

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

API 47-009-00181 County BROOKE District BUFFALO
Quad BETHANY Pad Name MARK OWEN BRK PAD Field/Pool Name PANHANDLE
Farm name OWEN, MARK Well Number MARK OWEN BRK 1H
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,452,332.142 Easting 538,681.331
Landing Point of Curve Northing 4,452,505.766 Easting 538,296.322
Bottom Hole Northing 4,454,183.885 Easting 537,613.587

Elevation (ft) 1,165.4' 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

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Date permit issued 01/03/2017 Date drilling commenced 11/28/2017 Date drilling ceased 01/01/2018
Date completion activities began 04/11/2018 Date completion activities ceased 05/13/2018
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 856' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 332' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

[Signature] 8/30/18

Reviewed by:
SB 8/30/18

API 47-009 - 00181 Farm name OWEN, MARK Well number MARK OWEN BRK 1H

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	24	20	126'	NEW	J-55/106.50#		Y
Surface	17.5	13.375	405'	NEW	J-55/54.50#		Y, 23 bbls
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1,720'	NEW	J-55/36#		Y, 30 bbls
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	12,532'	NEW	HCP-110/20#		Y
Tubing		2.375	6,377'	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE	15.60	1.20		SURFACE	24
Surface	CLASS A	405	15.60	1.20	486	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	656	15.60	1.20	787.2	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2,315	15.60	1.19	2,754.85	SURFACE	24
Tubing							

Drillers TD (ft) 12,532' Loggers TD (ft) 12,532'
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

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Kick off depth (ft) 5,336'

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

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Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

SURFACE: 7 CENTRALIZERS - EVERY THIRD JOINT OF CASING
 INTERMEDIATE: 24 CENTRALIZERS - EVERY THIRD JOINT OF CASING
 PRODUCTION: 181 CENTRALIZERS - EVERY THIRD JOINT FROM SURFACE TO TOP OF CURVE, THEN EVERY JOINT UNTIL TD

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

**MARK OWEN BRK 1H
ATTACHMENT 1
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	3/31/2018	12,418	12,311	42
2	4/12/2018	12,278	12,171	42
3	4/12/2018	12,138	12,029	42
4	4/12/2018	11,998	11,891	42
5	4/12/2018	11,858	11,751	42
6	4/13/2018	11,718	11,611	42
7	4/13/2018	11,575	11,471	42
8	4/13/2018	11,438	11,333	42
9	4/13/2018	11,298	11,191	42
10	4/13/2018	11,158	11,051	42
11	4/14/2018	11,018	10,908	42
12	4/14/2018	10,879	10,771	42
13	4/13/2018	10,738	10,631	42
14	4/14/2018	10,598	10,491	42
15	4/15/2018	10,453	10,351	42
16	4/15/2018	10,318	10,211	42
17	4/15/2018	10,178	10,071	42
18	4/16/2018	10,038	9,931	42
19	4/16/2018	9,898	9,795	42
20	4/16/2018	9,758	9,651	42
21	4/16/2018	9,618	9,511	42
22	4/17/2018	9,478	9,371	42
23	4/17/2018	9,335	9,231	42
24	4/17/2018	9,198	9,095	42
25	4/17/2018	9,058	8,951	42
26	4/18/2018	8,918	8,811	42
27	4/18/2018	8,778	8,671	42
28	4/18/2018	8,638	8,531	42
29	4/18/2018	8,498	8,391	42
30	4/18/2018	8,358	8,251	42
31	4/19/2018	8,218	8,111	42
32	4/19/2018	8,078	7,971	42
33	4/19/2018	7,937	7,831	42
34	4/19/2018	7,798	7,691	42
35	4/20/2018	7,658	7,551	42
36	4/20/2018	7,518	7,411	42
37	4/20/2018	7,378	7,267	42
38	4/20/2018	7,238	7,131	42
39	4/21/2018	7,098	6,991	42
40	4/21/2018	6,958	6,851	42
41	4/21/2018	6,821	6,711	42
42	4/21/2018	6,678	6,571	42
43	4/21/2018	6,538	6,431	42

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**MARK OWEN BRK 1H
ATTACHMENT 2**

STIM REPORT

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/othe
1	4/11/2018	90.5	7,344	5,753	4,350	500,325	7,098	0
2	4/12/2018	90.9	7,133	5,652	4,436	503,450	7,135	0
3	4/12/2018	87.2	6,906	5,311	4,818	504,940	7,201	0
4	4/12/2018	89.7	7,102	4,600	4,698	499,775	7,096	0
5	4/12/2018	89.7	7,107	3,688	4,759	500,025	7,103	0
6	4/13/2018	90	7,012	5,867	4,784	499,825	7,117	0
7	4/13/2018	91	6,820	5,146	4,604	501,600	6,964	0
8	4/13/2018	90.4	6,883	4,483	4,450	502,700	7,004	0
9	4/13/2018	90.2	6,882	4,605	4,901	499,875	7,069	0
10	4/14/2018	90.4	6,745	4,997	4,705	500,200	7,054	0
11	4/14/2018	90	6,802	5,946	4,487	498,740	7,015	0
12	4/14/2018	89	6,606	4,637	4,726	499,120	7,863	0
13	4/14/2018	89.8	6,706	4,486	4,884	499,700	7,011	0
14	4/15/2018	90	6,820	4,373	4,689	500,400	6,957	0
15	4/15/2018	90.1	6,860	5,630	4,483	501,520	6,774	0
16	4/15/2018	90.8	6,853	4,452	4,754	499,960	6,747	0
17	4/16/2018	90	6,776	4,703	4,477	500,815	7,698	0
18	4/16/2018	90	6,879	5,819	4,361	499,925	6,939	0
19	4/16/2018	91	6,623	5,192	4,437	498,380	6,924	0
20	4/16/2018	90.8	6,805	4,373	4,660	499,920	6,855	0
21	4/17/2018	90.3	6,561	4,669	4,999	500,750	6,944	0
22	4/17/2018	88	6,724	5,671	5,072	499,970	7,493	0
23	4/17/2018	91	6,636	5,586	4,619	503,580	6,660	0
24	4/17/2018	91	6,651	5,387	4,455	501,140	6,128	0
25	4/17/2018	90.2	6,677	4,067	5,125	500,250	6,323	0
26	4/18/2018	89.9	6,605	4,348	5,014	499,810	6,338	0
27	4/18/2018	91	6,657	5,380	4,759	500,540	5,682	0
28	4/18/2018	90	6,567	5,575	4,506	501,480	5,657	0
29	4/18/2018	89.9	6,440	4,290	5,080	499,070	5,648	0
30	4/19/2018	90.1	6,591	4,473	4,876	500,400	5,630	0
31	4/19/2018	90	6,538	6,119	4,660	500,100	5,579	0
32	4/19/2018	91	6,321	5,805	4,392	500,300	5,649	0
33	4/19/2018	89.8	6,464	3,685	4,987	499,910	5,565	0
34	4/20/2018	90	6,513	4,544	5,131	500,250	5,612	0
35	4/20/2018	91	6,458	4,914	5,191	501,820	5,619	0
36	4/20/2018	90	6,411	5,569	4,384	502,360	5,447	0
37	4/20/2018	89.9	6,570	3,691	4,938	503,180	5,624	0
38	4/20/2018	90.4	6,430	4,685	5,063	500,350	5,464	0
39	4/21/2018	89.4	6,436	6,111	5,105	500,450	5,568	0
40	4/21/2018	91	6,283	5,754	4,400	499,970	5,552	0
41	4/21/2018	91	6,626	6,419	4,653	502,560	5,557	0
42	4/21/2018	90	6,449	5,969	4,442	501,660	5,542	0
43	4/21/2018	91	6,026	6,079	4,334	503,260	5,522	0

