

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

API 47 - 097 - 03862 County Upshur District Banks
Quad Goshen Pad Name Flamco Field/Pool Name _____
Farm name Flamco Inc. Well Number 211
Operator (as registered with the OOG) Arsenal Resources
Address 6031 Wallace Road Ext., Suite 300 City Wexford State PA Zip 15090

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4288487.850 Easting 555268.264
Landing Point of Curve Northing 4288540.516 Easting 555132.905
Bottom Hole Northing 4290368.285 Easting 554458.207

Elevation (ft) 2132.9' 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)
Oil Based Muds

Date permit issued 5/10/2017 Date drilling commenced 06/15/2017 Date drilling ceased 7/11/2017
Date completion activities began 7/22/2017 Date completion activities ceased 7/30/2017
Verbal plugging (Y/N) N/A 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 550' Open mine(s) (Y/N) depths N
Salt water depth(s) ft no saltwater expected Void(s) encountered (Y/N) depths N
Coal depth(s) ft 239' - 319' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed
Bryan Harris
5-10-18

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Reviewed by: _____

API 47-097 - 03862

Farm name Flamco Inc.

Well number 211

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"	24"	80'	NEW	94'	N/A	Y
Surface	17.5"	13 3/8"	648'	NEW	54.50'	120'	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	1,567'	NEW	40'	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	13,428'	NEW	20'	N/A	N
Tubing							
Packer type and depth set							

Comment Details Cement to surface on Conductor, Surface, and Intermediate. Production top of Cement at 1355 ft

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	A	230	15.6	1.2	276	Surface	8+
Surface	A	590	15.60	1.20	708	Surface	8+
Coal							
Intermediate 1	A	145/335	15.20/15.70	1.26/1.30	183/436	Surface	8+
Intermediate 2	C -Kickoff Plug	584/110	17.50/14.70	0.94/1.37	549/151	6,150	24
Intermediate 3	C- 2nd Kickoff Plug	584	17.50	0.94	549	6,150	24
Production	A	866/1589	13.80/15.00	1.34/1.29	1160/2050	Surface	8+
Tubing							

Drillers TD (ft) 14,182'

Loggers TD (ft) 7,340'

Deepest formation penetrated Marcellus

Plug back to (ft) 6,150'

Plug back procedure See kickoff plug cement above. Pumped 1,200' cement plug to fill pilot hole with a 2-7/8" tubing stinger. TOOH attempted to drill curve, unsuccessful, cemented back a 2nd time and drilled curve and lateral.

Kick off depth (ft) 6359'

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

20" - No centralizers 13 3/8" - one bow spring centralizer on every other joint 9 5/8" - one bow spring centralizer every third joint from TD to surface 5 1/2" - one semi rigid centralizer on every joint from TD of casing to end of curve. Then every other joint to KOP. Every third joint from KOP to 1,600'; there will be no centralizers from 1,600' to surface

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS 29 Stages, 1160 perforations

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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Perforation Record

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations (s)
29	7/30/2017 15:20	7,578.00	7,740.00	40	Marcellus Shale
28	7/30/2017 7:28	7,778.00	7,940.00	40	Marcellus Shale
27	7/30/2017 2:25	7,978.00	8,140.00	40	Marcellus Shale
26	7/29/2017 20:01	8,178.00	8,340.00	40	Marcellus Shale
25	7/29/2017 14:31	8,378.00	8,540.00	40	Marcellus Shale
24	7/29/2017 4:03	8,578.00	8,740.00	40	Marcellus Shale
23	7/28/2017 22:19	8,778.00	8,940.00	40	Marcellus Shale
22	7/28/2017 16:17	8,978.00	9,140.00	40	Marcellus Shale
21	7/28/2017 8:16	9,178.00	9,340.00	40	Marcellus Shale
20	7/28/2017 1:53	9,378.00	9,540.00	40	Marcellus Shale
19	7/27/2017 20:19	9,578.00	9,740.00	40	Marcellus Shale
18	7/27/2017 14:42	9,778.00	9,940.00	40	Marcellus Shale
17	7/27/2017 8:31	9,978.00	10,140.00	40	Marcellus Shale
16	7/27/2017 2:46	10,178.00	10,340.00	40	Marcellus Shale
15	7/26/2017 20:04	10,378.00	10,540.00	40	Marcellus Shale
14	7/26/2017 12:36	10,578.00	10,740.00	40	Marcellus Shale
13	7/26/2017 4:53	10,778.00	10,940.00	40	Marcellus Shale
12	7/25/2017 23:04	10,978.00	11,140.00	40	Marcellus Shale
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10	7/25/2017 10:41	11,378.00	11,540.00	40	Marcellus Shale
9	7/25/2017 0:40	11,578.00	11,740.00	40	Marcellus Shale
8	7/24/2017 18:34	11,778.00	11,940.00	40	Marcellus Shale
7	7/24/2017 9:01	11,978.00	12,140.00	40	Marcellus Shale
6	7/24/2017 2:48	12,178.00	12,340.00	40	Marcellus Shale
5	7/23/2017 21:37	12,378.00	12,540.00	40	Marcellus Shale
4	7/23/2017 14:58	12,578.00	12,740.00	40	Marcellus Shale
3	7/23/2017 9:18	12,778.00	12,940.00	40	Marcellus Shale
2	7/23/2017 2:30	12,978.00	13,100.00	40	Marcellus Shale
1	6/22/2017 6:30	13,178.00	13,341.00	32	Marcellus Shale

