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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Friday, July 13, 2018  
WELL WORK PERMIT  
Horizontal 6A / New Drill

ARSENAL RESOURCES LLC  
6031 WALLACE ROAD EXTENSION SUITE 603

WEXFORD, PA 15090

Re: Permit approval for Mackey Wolfe 211  
47-001-03361-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin  
Chief

A handwritten signature in blue ink, appearing to read 'James A. Martin', is written over the printed name and title.

Operator's Well Number: Mackey Wolfe 211  
Farm Name: Margaret Wolfe Mackey & John I  
U.S. WELL NUMBER: 47-001-03361-00-00  
Horizontal 6A New Drill  
Date Issued: 7/13/2018

# PERMIT CONDITIONS 4700103361

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

## CONDITIONS

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

# PERMIT CONDITIONS

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to [DEPOOGNotify@wv.gov](mailto:DEPOOGNotify@wv.gov).

WW-6B  
(04/15)

API NO. 47-001 -  
OPERATOR WELL NO. Mackey Wolfe 211  
Well Pad Name: Mackey Wolfe

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WELL WORK PERMIT APPLICATION

1) Well Operator: Arsenal Resources      494519412      Barbour      Cove      Thornton  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Mackey Wolfe 211      Well Pad Name: Mackey Wolfe

3) Farm Name/Surface Owner: Margaret Wolfe Mackey (Life Est.) & John M. Wolfe      Public Road Access: CR 92

4) Elevation, current ground: 1626.00'      Elevation, proposed post-construction: 1626.00'

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal  \_\_\_\_\_

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Target Formation- Marcellus Shale, Top- 7801.0ft, Bottom- 7899.0ft, Anticipated Thickness- 98ft, Associated Pressure- 0.5 psi/ft

8) Proposed Total Vertical Depth: 7885.0ft

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17936.10 ft

11) Proposed Horizontal Leg Length: 9249.86 ft

12) Approximate Fresh Water Strata Depths: ✓ 150', 218', 313', 327', 372', 423', 539', 735', 750' ✓

13) Method to Determine Fresh Water Depths: Offsetting well reported water depths (001-02940, 001-02941, 001-02942, 001-02943, 001-03062)

14) Approximate Saltwater Depths: 1700 ft ✓

15) Approximate Coal Seam Depths: Bakerstown- 155ft, Brushcreek- 275ft, Upper Freeport- 335ft, Lower Freeport- 375ft, Upper Kittanning- 440ft, Middle Kittanning- 530ft, Lower Kittanning- 535ft

16) Approximate Depth to Possible Void (coal mine, karst, other): None Known

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine?      Yes \_\_\_\_\_ No None Known

(a) If Yes, provide Mine Info: Name: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

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(04/15)

4700103361  
 API NO. 47-001  
 OPERATOR WELL NO. Mackey Wolfe 211  
 Well Pad Name: Mackey Wolfe

18)

**CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	24	New	H-40	94	80	80 ✓	CTS
Fresh Water	13.375	New	J-55	54.5	825	825 ✓	
Coal							
Intermediate	9.625	New	J-55	40	1,930	1,930 ✓	CTS
Production	5.5	New	P-110	20	17,936	17,936	TOC @ 1,780
Tubing							
Liners							

*Ernest L. Dwyer*  
3-6-18

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	24	36			0	Class A, 3% CaCl <sub>2</sub>	1.2
Fresh Water	13.375	17.5	0.38	2,730	900	Class A, 3% CaCl <sub>2</sub>	1.2
Coal							
Intermediate	9.625	12.25	0.395	3,950	1,500	Class A, 3% CaCl <sub>2</sub>	1.29
Production	5.5	8.5-8.75	0.361	12,640	9,500	Class A/50 50 Poz	1.29/1.34
Tubing					5,000		
Liners					N/A		

**PACKERS**

Kind:				
Sizes:				
Depths Set:				

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

The well will be started with a conductor rig drilling a 36" hole to Conductor programmed depth then running 24" casing and circulate cement back to surface. The conductor rig will move out and the drilling rig will move in and rig up. The drilling rig will then spud a 17 1/2" hole and drill to fresh water casing (Surface) to the programmed depth, Run 13- 3/8" casing and cement to surface. The rig will continue drilling a 12- 1/4" intermediate hole to the programmed depth, run 9- 5/8" casing and cement to surface. The rig will then continue to drill an 8- 3/4" hole to a designed KOP. We will then start drilling the curve and lateral section to the programmed total measured depth, run 5 1/2" casing and cement according to the program.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

The well will be completed using a plug and perforation method and stimulated with a slickwater and sand slurry. The anticipated maximum rate will be 90 bpm and the maximum pressure will be 9,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 3.90

22) Area to be disturbed for well pad only, less access road (acres): 3.90

23) Describe centralizer placement 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 curve. Then every other joint to KOP. Every third joint from KOP to 2,030'; there will be no centralizers from 2,030 to surface.

24) Describe all cement additives associated with each cement type:

24" will be grouted from surface. The 13 3/8" casing will be cemented to surface with Class A cement and no greater than 3% CaCl (calcium chloride). The 9 5/8" casing will be cemented to surface with Class A cement, & no greater than 3% calcium chloride. The 5 1/2" production string will be cemented back to 1,780' (+/- 150' above the casing shoe for the 9 5/8") with Class A and 50/50 Poz cement retarded (to extend pumpability) cellophane flaked for fluid loss, Bentonite gel as an extender (increased pumpability and fluid loss), a defoaming agent to decrease cement foaming during mixing to insure the cement is of proper weight to placement and possibly gypsum gas blocking additive to aid in blocking/gas migration (in combination with other additive mentioned here, helps cement achieve a "right angle" set) during the plastic phase of the cement set-up.

25) Proposed borehole conditioning procedures:

Top holes will be drilled with fresh water to KOP. At KOP, the wellbore will be loaded with synthetic oil based mud, barite-weighted mud system with such properties as to build a filter-cake on the bore-hole. This will provide lubricity as well as stabilizing the well bore. We will begin rotating the drill string and mud will be circulated upon reaching TD until no further cuttings are observed coming across the shaker screens. Once clean mud is circulated back to surface, we will pull three stands of drill pipe, load the hole, pull three stands and load the hole. The weight indicator on the rig will be monitored for any occurrences of drag and if any, additional hole cleaning efforts will be applied to that section of the well.

\*Note: Attach additional sheets as needed.

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## Purpose

The purpose of this pad-specific Hydraulic Fracturing Monitoring Plan is to identify and notify conventional well operators near Arsenal Resources hydraulic fracturing in Barbour County, WV prior to hydraulic fracturing at the Mackey Wolfe 211 pad.

Due to the apparent presence of unique geological conditions, the potential for communication between deep geologic zones exists in this area. This potential communication, via natural gas, water, or both, may occur between hydraulically fractured wells in the Marcellus formation (approximately 7,900' TVD) and existing conventional natural gas wells in the partially-depleted, relatively high permeability Elk Sand formations (approximately 5,900' TVD).

The plan is being implemented as an additional safety measure to be utilized in conjunction with best management practices and emergency action plans for this site. These additional measures include pre-notification of conventional well operators of the timing and location of the hydraulic fracturing, establishment of measures conventional well operators should implement, and assurance that the Division of Oil and Gas is notified of the timeline, as well as any issues that may arise during fracturing.

### 1. Communications with Conventional Operators.

Arsenal Resources, using available data (WV Geological Survey, WVDEP Website, and IHS data service), has identified all known conventional wells and well operators within 500 feet of this pad and the lateral sections. A map showing these wells along with a list of the wells and operators is included in Attachment A.

Upon approval of this plan, Arsenal Resources will notify these operators, via letter, of the hydraulic fracturing schedule for these wells. A copy of this letter is included in Attachment B.

The letter provides recommendations to these conventional operators to 1) increase their monitoring of their wells during that time period, 2) ensure that their well head equipment is sound, and 3) provide immediate notification to Arsenal Resources and the OOG in the event of any changes in their well conditions.

Specifically, the letter recommends that conventional well operators conduct the following activities during and after fracturing operations:

1. Inspect their surface equipment prior to fracturing to establish integrity and establish pre-frac well conditions.
2. Observe wells closely during and after fracturing and monitor for abnormal increases in water, gas or pressure.
3. Inspect or install master valves rated to 3,000 psi or other necessary equipment for wellhead integrity.
4. Notify the OOG and ARSENAL RESOURCES if any changes in water, gas production, pressure or other anomalies are identified.

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## 2. Reporting

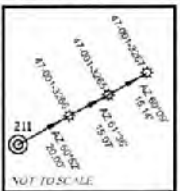
Arsenal Resources will provide information relating to the hydraulic fracturing schedule, communication with conventional operators, and ongoing monitoring of the work upon request of OOG or immediately after any event of any noted abnormalities.