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Well Name: Mark Owen BRK 1H

470090001810000

ATTACHMENT 3

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	0.00	0.00	300.00	300.00	
Top of Salt Water	856.00	856.00	NA	NA	
Pittsburgh Coal	332.00	332.00	387.00	387.00	
Pottsville (ss)	548.00	548.00	687.00	687.00	
Mauch Chunk (shale)	687.00	687.00	850.00	850.00	
Raven Cliff (ss)	850.00	850.00	1063.00	1063.00	
Maxton (ss)	1205.00	1205.00	1265.00	1265.00	
Greenbriar (ls)	1348.00	1348.00	1502.00	1502.00	
Big Injun (ss)	1502.00	1502.00	1650.00	1650.00	
Berea (siltstone)	2010.00	2010.00	5449.00	5449.00	
Rhinestreet (shale)	5449.00	5449.00	5704.00	5704.00	
Cashaqua (shale)	5704.00	5704.00	5955.00	5761.00	
Middlesex (shale)	5955.00	5761.00	6041.00	5826.00	
Burket (shale)	6041.00	5826.00	6061.00	5840.00	
Tully (ls)	6061.00	5840.00	6143.00	6011.00	
Mahantango (shale)	6143.00	6011.00	6441.00	6014.00	
Marcellus (shale)	6441.00	6014.00	NA	NA	GAS

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**5D Survey Report**

SOUTHWESTERN ENERGY

Field Name: *SOUTHWESTERN_BROOKE CO, WV UTM NAD 83
(17N)*

Site Name: *Mark Owen Pad*

Well Name: *Mark Owen BRK 1H*

Survey: *Definitive survey*

2 January 2018

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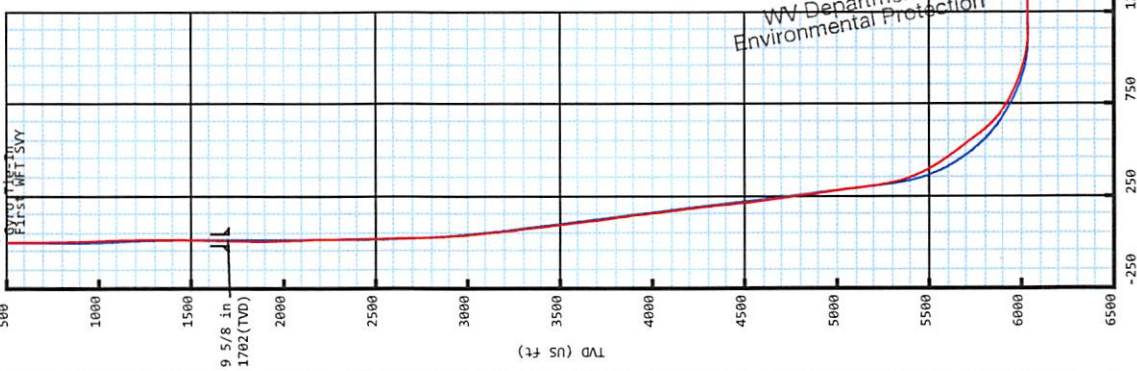
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Southwestern Energy
Mark Owen BRK 1H
Brooke Co, WV
SDC 40

Plan vs Actual

KB: 1192.2'
GL: 1166.2'



Plan Data for Mark Owen BRK 1H

Plan Point Information:
Dogleg Severity Unit: °/100.00ft
Position offsets from Slot centre

MD Inc (USft)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	YSec (USft)	DLS (DLSU)	ToolFace Comments
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
26.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1150.00	3.50	10.00	1149.78	10.52	1.86	8.20	10.0 Drop
1500.00	0.00	0.00	1489.56	21.05	3.71	16.40	180.0 Hold
2394.37	0.00	0.00	2393.93	21.05	3.71	16.40	0.0 Nudge #2
3244.37	17.00	263.70	3231.52	7.31	-120.71	66.47	263.7 Hold
5432.52	17.00	263.70	5324.06	-62.92	-756.60	322.35	0.0
6354.75	70.00	331.78	5995.29	348.57	-1136.56	868.43	74.9 Build/Turn 9° DLS
6592.87	90.61	337.76	6035.20	559.81	-1235.69	1100.98	16.6 Landing Point
12557.49	90.61	337.76	5971.20	6080.32	-3493.26	7012.36	0.0

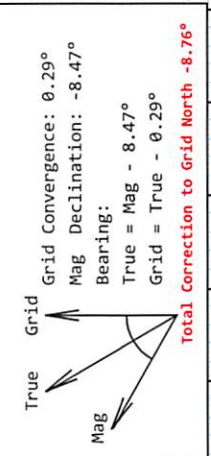
Plan Data for Mark Owen BRK 1H

Field: SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)
Map Unit: USFT
Projected Coordinate System: NAD83 / UTM zone 17N

Site: Mark Owen Pad
Unit: USFeet
TVD Reference: Vertical Reference Datum (VRD)
Company Name: SOUTHWESTERN ENERGY
Position: Northing: 14607357.50USft Latitude: 40.220512°
 Easting: 1767337.69USft Longitude: -80.545328°
North Reference: Grid
Grid Convergence: 0.29°
Elevation Above VRD: 1166.20USft

Slot: Mark Owen BRK 1H
Position: Offset is from Site centre
 +N/-S: 2.11USft Northing: 14607359.67USft Latitude: 40.220518°
 +E/-W: -13.97USft Easting: 1767323.72USft Longitude: -80.545378°
Elevation Above VRD: 1166.20USft

Well: Mark Owen BRK 1H
Type: Main-Well
File Number: Plan: P1.V2
 Plan Folder: P1
 Vertical Section: Position offset of origin from Slot centre:
 +N/-S: 0.00USft Azimuth: 330.12°
 +E/-W: 0.00USft
Magnetic Parameters: Dip: Date:
 HDGM: 52645(mt) -8.47° 67.68° 2017-12-12