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Stimulation Information Per Stage

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)
1	07/22/2017	79.00	7,028	7726	7,299	502,440
2	07/23/2017	81.00	7,295	7606	3,361	496,880
3	07/23/2017	80.00	6,838	6425	3,562	511,460
4	07/23/2017	79.00	7,924	6286	4,076	458,560
5	07/23/2017	81.00	6,874	5531	3,160	600,380
6	07/24/2017	82.00	7,020	6972	3,521	599,380
7	07/24/2017	81.00	6,711	6914	3,409	806,960
8	07/24/2017	81.00	7,089	5694	3,519	744,000
9	07/25/2017	81.00	7,021	6137	3,747	803,500
10	07/25/2017	82.00	6,846	5748	3,753	800,080
11	07/25/2017	81.00	7,039	6978	3,528	802,920
12	07/26/2017	81.00	6,789	6570	4,426	806,560
13	07/26/2017	81.00	6,704	5646	3,577	801,080
14	07/26/2017	80.00	6,448	6685	3,960	804,700
15	07/26/2017	81.00	6,409	6402	3,647	804,220
16	07/27/2017	82.00	6,578	6620	4,145	806,120
17	07/27/2017	80.00	6,830	6851	3,924	772,460
18	07/27/2017	81.00	6,310	6590	3,790	806,580
19	07/27/2017	81.00	6,505	6650	4,092	802,460
20	07/28/2017	81.00	6,326	6706	4,281	800,860
21	07/28/2017	82.00	6,581	5196	4,598	803,280
22	07/28/2017	80.00	6,665	7006	4,673	800,760
23	07/28/2017	80.00	6,499	6492	3,934	811,500
24	07/29/2017	81.00	6,343	6512	3,828	800,380
25	07/29/2017	80.00	6,498	6827	4,148	800,500
26	07/29/2017	80.00	6,521	6891	4,979	803,360
27	07/30/2017	81.00	6,468	6239	4,056	805,540
28	07/30/2017	82.00	6,738	7807	4,523	800,100
29	07/30/2017	81.00	7,219	7198	3,937	815,540

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Amount of
Water (bbls)

13,039
11,109
10,778
14,220
11,562
11,725
15,201
15,437
13,990
14,017
15,280
14,869
15,262
14,467
14,307
15,587
15,788
14,290
14,277
14,067
16,111
14,714
14,284
14,774
15,563
15,468
14,056
14,397
15,789

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Environmental Protection

API 47- 097 - 03862 Farm name Flamco Inc. Well number 211

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus Shale</u>	<u>7162</u> TVD	<u>7650</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface NA psi Bottom Hole NA psi DURATION OF TEST 525 hrs

OPEN FLOW Gas 5018 mcfpd Oil 0 bpd NGL 0 bpd Water 1413 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
Sand/ Silt	0	210	0	210	Sand/ Silt
Upper Kittanning	210	212	210	212	Coal
Middle Kittanning	330	331	330	331	Coal
Big Lime	1704	1990	1710	2000	Limestone
Benson	4188	4258	4230	4310	Sandstone
Elk	4542	4599	4590	4660	Siltstone
Burkett	7000	7044	7230	7310	Shale
Tully	7044	7064	7310	7350	Limestone
Mahantango	7064	7126	7350	7500	Shale
Marcellus	7126	7162	7500	7650	Shale
Purcell	7162	7166	7650	7670	Limestone
Lower Marcellus	7166	7205	7670	14182	Shale
Onondaga	7205	7213	7262	7271	Limestone

Please insert additional pages as applicable.