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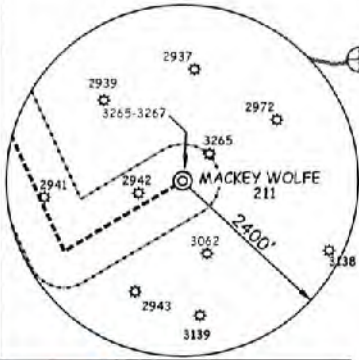
**NOTES ON SURVEY**  
 1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. 2. ONE DWELLING IS LOCATED WITHIN 625' OF THE CENTER OF WELL PAD. 3. WELL SPOT CIRCLE & 2" TOPO MARK SCALE IS 1"=2000'

**MACKEY WOLFE PAD LAYOUT**



**ARSENAL RESOURCES  
MACKEY WOLFE 211**  
 (S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD'83 S.P.C.(FT) N. 275,369.0 E. 1,659,966.3  
 NAD'83 GEO. LAT-(N) 39.255388 LONG-(W) 79.866741  
 NAD'83 UTM (M) N. 4,345,708.5 E. 506,052.8  
**LANDING POINT**  
 NAD'83 S.P.C.(FT) N. 274,087.00 E. 1,857,110.4  
 NAD'83 GEO. LAT-(N) 39.254320 LONG-(W) 79.893360  
 NAD'83 UTM (M) N. 4,345,582.6 E. 595,483.1  
**BOTTOM HOLE**  
 NAD'83 S.P.C.(FT) N. 283,411.4 E. 1,853,288.8  
 NAD'83 GEO. LAT-(N) 39.277400 LONG-(W) 79.909990  
 NAD'83 UTM (M) N. 4,348,130.0 E. 594,276.1

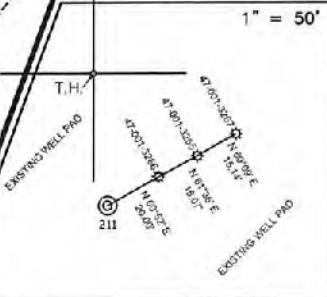
LAW	SURFACE OWNER	TAX MAP - PCL	ACREAGE
A	MARGARET WOLFE MACKEY (LIFE EST.) & JOHN M. WOLFE	7-21	229.935±
B	CATHARINE WOLFE	7-21.1	2.92±
C	MARGARET WOLFE MACKEY (LIFE EST.) & JOHN M. WOLFE	7-21.2	1.665±
D	STATE OF WV		
E	MORGANTOWN-SHEPHERD TOWNSHIP	7-21.3	27.65±
F	TAMUS PIZZER	7-10	89.98±
G	SCOTT & DENISE HARBINGER	7-11.1	187.80±
H	CATHARINE WOLFE	7-11	86±
I	DAVID & MARY KEENER	7-4	64±
J	ZACKARY BERGDORF	7-5	63.15±
K	GREGORY & LISA LOCK	4-5	10±
L	RUSSELL KEENER	4-5	74.80±
M	ZACKARY BERGDORF ET AL	4-2	41.53±
N	DELMAS PIZZER ET AL	4-4	99±



**LEGEND**

LEASE LINE	
SURFACE LINE	
WELL LATERAL	
500' OFFSET LINE	
THE LINE	
CREEK	
ROAD	
FENCE LINE	
COUNTY ROUTE	
STATE ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
LEASE TAG	

**REFERENCES**



**SLS**  
 Land & Energy Development  
 Solutions from the ground up.  
 P.O. Box 150 • 17 James Drive • Glenville, WV 26031 • (304) 462-9034  
 www.slsenergy.com



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 THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 *Gregory A. Smith*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE MARCH 2, 20 18  
 REVISED \_\_\_\_\_  
 OPERATORS WELL NO. MACKEY WOLFE 211  
 API WELL NO. 47  
 STATE \_\_\_\_\_ COUNTY \_\_\_\_\_ PERMIT \_\_\_\_\_

MINIMUM DEGREE OF ACCURACY 1/2500 FILE NO. 7968NP211.dwg  
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA  
 DIVISION OF ENVIRONMENTAL PROTECTION  
 OFFICE OF OIL AND GAS

**WELL TYPE:** OIL \_\_\_\_\_ GAS X INJECTION \_\_\_\_\_ WASTE DISPOSAL \_\_\_\_\_ IF "GAS" PRODUCTION X STORAGE \_\_\_\_\_ DEEP \_\_\_\_\_ SHALLOW X

**LOCATION:**  
 ELEVATION 1,526' WATERSHED LITTLE COVE RUN  
 DISTRICT COVE COUNTY BARBOUR QUADRANGLE THORNTON 7.5'

**SURFACE OWNER:** MARGARET WOLFE MACKEY (LIFE EST.) & JOHN M. WOLFE ACREAGE 226.185±  
**ROYALTY OWNER:** MARGARET WOLFE MACKEY (LIFE EST.) & JOHN M. WOLFE ET AL ACREAGE 226.185±

**PROPOSED WORK:** LEASE NO. \_\_\_\_\_  
 DRILL X CONVERT \_\_\_\_\_ DRILL DEEPER \_\_\_\_\_ REDRILL \_\_\_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_\_\_ PERFORATE NEW FORMATION \_\_\_\_\_ PLUG AND ABANDON \_\_\_\_\_ CLEAN OUT AND REPLUG \_\_\_\_\_ OTHER \_\_\_\_\_  
 PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
 ESTIMATED DEPTH 17,936.1' TMD / 7,885' TVD

**WELL OPERATOR:** ARSENAL RESOURCES **DESIGNATED AGENT:** WILLIAM VEIGEL  
**ADDRESS:** 6031 WALLACE RD. EXT. SUITE 300 **ADDRESS:** 65 PROFESSIONAL PLACE  
WEXFORD, PA 15090 BRIDGEPORT, WV 26330

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AOR-ATTACHMENT "A"

Area of Review Report - **Mackey Wolfe** Pad, **211** Lateral, **Barbour** County, WV

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Well Name	API Number	Operator Name / Address	Well Type	Latitude	Longitude	Total Depth	Perforated Formation(s)	Producing Zones not Perforated
Mackey-Wolfe 5	001-02940	Diversified Resources, Inc	Active	39.256329	-79.885496	5662	Balltown, Benson, Alexander, Elk	NA
Mackey-Wolfe 6	001-02941	Diversified Resources, Inc	Active	39.254932	-79.893262	5666	Balltown, Alexander, Elk	NA
Mackey-Wolfe 7	001-02942	Diversified Resources, Inc	Active	39.254932	-79.888972	5582	Alexander, Elk	NA
Mackey-Wolfe 3	001-02938	Diversified Resources, Inc	Active	39.258412	-79.894941	5752	Balltown, Alexander, Elk	NA
Harshberger 6	001-02916	Diversified Resources, Inc	Active	39.261457	-79.89718	5583	Speechley, Balltown, Elk	NA
Harshberger 4	001-02934	Diversified Resources, Inc	Active	39.258557	-79.899604	5772	Speechley, Elk	NA
Harshberger 10R	001-03258	Diversified Resources, Inc	Active	39.263897	-79.898786	5576	Balltown, Alexander, Elk	NA
Harshberger 2	001-02932	Diversified Resources, Inc	Active	39.269287	-79.9011	5732	Balltown, Elk	NA
Arthur Harker 2	001-03205	Diversified Resources, Inc	Active	39.271951	-79.903871	5478	Balltown, Benson, Elk	NA
Arthur Harker 1	001-03204	Diversified Resources, Inc	Active	39.2753	-79.904191	5600	Alexander, Elk	NA
G&J Akers 1	001-02926	Diversified Resources, Inc	Active	39.278567	-79.906888	5836	Speechley, Benson, Alexander, Elk	NA

7,885 lvd

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AOR - ATTACHMENT "A"





4700103361

Click or tap to enter a date.

**Diversified Resources**

Address

State

RE: Mackey Wolfe 211

Dear Sir/Madam,

Arsenal Resources has developed a Marcellus pad Mackey Wolfe 211, located in Barbour County, WV. As an owner or operator of conventional natural gas wells in this area, we are requesting your assistance in this matter.

Due to the apparent presence of unique geological conditions, the potential for communication between deep geologic zones exists in this area. This potential communication, via natural gas, water, or both, may occur between hydraulically fractured wells in the Marcellus formation (approximately 7,900 TVD) and existing conventional natural gas wells included in the attached well list for which you are believed to be the operator.

Arsenal Resources anticipates conducting hydraulic fracturing at the Mackey Wolfe 211 Pad during the **Quarter of 2018**. We have identified conventional natural gas wells operated by your company within 500' (lateral distance) of our newly planned wells. Plats for each well on this pad are attached.

