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

API 47 - 103 - 03371 County W	ETZEL	District PROCTOR	
•	WILLIAM RITCHEA-WTZ-		
Farm name WILLIAM D. RITCHEA & SHIRLEY I			IAM RITCHEA WTZ 8H
Operator (as registered with the OOG) SWN PROD	UCTION COMPANY	, LLC	
	ty SPRING	State TX	Zip 77391-2359
Top hole Northing $4,391,1$		Easting 529,225.798	
Landing Point of Curve Northing 4,390,8  Bottom Hole Northing 4,388,6		Easting 529,090.506 Easting 531,420.225	
Bottom Hole Holding Steels		Easting do 1,420,220	
Elevation (ft) 1,563' GL Type of	Well ■New □ Existing	Type of Report	□Interim ■Final
Permit Type 🗆 Deviated 🗅 Horizontal 📕 H	Horizontal 6A 🛮 🗆 Vert	ical Depth Type	□ Deep 🚪 Shallow
Type of Operation □ Convert □ Deepen ■ Dril	ll 🗆 Plug Back 🗆	Redrilling   Rework	■ Stimulate
Well Type □ Brine Disposal □ CBM 💄 Gas □ Oil	□ Secondary Recovery	□ Solution Mining □ Sto	rage □ Other
Type of Completion ■ Single □ Multiple Fluids  Drilled with □ Cable ■ Rotary	s Produced 🗆 Brine 🖟	■Gas □ NGL □ Oil	□ Other
Drilling Media Surface hole ■ Air □ Mud ■Fro	esh Watar Interme	diatabala Main — Mard	-T. 1 W/ D.
Production hole Air Mud Fresh Water		diate hole Air 🗆 Mud	□ Fresh water □ Brine
Mud Type(s) and Additive(s)  SOBM			
Date permit issued 2/9/2021 Date drillin	g commenced 4/1/2	2021 Date drilling o	eased 4/13/2021
Date completion activities began 5/12/2021	g commonded	Date diffing c	6/16/2021
Verbal plugging (Y/N) N Date permission	h 1 / a	Granted by	N/A
Date permission	gramou	Granted by	RECEIVED Office of Oil and Gas
Please note: Operator is required to submit a plugging	gapplication within 5 dag	ys of verbal permission to pl	
Freshwater depth(s) ft 541'	Open mine(s) (	Y/N) depths	N WV Department of Environmental Protect
Salt water depth(s) ft 1556'	1	tered (Y/N) depths	N
Coal depth(s) ft 1492'		untered (Y/N) depths	N
Is coal being mined in area (Y/N)	.,		

Rev. 8/23/13 API 47- 103 WILLIAM D. RITCHEA & SHIRLEY E. RITCHEA WEll number\_WILLIAM RITCHEA WTZ 8H 03371 Farm name CASING Hole Casing New or Grade Basket Did cement circulate (Y/N) **STRINGS** Size Size Depth Used wt/ft Depth(s) \* Provide details below\* Conductor 24 20 126 NEW J-55/94# Υ Surface 17.5 13.375 591 NEW J-55/54.5# Y; 35 BBLS Coal SEE INTERMEDIATE Intermediate 1 12.25 9.625 2.959 NEW J-55/36# Y; 31 BBLS Intermediate 2 Intermediate 3 Production 8.75/8.50 5.5 18,717 NEW P-110/20# Υ Tubing Packer type and depth set Comment Details CEMENT Class/Type Number Slurry Yield Volume Cement WOC DATA of Cement of Sacks (ft 3/sks) wt (ppg)  $(ft^{\frac{3}{2}})$ Top (MD) (hrs) Conductor CLASS A GROUT TO SURFACE SURFACE 24 Surface CLASS A 586 15.60 1.19 697.34 **SURFACE** 8 Coal SEE INTERMEDIATE Intermediate 1 CLASS A 975 15.60 1.18 1,150.5 SURFACE 8 Intermediate 2 Intermediate 3 Production CLASS A 3,343 15.00 1.23 SURFACE 4,111.89 24 Tubing Drillers TD (ft) 18,717' Loggers TD (ft) 18,717' Deepest formation penetrated MARCELLUS Plug back to (ft) N/A Plug back procedure N/A Kick off depth (ft) 6,820' 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 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 TO 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

API 47- 103 \_ 03371

Farm name\_WILLIAM D. RITCHEA & SHIRLEY E. RITCHEA Well number\_WILLIAM RITCHEA WTZ 8H

#### PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	<b>ATTACHMEN</b>	1		

Please insert additional pages as applicable.

### STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations 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 (units)
		SEE	ATTACHMEN	2				

Please insert additional pages as applicable.

API 47- 103	03371	Farm	name_WILLIAM D.	RITCHEA	SHIRLEY E. R	RITCHEA Well r	umber_	WILLIAM F	RITCHEA WTZ	8H
PRODUCING	FORMATION	(S)	DEPTHS							
MARCELLUS			7,534'	_TVD	7,882'	MD				
			)							
Please insert ac	lditional pages	as applicable.								
GAS TEST	□ Build up	⊐ Drawdown	□ Open Flow		OIL TEST	☐ Flow □	Pump			
SHUT-IN PRE	SSURE Sur	face 1785	psi Botto	m Hole_	ps	si DURAT	ION O	F TEST	hrs	
OPEN FLOW	Gas 17,946 mc	Oil fpd 34	NGL bpd	bpd	Water 1,102			RED BY	□ Pilot	
LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTO DEPTH II MD	N FT DESCE	RIBE ROCK TYF OF FLUID (FRE:			ANTITYAND LL, GAS, H₂S, ETO	C)
	0 SEE	ATTACHMENT	0 3							
	JEL	ATTACHMENT	3							
		-								
Please insert ac	  ditional pages :	as applicable.								
Drilling Contra	actor SWN DRIL		NY							
Address PO BC	X 12359		City	SPRING		State	TX	_ Zip _7739	11-2359	_
	any BAKER HU GORGANS MILL R		City	THE WO	ODLANDS	State	TX	Zip 7738	0	
Cementing Co.	mpany AMERIC	CAN CEMENTIN	IGIIC					_ +		
Address 4402 N			City	LIBERTY	·	State	TX	Zip_7757	'5	
Stimulating Co		WELL SERVICE	ES City	SPRING		State	TX	Zip 7739	)1	
	dditional pages	as applicable.		5 <del></del>		Suite		z.ip		
_	DENISE GRA	НАМ	0		Telep	hone 832-796	-6139			
Signature /	UNXC	TAVUL	Witle R	EGULATO	RY ANALYST		Date _	5.31.2	071	

## **Hydraulic Fracturing Fluid Product Component Information Disclosure**

Job Start Date:	5/12/2021
Job End Date:	6/9/2021
State:	West Virginia
County:	Wetzel
API Number:	47-103-03371-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	WILLIAM RITCHEA WTZ 8
Latitude:	39.66959291
Longitude:	-80.65925421
Datum:	NAD83
Federal Well:	NO.
Indian Well:	NO
True Vertical Depth:	7,649
Total Base Water Volume (gal):	17,959,554
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
Base Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	90.07267	Density = 8.345
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	85.00000	0.42792	

HCL	SWN Well Services	Solvent					
				Listed Below			
SWN FRW-11LC	SWN Well Services	Friction Reducer					
				Listed Below			
Sand	SWN Well Services	Proppant					
				Listed Below			
Tolicide PS 50A	SWN Well Services	Biocide					
				Listed Below			
Plexaid 655WG	SWN Well Services	Scale Inhibitor					
				Listed Below			
Ecopol-FEAC	SWN Well Services	Iron Control					
				Listed Below			
Econo-Cl200	SWN Well Services	Corrosion Inhibitor					
				Listed Below		: • :	
Items above are Tra	de Nam <b>es</b> with th	e exception of Base Wa	ater Items below are the ind	ividual ingredients.		Religion from	
			Crystalline Silica, quartz	14808-60-7	100.00000	9.38760	
			Hydrochloric Acid	7647-01-0	15.00000	0.05675	
			Petroleum Distillates, Hydrotreated	64742-47-8	25.00000	0.03453	
			Tetrakis	55566-30-8	55.00000	0.00790	
			Glycerin	56-81-5	50.00000	0.00316	