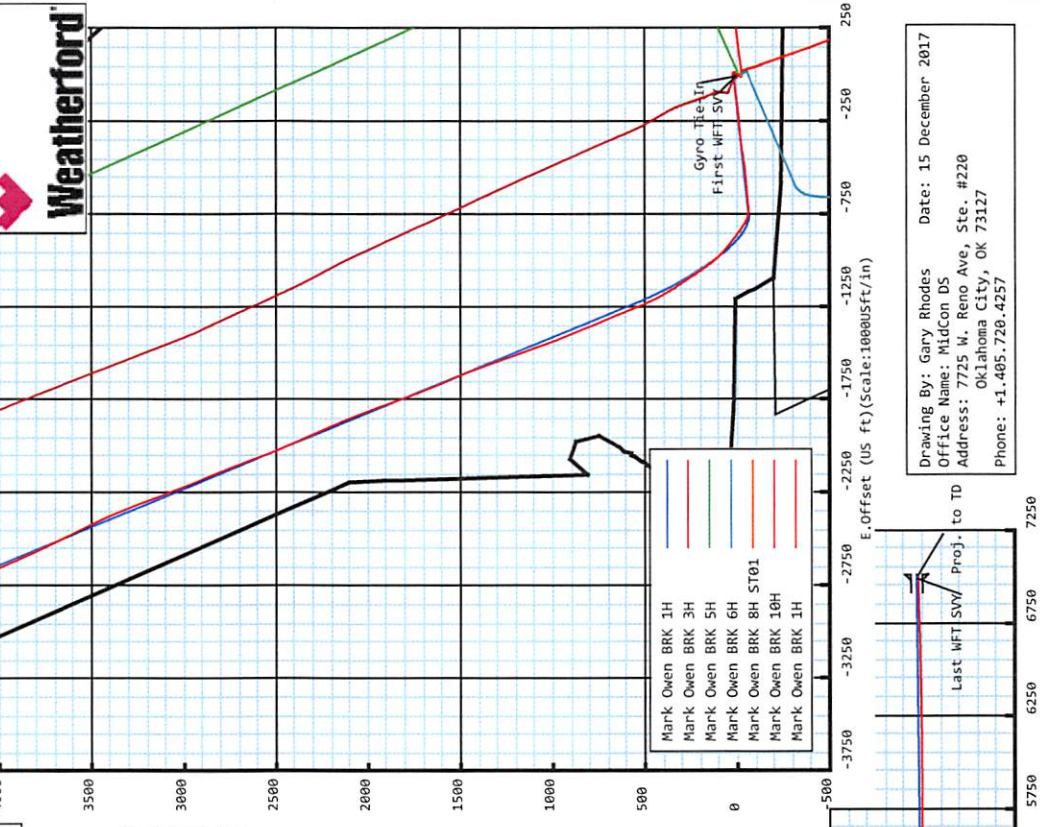


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Plan Data for Mark Owen BRK 1H

Formation Point Information:

Name	TVD (USft)	SS (USft)	MD (USft)
Base of Fresh Water	240.20	952.00	240.20
Pittsburgh Coal	332.20	860.00	332.20
Top of Salt Water	856.20	336.00	856.20
Maxton	1217.20	-25.00	1217.52
Big Lime	1366.20	-174.00	1366.62
Big Injun	1507.20	-315.00	1507.64
Base Big Injun	1657.20	-465.00	1657.64
Berea	2014.20	-822.00	2014.64
Upper Rhinestreet	5454.20	-4262.00	5570.18
Lower Rhinestreet	5569.20	-4377.00	5696.80
Basal Rhinestreet	5635.20	-4443.00	5773.20
Cashaqua	5710.20	-4518.00	5865.06
Middlesex	5793.20	-4574.00	5938.57
Lower Middlesex	5793.20	-4601.00	5976.03
Burket	5828.20	-4636.00	6027.09
Tully	5847.20	-4655.00	6056.25
Mahantango	5901.20	-4709.00	6146.47
Levanna	6009.20	-4817.00	6399.60
Upper Marcellus	6028.20	-4836.00	6489.22



Drawing By: Gary Rhodes Date: 15 December 2017
 Office Name: MidCon DS
 Address: 7725 W. Reno Ave, Ste. #220
 Oklahoma City, OK 73127
 Phone: +1.405.720.4257

Mark Owen BRK 1H

Map Units:	US ft	Company Name:	SOUTHWESTERN ENERGY
Field Name:	Vertical Reference Datum (VRD):		
SOUTHWESTER N_BROOKE CO, WV UTM NAD 83 (17N)	Projected Coordinate System: NAD83 / UTM zone 17N		
Comment:			

Site: Mark Owen Pad	Units: US ft	North Reference: Grid	Convergence Angle: 0.29
	Position:	Northing: 14607357.56 US ft	Latitude: 40.220512
		Easting: 1767337.69 US ft	Longitude: -80.545328
	Elevation above Field Reference: 1166.20 US ft		
Comment:			

Slot: Mark Owen BRK 1H	Position (Relative to Site Centre)		
	+N/-S: 2.11 US ft	Northing: 14607359.67 US ft	Latitude: 40.220518
	+E/-W: -13.97 US ft	Easting: 1767323.72 US ft	Longitude: -80.545378
	Elevation above Field Reference: 1166.20 US ft		
Comment:			

Well: Mark Owen BRK 1H	Type: Main well	UWI:
	File Number:	Comment:
	Closure Distance: 7012.87 US ft	Closure Azimuth: 330.03°
	Vertical Section: Position of Origin (Relative to Slot centre)	
	+N/-S: 0.00 US ft	+E/-W: 0.00 US ft Az: 330.12°

Drill floor: Survey Name: Definitive Survey			
Rig Height (Drill Floor): 26.00 US ft	Elevation above Field Reference: 1192.20 US ft	Inclination: 0.00°	Azimuth: 0.00°

Survey Name: Definitive Survey			
Date: 12/Dec/2017	Survey Tool: See Survey Tool Ranges below.	Comment:	Company:

Magnetic Model:				
Model Name: HDGM	Date: 12/Dec/2017	Field Strength: 52645.0nT	Declination: -8.47°	Dip: 67.68°

Tie Point:					
MD: 0.00 US ft	Inclination: 0.00°	Azimuth: 0.00°	TVD: -0.00 US ft	North Offset: 0.00 US ft	East Offset: 0.00 US ft

Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
GYRO_GC_WIR+DPIPE_GYD	0.00	537.00	Gyro
MWD	537.00	1658.00	WFT MWD_01
MFAC_US_V2	1658.00	1736.00	WFT MWD_02
MFAC_US_V2	1736.00	1801.00	WFT MFAC_02
MWD	1801.00	5835.00	WFT MWD_02
MWD	5835.00	12532.00	WFT MWD_03

Wellpath created using minimum curvature.