We recommend that conventional well operators conduct the following activities before, during and after fracturing operations:

1. Inspect surface equipment, prior to fracturing, to establish integrity and establish well conditions.
2. Observe wells closely during and after fracturing and monitor for abnormal increases in water, gas, or pressure.
3. Inspect or install master valves rated to 3,000 psi or other necessary equipment for wellhead integrity.
4. Notify the OOG and Arsenal Resources if any changes in water, gas production, pressure or other anomalies are identified.

Please feel free to contact me at 724-940-1224 with any questions or comments. You may also contact the WV Office of Oil and Gas at 304-926-0499.

Sincerely,

Carolinda Flanagan  
Permitting Specialist

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AOR - ATTACHMENT "B"



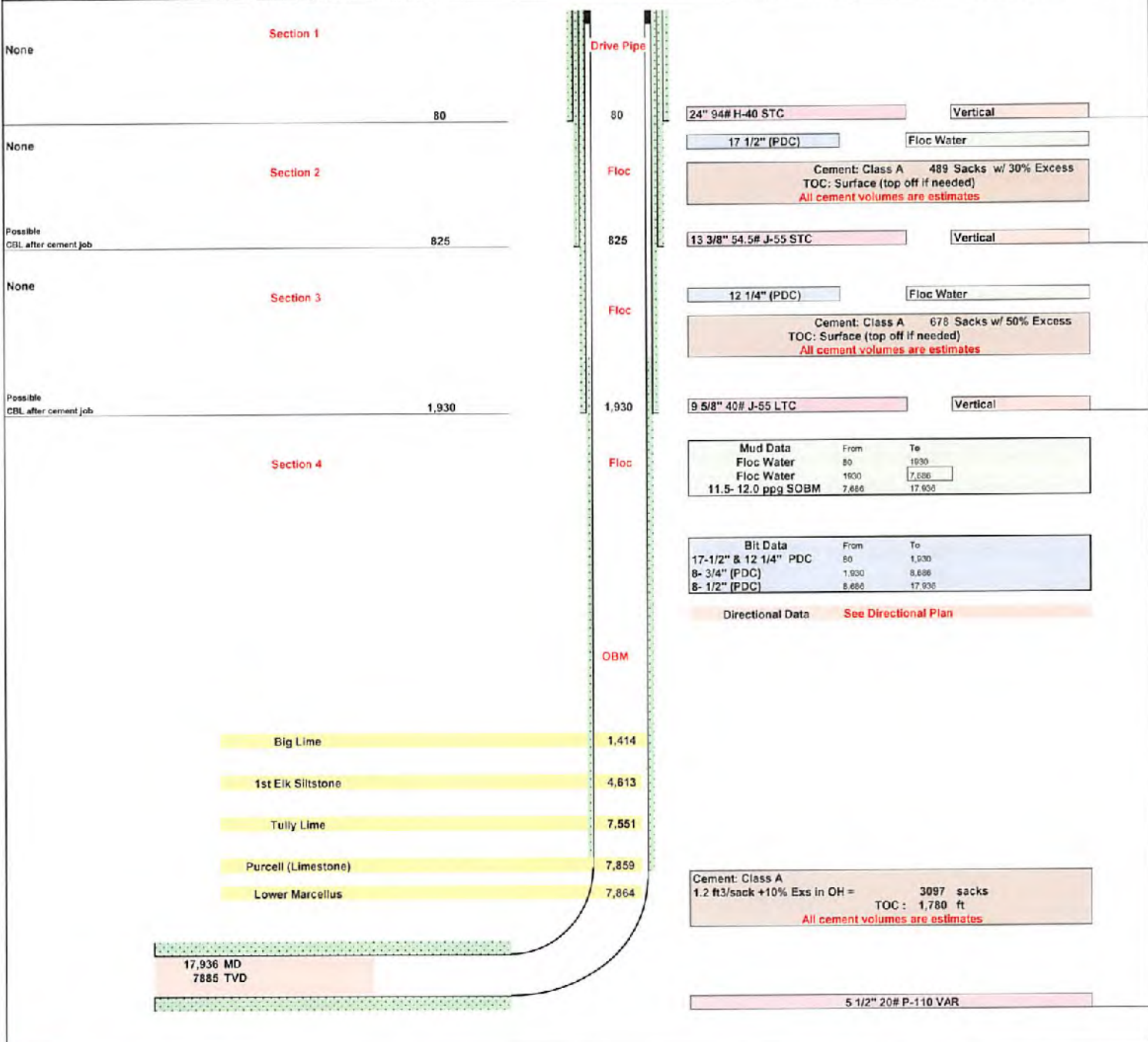
Arsenal Resources  
 Mackey Wolfe 211  
 Casing Design  
 Directional Plan # 1 QES

4700103361

Other Names:	N/A
Surface Location:	TBD
Bottom Hole Location:	TBD
Total Depth:	17,936 MD (ft) 7,885 TVD (ft)

County:	Barbour
State:	West Virginia
AFE #:	XX   API #: XX
RKB:	27
Ground Level:	1,626

Logs	Significant Formations (TVD)	Depth (ft) MD	Depth (ft) TVD	Hole Size	Casing and Cement	Mud	Directional & Surveys Data / Csn Point
------	------------------------------	---------------	----------------	-----------	-------------------	-----	--



Revision 1  
 Note: Not drawn to scale  
 Cement Outside Casing Seal Assembly in Annulus  
 Date Last Revised: 5-Mar-18  
 Jarrett Toms

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<b>Mackey Wolfe #211</b>		
<b>CEMENT ADDITIVES</b>		
	<b>Name</b>	<b>Purpose</b>
Additive #1:	Bentonite	Helping fluid loss, reducing free water
Additive #2:	Calcium Chloride	Accelerator for low temp application
Additive #3:	Celloflake	Loss circulation additive
Additive #4:	Gypsum	Used for thixotropic properties
Additive #5:	Lignosulfonate	Low temp cement retarder
Additive #6:	Naphthalene Based Dispersant	Used to improve rheological properties of cement
Additive #7:	Cellulose	Help with fluid loss

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WW-9  
(4/16)

API Number 47 - 001 - \_\_\_\_\_  
Operator's Well No. Mackey Wolfe 211

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Arsenal Resources OP Code 494519412

Watershed (HUC 10) Tributary of Little Cove Run Quadrangle Thornton

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: \_\_\_\_\_

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? \_\_\_\_\_

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_ )
- Reuse (at API Number Various)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

Will closed loop system be used? If so, describe: Yes, the closed loop system will contain all of the drilling medium and drill cuttings on location and then be taken to a landfill. ✓

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Vertical: Freshwater, Horizontal: Oil Based Mud ✓

-If oil based, what type? Synthetic, petroleum, etc. Synthetic ✓

Additives to be used in drilling medium? Bentonite, Soap & Polymer Sticks, Soda Ash, Sodium Bicarbonate, Defoamer, Base Oil, Emulsifiers, Lime, Barite ✓

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill ✓

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Meadowfill Landfill/Waste Management, Westmoreland Sanitary Landfill, and Apex Landfill ✓

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature *William Veigel*  
Company Official (Typed Name) William Veigel  
Company Official Title Designated Agent

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Subscribed and sworn before me this 6<sup>TH</sup> day of MARCH, 20 18

*Carolinda J. Lang*  
My commission expires 9/15/2021

Notary Public  
OFFICIAL SEAL  
NOTARY PUBLIC  
STATE OF WEST VIRGINIA  
CAROLINDA FLANAGAN  
PO Box 803  
Lumberport WV 26386  
My Commission Expires September 15, 2021

WV Department of  
Environmental Protection

Arsenal Resources

Proposed Revegetation Treatment: Acres Disturbed 3.90 Prevegetation pH 6.5

Lime 2 Tons/acre or to correct to pH 7

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	129	Orchard Grass	129
Rye	93	Rye	93
Clover	24	Clover	24
Timothy	45	Timothy	45

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: Re-seed and mulch all disturbed areas as soon as reasonably possible per regulation. Upgrade erosion and sediment control measures where needed per the West Virginia Erosion and Sediment Control Field Manual.

Title: OIL + GAS INSPECTOR

Date: 3-6-18

Field Reviewed? (X) Yes ( ) No

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**ARSENAL**

R E S O U R C E S

## **SITE SAFETY PLAN**

### **MACKEY WOLFE #211 WELL PAD**

**911 Address:**

**18394 Morgantown Pike  
Moatsville WV 26405**

A handwritten signature in blue ink, appearing to read "Ernest L. Reynolds".

