8,874	9,042	4,330	5,529	3,403	
BETTY SCHAFFER MSH 201	33	9/12/2015	102	6,982	8,433	4,587	701,066	10,500	
BETTY SCHAFFER MSH 201	34	9/12/2015	101	6,678	7,384	4,263	699,040	10,572	
BETTY SCHAFFER MSH 201	35	9/13/2015	101	6,540	7,644	4,224	695,503	10,217	
BETTY SCHAFFER MSH 201	36	9/13/2015	102	7,369	9,227	4,405	699,372	10,493	
BETTY SCHAFFER MSH 201	37	9/14/2015	101	6,752	8,256	4,610	697,901	10,260	
BETTY SCHAFFER MSH 201	38	9/14/2015	101	6,541	7,199	4,683	754,247	11,139	
Grand total	Grand total	8/31/2015	97	7,652	9,550	4,364	24,370,995	383,745	

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## PERFORATION INFO BY STAGE BETTY SCHAFFER 201H

WELL NAME	STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
BETTY SCHAFFER MSH 201	1	8/31/2015	15,713	15,895	42
BETTY SCHAFFER MSH 201	2	9/1/2015	15,473	15,655	42
BETTY SCHAFFER MSH 201	3	9/1/2015	15,233	15,415	42
BETTY SCHAFFER MSH 201	4	9/1/2015	14,993	15,175	42
BETTY SCHAFFER MSH 201	5	9/2/2015	14,753	14,935	42
BETTY SCHAFFER MSH 201	6	9/2/2015	14,513	14,695	42
BETTY SCHAFFER MSH 201	7	9/2/2015	14,273	14,455	42
BETTY SCHAFFER MSH 201	8	9/3/2015	14,033	14,215	42
BETTY SCHAFFER MSH 201	9	9/3/2015	13,793	13,975	42
BETTY SCHAFFER MSH 201	10	9/3/2015	13,553	13,735	42
BETTY SCHAFFER MSH 201	11	9/4/2015	13,313	13,495	42
BETTY SCHAFFER MSH 201	12	9/4/2015	13,073	13,255	42
BETTY SCHAFFER MSH 201	13	9/4/2015	12,833	13,015	42
BETTY SCHAFFER MSH 201	14	9/5/2015	12,593	12,775	42
BETTY SCHAFFER MSH 201	15	9/5/2015	12,353	12,535	42
BETTY SCHAFFER MSH 201	16	9/5/2015	12,113	12,295	42
BETTY SCHAFFER MSH 201	17	9/6/2015	11,873	12,055	43
BETTY SCHAFFER MSH 201	18	9/6/2015	11,633	11,815	42
BETTY SCHAFFER MSH 201	19	9/7/2015	11,393	11,575	42
BETTY SCHAFFER MSH 201	20	9/7/2015	11,153	11,330	42
BETTY SCHAFFER MSH 201	21	9/7/2015	10,913	11,095	42
BETTY SCHAFFER MSH 201	22	9/8/2015	10,673	10,855	42
BETTY SCHAFFER MSH 201	23	9/8/2015	10,433	10,615	42
BETTY SCHAFFER MSH 201	24	9/9/2015	10,193	10,375	42
BETTY SCHAFFER MSH 201	25	9/9/2015	9,953	10,135	84
BETTY SCHAFFER MSH 201	26	9/9/2015	9,713	9,895	42
BETTY SCHAFFER MSH 201	27	9/10/2015	9,473	9,655	42
BETTY SCHAFFER MSH 201	28	9/10/2015	9,233	9,415	42
BETTY SCHAFFER MSH 201	29	9/10/2015	8,993	9,175	42
BETTY SCHAFFER MSH 201	30	9/11/2015	8,753	8,933	30
BETTY SCHAFFER MSH 201	31	9/11/2015	8,510	8,695	42
BETTY SCHAFFER MSH 201	32	9/11/2015	8,273	8,455	42
BETTY SCHAFFER MSH 201	33	9/12/2015	8,033	8,215	42
BETTY SCHAFFER MSH 201	34	9/12/2015	7,793	7,975	19
BETTY SCHAFFER MSH 201	35	9/13/2015	7,553	7,735	42
BETTY SCHAFFER MSH 201	36	9/13/2015	7,313	7,495	42
BETTY SCHAFFER MSH 201	37	9/14/2015	7,073	7,255	42
BETTY SCHAFFER MSH 201	38	9/14/2015	6,833	7,017	42