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5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (%/100US ft)	Comment
0.00	0.00	0.00	-0.00	0.00	0.00	0.00	40.220518	-80.545378	0.00	
50.00	0.44	333.39	50.00	0.19	0.17	-0.09	40.220518	-80.545378	0.88	
100.00	0.38	298.94	100.00	0.53	0.42	-0.32	40.220519	-80.545379	0.50	
150.00	0.37	305.45	150.00	0.81	0.60	-0.59	40.220520	-80.545380	0.09	
200.00	0.50	267.42	200.00	1.06	0.68	-0.94	40.220520	-80.545381	0.62	
250.00	0.34	314.75	249.99	1.30	0.78	-1.27	40.220520	-80.545383	0.74	
293.00	0.30	332.93	292.99	1.54	0.97	-1.41	40.220521	-80.545383	0.25	
355.00	0.26	347.38	354.99	1.84	1.25	-1.51	40.220521	-80.545383	0.13	
447.00	0.36	46.54	446.99	2.10	1.65	-1.35	40.220523	-80.545383	0.35	
537.00	0.65	54.42	536.99	2.22	2.14	-0.73	40.220524	-80.545381	0.33	Gyro Tie-In
595.00	1.06	55.22	594.98	2.30	2.64	-0.02	40.220525	-80.545378	0.71	First WFT SVY
686.00	1.90	47.03	685.95	2.71	4.15	1.78	40.220529	-80.545372	0.95	
779.00	1.96	31.26	778.90	3.83	6.56	3.73	40.220536	-80.545365	0.57	
871.00	2.33	18.70	870.83	5.83	9.67	5.14	40.220544	-80.545359	0.65	
964.00	2.28	0.72	963.76	8.67	13.31	5.77	40.220554	-80.545357	0.78	
1057.00	2.25	357.85	1056.69	11.88	16.99	5.73	40.220565	-80.545357	0.13	
1149.00	1.48	356.97	1148.64	14.54	19.98	5.60	40.220573	-80.545358	0.84	
1242.00	0.45	22.79	1241.62	15.83	21.52	5.68	40.220577	-80.545357	1.17	
1335.00	0.45	110.85	1334.62	15.77	21.72	6.16	40.220578	-80.545356	0.67	
1427.00	0.35	176.62	1426.62	15.24	21.31	6.51	40.220576	-80.545354	0.48	
1520.00	1.05	154.68	1519.61	14.13	20.26	6.89	40.220574	-80.545353	0.79	
1613.00	1.29	150.89	1612.59	12.24	18.57	7.77	40.220569	-80.545350	0.27	
1658.00	1.40	148.23	1657.58	11.18	17.67	8.30	40.220566	-80.545348	0.28	
1736.00	1.17	129.24	1735.56	9.48	16.35	9.42	40.220563	-80.545344	0.62	
1801.00	1.16	133.25	1800.55	8.23	15.48	10.42	40.220560	-80.545340	0.13	
1894.00	1.30	285.02	1893.54	8.08	15.11	10.08	40.220559	-80.545342	2.57	
1986.00	1.82	298.47	1985.51	10.06	16.08	7.79	40.220562	-80.545350	0.69	
2079.00	1.81	320.08	2078.46	12.76	17.91	5.55	40.220567	-80.545358	0.73	
2172.00	1.26	348.64	2171.43	15.18	20.04	4.41	40.220573	-80.545362	1.00	
2265.00	1.06	5.21	2264.41	16.85	21.89	4.28	40.220578	-80.545362	0.42	
2357.00	0.84	352.39	2356.40	18.17	23.41	4.27	40.220582	-80.545362	0.33	
2451.00	0.91	279.76	2450.39	19.29	24.22	3.44	40.220584	-80.545365	1.10	
2543.00	3.20	257.45	2542.32	20.52	23.79	0.22	40.220583	-80.545377	2.59	
2636.00	5.43	254.13	2635.06	22.36	22.02	-6.55	40.220579	-80.545401	2.41	
2729.00	6.63	254.16	2727.54	24.72	19.35	-15.95	40.220571	-80.545435	1.29	
2822.00	7.88	257.08	2819.79	27.88	16.46	-27.33	40.220564	-80.545476	1.40	
2914.00	10.17	263.42	2910.65	32.94	14.12	-41.55	40.220557	-80.545527	2.71	
3007.00	11.16	266.12	3002.04	40.13	12.57	-58.68	40.220553	-80.545588	1.19	
3099.00	13.04	265.62	3092.00	48.50	11.17	-77.92	40.220550	-80.545657	2.05	
3192.00	15.18	262.73	3182.19	57.70	8.83	-100.46	40.220544	-80.545738	2.42	
3285.00	16.91	263.69	3271.56	67.79	5.80	-125.98	40.220536	-80.545829	1.88	
3378.00	17.72	262.00	3360.34	78.47	2.35	-153.44	40.220527	-80.545928	1.03	
3470.00	16.63	262.33	3448.24	88.67	-1.36	-180.35	40.220517	-80.546024	1.19	
3563.00	16.13	262.58	3537.47	98.63	-4.80	-206.35	40.220508	-80.546117	0.54	
3656.00	16.62	264.27	3626.69	109.01	-7.80	-232.40	40.220500	-80.546211	0.73	
3748.00	17.73	265.16	3714.59	120.32	-10.30	-259.45	40.220493	-80.546308	1.24	
3841.00	18.10	264.36	3803.08	132.24	-12.91	-287.93	40.220487	-80.546410	0.48	
3934.00	16.50	264.64	3891.87	143.65	-15.56	-315.46	40.220480	-80.546508	1.72	
4027.00	15.35	264.73	3981.30	154.26	-17.93	-340.87	40.220474	-80.546599	1.24	
4119.00	16.69	262.58	4069.73	164.38	-20.75	-366.10	40.220466	-80.546690	1.50	RECEIVED Office of Oil and Gas
4212.00	18.12	261.36	4158.47	174.72	-24.65	-393.64	40.220456	-80.546789	1.59	
4305.00	18.56	261.54	4246.74	185.36	-29.00	-422.58	40.220444	-80.546892	0.48	JUL 12 2018
4398.00	17.30	261.21	4335.22	195.74	-33.29	-450.88	40.220433	-80.546994	1.36	
4490.00	16.72	261.80	4423.20	205.55	-37.27	-477.50	40.220422	-80.547089	0.66	WV Department of Environmental Protection
4583.00	17.93	263.95	4511.98	216.28	-40.69	-504.98	40.220413	-80.547188	1.47	
4676.00	18.52	264.67	4600.31	228.20	-43.57	-533.92	40.220406	-80.547291	0.68	
4769.00	17.46	265.04	4688.76	240.21	-46.15	-562.53	40.220399	-80.547394	1.15	
4861.00	16.83	265.54	4776.68	251.75	-48.38	-589.55	40.220393	-80.547491	0.70	