	Ammonium Chloride	12125-02-9	2.00000	0.00276	
	Oleic Acid Diethanolamide	93-83-4	1.50000	0.00207	
	Olcohols, C12-1, ethoxylated	68551-12-2	1.50000	0.00207	
	Acetic Acid	64-19-7	37.50000	0.00076	
	Diethylenetriamine penta	15827-60-8	10.00000	0.00063	
	Methanol	67-56-1	80.00000	0.00046	
	Citric Acid	77-92-9	22.50000	0.00045	
	Acrylic acid terpolymer	397256-50-7	1.00000	0.00014	
	Oxyalkylated fatty acid	68951-67-7	9.67400	0.00006	
	Fatty acids	61790-12-3	5.02700	0.00003	
1 1	Modified thiourea polymer	68527-49-1	4.74600	0.00003	
	Potassium acetate	127-08-2	0.02200	0.00000	
	Formaldehyde	50-00-0	0.00400	0.00000	

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)

<sup>\*</sup> Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%
\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line



Well Name:

William Ritchea WTZ 8H

47103033710000

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	541.00	541.00	
Top of Salt Water	1556.00	1556.00	NA	NA	
Pittsburgh Coal	1492.00	1492.00	1499.00	1499.00	
Raven Cliff (ss)	1973.00	1973.00	2507.00	2507.00	
Maxton (ss)	2507.00	2507.00	2663.00	2663.00	
Big Injun (ss)	2663.00	2663.00	2907.00	2907.00	
Berea (siltstone)	3271.00	3267.00	3361.00	3327.00	
Rhinestreet (shale)	7008.00	6881.00	7483.00	7304.00	
Middlesex (shale)	7483.00	7304.00	7621.00	7401.00	
Burket (shale)	7621.00	7401.00	7656.00	7424.00	
Tully (ls)	7656.00	7424.00	7691.00	7445.00	
Mahantango (shale)	7691.00	7445.00	7882.00	7534.00	
Marcellus (shale)	7882.00	7534.00	NA	NA	GAS

# WILLIAM RITCHEA WTZ 8H ATTACHMENT 1 PERE REPORT

STAGE NUM	Perf Date	Perf Bottom MD	Perf Top MD2	# SHOTS PER STG
1	5/6/2021		18,555	36
	2 5/13/2021		18,342	36
	5/13/2021		18,129	36
			17,917	36
	5/14/2021		17,704	36
-6			17,491	36
			17,279	36
8			17,066	36
g			16,854	36
10			16,641	36
11			16,428	36
12			16,216	36
13	5/18/2021	16,182	16,003	36
1/	5/18/2021	15,970	15,791	36
15	5/18/2021	15,757	15,578	36
16	5/19/2021	15,545	15,365	36
17	5/19/2021	15,332	15,153	36
18	5/20/2021	15,119	14,940	36
19	5/21/2021	14,907	14,728	36
20	5/22/2021	14,694	14,515	36
21	5/22/2021	14,482	14,302	36
22	5/23/2021	14,269	14,090	36
23	5/24/2021	14,056	13,877	36
24	5/25/2021	13,844	13,665	36
25	5/26/2021	13,631	13,451	36
26	5/27/2021	13,419	13,239	36
27	7 5/28/2021	13,206	13,027	36
28	5/28/2021	12,993	12,814	36
29	5/29/2021	12,781	12,602	36
30	5/29/2021	12,568	12,389	36
31	5/30/2021	12,352	12,176	36
32	5/31/2021	12,144	11,963	36
33	6/1/2021	11,930	11,751	36
34	6/1/2021	11,718	11,539	36
35	6/1/2021	11,505	11,326	36
36	6/2/2021	11,293	11,113	36
37	7 6/2/2021	11,080	10,901	36
38	6/3/2021	10,867	10,688	36
39	6/3/2021	10,655	10,476	
40	6/4/2021	10,442	10,263	36
4:	L 6/4/2021		10,050	
42	2 6/4/2021		9,838	
43	6/5/2021	9,804	9,625	