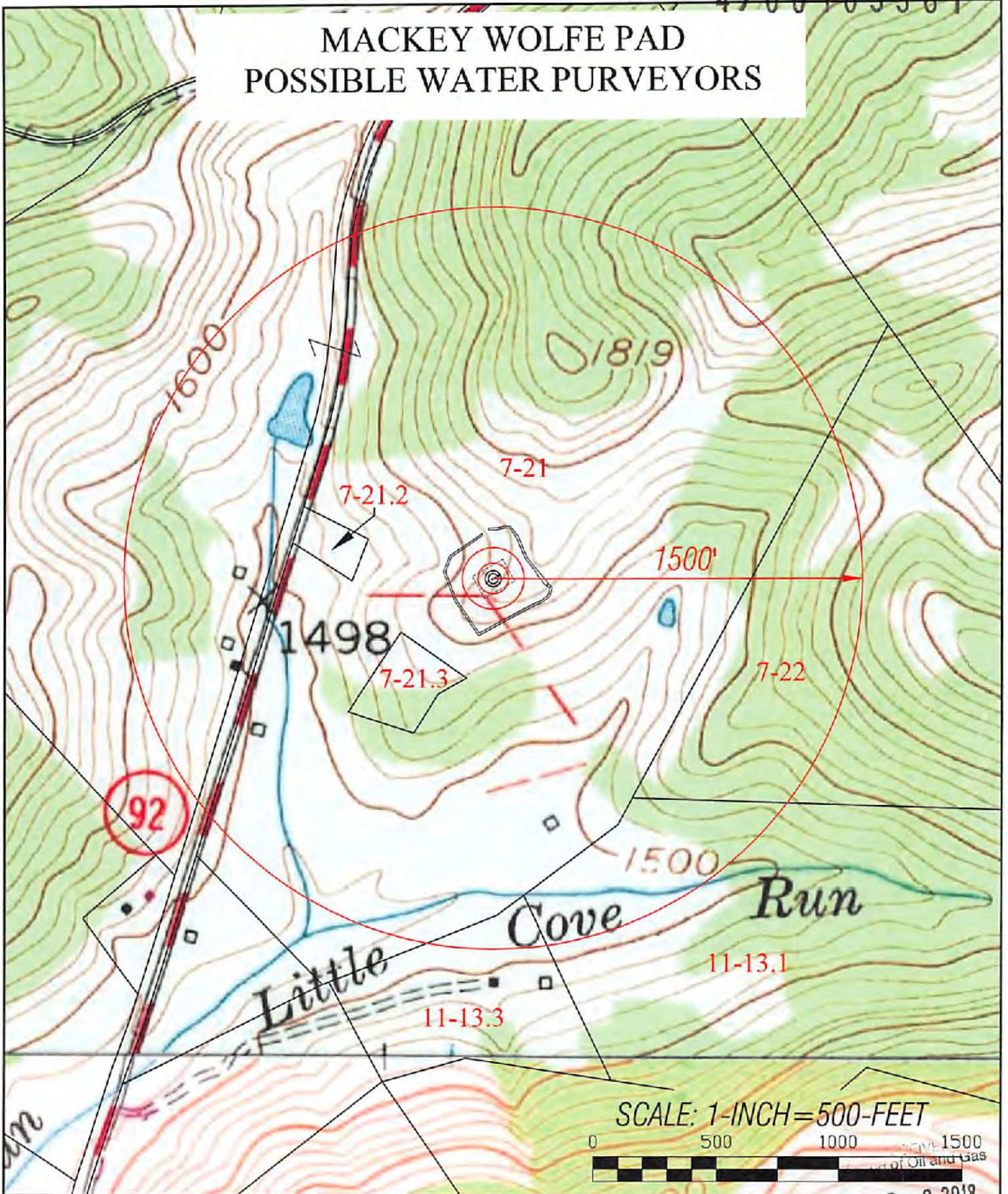
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# MACKEY WOLFE PAD POSSIBLE WATER PURVEYORS



TOPO SECTIONS OF:  
THORNTON & NESTORVILLE  
WV 7.5' QUADS

OPERATOR:  
ARSENAL RESOURCES  
65 Professional Place, Suite 200  
Bridgeport, WV 26330

DRAWN BY: K.G.M.	FILE NO. 7968	DATE 02-28-18	CADD FILE: 7968WATERPURVEYORS.DWG
---------------------	------------------	------------------	--------------------------------------

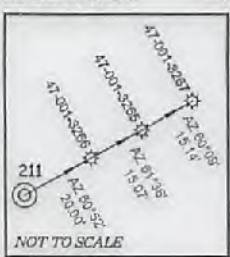
COUNTY BARBOUR	DISTRICT COVE
-------------------	------------------



**NOTES ON SURVEY**

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL.
- ONE DWELLING IS LOCATED WITHIN 625' OF THE CENTER OF WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE (SHELDON) 1"=2000'

**MACKEY WOLFE PAD LAYOUT**



**ARSENAL RESOURCES  
MACKEY WOLFE 211**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 275,369.0	E. 1,859,986.3
NAD'83 GEO.	LAT-(N) 39.255388	LONG-(W) 79.886741
NAD'83 UTM (M)	N. 4,345,706.5	E. 596,052.8

**LANDING POINT**

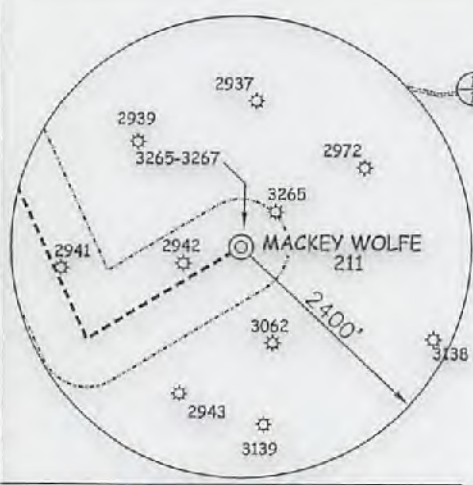
NAD'83 S.P.C.(FT)	N. 274,987.90	E. 1,857,110.4
NAD'83 GEO.	LAT-(N) 39.254320	LONG-(W) 79.893360
NAD'83 UTM (M)	N. 4,345,582.9	E. 595,483.1

**BOTTOM HOLE**

NAD'83 S.P.C.(FT)	N. 283,411.4	E. 1,853,288.8
NAD'83 GEO.	LAT-(N) 39.277400	LONG-(W) 79.906990
NAD'83 UTM (M)	N. 4,348,130.0	E. 594,276.1

NAD'83 GRID NORTH

TAG	SURFACE OWNER	TAX MAP / PCL.	ACREAGE
A	MARGARET WOLFE MACKEY (LIFE EST) & JOHN M. WOLFE	7-21	226.815±
B	CATHARINE WOLFE	7-21.3	2.32±
C	MARGARET WOLFE MACKEY (LIFE EST) & JOHN M. WOLFE	7-21.2	1.86±
D	STATE OF WV MORGANTOWN-BEVERLY TURNPIKE		
E	HAZEL N. WOLFE HEIRS	7-21.1	27.65±
F	JAMES PITZER	7-10	89.98±
G	SCOTT & DENISE HARSHBERGER	7-11.3	187.83±
H	CATHARINE WOLFE	7-13	65±
I	DAVID & MARY KEENER	7-4	64±
J	ZACKARY BERGDORF	7-3	65.15±
K	GREGORY & LISA LOOK	4-5.1	10±
L	RUSSELL KEENER	8-5	74.80±
M	ZACKARY BERGDORF ET AL.	4-6.2	41.53±
N	DELMAS PITZER ET AL.	4-4	99±



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www.slsurveys.com

**LEGEND**

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- FENCE LINE
- COUNTY ROUTE
- STATE ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- LEASE TAG

**REFERENCES**

1" = 50'

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 THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S.  
677 Gregory A. Smith



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE MARCH 2, 20 18  
REVISED \_\_\_\_\_  
OPERATORS WELL NO. MACKEY WOLFE 211  
API WELL NO. 47 - 001 - 03361  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7968NP211.dwg  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

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

LOCATION:  
ELEVATION 1,626' WATERSHED LITTLE COVE RUN  
DISTRICT COVE COUNTY BARBOUR QUADRANGLE THORNTON 7.5'

SURFACE OWNER MARGARET WOLFE MACKEY (LIFE EST) & JOHN M. WOLFE ACREAGE 226.185±  
ROYALTY OWNER MARGARET WOLFE MACKEY (LIFE EST) & JOHN M. WOLFE ET AL. ACREAGE 226.185±  
LEASE NO. \_\_\_\_\_

PROPOSED WORK:  
DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER \_\_\_\_\_

PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
ESTIMATED DEPTH 17,936.1' TMD / 7,885' TVD

WELL OPERATOR ARSENAL RESOURCES DESIGNATED AGENT WILLIAM VEIGEL  
ADDRESS 6031 WALLACE RD. EXT. SUITE 300 ADDRESS 65 PROFESSIONAL PLACE  
WEXFORD, PA 15090 BRIDGEPORT, WV 26330

B.H. LONGITUDE 79°52'30"

13,214' T.H.

