

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

API 47-033-05767 County Harrison District Union
Quad Mount Clare Pad Name Paletta Field/Pool Name _____
Farm name Domineck Paletta Estate C/O Tony Paletta, G. Diane Sullivan Well Number 2
Operator (as registered with the OOG) Arsenal Resources
Address 6031 Wallace Road Ext., Ste 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 4340239.02 Easting 554637.30
Landing Point of Curve Northing 4340349.39 Easting 554596.41
Bottom Hole Northing 4341601.33 Easting 554132.99

Elevation (ft) 1161.40 ~~1165~~ 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)
Synthetic Oil-Based Mud

Date permit issued 9/20/2013 Date drilling commenced 5/11/2015 Date drilling ceased 4/04/2017
Date completion activities began 5/18/2017 Date completion activities ceased 05/29/2017
Verbal plugging (Y/N) N Date permission granted NA Granted by NA

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 _____ Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

APPROVED
NAME: [Signature]
DATE: 11/13/2017

Reviewed by:
[Signature]

01/05/2018

API 47- 033 - 05767

Farm name Domineck Paletta Estate C/O Tony Paletta, G. Diane Sullivan Well number 2

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	94.00	NA	Y
Surface	17 1/2"	13 3/8"	585'	New	54.50	120'	Y
Coal	NA	NA	NA	NA	NA	NA	NA
Intermediate 1	12 1/4"	9 5/8"	2,649'	New	40	NA	Y
Intermediate 2	NA	NA	NA	NA	NA	NA	NA
Intermediate 3	NA	NA	NA	NA	NA	NA	NA
Production	8 1/2"	5 1/2"	12,069.9'	New	20	NA	N
Tubing	NA	NA	NA	NA	NA	NA	NA
Packer type and depth set		NA					

Comment Details Cement to surface on Conductor, Surface, and Intermediate. Top of Cement at 1,518'

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	210	15.60	1.20	252	Surface	8+
Surface	A	540	15.60	1.22	658.8	Surface	8+
Coal	NA	NA	NA	NA	NA	NA	NA
Intermediate 1	A	536/172	14.50/15.70	1.55/1.29	830.8/221.88	Surface	8+
Intermediate 2	NA	NA	NA	NA	NA	NA	NA
Intermediate 3	NA	NA	NA	NA	NA	NA	NA
Production	A	880/1075	13.8/15.00	1.33/1.30	1170.4/1397.5	1,518'	8+
Tubing	NA	NA	NA	NA	NA	NA	NA

Drillers TD (ft) 12,076

Loggers TD (ft) NA

Deepest formation penetrated Marcellus

Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) KOP of Curve at 6420, No Plug

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

24" - 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
Then every other joint to KOP. Every third joint from KOP to 2,500'; there will be no centralizers from 2,500' to surface.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS 22 stages, 880 perforations

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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Well number 2

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
		See Attached			

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 Attached						

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PRODUCING FORMATION(S)	DEPTHS	
Marcellus Shale	7145	TVD 7365 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	6912	0	6980	Sand/silt
Burket	6912	6937	6980	7012	Shale, gas
Tully	6937	6992	7012	7088	Limestone
Mahantango	6992	7145	7088	7365	Shale
Marcellus	7145	7166	7365	7422	Shale, gas
Purcell	7166	7184	7422	7473	Limestone, gas
Lower Marcellus	7184	7235	7473	12076	Shale, gas

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Please insert additional pages as applicable.

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

Logging Company NA
Address _____ City _____ State _____ Zip _____

Cementing Company Universal Well Services
Address 18360 Technology Dr Box 4 City Meadville State PA Zip 16335

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 [Signature] Title OPERATIONS MANAGER Date 8/22/17

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

Stage No.	Perforation Date	Perforated From MD Ft.	Perforated to MD Ft.	Number of Perforations
1	5/28/2017	7623	7785	40
2	5/27/2017	7823	7985	40
3	5/27/2017	8023	8185	40
4	5/27/2017	8223	8385	40
5	5/27/2017	8423	8585	40
6	5/26/2017	8623	8785	40
7	5/25/2017	8823	8985	40
8	5/25/2017	9023	9185	40
9	5/24/2017	9223	9385	40
10	5/24/2017	9423	9585	40
11	5/23/2017	9623	9785	40
12	5/23/2017	9923	9985	40
13	5/23/2017	10023	10185	40
14	5/22/2017	10223	10385	40
15	5/21/2017	10423	10585	40
16	5/21/2017	10623	10785	40
17	5/21/2017	10823	10985	40
18	5/20/2017	11023	11185	40
19	5/19/2017	11223	11385	40
20	5/19/2017	11423	11585	40
21	5/18/2017	11623	11785	40
22	5/15/2017	11823	11982	40