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
4954.00	18.23	265.62	4865.35	263.79	-50.53	-617.48	40.220388	-80.547591	1.51	
5047.00	18.56	264.89	4953.60	276.25	-52.96	-646.73	40.220382	-80.547696	0.43	
5139.00	16.82	264.11	5041.25	287.80	-55.63	-674.56	40.220375	-80.547795	1.91	
5232.00	15.92	263.77	5130.48	298.38	-58.40	-700.62	40.220367	-80.547889	0.97	
5279.00	18.13	264.51	5175.42	303.99	-59.80	-714.31	40.220364	-80.547938	4.72	
5325.00	17.92	265.46	5219.16	309.97	-61.04	-728.49	40.220361	-80.547989	0.79	
5371.00	17.65	273.77	5262.97	316.87	-61.14	-742.50	40.220361	-80.548039	5.54	
5418.00	18.06	283.94	5307.71	325.86	-58.92	-756.69	40.220367	-80.548090	6.68	
5464.00	20.49	291.03	5351.14	337.05	-54.31	-771.13	40.220380	-80.548141	7.33	
5511.00	23.29	296.15	5394.75	351.14	-47.26	-787.15	40.220399	-80.548199	7.21	
5557.00	26.47	300.50	5436.48	367.60	-38.05	-804.15	40.220425	-80.548259	7.97	
5603.00	29.36	304.35	5477.13	386.68	-26.48	-822.30	40.220457	-80.548324	7.40	
5650.00	32.49	307.08	5517.44	408.67	-12.36	-841.89	40.220496	-80.548394	7.30	
5696.00	34.73	307.94	5555.75	432.18	3.15	-862.08	40.220539	-80.548466	4.98	
5742.00	36.69	307.78	5593.10	457.03	19.62	-883.28	40.220584	-80.548542	4.27	
5789.00	38.10	308.24	5630.44	483.47	37.20	-905.77	40.220633	-80.548622	3.06	
5835.00	39.00	309.13	5666.41	510.15	55.12	-928.14	40.220682	-80.548702	2.30	
5906.00	38.04	314.01	5721.97	552.04	84.42	-961.21	40.220763	-80.548820	4.49	
5936.00	37.81	316.16	5745.64	569.84	97.48	-974.23	40.220799	-80.548866	4.47	
5983.00	38.89	319.90	5782.50	598.35	119.16	-993.72	40.220859	-80.548936	5.44	
6029.00	42.88	322.13	5817.27	628.07	142.57	-1012.63	40.220924	-80.549003	9.23	
6075.00	47.50	323.70	5849.69	660.44	168.61	-1032.29	40.220995	-80.549073	10.33	
6122.00	50.61	324.77	5880.48	695.75	197.41	-1053.03	40.221075	-80.549147	6.84	
6168.00	54.84	325.90	5908.34	732.22	227.52	-1073.84	40.221158	-80.549221	9.40	
6214.00	60.70	326.55	5932.86	771.02	259.85	-1095.45	40.221247	-80.549297	12.79	
6261.00	64.70	326.80	5954.41	812.70	294.74	-1118.39	40.221343	-80.549379	8.52	
6307.00	67.62	327.26	5973.00	854.71	330.04	-1141.29	40.221440	-80.549460	6.41	
6353.00	70.58	328.82	5989.41	897.65	366.50	-1164.03	40.221541	-80.549541	7.17	
6400.00	73.63	330.93	6003.85	942.37	405.18	-1186.46	40.221647	-80.549621	7.77	
6446.00	75.93	332.97	6015.93	986.73	444.35	-1207.33	40.221755	-80.549695	6.58	
6493.00	79.07	334.82	6026.10	1032.51	485.55	-1227.51	40.221869	-80.549766	7.71	
6539.00	83.70	337.25	6032.99	1077.73	527.10	-1245.97	40.221983	-80.549832	11.34	
6585.00	88.09	338.77	6036.28	1123.16	569.63	-1263.15	40.222100	-80.549893	10.10	
6632.00	90.99	337.92	6036.66	1169.67	613.31	-1280.49	40.222220	-80.549954	6.43	
6678.00	90.49	336.78	6036.07	1215.30	655.75	-1298.20	40.222337	-80.550017	2.71	
6771.00	90.74	337.85	6035.07	1307.57	741.55	-1334.07	40.222573	-80.550143	1.18	
6864.00	90.49	337.44	6034.07	1399.76	827.56	-1369.44	40.222810	-80.550269	0.52	
6956.00	90.80	337.99	6033.03	1490.95	912.68	-1404.32	40.223044	-80.550392	0.69	
7049.00	90.19	339.32	6032.23	1582.91	999.30	-1438.17	40.223282	-80.550512	1.57	
7142.00	90.12	339.79	6031.98	1674.65	1086.44	-1470.65	40.223522	-80.550626	0.51	
7235.00	90.12	340.48	6031.78	1766.24	1173.90	-1502.26	40.223763	-80.550738	0.74	
7324.00	90.37	340.66	6031.40	1853.76	1257.83	-1531.86	40.223993	-80.550843	0.35	
7417.00	90.25	340.31	6030.90	1945.24	1345.49	-1562.93	40.224235	-80.550952	0.40	
7510.00	90.43	338.51	6030.35	2037.02	1432.54	-1595.63	40.224474	-80.551068	1.95	
7603.00	90.18	338.24	6029.85	2129.05	1519.00	-1629.91	40.224712	-80.551189	0.40	
7695.00	90.18	336.51	6029.56	2220.31	1603.91	-1665.30	40.224946	-80.551314	1.88	
7788.00	90.06	337.79	6029.37	2312.61	1689.61	-1701.41	40.225181	-80.551442	1.38	
7878.00	90.93	339.69	6028.59	2401.59	1773.48	-1734.04	40.225412	-80.551558	2.32	
7967.00	90.80	340.47	6027.25	2489.23	1857.14	-1764.36	40.225642	-80.551665	0.89	
8060.00	90.80	339.25	6025.95	2580.88	1944.45	-1796.38	40.225883	-80.551778	1.31	
8153.00	90.99	339.09	6024.50	2672.71	2031.36	-1829.44	40.226122	-80.551895	0.27	
8245.00	90.68	338.72	6023.16	2763.63	2117.18	-1862.55	40.226358	-80.552012	0.52	
8335.00	90.62	335.79	6022.14	2852.91	2200.17	-1897.34	40.226586	-80.552135	3.26	
8428.00	90.74	335.65	6021.03	2945.46	2284.94	-1935.58	40.226819	-80.552270	0.20	
8521.00	90.68	337.10	6019.88	3037.90	2370.13	-1972.85	40.227054	-80.552402	1.56	
8614.00	90.56	335.98	6018.87	3130.31	2455.44	-2009.87	40.227289	-80.552533	1.21	
8706.00	90.68	338.82	6017.88	3221.55	2540.36	-2045.22	40.227522	-80.552659	3.09	
8799.00	90.19	340.12	6017.17	3313.31	2627.45	-2077.83	40.227762	-80.552774	1.49	
8892.00	90.37	339.55	6016.72	3404.98	2714.75	-2109.89	40.228002	-80.552887	0.64	

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Environmental Protection

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
8985.00	90.43	339.16	6016.07	3496.77	2801.77	-2142.68	40.228242	-80.553003	0.42	
9077.00	90.43	338.49	6015.38	3587.71	2887.56	-2175.91	40.228478	-80.553120	0.73	
9170.00	90.06	338.41	6014.98	3679.73	2974.06	-2210.07	40.228716	-80.553241	0.41	
9263.00	89.94	338.49	6014.98	3771.75	3060.56	-2244.23	40.228954	-80.553362	0.16	
9356.00	90.06	339.12	6014.98	3863.68	3147.27	-2277.85	40.229192	-80.553481	0.69	
9448.00	90.55	339.62	6014.49	3954.48	3233.36	-2310.27	40.229429	-80.553596	0.76	
9541.00	89.94	338.25	6014.09	4046.38	3320.15	-2343.69	40.229668	-80.553714	1.61	
9634.00	89.88	336.22	6014.24	4138.66	3405.90	-2379.68	40.229904	-80.553841	2.18	
9727.00	89.94	334.20	6014.38	4231.29	3490.32	-2418.67	40.230136	-80.553979	2.17	
9820.00	90.00	333.06	6014.43	4324.11	3573.64	-2459.98	40.230366	-80.554126	1.23	
9913.00	90.12	334.75	6014.34	4416.91	3657.16	-2500.88	40.230595	-80.554271	1.82	
10005.00	90.25	333.93	6014.04	4508.66	3740.09	-2540.72	40.230824	-80.554412	0.90	
10098.00	90.74	335.64	6013.23	4601.34	3824.22	-2580.34	40.231055	-80.554553	1.91	
10191.00	91.05	336.80	6011.78	4693.80	3909.31	-2617.83	40.231289	-80.554685	1.29	
10284.00	90.74	337.65	6010.33	4786.08	3995.05	-2653.83	40.231525	-80.554813	0.97	
10374.00	91.11	337.23	6008.88	4875.33	4078.15	-2688.35	40.231754	-80.554935	0.62	
10463.00	91.11	338.53	6007.15	4963.50	4160.58	-2721.86	40.231981	-80.555054	1.46	
10556.00	90.37	339.43	6005.95	5055.38	4247.39	-2755.21	40.232220	-80.555171	1.25	
10649.00	90.31	339.21	6005.40	5147.18	4334.39	-2788.05	40.232459	-80.555288	0.25	
10739.00	90.12	339.36	6005.06	5236.03	4418.57	-2819.89	40.232691	-80.555400	0.27	
10828.00	90.49	339.67	6004.59	5323.84	4501.94	-2851.04	40.232920	-80.555510	0.54	
10918.00	90.56	338.81	6003.76	5412.70	4586.10	-2882.93	40.233152	-80.555623	0.96	
11008.00	90.37	337.76	6003.03	5501.78	4669.70	-2916.23	40.233382	-80.555741	1.19	
11101.00	90.68	340.50	6002.18	5593.62	4756.59	-2949.36	40.233621	-80.555858	2.96	
11190.00	90.62	340.48	6001.17	5681.16	4840.48	-2979.08	40.233851	-80.555963	0.07	
11280.00	90.43	339.44	6000.35	5769.83	4925.02	-3009.92	40.234084	-80.556072	1.17	
11373.00	90.00	335.97	6000.00	5862.01	5011.06	-3045.20	40.234321	-80.556197	3.76	
11465.00	90.18	335.12	5999.85	5953.59	5094.80	-3083.28	40.234551	-80.556332	0.94	
11555.00	90.43	338.86	5999.37	6042.93	5177.62	-3118.45	40.234779	-80.556456	4.16	
11648.00	90.80	338.57	5998.38	6134.88	5264.28	-3152.21	40.235018	-80.556576	0.51	
11741.00	91.05	337.63	5996.87	6226.97	5350.55	-3186.90	40.235255	-80.556698	1.05	
11833.00	91.17	335.90	5995.09	6318.33	5435.07	-3223.18	40.235487	-80.556827	1.88	
11923.00	90.99	336.20	5993.40	6407.83	5517.31	-3259.71	40.235714	-80.556956	0.39	
12016.00	90.99	335.27	5991.79	6500.37	5602.08	-3297.92	40.235947	-80.557092	1.00	
12108.00	91.23	334.72	5990.01	6592.02	5685.44	-3336.80	40.236177	-80.557230	0.65	
12201.00	91.05	335.32	5988.16	6684.66	5769.72	-3376.07	40.236409	-80.557369	0.67	
12294.00	91.91	337.83	5985.75	6777.03	5855.02	-3413.03	40.236643	-80.557500	2.85	
12384.00	91.17	337.34	5983.33	6866.24	5938.19	-3447.33	40.236872	-80.557621	0.99	
12476.00	90.92	338.04	5981.66	6957.42	6023.29	-3482.25	40.237106	-80.557745	0.81	
12509.00	91.05	338.20	5981.09	6990.10	6053.91	-3494.55	40.237191	-80.557788	0.62	Last WFT SVY
12532.00	91.05	338.20	5980.67	7012.86	6075.26	-3503.09	40.237249	-80.557818	0.00	Proj. to TD