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**Well Name: BETTY SCHAFFER MSH 201H**

LITHOLOGY/FORMATION	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, TVD (FT)	TOP DEPTH, MD (FT)	BOTTOM DEPTH, MD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	N.A.	106.00	N.A.	106.00	
Top of Salt Water	535.00	N.A.	535.00	N.A.	
Pittsburgh Coal	350.09	1376.11	350.10	1376.16	?
Big Injun (ss)	1376.11	1921.00	1376.16	1922.00	?
Berea (siltstone)	1921.00	5380.95	1922.00	5709.43	?
Rhinestreet (shale)	5380.95	5660.05	5709.43	6039.83	?
Cashaqua (shale)	5660.05	5731.25	6039.83	6132.78	?
Middlesex (shale)	5731.25	5796.98	6132.78	6226.62	?
Burket (shale)	5796.98	5826.40	6226.62	6272.25	?
Tully (ls)	5826.40	5860.08	6272.25	6327.94	?
Mahantango (shale)	5860.08	5975.18	6327.94	6619.93	?
Marcellus (shale)	5975.18	N.A.	6619.93	N.A.	?

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RETTEW Associates, Inc.  
27 Travate Street, Suite 101  
Bridgeport, WV 26330  
Phone (800) 738-8395  
Email: rettew@rettew.com  
Website: www.rettew.com

**SURFACE HOLE LOCATION (SHL):**

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,426,810.708  
EASTING: 531,105.246

**LANDING POINT LOCATION (LPL):**

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,426,676.766  
EASTING: 531,885.235

**BOTTOM HOLE LOCATION (BHL):**

UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4,424,409.653  
EASTING: 532,929.699

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

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 52°19'50" W	775.67'	SHL TO LANDMARK	
L2	S 15°38'31" E	2705.27'	SHL TO LANDMARK	
L3	N 06°31'10" E	103.86'	SHL TO REF. PNT.	1/2" Ø REBAR SET
L4	S 34°55'18" W	228.35'	SHL TO REF. PNT.	1/2" Ø REBAR SET
L5	S 80°15'35" E	2596.35'	SHL TO LP	
L6	S 24°44'08" E	8189.41'	LP TO BHL	
L7	S 44°14'32" E	378.53'	ASDRILLED BORE	
L8	S 32°46'11" E	264.89'	ASDRILLED BORE	
L9	S 23°26'52" E	633.84'	ASDRILLED BORE	
L10	S 23°25'13" E	2338.84'	ASDRILLED BORE	
L11	S 26°06'00" E	368.94'	ASDRILLED BORE	
L12	S 23°05'12" E	1980.11'	ASDRILLED BORE	
L13	S 19°49'44" E	378.70'	ASDRILLED BORE	
L14	S 24°05'02" E	1419.66'	ASDRILLED BORE	
L15	S 26°06'19" E	189.99'	ASDRILLED BORE	
L16	S 23°18'30" E	215.93'	ASDRILLED BORE	

2,968'

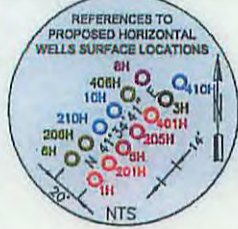
Latitude: 40°00'00"

Longitude: 80°37'30"