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Formation(s)
Marcellus Shale
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Stage Number	Stimulation Date	Average Rate (bpm)	Average Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Sand Volume (lbs)	Water Volume (Bbls)
1	5/18/2017	77	8031	8852	4066	499080	12098
2	5/18/2017	76	8177	7310	5066	212260	10292
3	5/19/2017	80	7691	6240	4649	499460	11128
4	5/19/2017	80	7505	6205	4780	505480	10749
5	5/20/2017	79	7901	7273	5182	500600	10851
6	5/20/2017	81	7601	6736	4971	503700	9656
7	5/21/2017	79	7597	6075	5017	499840	9588
8	5/22/2017	77	7537	6252	5039	504080	10893
9	5/22/2017	79	7488	6507	4802	500300	11310
10	5/23/2017	79	7559	6529	4876	500640	8975
11	5/23/2017	80	732	6863	5474	500700	9064
12	5/23/2017	80	7595	6248	4858	498520	8861
13	5/24/2017	79	7380	6737	5086	505240	10098
14	5/24/2017	76	7988	6464	4857	501240	12410
15	5/25/2017	80	7415	6532	4834	507440	12017
16	5/25/2017	76	7418	6333	5174	500560	10948
17	5/26/2017	80	7371	6998	5314	503540	9688
18	5/27/2017	79	7396	6361	5015	501260	11094
19	5/27/2017	77	7396	6404	4926	500300	11036
20	5/28/2017	78	7586	7470	4886	500020	9864
21	5/28/2017	79	7190	6433	4991	500640	10422
22	5/29/2017	80	7337	6291	5364	499780	8795

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/18/2017
Job End Date:	5/29/2017
State:	West Virginia
County:	Harrison
API Number:	47-033-05767-00-00
Operator Name:	Arsenal Resources
Well Name and Number:	Paletta 2H
Latitude:	39.21089000
Longitude:	-80.36710000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,237
Total Base Water Volume (gal):	9,783,354
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	87.88656	None
Sand (Proppant)	Keane	Proppant	Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	11.56650	None
Hydrochloric Acid (7.5%)	Keane	Acid Inhibitor	Water	7732-18-5	92.50000	0.39285	None
			Hydrochloric Acid	7647-01-0	7.50000	0.03185	None
KFR-16FW	Keane	Friction Reducer	Water	7732-18-5	60.00000	0.05744	None
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01915	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00144	None
			ammonium chloride	12125-02-9	1.50000	0.00144	None
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00096	None
MBC-516	Keane	Biocide	Water	7732-18-5	56.70000	0.00498	None
			Glutaral	111-30-8	26.70000	0.00234	None

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			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00070	None
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00047	None
			ethonal	64-17-5	2.80000	0.00025	None
KL-SI-21	Keane	Scale Inhibitor					
			polyphosphoric acids, esters with triethanolamine, sodium salts	68131-72-6	30.00000	0.00461	None
KAI-12	Keane	Acid Inhibitor					
			Ethylene glycol	107-21-1	40.00000	0.00095	None
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00047	None
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00024	None
			formic acid	64-18-6	10.00000	0.00024	None
			Ethoxylated alcohol	68131-39-5	10.00000	0.00024	None
			Cinnamaldehyde	104-55-2	10.00000	0.00024	None
			isoproyl alcohol	67-63-0	5.00000	0.00012	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	0.39285	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01915	
			Glutaral	111-30-8	26.70000	0.00234	
			oleic acid diethanolamide	93-83-4	1.50000	0.00144	
			ammonium chloride	12125-02-9	1.50000	0.00144	
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00096	
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00070	
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00047	
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00047	
			ethonal	64-17-5	2.80000	0.00025	
			formic acid	64-18-6	10.00000	0.00024	
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00024	
			Cinnamaldehyde	104-55-2	10.00000	0.00024	
			Ethoxylated alcohol	68131-39-5	10.00000	0.00024	
			isoproyl alcohol	67-63-0	5.00000	0.00012	
			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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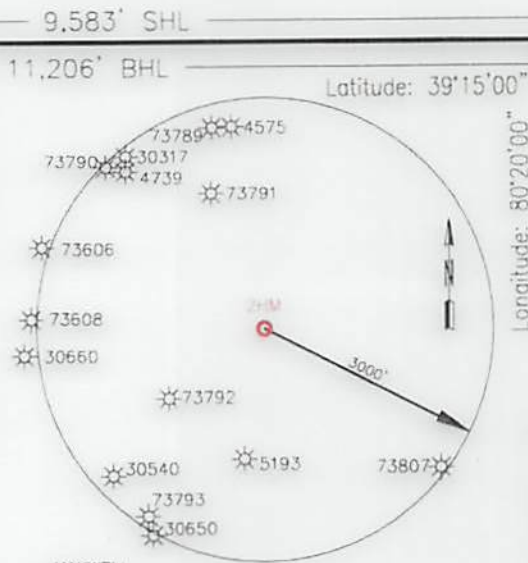
THRASHER