## WILLIAM RITCHEA WTZ 8H ATTACHMENT 1 PERF REPORT

STAGE NUM	Perf Date	Perf Bottom MD	Perf Top MD2	# SHOTS PER STG
44	6/5/2021	9,592	9,413	36
45	6/6/2021	9,379	9,200	36
46	6/6/2021	9,167	8,987	36
47	6/7/2021	8,954	8,775	36
48	6/7/2021	8,741	8,562	36
49	6/8/2021	8,529	8,350	36
50	6/8/2021	8,316	8,137	36
51	6/9/2021	8,104	7,924	36

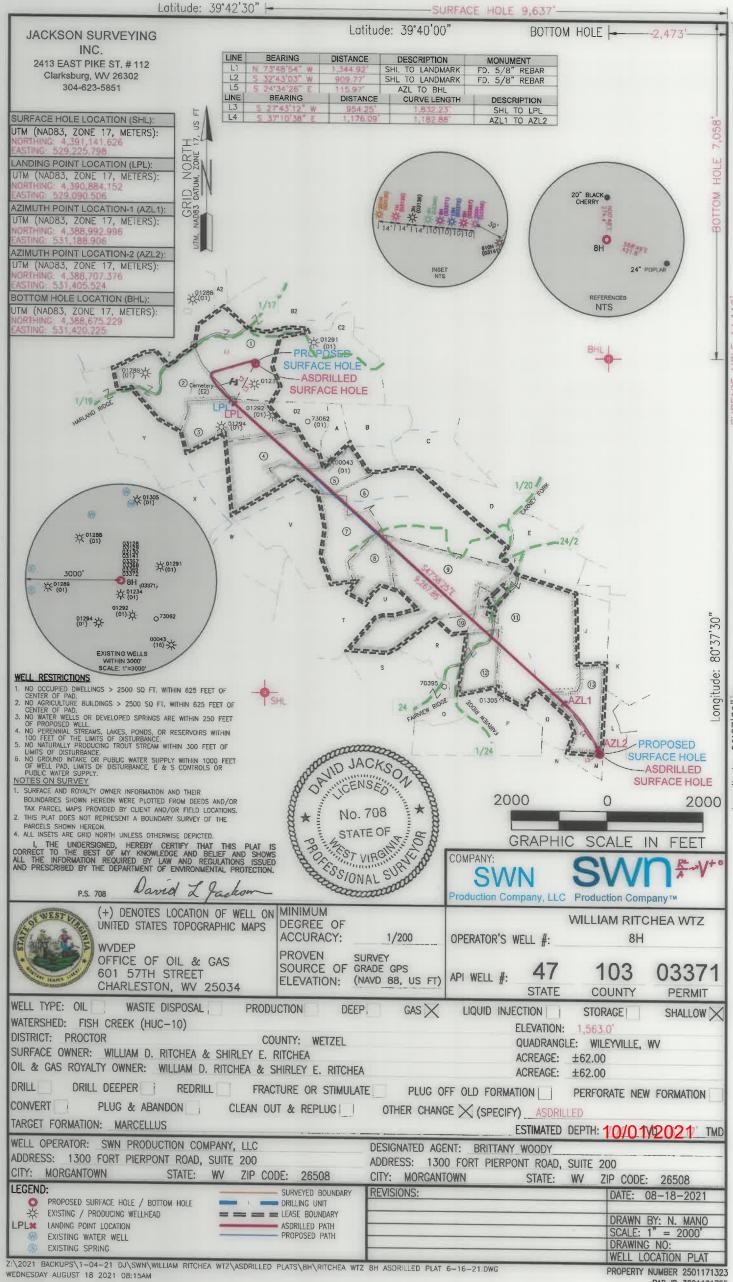
## WILLIAM RITCHEA WTZ 8H ATTACHMENT 2

			- FW2	STIM REPORT				
STAGE NUM	Calus Dates	Ave Pump	Ave	Max				Amount of
	Stim Date	Rate (BPM)	Treatment	Breakdown	ISIP (PSI)	Proppant (lbs)		nitrogen/othe
1			7,747	7,612	4,334	115,940		0
2			8,837					0
3			8,782					0
4			8,887					0
5			9,050					0
6			8,807					0
7			9,016		4,800		8,671	0
8			8,961		4,563			0
9			9,083		4,681			0
10			9,032		4,860			0
11			9,029	6,622			8,575	0
12			9,046				8,559	0
13			9,097		4,976		8,754	0
14			9,064		5,012	313,020	8,770	0
15			9,082		5,321		8,599	0
16		93.8	8,653	6,669	5,282	311,560	9,516	0
17		99	8,764	6,520	5,298	317,710	8,431	0
18			8,895	6,765	4,707	310,770	8,458	0
19			8,941	6,540	4,762	310,140	8,614	0
20	5/22/2021	90.6	8,572	6,658	4,653	314,400	8,902	0
21	5/23/2021	99.3	8,801	5,786	4,912	309,690		0
22	5/24/2021	97.6	8,932	6,487	4,779			0
23	5/25/2021	98.7	8,961	6,384	4,644		8,704	0
24	5/26/2021	96	8,809	6,506	4,278			0
25	5/27/2021	99.4	7,939	5,620			8,523	0
26	5/28/2021	99.4	8,410	7,005	4,908		8,902	0
27	5/28/2021	99.4	8,458	6,563	4,435			0
28	5/29/2021	99.6	8,600	6,320				0
29	5/29/2021	98	8,391		5,302			0