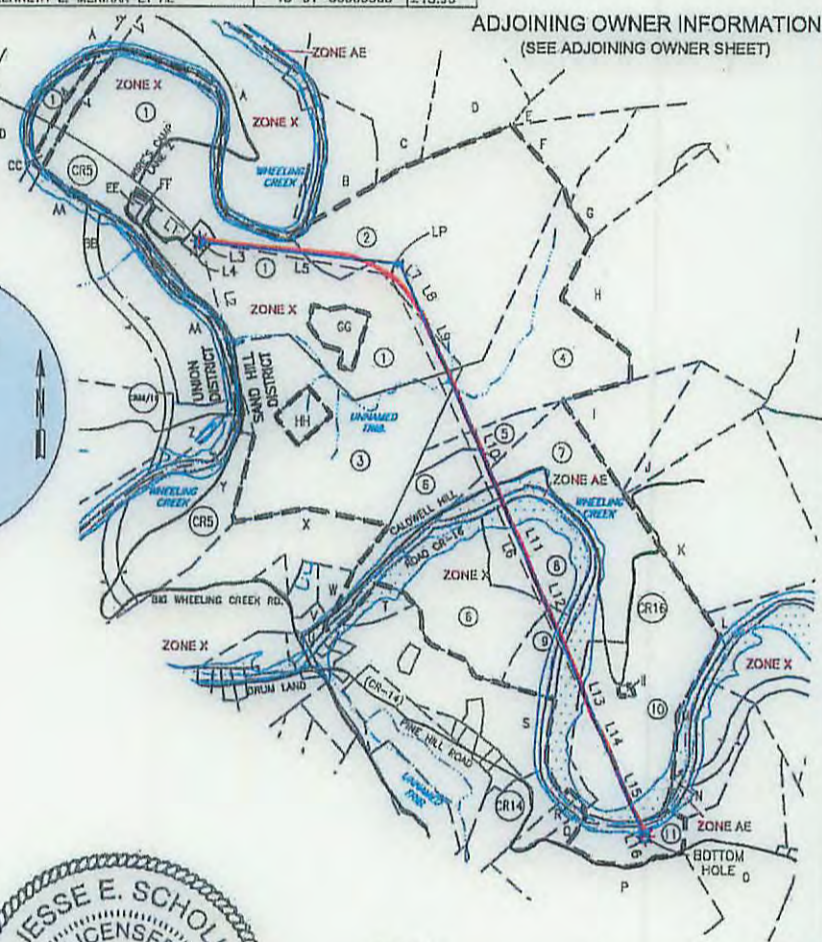
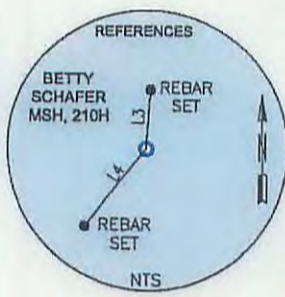
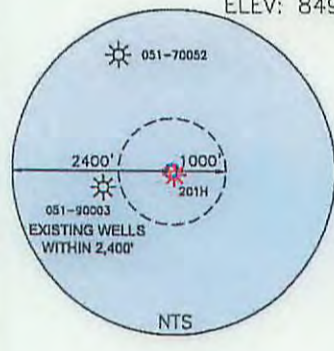
3,326'

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	BETTY JANE SCHAFER, LIFE ESTATE; ROY ALVIN SCHAFER, REMAINDERMAN; EDWARD J. SCHAFER, REMAINDERMAN	12-09-00220000	±205.06
2	CHARLES B. AND CARLA S. FISHER	12-09-00200000	±132.66
3	CLIVE P. GROSCHOFF	12-10-00010002	±85.43
4	CALVIN C. MERINAR	12-09-00190000	±85.50
5	CALVIN C. MERINAR	12-10-00070000	±13.40
6	GEETA	15-01-00020000	±82.91
7	KENNETH L. MERINAR ET AL.	12-10-00080000	±90.09
8	DOUGLAS FINTEL	15-01-00020001	±41.30
9	ROBERT E. AND DEBRA A. BAUER	15-01-00020002	±10.79
10	GLENN M. HICKEY	12-10-00080000	±29.03
11	KENNETH L. MERINAR ET AL.	15-01-00060003	±13.96

SHL  
**AS-DRILLED**



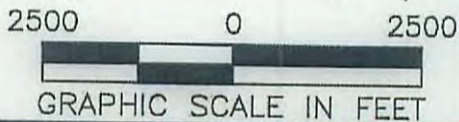
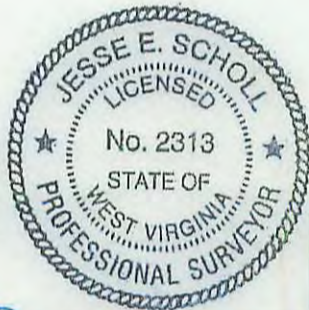
**SWN PRODUCTION COMPANY, LLC**  
**"BETTY SCHAFER MSH, 210H"**  
**SURFACE HOLE**  
ELEV: 849.00' (AS-DRILLED)



ADJOINING OWNER INFORMATION  
(SEE ADJOINING OWNER SHEET)

- 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.