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
- 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.

8102/9/10

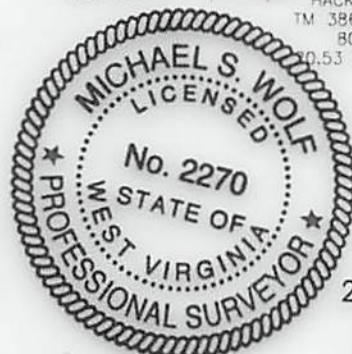


AS-DRILLED COORDINATES	
SURFACE HOLE LOCATION (SHL):	
UTM (NAD83, ZONE 17, METERS):	NORTHING: 4,340,239.02
	EASTING: 554,637.30
LANDING POINT LOCATION (LPL):	
UTM (NAD83, ZONE 17, METERS):	NORTHING: 4,340,349.39
	EASTING: 554,596.41
BOTTOM HOLE LOCATION (BHL):	
UTM (NAD83, ZONE 17, METERS):	NORTHING: 4,341,601.33
	EASTING: 554,132.99

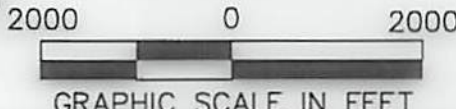


PROPOSED COORDINATES:	
SURFACE HOLE LOCATION (SHL):	
UTM (NAD83, ZONE 17, METERS):	NORTHING: 4,340,239.02
	EASTING: 554,637.30
LANDING POINT LOCATION (LPL):	
UTM (NAD83, ZONE 17, METERS):	NORTHING: 4,340,500.70
	EASTING: 554,529.12
BOTTOM HOLE LOCATION (BHL):	
UTM (NAD83, ZONE 17, METERS):	NORTHING: 4,341,604.99
	EASTING: 554,124.23

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.



LINE	BEARING	DISTANCE
L1	S86°10'43"E	487.67'
L2	S23°37'40"W	756.81'
L3	N85°48'29"W	478.81'
L4	N23°04'17"E	750.93'
T1	S73°45'05"W	1230.72'
T2	N73°29'25"W	1667.43'



P.S. 2270 *ACAS WJZ 8/1/17*

<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 ELEVATION: GRADE GPS (NAVD 88, US FT)</p>	<p>OPERATOR'S WELL #: PALETTA PAD 2HM</p> <p>API WELL #: 47 033 05767</p> <p>STATE COUNTY PERMIT</p>
	<p>WELL TYPE: OIL WASTE DISPOSAL PRODUCTION DEEP GAS LIQUID INJECTION STORAGE SHALLOW</p> <p>WATERSHED: WEST FORK RIVER</p> <p>DISTRICT: UNION COUNTY: HARRISON</p> <p>SURFACE OWNER: DOMINECK PALETTA, ESTATE</p> <p>OIL & GAS ROYALTY OWNER: DOMINECK PALETTA ESTATE C/O TONY PALETTA, DIANE G. SULLIVAN</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 X (SPECIFY) AS-DRILLED</p> <p>TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,236' (VD 12,076' IMD)</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 EXTENTION #300</p> <p>CITY: WEXFORD STATE: WV 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 --- AS-DRILLED PATH --- PROPOSED PATH 	<p>REVISIONS:</p> <p>DATE: 07-25-2017</p> <p>DRAWN BY: R. DOERR</p> <p>SCALE: 1" = 2000'</p> <p>DRAWING NO: 030-3243</p> <p>WELL LOCATION PLAT</p>