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/11/2018
Job End Date:	4/21/2018
State:	West Virginia
County:	Brooke
API Number:	47-009-00181-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Mark Owen BRK 1H
Latitude:	40.22051800
Longitude:	-80.54537800
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,014
Total Base Water Volume (gal):	11,442,348
Total Base Non Water Volume:	0



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	Southwestern Energy	Carrier/Base Fluid	Water	7732-18-5	100.00000	81.04160	
Sand	J.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	18.28768	
HCL Acid (12.6%-17.5%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.48235	
WFRA-2000	J.S. Well Services, LLC	Friction Reducer	Hydrogen Chloride	7647-01-0	17.50000	0.11215	
			Water	7732-18-5	60.00000	0.02870	
			2-Propenoic acid, polymer with 2-propanamide	9003-06-9	30.00000	0.01435	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01177	
	Nalco Champion	Anti-Bacterial Agent	Methanol	64-17-5	60.00000	0.00922	
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00586	
			Glutaraldehyde	111-30-8	10.00000	0.00195	

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SCAL16486A	Nalco Champion	Scale Inhibitor	Ethylene Glycol	107-21-1	30.00000	0.00167
			Amine Triphosphate	Proprietary	30.00000	0.00150
LT FLUSH SYSTEM I	J.S. Well Services, LLC	Other	Mineral oil, petroleum distillates, hydro-treated light naphthenic	64742-53-6	100.00000	0.00065
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors	Ethylene glycol	107-21-1	40.00000	0.00024
			Cinnamaldehyde	104-55-2	20.00000	0.00009
			Formic acid	64-18-6	20.00000	0.00008
			Butyl cellosolve	111-76-2	20.00000	0.00008
			Polyether	60828-78-6	10.00000	0.00004
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00002
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.						

* 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)

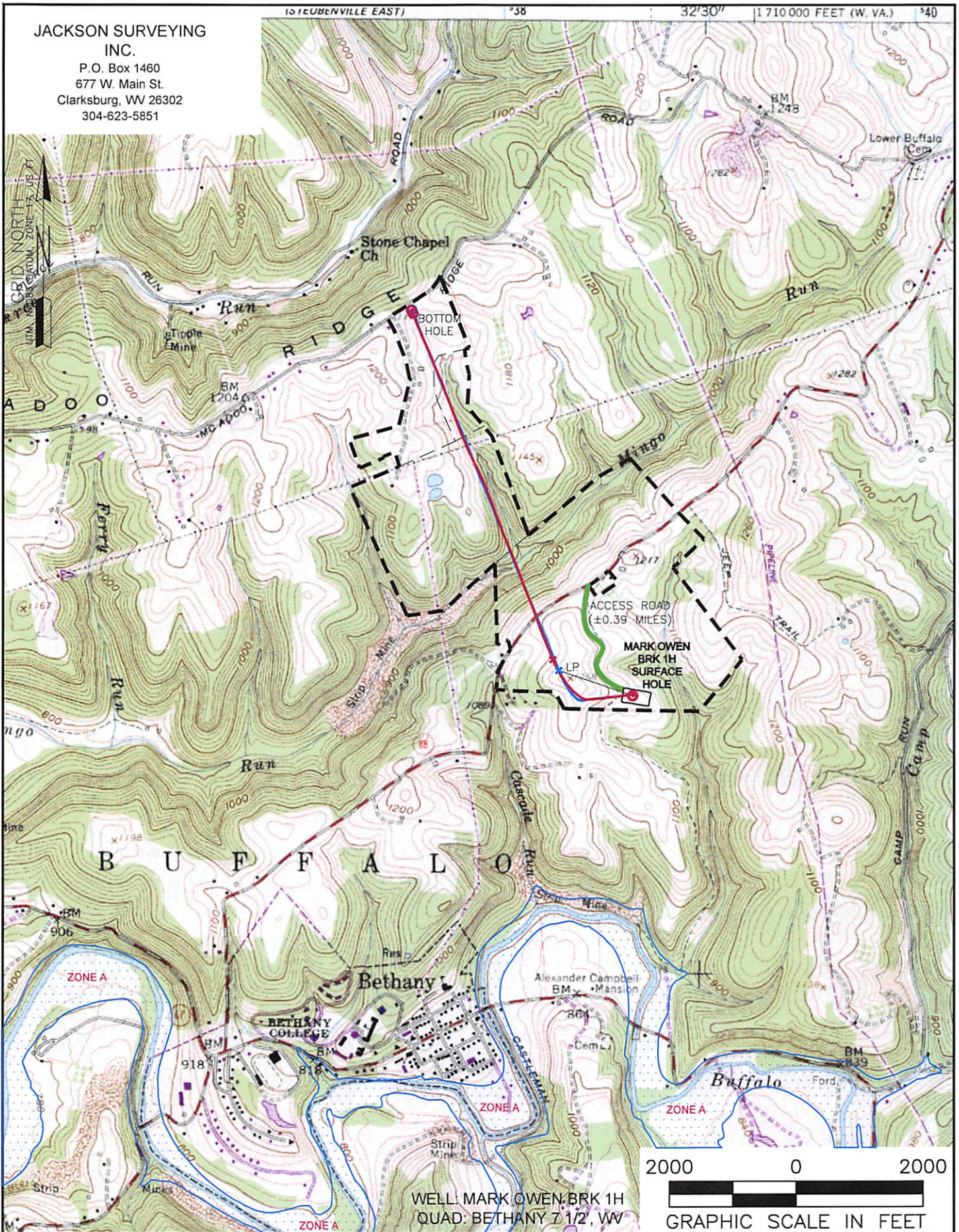
RECEIVED
Office of Oil and Gas

JUL 12 2018

WV Department of
Environmental Protection



JACKSON SURVEYING

INC.
 P.O. Box 1460
 677 W. Main St.
 Clarksburg, WV 26302
 304-623-5851

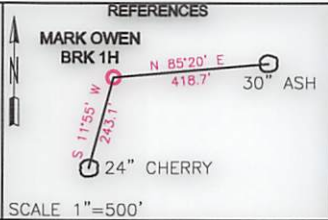
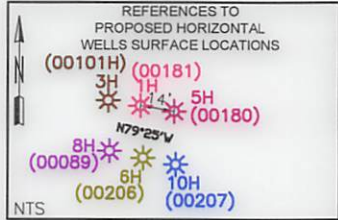