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.



COMPANY: **SWN** Production Company, LLC

P.S. 2313

<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL &amp; GAS 601 57TH STREET CHARLESTON, WV 25034</p>	<p>MINIMUM DEGREE OF ACCURACY: 1/200</p> <p>PROVEN SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)</p>	<p>BETTY SCHAFER MSH</p> <p>OPERATOR'S WELL #: 210H</p> <p>API WELL #: 47 STATE 51 COUNTY 01776 PERMIT</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW

WATERSHED: MIDDLE OHIO NORTH DISTRICT: SAND HILL COUNTY: MARSHALL ELEVATION: ±849.00 (AS-DRILLED)

SURFACE OWNER: SCHAFER, BETTY JANE QUADRANGLE: MOUNDSVILLE, WV-OH

OIL & GAS ROYALTY OWNER: SCHAFER, BETTY JANE ACREAGE: ±205.06

DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY)

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,097' TVD 15,416' TVD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: DEE SOUTHALL

ADDRESS: P.O. BOX 1300 ADDRESS: P.O. BOX 1300

CITY: JANE LEW STATE: WV ZIP CODE: 26378 CITY: JANE LEW STATE: WV ZIP CODE: 26378

**LEGEND:**

- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING/PRODUCING WELLHEAD/BOTTOM HOLE
- ABANDONED WELL
- PLUGGED & ABANDONED WELL
- CUT CONDUCTOR
- PERMITTED DHP
- TIE LINE
- LEASE BOUNDARY
- AS-DRILLED DHP
- ABANDONED PATH

**REVISIONS:**

DATE: 12-29-2015

DRAWN BY: B. HERMAN

SCALE: 1" = 2500'

DRAWING NO: 087569000

WELL LOCATION PLAT



RETTEW Associates, Inc.  
 Travata Street, Suite 101  
 Morgantown, WV 26530  
 Phone (800) 738-8395  
 Fax (304) 293-1111  
 Email: rettetw@rettetw.com  
 Website: www.rettetw.com

**SURFACE HOLE LOCATION (SHL):**  
 M (NAD83, ZONE 17, METERS):  
 ORTHING: 4,426,810.708  
 STING: 531,105.246

**LANDING POINT LOCATION (LPL):**  
 M (NAD83, ZONE 17, METERS):  
 ORTHING: 4,426,676.766  
 STING: 531,885.235

**BOTTOM HOLE LOCATION (BHL):**  
 M (NAD83, ZONE 17, METERS):  
 ORTHING: 4,424,409.653  
 STING: 532,929.699

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

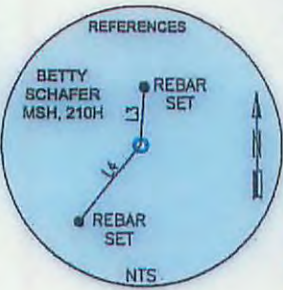
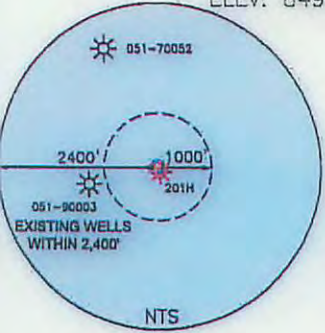
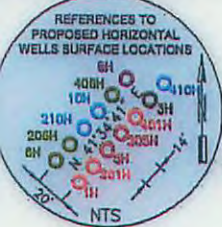
LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 52°19'50" W	775.67'	SHL TO LANDMARK	
L2	S 15°38'31" E	2705.27'	SHL TO LANDMARK	
L3	N 06°31'10" E	103.86'	SHL TO REF. PNT.	1/2"Ø REBAR SET
L4	S 34°55'18" W	228.35'	SHL TO REF. PNT.	1/2"Ø REBAR SET
L5	S 80°15'35" E	2595.35'	SHL TO LP	
L6	S 24°44'08" E	8189.41'	LP TO BHL	
L7	S 44°14'32" E	378.53'	ASDRILLED BORE	
L8	S 32°48'11" E	284.89'	ASDRILLED BORE	
L9	S 23°26'52" E	633.84'	ASDRILLED BORE	
L10	S 23°25'13" E	2338.64'	ASDRILLED BORE	
L11	S 26°06'00" E	366.94'	ASDRILLED BORE	
L12	S 23°05'12" E	1880.11'	ASDRILLED BORE	
L13	S 19°49'44" E	378.70'	ASDRILLED BORE	
L14	S 24°05'02" E	1419.66'	ASDRILLED BORE	
L15	S 26°06'19" E	189.99'	ASDRILLED BORE	
L16	S 23°18'30" E	215.93'	ASDRILLED BORE	