COUNTY NAME

PERMIT



WW-6A1  
(5/13)

Operator's Well No. Mackey Wolfe 211

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
----------------------	-----------------------	-----------------------	---------	-----------

See Attached

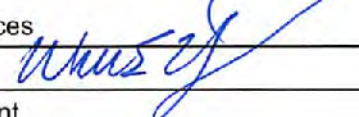
**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

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The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Arsenal Resources  
 By: William Veigel   
 Its: Designated Agent

**Attachment to WW-6A1, Mackey Wolfe 211**

Letter Designation/Number Designation on Plat	Grantor, Lessor, Assignor, etc.	Grantee, Lessee, Assignee, etc.	Royalty	Book/Page	Acreage
A	Margaret Mackey	Falcon Partners	0.125	145/391	237.54
	Falcon Partners	Mar Key, LLC		157/92	
A	John M. Wolfe	Falcon Partners	0.125	145/402	123.54
	Falcon Partners	Mar Key, LLC		157/92	
B	Margaret Mackey	Falcon Partners	0.125	145/391	237.54
	Falcon Partners	Mar Key, LLC		157/92	
B	John M. Wolfe	Falcon Partners	0.125	145/402	123.54
	Falcon Partners	Mar Key, LLC		157/92	
C	Margaret J. Mackey	Mar Key, LLC	0.125	157/578	1.865
C	John M. Wolfe	Mar Key, LLC		157/580	1.865
D	West Virginia Department of Transportation, Division of Highways	Mar Key, LLC	0.15	165/400	8.69
E	Bigelow Lodge #52 AF & AM	Falcon Partners	0.125	146/96	30
	Falcon Partners	Mar Key, LLC		164/338	
E	Carol Gill and Ruth Ann Carson	Falcon Partners	0.125	145/386	30

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**Attachment to WW-6A1, Mackey Wolfe 211**

Letter Designation/Number Designation on Plat	Grantor, Lessor, Assignor, etc.	Grantee, Lessee, Assignee, etc.	Royalty	Book/Page	Acreage
	Falcon Partners	Mar Key, LLC		164/338	
F	James Pitzer	Falcon Partners	0.125	146/607	86.94
	Falcon Partners	Mar Key, LLC		157/92	
F	Eric M. Freeman and Murl Ray Freeman	Falcon Partners	0.125	150/21	86.94
	Falcon Partners	Mar Key, LLC		157/92	
G	Scott L. Harshberger and Denise E. Harshberger, his wife	Falcon Partners	0.125	144/636	199.87
	Falcon Partners	Mar Key, LLC		157/92	
H	Catherine M. Wolfe and Dorwin J. Wolfe	Falcon Partners	0.125	145/396	65
	Falcon Partners	Mar Key, LLC		164/338	
I	David L. Keener and Mary L. Craig	Falcon Partners	0.125	146/428	73.56
	Falcon Partners	Mar Key, LLC		157/92	
J	Arthur L. Harker and Rosalea B. Harker	Falcon Partners	0.125	152/123	176.68
	Falcon Partners	Mar Key, LLC		157/92	
K	Robert W. Bruner and Wilma L. Bruner f/k/a Wilma L. Squires	Mar Key, LLC	0.15	163/233	84.8
K	Lowell F. Squires	Mar Key, LLC	0.15	163/246	84.8
K	Margaret A. Roy	Mar Key, LLC	0.15	160/9	84.8

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**Attachment to WW-6A1, Mackey Wolfe 211**

<b>Letter Designation/Number Designation on Plat</b>	<b>Grantor, Lessor, Assignor, etc.</b>	<b>Grantee, Lessee, Assignee, etc.</b>	<b>Royalty</b>	<b>Book/Page</b>	<b>Acreage</b>
K	Gregory S. Louk and Lesa S. Louk	Mar Key, LLC	0.15	159/107	10
L	Russel L. Keener, Jr.	Mar Key, LLC	0.15	159/104	74.8
L	Robert W. Bruner and Wilma L. Bruner f/k/a Wilma L. Squires	Mar Key, LLC	0.15	163/233	84.8
L	Lowell F. Squires	Mar Key, LLC	0.15	163/246	84.8
L	Margaret A. Roy	Mar Key, LLC	0.15	160/9	84.8
M	Arthur L. Harker and Rosalea B. Harker	Falcon Partners	0.125	152/123	176.68
	Falcon Partners	Mar Key, LLC		157/92	
N	John Haskiell and Peggy Haskiell	Falcon Partners	0.125	150/439	99
	Falcon Partners	Mar Key, LLC		164/338	
N	George D. Pitzer	Falcon Partners	0.125	146/371	99
	Falcon Partners	Mar Key, LLC		164/338	
N	Roy E. Pitzer	Falcon Partners	0.125	146/381	99
	Falcon Partners	Mar Key, LLC		164/338	

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**MAR 8 2018**  
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**Agreement to Drill, Complete and Operate Oil & Gas Wells**

This Agreement to Drill, Complete and Operate Oil & Gas Wells (this "Agreement"), by and among Mountaineer Keystone LLC, a West Virginia limited liability company ("Mountaineer Keystone"), PDC Mountaineer, LLC, a Delaware limited liability company ("PDC"), and PDC Mountaineer Holdings, LLC, a Delaware limited liability company ("PDC Holdings"), is effective as of October 15, 2014. (the "Effective Date") and sets forth the terms pursuant to which Mountaineer Keystone will drill, complete and operate the Wells (as defined below) on behalf of PDC and PDC Holdings. Mountaineer Keystone, PDC, and PDC Holdings are each a "Party" and are collectively the "Parties". In consideration of the foregoing and the respective agreements hereinafter set forth and the mutual benefits to be derived therefrom, the Parties, intending to be legally bound, hereby agree as follows:

1. **Term:** This Agreement is effective from the Effective Date until terminated by Mountaineer Keystone on the one hand or PDC and PDC Holdings on the other hand with 30 days' written notice to the other Party or Parties, as applicable (the "Term").
2. **Authorization to Operate:** PDC and PDC Holdings authorize Mountaineer Keystone to undertake and perform, on PDC and PDC Holdings behalf, all operations, including without limitation permit applications, well pad preparation, drilling and completing wells, and marketing gas, oil and other hydrocarbons therefrom with respect to all oil and gas wells to be drilled on oil and gas leasehold acreage held by PDC or PDC Holdings. PDC, PDC Holdings and Mountaineer Keystone are affiliates with a common parent. Mountaineer Keystone was formed to operate oil and gas leasehold acreage held by PDC, PDC Holdings and certain other affiliates. Mountaineer Keystone agrees that it shall, in a good and workmanlike manner and in accordance with industry standards as they prevail in the area, drill, complete and operate oil and gas wells on leasehold acreage owned by PDC or PDC Holdings from time to time as directed by PDC or PDC Holdings (collectively, the "Wells").
3. **No Third Party Beneficiary:** This Agreement is for the benefit of the Parties and is not for the benefit of any third party.
4. **Counterparts:** This Agreement may be simultaneously executed in several counterparts and via facsimile or similar electronic transmittal, each of which shall be deemed to be an original and taken together shall constitute one and the same instrument.

[Signature Page Follows]

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IN WITNESS WHEREOF, Mountaineer Keystone, PDC, and PDC Holdings have caused their duly authorized representatives to execute this Agreement as of the Effective Date.


**MOUNTAINEER KEYSTONE LLC**

By:   
Name: Robert Keel  
Title: CEO

**PDC MOUNTAINEER, LLC**

By:   
Name: Robert Keel  
Title: CEO

**PDC MOUNTAINEER HOLDINGS, LLC**

By:   
Name: Robert Keel  
Title: CEO

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**Agreement to Drill, Complete and Operate Oil & Gas Wells**

This Agreement to Drill, Complete and Operate Oil & Gas Wells (this "Agreement"), by and among Arsenal Resources LLC, a West Virginia limited liability company ("Arsenal"), River Ridge Energy, LLC, a Delaware limited liability company ("River Ridge"), and River Ridge Energy, Holdings, LLC, a Delaware limited liability company ("River Ridge Holdings"), is effective as of March 1, 2017. (the "Effective Date") and sets forth the terms pursuant to which Arsenal will drill, complete and operate the Wells (as defined below) on behalf of River Ridge and River Ridge Holdings. Arsenal, River Ridge, and River Ridge Holdings are each a "Party" and are collectively the "Parties". In consideration of the foregoing and the respective agreements hereinafter set forth and the mutual benefits to be derived therefrom, the Parties, intending to be legally bound, hereby agree as follows:

1. **Term:** This Agreement is effective from the Effective Date until terminated by Arsenal on the one hand or River Ridge and River Ridge Holdings on the other hand with 30 days' written notice to the other Party or Parties, as applicable (the "Term").
2. **Authorization to Operate:** River Ridge and River Holdings authorize Arsenal to undertake and perform, on River Ridge and River Ridge Holdings behalf, all operations, including without limitation permit applications, well pad preparation, drilling and completing wells, and marketing gas, oil and other hydrocarbons therefrom with respect to all oil and gas wells to be drilled on oil and gas leasehold acreage held by River Ridge or River Ridge Holdings. River Ridge, River Ridge Holdings and Arsenal are affiliates with a common parent. Arsenal was formed to operate oil and gas leasehold acreage held by River Ridge, River Ridge Holdings and certain other affiliates. Arsenal agrees that it shall, in a good and workmanlike manner and in accordance with industry standards as they prevail in the area, drill, complete and operate oil and gas wells on leasehold acreage owned by River Ridge or River Ridge Holdings from time to time as directed by River Ridge or River Ridge Holdings (collectively, the "Wells").
3. **No Third Party Beneficiary:** This Agreement is for the benefit of the Parties and is not for the benefit of any third party.
4. **Counterparts:** This Agreement may be simultaneously executed in several counterparts and via facsimile or similar electronic transmittal, each of which shall be deemed to be an original and taken together shall constitute one and the same instrument.