WELL: MARK OWEN BRK 1H
 QUAD: BETHANY Z 1/2, WV



NAME AND DISTANCE TO THE NEAREST STREAM: MINGO RUN IS LOCATED ±0.52 MILES NW, OF THE CENTER OF THE DRILL PAD.		STREAM CROSSING COORDINATES (NAD 83): NO NEW CROSSINGS.		COMPANY:  	
WELL RESTRICTIONS: WELL PAD, LOD, & E & S CONTROL FEATURES TO PERENNIAL STREAM, LAKE, POND, RESERVOIR OR WETLAND: >100 FEET WELL PAD, LOD, & E & S CONTROL FEATURES TO NATURALLY PRODUCING TROUT STREAM: >300 FEET WELL PAD, LOD, & E & S CONTROL FEATURES TO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY: >1000 FEET WELL SHL TO EXISTING WATER WELL OR DEVELOPED SPRING: >250 FEET CENTER OF PAD TO OCCUPIED DWELLING STRUCTURE: >625 FEET CENTER OF PAD TO AGRICULTURAL BUILDINGS LARGER THAN 2500 SQ FT: >625 FEET		OPERATOR'S MARK OWEN BRK		WELL #: 1H	
FEMA FLOOD INFORMATION: BY GRAPHIC PLOTTING ONLY FEMA FIRM INCORPORATED AREA OF BROOKE COUNTY, WEST VIRGINIA; MAP NUMBER 54009C0135 D AND 54009C0130 D; EFFECTIVE DATE: APRIL 19, 2010.		LOCATION: BUFFALO DISTRICT, BROOKE COUNTY, WEST VIRGINIA		SURFACE HOLE LOCATION: GEOGRAPHIC (NAD83): LATITUDE: 40.220518° LONGITUDE: -80.545378°	
LEGEND: ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ⊗ EXISTING / PRODUCING WELLHEAD ⊗ ABANDONED WELL ⊗ PLUGGED & ABANDONED WELL △ CUT CONDUCTOR		○ EXISTING SPRING ○ EXISTING WATER WELL — ACCESS ROAD — ACCESS ROAD TO PREV. SITE — HIGHWAY/INTERSTATE — COUNTY ROAD		BOTTOM HOLE LOCATION: GEOGRAPHIC (NAD83): LATITUDE: 40.237263° LONGITUDE: -80.557783°	
REVISIONS:		DATE: 06-04-2018		DRAWN BY: N. MANO SCALE: 1" = 2000' DRAWING NO.: TOPOGRAPHIC MAP	

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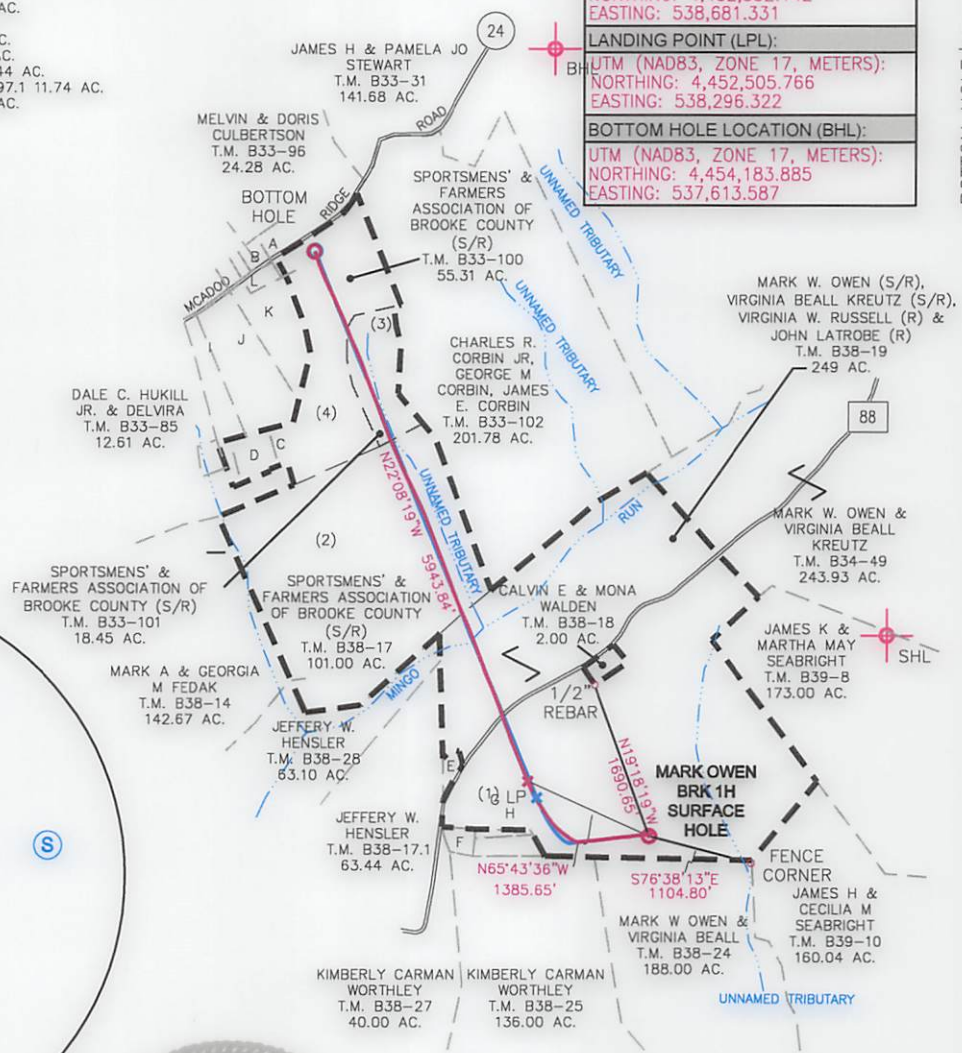
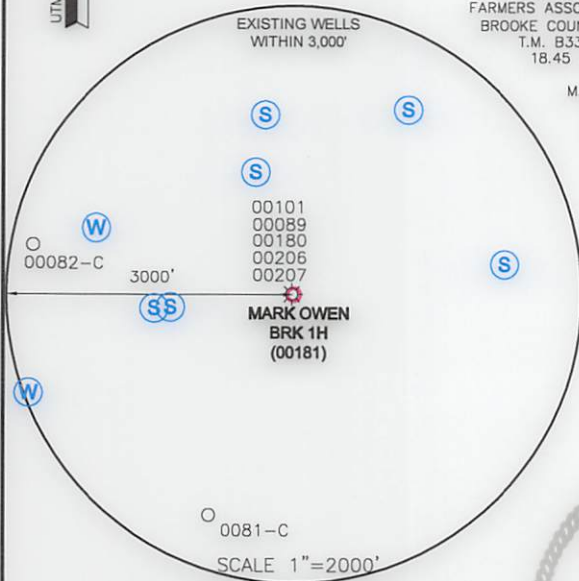


SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,332.123 EASTING: 538,681.347
"LANDING POINT" LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,454.406 EASTING: 538,324.478
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,454,185.405 EASTING: 537,616.593
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,332.142 EASTING: 538,681.331
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,505.766 EASTING: 538,296.322
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,454,183.885 EASTING: 537,613.587

- A- GINGER ROSE LEONI T.M. B33-99 1.73 AC.
- B- BRIAN & JACINDA LONG T.M. B33-98 1.00 AC.
- C- MONONGAHELA POWER COMPANY T.M. B38-16 1.31 AC.
- D- SPORTSMEN'S & FARMERS ASSOCIATION OF BROOKE COUNTY T.M. B38-15 2.21 AC.
- E- KEVIN SCOTT & LISA KAY STEWART T.M. B38-20 1.06 AC.
- F- LANCE M ELSON T.M. B38-21 1.62 AC.
- G- NOLTE & GLADYS VAN CAMP, AS TRUSTEES OF THE 2002 VAN CAMP FAMILY TRUST T.M. B38-22 0.942 AC.
- H- NOLTE & GLADYS VAN CAMP, AS TRUSTEES OF THE 2002 VAN CAMP FAMILY TRUST T.M. B38-23 2.27 AC.
- I- DANNY C. & TAMERA J. HUKILL T.M. B33-97.2 11.01 AC.
- J- MICHAEL & SHERYL ANN KOSCEVIC T.M. B33-97.3 11.44 AC.
- K- GEORGE A. TANNER & BARBARA B. SWEET T.M. B33-97.1 11.74 AC.
- L- BRIAN LONG & JACINDA LONG T.M. B33- 97.4 1.668 AC.

LEGEND

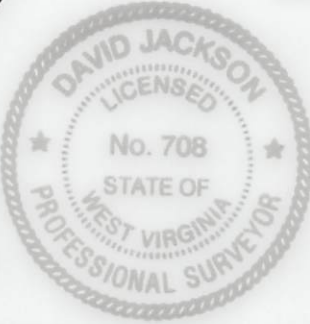
WATERWELL	(W)
SPRING	(S)
STREAM	(ST)
SURFACE OWNER (S)	(S)
ROYALTY OWNER (R)	(R)
SURFACE & ROYALTY OWNER (S/R)	(S/R)
DIVISION LINES BETWEEN LEASE TRACTS	---
ADJOINERS LINES	---



NOTES ON SURVEY

- NO DWELLINGS OR AGRICULTURAL BUILDINGS GREATER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- ALL WELLS WITHIN 500' OF THE HORIZONTAL LEG ARE SHOWN ON THIS PLAT BASED UPON INFORMATION TAKEN FROM DEP MAPPING, WELL PLATS AND AERIAL PHOTOS.
- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.

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. 708 *David J. Jackson*

COMPANY: **SWN** Production Company, LLC

MARK OWEN BRK

OPERATOR'S WELL #: **1H**

API WELL #: **47 009 00181**

STATE COUNTY PERMIT

	(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS	MINIMUM DEGREE OF ACCURACY: 1/200	MARK OWEN BRK OPERATOR'S WELL #: 1H		
	WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034	PROVEN SURVEY SOURCE OF ELEVATION: GRADE GPS (NAVD 88, US FT)	API WELL #: 47 009 00181 STATE COUNTY PERMIT		

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

WATERSHED: BUFFALO CREEK ELEVATION: 1,165.4'

DISTRICT: BUFFALO COUNTY: BROOKE QUADRANGLE: BETHANY 7 1/2'

SURFACE OWNER: MARK W. OWEN & VIRGINIA BEALL KREUTZ ACREAGE: 249.00

OIL & GAS ROYALTY OWNER: MARK W. OWEN & VIRGINIA BEALL KREUTZ, VIRGINIA W. RUSSELL & JAMES LATROBE ACREAGE: 249.00

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

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,037 TVD 12,532 TMD

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:	<ul style="list-style-type: none"> ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ☆ EXISTING / PRODUCING WELLHEAD LPL* LANDING POINT LOCATION (W) EXISTING WATER WELL (S) EXISTING SPRING 	<ul style="list-style-type: none"> --- SURVEYED BOUNDARY --- DRILLING UNIT --- LEASE BOUNDARY --- ASDRILLED PATH --- PROPOSED PATH 	REVISIONS: DATE: 06-04-2018 DRAWN BY: N. MANO SCALE: 1" = 2000' DRAWING NO: WELL LOCATION PLAT
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JACKSON SURVEYING

INC.

P.O. Box 1460
677 W. Main St.
Clarksburg, WV 26302
304-623-5851

ADJOINING OWNERS

TRACT	ADJOINING SURFACE OWNER (S)	TAX PARCEL	ACRES
A	TAMMY M. WITHERS (S)	07-B34-04	13.00
B	TAMMY M. WITHERS (S)	07-B39-06	11.08
C	TAMMY M. WITHERS (S)	07-B39-05	1.94
D	PHILLIP M. GREATHOUSE & MARY GREATHOUSE (S)	07-B39-07	13.01
E	RAYMOND W. KIRKBRIDE JR. & JENNIFER VAIL-KIRKBRIDE (S)	07-B34-51	3.42
F	MICHAEL M. HENSLER (S)	07-B34-57.4	18.27
G	KEVIN L. MINOR & RULETTA K. MINOR (S)	07-B34-52	2.61
H	MARK T. KYANKO & MARI J. KYANKO (S)	07-B34-53	2.40
I	MICHAEL M. HENSLER (S)	07-B34-57.1	0.55
J	MICHAEL M. HENSLER (S)	07-B34-54	1.22
K	LOUIS W. HENSLER JR. & MARGARET HENSLER (S)	07-B34-55	1.22
L	WILLIAM W. ROADMAN & PAULA L. ROADMAN (S)	07-B34-56	1.13
M	LEE R. MENEELY & CLEA C. MENEELY (S)	07-B34-41	0.28
N	ROBERT E. ANDREWS & JACQUILINE ANDREWS (S)	07-B34-40	0.58
O	WILLIAM MATTHEW GADD & BARBARA ESTELLE GADD (S)	07-B34-39	0.67
P	DEUTSCHE BANK NATIONAL TRUST COMPANY (S)	07-B34-38	0.70
Q	DAVID LAZZAROTTI & LAURA LAZZAROTTI (S)	07-B34-37	0.58
R	DAVID LAZZAROTTI & LAURA LAZZAROTTI (S)	07-B34-36	0.86
S	WILLIAM J. WALES & MARSHA E. WALES (S)	07-B34-59	1.05
T	JEFFERY A. SHAFFER & MARTHA L SHAFFER (S)	07-B34-34	0.57
U	BRIAN KEITH WHITE (S)	07-B34-33	0.58
V	HELEN ANN VANCAMP (S)	07-B34-31	0.58
W	TERRY L. ROWLAND & CATHY ROWLAND (S)	07-B34-60	1.27

REVISIONS:	COMPANY:	SWN Production Company, LLC	SWN ^{R+} / _A ^{V+} / _A Production Company™
	OPERATOR'S	MARK OWEN BRK	
	WELL #:	1H	
	LOCATION:	BUFFALO DISTRICT, BROOKE COUNTY, WEST VIRGINIA	
		DATE:	06-04-2018
		DRAWN BY: N. MANO	
		SCALE: N/A	
		DRAWING NO:	
		ADJOINING OWNERS	