Latitude: 40°00'00"

Longitude: 80°37'30"

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	BETTY JANE SCHAFER, LIFE ESTATE; ROY ALVIN SCHAFER, REMAINDERMAN; EDWARD J. SCHAFER, REMAINDERMAN	12-09-00220000	±205.06
2	CHARLES B. AND CARLA S. FISHER	12-09-00200000	±132.86
3	OLIVE P. DROSKOPF	12-10-00010002	±85.43
4	CALVIN C. MERINAR	12-09-00190000	±85.50
5	CALVIN C. MERINAR	12-10-00070000	±13.40
6	GEETA	15-01-00020000	±82.91
7	KENNETH L. MERINAR ET AL	12-10-00090000	±90.09
8	DOUGLAS FINTEL	15-01-00020001	±41.30
9	ROBERT E. AND DEBRA A. BAUER	15-01-00020002	±10.79
10	GLENN M. HICKEY	12-10-00080000	±29.03
11	KENNETH L. MERINAR ET AL	15-01-00060003	±13.95

SHL  
**AS-DRILLED**



**SWN PRODUCTION COMPANY, LLC**  
**"BETTY SCHAFER MSH, 210H"**  
**SURFACE HOLE**  
 ELEV: 849.00' (AS-DRILLED)

ADJOINING OWNER INFORMATION  
 (SEE ADJOINING OWNER SHEET)



**NOTES ON SURVEY**  
 COORDINATE 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 825 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.

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S. 2313

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

WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200  
 PROVEN SURVEY SOURCE OF GRADE GPS  
 ELEVATION: (NAVD 88, US FT)

COMPANY: **SWN** Production Company, LLC

OPERATOR'S WELL #: 210H

API WELL #: 47 STATE 51 COUNTY 01776 PERMIT HGA

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW

WATERSHED: MIDDLE OHIO NORTH

DISTRICT: SAND HILL COUNTY: MARSHALL

SURFACE OWNER: SCHAFER, BETTY JANE

OIL & GAS ROYALTY OWNER: SCHAFER, BETTY JANE

DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY)

TARGET FORMATION: MARCELLUS

ESTIMATED DEPTH: 6,097' TVD 16,416' BVD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC

ADDRESS: P.O. BOX 1300

DESIGNATED AGENT: DEE SOUTHALL

CITY: JANE LEW STATE: WV ZIP CODE: 26378

ADDRESS: P.O. BOX 1300

CITY: JANE LEW STATE: WV ZIP CODE: 26378

REVISIONS:

DATE: 12-29-2015

DRAWN BY: B. HERMAN

SCALE: 1" = 2500'

DRAWING NO: 087569000

WELL LOCATION PLAT

02/26/2016



# SWN

Southwestern Energy<sup>®</sup>

PO Box 1300  
Jane Lew, WV 26378  
PHONE: (832) 796-1610

January 5, 2015

Ms. Laura Cooper  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

**RE:** Betty Schafer MSH 201H and Betty Schafer MSH 210H Frac Focus Reports

01/04/16

01/04/16

Dear Ms. Cooper:

Enclosed please find the Frac Focus reports that were excluded from the WR-35 forms for the above referenced wells. Apparently they were in the system as another name and I looked over them. I apologize for the inconvenience and any confusion this may have caused.