Drilling Contractor H&P
Address 1437 South Boulder Ave. City Tulsa State OK Zip 74119

Logging Company Schlumberger
Address 300 Schlumberger Dr City Sugar Land State TX Zip 77478

Cementing Company C&J Energy Svc.
Address 528 industrial Park Rd. City Jane Lew State WV Zip 26378

Stimulating Company Keane Group
Address 2121 Sage Road City Houston State TX Zip 77056

Please insert additional pages as applicable.

Completed by Arsenal Resources Telephone _____
Signature _____ Title _____ Date _____

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

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

API 47-097-03862 County Upshur District Banks
Quad Goshen Pad Name Flamco Field/Pool Name _____
Farm name Flamco Inc. Well Number 211
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As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4288487.850 Easting 555268.264
Landing Point of Curve Northing 4288540.516 Easting 555132.905
Bottom Hole Northing 4290368.285 Easting 554458.207

Elevation (ft) 2132.9' 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)
Oil Based Muds

Date permit issued 5/10/2017 Date drilling commenced 06/15/2017 Date drilling ceased 7/11/2017
Date completion activities began 7/22/2017 Date completion activities ceased 7/30/2017
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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Environmental Protection

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

Freshwater depth(s) ft _____ Open mine(s) (Y/N) depths N
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths N
Coal depth(s) ft 210-212 330-331 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

Reviewed by:
[Signature]
(Bryan Harris)

API 47-097 - 03862 Farm name Flamco Inc. Well number 211

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"	24"	80'	NEW	94'	N/A	Y
Surface	17.5"	13 3/8"	648'	NEW	54.50'	120'	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	1,567'	NEW	40'	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	13,428'	NEW	20'	N/A	Y
Tubing							
Packer type and depth set							

Comment Details Cement to surface on Conductor, Surface, and Intermediate. Production top of Cement at 1355 ft

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	A	230	15.6	1.2	276	Surface	8+
Surface	A	590	15.60	1.20	708	Surface	8+
Coal							
Intermediate 1	A	145/335	15.20/15.70	1.26/1.30	183/436	Surface	8+
Intermediate 2	C -Kickoff Plug	584/110	17.50/14.70	0.94/1.37	549/151	6,150	24
Intermediate 3	C- 2nd Kickoff Plug	584	17.50	0.94	549	6,150	24
Production	A	866/1589	13.80/15.00	1.34/1.29	1160/2050	Surface	8+
Tubing							

Drillers TD (ft) 14,182' Loggers TD (ft) 7,340'

Deepest formation penetrated Marcellus Plug back to (ft) 6,150'

Plug back procedure See kickoff plug cement above. Pumped 1,200' cement plug to fill pilot hole with a 2-7/8" tubing stinger. TOOH attempted to drill curve, unsuccessful, cemented back a 2nd time and drilled curve and lateral.

Kick off depth (ft) 6359'

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 _____
20" - No centralizers 13 3/8" - one bow spring centralizer on every other joint 9 5/8" - one bow spring centralizer every third joint from TD to surface 5 1/2" - one semi rigid centralizer on every joint from TD of casing to end of curve. Then every other joint to KOP. Every third joint from KOP to 1,600'; there will be no centralizers from 1,600' to surface
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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS 29 Stages, 1160 perforations

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

Perforation Record

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations (s)
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1	6/22/2017 6:30	13,178.00	13,341.00	32	Marcellus Shale

Stimulation Information Per Stage

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18	07/27/2017	81.00	6,310	6590	3,790	806,580
19	07/27/2017	81.00	6,505	6650	4,092	802,460
20	07/28/2017	81.00	6,326	6706	4,281	800,860
21	07/28/2017	82.00	6,581	5196	4,598	803,280
22	07/28/2017	80.00	6,665	7006	4,673	800,760
23	07/28/2017	80.00	6,499	6492	3,934	811,500
24	07/29/2017	81.00	6,343	6512	3,828	800,380
25	07/29/2017	80.00	6,498	6827	4,148	800,500
26	07/29/2017	80.00	6,521	6891	4,979	803,360
27	07/30/2017	81.00	6,468	6239	4,056	805,540
28	07/30/2017	82.00	6,738	7807	4,523	800,100
29	07/30/2017	81.00	7,219	7198	3,937	815,540

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**Amount of
Water (bbls)**

13,039
11,109
10,778
14,220
11,562
11,725
15,201
15,437
13,990
14,017
15,280
14,869
15,262
14,467
14,307
15,587
15,788
14,290
14,277
14,067
16,111
14,714
14,284
14,774
15,563
15,468
14,056
14,397
15,789