30	5/30/2021	98.3	8,569	6,016				0
31	5/31/2021	98.4	8,399					0
32	5/31/2021	99.4	8,224					0
33	6/1/2021	100	9,140					0
34	6/1/2021	99.9	8,359					
35	6/2/2021	94.9	8,742					
36	6/2/2021	99.4						
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
			<u>.</u>					
49	6/8/2021	98	7,994	6,457	4,670	312,160	8,163	

### WILLIAM RITCHEA WTZ 8H 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
	50	6/8/2021	100	7,564	6,421	4,802	316.730	8,243	0
Ţ	51	6/9/2021	99.4	7,814	6,657	4,802	309,660	8,171	0



## JACKSON SURVEYING

INC. 2413 EAST PIKE ST. # 112 Clarksburg, WV 26302 304-623-5851

WELL BORE TRACTS					
TRACT	SURFACE OWNER (5) / ROYALTY OWNER (R)	TAX PARCEL			
1	RITCHEA WILLIAM D & SHIRLEY E (S/R)	12-0015-21			
TRACT	SURFACE OWNER (S)	TAX PARCEL			
2	PITOSCIA WILLIAM R(S)	12-0014-27			
3	DUELLEY BERNARD LEE ET AL & HALL SUSAN (S)	12-0015-25			
4	LEMASTERS HAROLD E & BETTY S; LEMASTERS KEYSTONE TRUST &				
	STANSBERRY LINDA SNIDER & SNIDER JAMES F. (S)	12-0015-31			
	LEMASTERS HAROLD E & BETTY S; LEMASTERS KEYSTONE TRUST &				
5	STANSBERRY LINDA SNIDER & SNIDER JAMES F.(S)	12-0015-32			
6	MELOTT TERREL LEMOYN (S)	01-0010-22			
7	A&D WOODLANDS LTD(S)	01-0009-15			
8	RITCHEA WILLIAM D; RITCHEA SHIRLEY (S)	01-0009-16			
9	RITCHEA WILLIAM D; RITCHEA SHIRLEY E (S)	01-0010-21			
10	WYKERT WAYNE (S)	01-0010-45.2			
11	RITCHEA WILLIAM D & SHIRLEY E (S)	01-0010-33			
12	WYKERT WAYNE (S)	01-0010-45.1			
13	FLEMING ALAN & CYNTHIA (S)	01-0010-48			