If you have any questions or need additional information, please call me at 832-796-6215.

Thank you.

Sincerely,



Cody Magby  
Regulatory Analyst  
10000 Energy Drive  
Houston, TX 77389

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The Right People doing the Right Things,  
wisely Investing the cash flow from  
our underlying Assets, will create Value+

02/26/2016

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/26/2015
Job End Date:	10/1/2015
State:	West Virginia
County:	Marshall
API Number:	47-051-01776-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	SCHAFFER BETTY MSH 201H
Longitude:	-80.63583000
Latitude:	39.99075000
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	5,992
Total Base Water Volume (gal):	16,117,306
Total Base Non Water Volume:	0



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 WV Department of  
 Environmental Protection

## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Operator	Carrier	Water	7732-18-5	100.00000	84.19839	
Sand, White, 40/70	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A		8.34710	
Sand, White, 100 mesh	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A		6.37630	
HCl, 5.1 - 7.5%	Baker Hughes	Acidizing	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.67381	SmartCare Product
HCl, 10.1 - 15%	Baker Hughes	Acidizing	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.20466	SmartCare Product
MaxPerm-20A, 265 gallon tote	Baker Hughes	Friction Reducer	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.10725	SmartCare Product
Alpha 1427	Baker Hughes	Biocide	MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00963	SmartCare Product
Scaletrol 720	Baker Hughes	Scale Inhibitor					



			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00942	SmartCare Product
Ferrotrol 300L	Baker Hughes	Iron Control					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00386	SmartCare Product
GBW-5	Baker Hughes	Breaker					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00178	SmartCare Product
CI-39	Baker Hughes	Corrosion Inhibitor					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00113	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Ingredients in Additive (s) (MSDS and non- MSDS)	Baker Hughes	See Trade Name(s) List					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	14.71181	
			Water	7732-18-5	92.50000	0.87341	
			Hydrochloric Acid	7647-01-0	15.00000	0.08117	
			1-Propanesulfonic acid, 2- methyl-2-[(1-oxo-2-propen-1-yl) amino]-, polymer with 2- propenamido, sodium salt	83446-68-8	60.00000	0.06430	
			Hydrotreated Light Distillate	64742-47-8	30.00000	0.03215	
			Sodium Chloride	7647-14-5	5.00000	0.00545	
			Sorbitan, mono-(9Z)-9- octadecenoate	1338-43-8	5.00000	0.00536	
			Oxyalkylated alcohol	78330-21-9	5.00000	0.00536	
			Polyoxyethylene sorbitan monooleate	9005-65-6	5.00000	0.00536	
			Ethylene Glycol	107-21-1	45.00000	0.00423	
			Glutaraldehyde	111-30-8	30.00000	0.00289	
			Citric Acid	77-92-9	60.00000	0.00232	
			2-Propenoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9	20.00000	0.00188	
			Ammonium Persulphate	7727-54-0	100.00000	0.00176	
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00096	
			Quaternary Ammonium Compound	68424-85-1	5.00000	0.00054	
			Ethanol	64-17-5	5.00000	0.00048	
			Calcium Chloride	10043-52-4	5.00000	0.00047	
			Oxyalkylated Fatty Acid	61791-002	40.00000	0.00045	
			Formic Acid	64-18-6	30.00000	0.00034	
			Tar Bases, Quinoline Derivs., Benzyl Chloride-Quaternized	72480-70-7	30.00000	0.00034	
			Aldehyde	104-55-2	30.00000	0.00034	
			Potassium Chloride	7447-40-7	1.00000	0.00009	
			Sulfurized polyolefin	68037-13-8	5.00000	0.00006	
			Isopropanol	67-63-0	5.00000	0.00006	
			Potassium Iodide	7681-11-0	2.00000	0.00002	
			Polyaklylene	7756-94-7	1.00000	0.00001	

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		Potassium Acetate	127-08-2	0.50000	0.00001
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\* Total Water Volume sources may include fresh water, produced water, and/or recycled water  
 \*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.  
 Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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