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WV Department of
Environmental Protection

API 47- 097 - 03862 Farm name Flamco Inc. Well number 211

PRODUCING FORMATION(S)	DEPTHS	
Marcellus Shale	7162	TVD 7650 MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
Sand/ Silt	0	210	0	210	Sand/ Silt
Upper Kittanning	210	212	210	212	Coal
Middle Kittanning	330	331	330	331	Coal
Big Lime	1704	1990	1710	2000	Limestone
Benson	4188	4258	4230	4310	Sandstone
Elk	4542	4599	4590	4660	Siltstone
Burkett	7000	7044	7230	7310	Shale
Tully	7044	7064	7310	7350	Limestone
Mahantango	7064	7126	7350	7500	Shale
Marcellus	7126	7162	7500	7650	Shale
Purcell	7162	7166	7650	7670	Limestone
Lower Marcellus	7166	7205	7670	14182	Shale
Onondaga	7205	7213	7262	7271	Limestone

Please insert additional pages as applicable.

Drilling Contractor H&P
Address 1437 South Boulder Ave. City Tulsa State OK Zip 74119

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company C&J Energy Svc.
Address 528 Industrial Park Rd. City Jane Lew State WV Zip 26378

Stimulating Company Keane Group
Address _____ City _____ State _____ Zip _____

Please insert additional pages as applicable.

Completed by Arsenal Resources Telephone _____
Signature [Signature] Title Permitting Manager Date 1-8-18

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

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Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/9/2017
Job End Date:	9/29/2017
State:	West Virginia
County:	Taylor
API Number:	47-091-01325-00-00
Operator Name:	Arsenal Resources
Well Name and Number:	UNB 211H
Latitude:	39.43391200
Longitude:	-79.94397800
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,988
Total Base Water Volume (gal):	18,965,058
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	Ascent	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	89.61245	None
Sand (Proppant)	Keane	Proppant					
			Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	9.90444	None
Hydrochloric Acid (7.5%)	Keane	Acid Inhibitor					
			Water	7732-18-5	92.50000	0.32050	None
			Hydrochloric Acid	7647-01-0	7.50000	0.02599	None
KFR-16FW	Keane	Friction Reducer					
			Water	7732-18-5	60.00000	0.06614	None
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.02205	None
			ammonium chloride	12125-02-9	1.50000	0.00165	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00165	None
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00110	None
MBC-516	Keane	Biocide					
			Water	7732-18-5	56.70000	0.00545	None
			Glutaral	111-30-8	26.70000	0.00257	None

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			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00077	None
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00051	None
			ethonal	64-17-5	2.80000	0.00027	None
KLSI-21	Keane	Scale Inhibitor					
			polyphosphoric acids, esters with triethanolamine, sodium salts	68131-72-6	30.00000	0.00456	None
KAI-12	Keane	Acid Inhibitor					
			Ethylene glycol	107-21-1	40.00000	0.00063	None
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00031	None
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00016	None
			Ethoxylated alcohol	68131-39-5	10.00000	0.00016	None
			formic acid	64-18-6	10.00000	0.00016	None
			Cinnamaldehyde	104-55-2	10.00000	0.00016	None
			isoproyl alcohol	67-63-0	5.00000	0.00008	None
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.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	92.50000	0.32050	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.02205	
			Glutaral	111-30-8	26.70000	0.00257	
			oleic acid diethanolamide	93-83-4	1.50000	0.00165	
			ammonium chloride	12125-02-9	1.50000	0.00165	
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00110	
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00077	
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00051	
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00031	
			ethonal	64-17-5	2.80000	0.00027	
			Cinnamaldehyde	104-55-2	10.00000	0.00016	
			Ethoxylated alcohol	68131-39-5	10.00000	0.00016	
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00016	
			formic acid	64-18-6	10.00000	0.00016	
			isoproyl alcohol	67-63-0	5.00000	0.00008	
			Water	7732-18-5	85.00000	0.00001	

* 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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As-Drilled

SHL Latitude: 38°45'00" (ROCK CAVE)

8,744' SHL

11,394' BHL

BHL Latitude: 38°47'30" (GOSHEN)

THRASHER

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

NOTES ON SURVEY

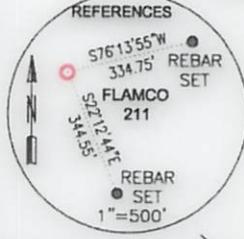
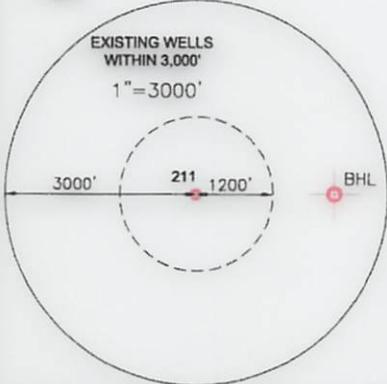
- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF 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.