[Signature Page Follows]

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IN WITNESS WHEREOF, Arsenal, River Ridge, and River Ridge Holdings have caused their duly authorized representatives to execute this Agreement as of the Effective Date.

**ARSENAL RESOURCES LLC**

By: Joel E. Symonds  
Name: Joel E. Symonds  
Title: Vice President - Land

**RIVER RIDGE ENERGY, LLC**

By: Joel E. Symonds  
Name: Joel E. Symonds  
Title: Vice President - Land

**RIVER RIDGE HOLDINGS, LLC**

By: Joel E. Symonds  
Name: Joel E. Symonds  
Title: Vice President - Land

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**West Virginia Secretary of State — Online Data Services**

**Business and Licensing**

Online Data Services Help

**Business Organization Detail**

*NOTICE: The West Virginia Secretary of State's Office makes every reasonable effort to ensure the accuracy of information. However, we make no representation or warranty as to the correctness or completeness of the information. If information is missing from this page, it is not in the The West Virginia Secretary of State's database.*

**MAR KEY LLC**

<b>Organization Information</b>								
Org Type	Effective Date	Established Date	Filing Date	Charter	Class	Sec Type	Termination Date	Termination Reason
LLC   Limited Liability Company	7/11/2011		7/11/2011	Domestic	Profit			

<b>Organization Information</b>			
<b>Business Purpose</b>	2111 - Mining, Quarrying, Oil & Gas Extraction - Oil and Gas Extraction - Crude Oil and Natural Gas Extraction		<b>Capital Stock</b>
<b>Charter County</b>		<b>Control Number</b>	99Q1F
<b>Charter State</b>	WV	<b>Excess Acres</b>	
<b>At Will Term</b>	A	<b>Member Managed</b>	MBR
<b>At Will Term Years</b>		<b>Par Value</b>	

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<b>Authorized Shares</b>

<b>Addresses</b>	
Type	Address
<b>Designated Office Address</b>	65 PROFESSIONAL PLACE SUITE 200 BRIDGEPORT, WV, 26330
<b>Mailing Address</b>	6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090 USA
<b>Notice of Process Address</b>	CORPORATION SERVICE COMPANY 209 WEST WASHINGTON STREET CHARLESTON, WV, 25302
<b>Principal Office Address</b>	6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090 USA
Type	Address

<b>Officers</b>	
Type	Name/Address
<b>Member</b>	ARSENAL RESOURCES ENERGY LLC 6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090
<b>Organizer</b>	PAUL M HERZING 560 EPSILON DR. PITTSBURGH, PA, 15238 USA
Type	Name/Address

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<b>Annual Reports</b>
<b>Date filed</b>

3/30/2017
6/20/2016
6/30/2015
4/28/2014
6/28/2013
5/8/2012
<b>Date filed</b>

For more information, please contact the Secretary of State's Office at 304-558-8000.

Tuesday, November 28, 2017 — 9:44 AM

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People Powered. Asset Strong.

March 7, 2018

Mr. James Martin, Chief of Oil and Gas  
West Virginia Department of Environmental Protection  
601 57th Street, SE  
Charleston, WV 25304

RE: Ownership of Roadways; Mackey Wolfe 211

Dear Mr. Martin:

In preparation of filing a permit application for the above referenced well, the Title Department of Arsenal Resources has conducted a thorough title examination in order to determine the ownership of the oil and gas underlying all roadways crossed by the proposed well. The findings of the title examination show that some of the roadways crossed by the proposed well are owned in fee by the West Virginia Department of Transportation, Division of Highways and that some are only right of ways. If owned in fee by the West Virginia Department of Transportation, Division of Highways, a lease covering its interest in the roadway or roadways has been properly obtained and provided in the application materials. If a right of way only, the oil and gas underlying such roadway or roadways is owned by the adjoining landowners and is also covered by the leaseholds provided in the application materials.

If you have any questions, concerns or need further information, please do not hesitate to contact me at the address listed below.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Ryan Brode'.

Ryan Brode  
Title Attorney

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STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE CERTIFICATION

Date of Notice Certification: 3-7-18

API No. 47- 001 -  
Operator's Well No. Mackey Wolfe 211  
Well Pad Name: Mackey Wolfe

**Notice has been given:**

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83	Easting: <u>596,052.8</u>
County: <u>Barbour</u>		Northing: <u>4,345,708.5</u>
District: <u>Cove</u>	Public Road Access: <u>CR 92</u>	
Quadrangle: <u>Thornton</u>	Generally used farm name: <u>Margaret Wolfe Mackey (Life Est.) &amp; John M. Wolfe</u>	
Watershed: <u>Tributary of Little Cove Run</u>		

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED <input type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input checked="" type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED <input checked="" type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH) <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION <input checked="" type="checkbox"/> 5. PUBLIC NOTICE <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION		<b>OOG OFFICE USE ONLY</b> <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED <input checked="" type="checkbox"/> RECEIVED <input checked="" type="checkbox"/> RECEIVED <input checked="" type="checkbox"/> RECEIVED RECEIVED Office of Oil and Gas MAR 8 2018
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**Required Attachments:**

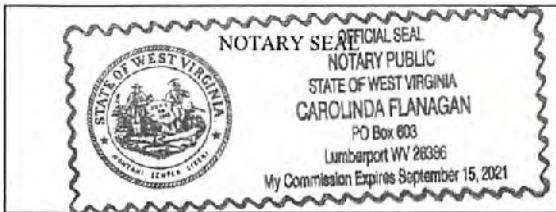
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

WV Department of Environmental Protection

**Certification of Notice is hereby given:**

THEREFORE, I William Veigel, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator:	<u>Arsenal Resources</u>	Address:	<u>6031 Wallace Road Extension, Suite 300</u>
By:	<u>William Veigel</u> <i>WVSEJ</i>		<u>Wexford, PA 15090</u>
Its:	<u>Designated Agent</u>	Facsimile:	<u>304-848-9134</u>
Telephone:	<u>724-940-1224</u>	Email:	<u>cflanagan@arsenalresources.com</u>



Subscribed and sworn before me this 6<sup>TH</sup> day of MARCH 2018  
*Carolinda Flanagan* Notary Public  
 My Commission Expires 9/15/2021

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.

Date of Notice: 3-7-18 Date Permit Application Filed: 3-7-18

Notice of:

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice  WSSP Notice  E&S Plan Notice  Well Plat Notice is hereby provided to:

SURFACE OWNER(s)  
Name: Margaret Wolfe Mackey (Life Est.) & John M. Wolfe  
Address: 3416 West Van Owen Street  
Springfield, MO 65810  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Road and/or Other Disturbance)  
Name: Margaret Wolfe Mackey (Life Est.) & John M. Wolfe  
Address: 3416 West Van Owen Street  
Springfield, MO 65810  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
Name: Shiloh Development, Inc.  
Address: 7 Maple Lake  
Bridgeport, WV 26330

COAL OPERATOR  
Name: Shiloh Development, Inc.  
Address: 7 Maple Lake  
Bridgeport, WV 26330

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)  
Name: See Attached  
Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

**This Notice Shall Include:**

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/office-of-oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/office-of-oil-and-gas/pages/default.aspx).