ADJOINING OWNERS TABLE				
TRACT	SURFACE OWNER	TAX PARCE		
A	BROWN SANDY K	12-0015-27		
В	BROWN SANDY K	12-0015-28		
C	YOHO KIMBERLY & KEITH ALLEN	12-0015-29		
D	MELOTT TERREL L	01-0010-10		
E	BARD VANESSA	01-0010-11.		
F	WYKERT ERIC D	01-0010-23		
G	RICHTER ROMEY & CAROL	01-0010-33.		
Н	YEATER CHESTER CJR & LORENE REVOCABLE TRUST	01-0010-32		
1	MCMILLEN SHARON I	01-0010-25		
J	MCMILLEN SHARON I	01-0010-34		
K	LASURE MICHAEL E. & VELVA C.	01-0010-35		
L	COASTAL FOREST RESOURCES CO	01-0014-03		
M	COASTAL FOREST RESOURCES CO & COASTAL TIMBERLANDS CO	01-0014-02.		
N	CAIN GLENN JR & ELEANOR T	01-0014-02		
0	COASTAL FOREST RESOURCES CO	01-0010-47		
P	CAIN SAMUEL EST & CAIN GLEN IR	01-0010-46		
Q.	WYKERT VERNA L	01-0009-13		
R	JERRELL WILMA & JEFFREY (S)	01-0010-45		
S	WYKERT VERNA L	01-0009-12		
T	MELLOTT EDWARD NOEL HRS	01-0009-06		
U	MELLOTT EDWARD NOEL HRS	01-0009-05		
V	MELLOTT TERREL	01-0009-14		
W	RICHMAN TROY M	01-0009-04		
Х	CECIL ROBERT LEE	12-0015-33		
Υ	PITOSCIA ANTHONY A & DAVID T	12-0014-26		
2	PITOSCIA WILLIAM R	12-0014-16		
A2	URBANEK SCOTT J & CHRYSTAL A	12-0015-13		
B2	LEMASTERS H C HRS & MANKER:	12-0015-13		
	CHARLES V REVOCABLE LIVING TRU	×= 0015 10		
C2	DUELLEY BERNARD LEE ETAL & HALL SUSAN	12-0015-22		
D2	DUELLEY BERNARD LEE ETAL & HALL SUSAN	12-0015-26		
E2	LEMASTERS CEMETERY	12-0015-20		

SURFACE HOLE LOCATION (SHL): UTM (NAD83, ZONE 17, METERS): NORTHING 4, 331, 41, 788 LANDING POINT LOCATION (LPL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4,390,900,221 AZIMUTH POINT LOCATION-1 (AZL1):
UTM (NAD83, ZONE 17, METERS):
NORTHING 4,388,988,625 AZIMUTH POINT LOCATION-2 (AZL2).
UTM (NAD83, ZONE 17, METERS):
NORTHING 4 388,690,685 BOTTOM HOLE LOCATION (BHL): UTM (NAD83, ZONE 17, METERS): NORTHING 4, 588.677, 399 EASTING: 531.418.796

REVISIONS:	COMPANY:		10/01/2		
REVISIONS:	COMPANT:	CIA/NI	CIAM	RenV+0	
		SWN	OVV	тм	
		Production Company, LLC	Production Company		
	OPERATOR'S	WILLIAM RITCHEA W	API#	DATE: 08-18-2021	
	WELL #:	8H	47-103-03371	DRAWN BY: N. MANO	
	DISTRICT:	COUNTY:	STATE:	SCALE: N/A	
	PROCTOR	WETZEL	WV	DRAWING NO:	
7-\ 2021 BACKUDC\ 1 04 24 D.I\ CWA\ 4				WELL LOCATION PLAT 2	