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	FLAMCO, INC.	1-2T-32.2	21.85
2	SUN LUMBER CO	1-2T-31	270.812
3	SUN LUMBER CO	1-2T-30.1	26.67
4	LOYCE KAY & RAYMOND M MASTERS	1-2T-31.2	0.83
5	HINKLE ARNIE L & GAYLA S	1-2T-30	5.92
6	HARRINGTON MAXINE	1-2S-25	42.35
7	ATLANTIC SEABOARD CORP.	1-2S-27	85.00
8	COASTAL FOREST RESOURCES CO	1-2S-13	187.30
9	HUMPHREY JOHN C	1-2S-24	23.125

Longitude: 80°20'00"

2,451' SHL

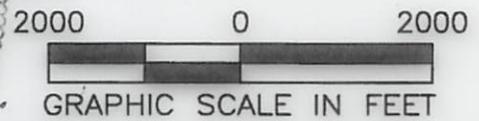
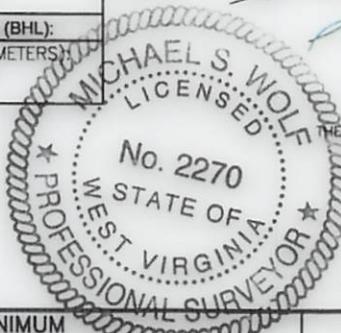
GRID NORTH
UTM, NAD83 DATUM, ZONE 17, US FT



SURFACE HOLE LOCATION (SHL):	SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,288,487.850 EASTING: 555,268.264	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,288,487.850 EASTING: 555,268.264
LANDING POINT LOCATION (LPL):	LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,288,540.516 EASTING: 555,132.905	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,288,412.403 EASTING: 555,185.479
BOTTOM HOLE LOCATION (BHL):	BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,290,368.285 EASTING: 554,458.207	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,290,369.414 EASTING: 554,461.167

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



<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 SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)</p>	<p>OPERATOR'S WELL #: 211</p> <p>API WELL #: 47 97 03862</p> <p>STATE COUNTY PERMIT</p>
	<p>WELL TYPE: OIL WASTE DISPOSAL PRODUCTION DEEP GAS <input checked="" type="checkbox"/> LIQUID INJECTION STORAGE SHALLOW <input checked="" type="checkbox"/></p> <p>WATERSHED: RIGHT FORK OF LITTLE KANAWHA</p> <p>DISTRICT: BANKS COUNTY: UPSHUR</p> <p>SURFACE OWNER: FLAMCO INC.</p> <p>OIL & GAS ROYALTY OWNER: FLAMCO INC.</p> <p>DRILL DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION</p> <p>CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED</p> <p>TARGET FORMATION: LATERAL: MARCELLUS, PILOT HOLE: HUNTERSVILLE CHERT ESTIMATED DEPTH: LATERAL: 7,149 TVD 14,182 TMD PILOT: 7,293 TVD</p>	<p>DESIGNATED AGENT: WILLIAM VEIGEL</p> <p>ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200</p> <p>CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330</p>
<p>WELL OPERATOR: ARSENAL RESOURCES</p> <p>ADDRESS: 6031 WALLACE ROAD EXTENSION #300</p> <p>CITY: WEXFORD STATE: PA ZIP CODE: 15090</p>		<p>LEGEND:</p> <ul style="list-style-type: none"> ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ⊙ EXISTING / PRODUCING WELLHEAD ⊗ ABANDONED WELL ⊗ PLUGGED & ABANDONED WELL △ CUT CONDUCTOR --- LEASE BOUNDARY --- 500' DHP BUFFER --- PROPOSED PATH --- AS-DRILLED PATH --- DHP BUFFER
<p>REVISIONS:</p>		<p>DATE: 01-05-2018</p> <p>DRAWN BY: R.DOERR</p> <p>SCALE: 1" = 2000'</p> <p>DRAWING NO: 030-3131</p> <p>WELL LOCATION PLAT</p>