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within one hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

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examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

**Water Well Testing:**

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

**Water Testing Laboratories:**

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

**Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:**

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

**Written Comment:**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

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Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**



**Time Limits and Methods for Filing Comments.**

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

**Comment Requirements**

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

**Permit Denial or Condition**

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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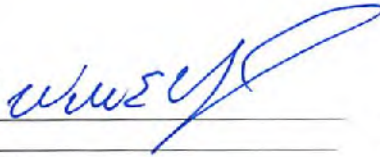
WV Department of  
Environmental Protection

WW-6A  
(8-13)

API NO. 47-00 **4700103361**  
OPERATOR WELL NO. Mackey Wolfe 211  
Well Pad Name: Mackey Wolfe

**Notice is hereby given by:**

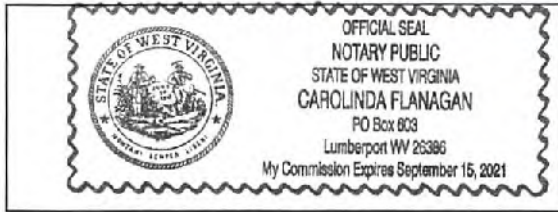
Well Operator: Arsenal Resources  
Telephone: 724-940-1224  
Email: cflanagan@arsenalresources.com



Address: 6031 Wallace Road Extension, Suite 300  
Wexford, PA 15090  
Facsimile: 304-848-9134

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

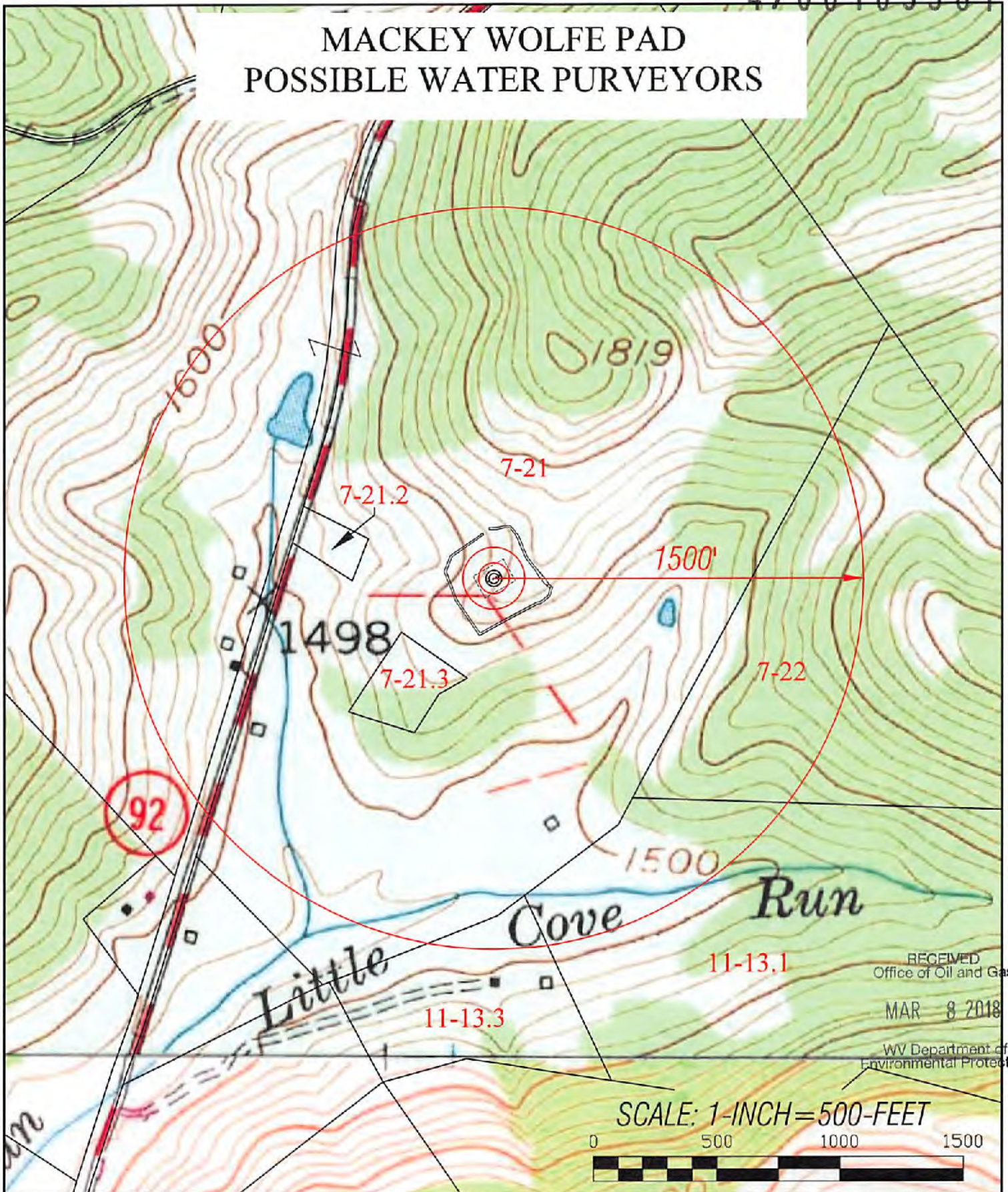


Subscribed and sworn before me this 6<sup>th</sup> day of MAR, 2018.  
Carolinda Flanagan Notary Public  
My Commission Expires 9/15/2021

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# MACKEY WOLFE PAD POSSIBLE WATER PURVEYORS



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TOPO SECTIONS OF:  
THORNTON & NESTORVILLE  
WV 7.5' QUADS

OPERATOR:  
**ARSENAL RESOURCES**  
65 Professional Place, Suite 200  
Bridgeport, WV 26330

DRAWN BY K.G.M.	FILE NO. 7968	DATE 02-28-18	CADD FILE: 7968WATERPURVEYOR.DWG
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COUNTY BARBOUR	DISTRICT COVE
-------------------	------------------



4700103361



Possible Water Purveyors within 1,500 feet of Mackey Wolfe Pad

DISTRICT	MAP	PARCEL	OWNER	IN CARE OF	ADDRESS
COVE	7	21	MACKEY MARGARET (LIFE EST) & JOHN M WOLFE	C/O JOHN M WOLFE	6 CLAUDE RD , MOATSVILLE , WV 26405
COVE	7	21.2	MACKEY MARGARET J (LIFE EST) JOHN MOORE WOLFE		3416 W VAN OWEN ST , SPRINGFIELD , MO 65810
COVE	7	21.3	WOLFE CATHARINE		18392 MORGANTOWN PIKE , MOATSVILLE , WV 26405
COVE	7	22	WOLFE HAZEL N HRS C/O RUTH ANN CARSON		PO BOX 406 , WINTERVILLE , NC 28590
COVE	11	13.1	WOLFE JOHN MOORE		6 CLAUDE RD , MOATSVILLE , WV 26405
COVE	11	13.3	WOLFE CHRISTOPHER M	CORELOGIC TAX SERVICES	1 CORELOGIC WAY DFW 4-3 , WESTLAKE , TX 76262

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WW-6A4  
(1/12)

**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**NOTICE OF INTENT TO DRILL**

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

**Notice Time Requirement:** Notice shall be provided at least TEN (10) days prior to filing a permit application.

**Date of Notice:** 3-7-18      **Date Permit Application Filed:** 3-7-18

**Delivery method pursuant to West Virginia Code § 22-6A-16(b)**

HAND DELIVERY       CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: *Provided*, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: *Provided, however*, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

**Notice is hereby provided to the SURFACE OWNER(s):**

**Name:** Margaret Wolfe Mackey (Life Est.) & John M. Wolfe

**Address:** 3416 West Van Owen Street

Springfield, MO 65810

**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(b), notice is hereby given that the undersigned well operator has an intent to enter upon the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>596,052.8</u>
County:	<u>Barbour</u>		Northing:	<u>4,345,708.5</u>
District:	<u>Cove</u>	Public Road Access:	<u>CR 92</u>	
Quadrangle:	<u>Thornton</u>	Generally used farm name:	<u>Margaret Wolfe Mackey (Life Est.) &amp; John M. Wolfe</u>	
Watershed:	<u>Tributary of Little Cove Run</u>			

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

**Well Operator:** Arsenal Resources  
**Address:** 6031 Wallace Road Extension, Suite 300  
Wexford, PA 15090  
**Telephone:** 724-940-1224  
**Email:** cflanagan@arsenalresources.com  
**Facsimile:** 304-848-9134

**Authorized Representative:** William Veigel  
**Address:** 65 Professional Place, Suite 200  
Bridgeport, WV 26330  
**Telephone:** 724-940-1224  
**Email:** cflanagan@arsenalresources.com  
**Facsimile:** 304-848-9134

RECEIVED  
Office of Oil and Gas

MAR 8 2018

WV Department of  
Environmental Protection

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF PLANNED OPERATION

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.

Date of Notice: 3-7-18 Date Permit Application Filed: 3-7-18

Delivery method pursuant to West Virginia Code § 22-6A-16(c)

- CERTIFIED MAIL  HAND
- RETURN RECEIPT REQUESTED DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)  
(at the address listed in the records of the sheriff at the time of notice):

Name: Margaret Wolfe Mackey (Life Est.) & John M. Wolfe  
Address: 3418 West Van Owen Street  
Springfield, MO 65810

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>596,052.8</u>
County:	<u>Barbour</u>		Northing:	<u>4,345,708.5</u>
District:	<u>Cove</u>	Public Road Access:	<u>CR 92</u>	
Quadrangle:	<u>Thornton</u>	Generally used farm name:	<u>Margaret Wolfe Mackey (Life Est.) &amp; John M. Wolfe</u>	
Watershed:	<u>Tributary of Little Cove Run</u>			

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by W. Va. Code § 22-6A-10(b) to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: Arsenal Resources  
Telephone: 724-940-1224  
Email: cflanagan@arsenalresources.com

Address: 6031 Wallace Road Extension, Suite 300  
Wexford, PA 15090  
Facsimile: 304-848-9134

RECEIVED  
Office of Oil and Gas

MAR 8 2018

WV Department of  
Environmental Protection

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

WW-6RW  
(1-12)

TIM MILLER  
P O BOX 898  
DELLSLOW, WV 26531-

4700103361

API NO. 47-001 -  
OPERATOR WELL NO. Mackey Wolfe 211  
Well Pad Name: Mackey Wolfe

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
**WELL LOCATION RESTRICTION WAIVER**

The well operator, Arsenal Resources is applying for a permit from the State of West Virginia to conduct oil or gas well work. Please be advised that well work permits are valid for twenty-four (24) months.

**Well Location Restrictions**

Pursuant to West Virginia Code § 22-6A-12(a), Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements.

**WAIVER**

I, Catharine M. Wolfe, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State: West Virginia UTM NAD 83 Easting: 596,052.75  
County: Barbour UTM NAD 83 Northing: 4,345,708.45  
District: Cove Public Road Access: CR 92  
Quadrangle: Thornton Generally used farm name: Margaret Wolfe Mackey (Life Est.) & John M. Wolfe  
Watershed: Tributary of Little Cove Run

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials and I therefore waive all well site restrictions listed under West Virginia Code § 22-6A-12(a).

**WELL SITE RESTRICTIONS BEING WAIVED**

\*Please check all that apply

- EXISTING WATER WELLS
- DEVELOPED SPRINGS
- DWELLINGS
- AGRICULTURAL BUILDINGS

**FOR EXECUTION BY A NATURAL PERSON**

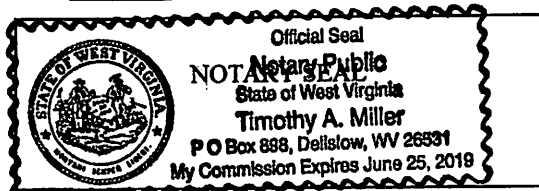
Signature: Catharine M. Wolfe  
Print Name: Catharine M. Wolfe  
Date: 2/22/18

**FOR EXECUTION BY A CORPORATION, ETC.**

Company: \_\_\_\_\_  
By: \_\_\_\_\_  
Its: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

Well Operator: Arsenal Resources  
By: William Veigel  
Its: Designated Agent

Signature: [Signature] RECEIVED Office of Oil and Gas  
Telephone: 724-940-1224 MAR 8 2018



Subscribed and sworn before me this 22 day of February, 2018  
[Signature] Timothy A. Miller - Notary Public  
My Commission Expires JUN 25, 2019

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
**VOLUNTARY STATEMENT OF NO OBJECTION**

**Instructions to Persons Named on Page WW-6A**

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

**Comment and Waiver Provisions**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

**VOLUNTARY STATEMENT OF NO OBJECTION**

I, John Moore Wolfe, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>598052.75</u>
County:	<u>Barbour</u>		Northing:	<u>4345708.45</u>
District:	<u>Cove</u>	Public Road Access:	<u>CR 92</u>	
Quadrangle:	<u>Thornton</u>	Generally used farm name:	<u>Margaret Wolfe Mackey (Life Est.) &amp; John M. Wolfe</u>	
Watershed:	<u>Tributary to Little Cove Run</u>			

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

<p>*Please check the box that applies</p> <p><input checked="" type="checkbox"/> SURFACE OWNER</p> <p><input checked="" type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input type="checkbox"/> COAL OPERATOR</p> <p><input checked="" type="checkbox"/> WATER PURVEYOR</p> <p><input type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p><b>FOR EXECUTION BY A NATURAL PERSON</b></p> <p>Signature: <u>[Signature]</u></p> <p>Print Name: <u>John M. Wolfe</u></p> <p>Date: <u>3/15/18</u></p> <p><b>FOR EXECUTION BY A CORPORATION, ETC.</b></p> <p>Company: _____</p> <p>By: _____</p> <p>Its: _____</p> <p>Signature: _____</p> <p>Date: _____</p>
--	---

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*Rec 006  
3-15-18*



4700103361

WW-6AW  
(1-12)

API NO. 47-077 -  
OPERATOR WELL NO. 211  
Well Pad Name: Mackey Wolfe

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
**VOLUNTARY STATEMENT OF NO OBJECTION**

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**VOLUNTARY STATEMENT OF NO OBJECTION**

I, Margaret Wolfe Mackey (Life Est.) & John M. Wolfe, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan required, and the well plat, all for proposed well work on the tract of land as follows:

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District: Cove  
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Watershed: Tributary to Little Cove Run

UTM NAD 83 Easting: 596052.75  
Northing: 4345708.45  
Public Road Access: CR 92  
Generally used farm name: Margaret Wolfe Mackey (Life Est.) & John M. Wolfe

Office of Oil and Gas

JUN 21 2018

Department of Environmental Protection

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

<p>*Please check the box that applies</p> <p><input checked="" type="checkbox"/> SURFACE OWNER</p> <p><input checked="" type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input type="checkbox"/> COAL OPERATOR</p> <p><input checked="" type="checkbox"/> WATER PURVEYOR</p> <p><input type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p><b>FOR EXECUTION BY A NATURAL PERSON</b></p> <p>Signature: <u>Margaret Wolfe Mackey</u>  Print Name: <u>Margaret Wolfe Mackey</u>  Date: <u>March 26, 2018</u></p> <p><b>FOR EXECUTION BY A CORPORATION, ETC.</b></p> <p>Company: _____  By: _____  Its: _____</p> <p>Signature: _____  Date: _____</p>
--	--

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WW-6AW  
(1-12)

API NO. 47-077 - \_\_\_\_\_  
 OPERATOR WELL NO. 211 \_\_\_\_\_  
 Well Pad Name: Mackey Wolfe \_\_\_\_\_

**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**VOLUNTARY STATEMENT OF NO OBJECTION**

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**VOLUNTARY STATEMENT OF NO OBJECTION**

I, Catharine Wolfe, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan required, and the well plat, all for proposed well work on the tract of land as follows: RECEIVED  
Office of Oil and Gas

State:	<u>West Virginia</u>	UTM NAD 83 Easting:	<u>596052.75</u>
County:	<u>Barbour</u>	UTM NAD 83 Northing:	<u>4345708.45</u>
District:	<u>Cove</u>	Public Road Access:	<u>CR 92</u>
Quadrangle:	<u>Thornton</u>	Generally used farm name:	<u>Margaret Wolfe Mackey (Life Est.) &amp; John M. Wolfe</u>
Watershed:	<u>Tributary to Little Cove Run</u>		

JUN 21 2018  
 WV Department of Environmental Protection

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--	---

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4700103361

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
**Division of Highways**

1900 Kanawha Boulevard East • Building Five • Room 110  
Charleston, West Virginia 25305-0430 • (304) 558-3505

Jim Justice  
Governor

Thomas J. Smith, P. E.  
Secretary of Transportation/  
Commissioner of Highways

January 26, 2018

James A. Martin, Chief  
Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304

Subject: DOH Permit for the Mackey Wolfe Pad, Taylor County

Mackey Wolfe 211 Well Site

Dear Mr. Martin,

The West Virginia Division of Highways has transferred Permit #04-2013-0240 for the subject site to ARSENAL Resources for access to the State Road for the well site located off of Taylor County 18/4 SLS.

The operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT for DOH District 4 and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton  
Regional Maintenance Engineer  
Central Office Oil & Gas Coordinator

RECEIVED  
Office of Oil and Gas  
MAR 8 2018  
WV Department of  
Environmental Protection

Cc: Kelly Davis  
ARSENAL Resources  
CH, OM, D-4  
File



4700103361

<b>Mackey Wolfe #211</b>			
<b>FRACTURING ADDITIVES</b>			
	<b>PURPOSE</b>	<b>TRADE NAME</b>	<b>CAS #</b>
Additive #1:	Friction Reducer	WFRA-405	Proprietary
Additive #2:	Scale Inhibitor	SI-1000	7440-21-3
Additive #3:	Biocide	BIOCLEAR 2000	25314-61-8
Additive #4:	Gelling Agent	LGC-15	9000-30-0
Additive #5:	Corrosion Inhibitor	AI-300	111-76-2
Additive #6:	Gel Breaker	AP-One	7727-54-0
Additive #7:	Acid	HCl - 7.5%	7647-01-0

RECEIVED  
Office of Oil and Gas  
MAR 8 2018  
WV Department of  
Environmental Protection

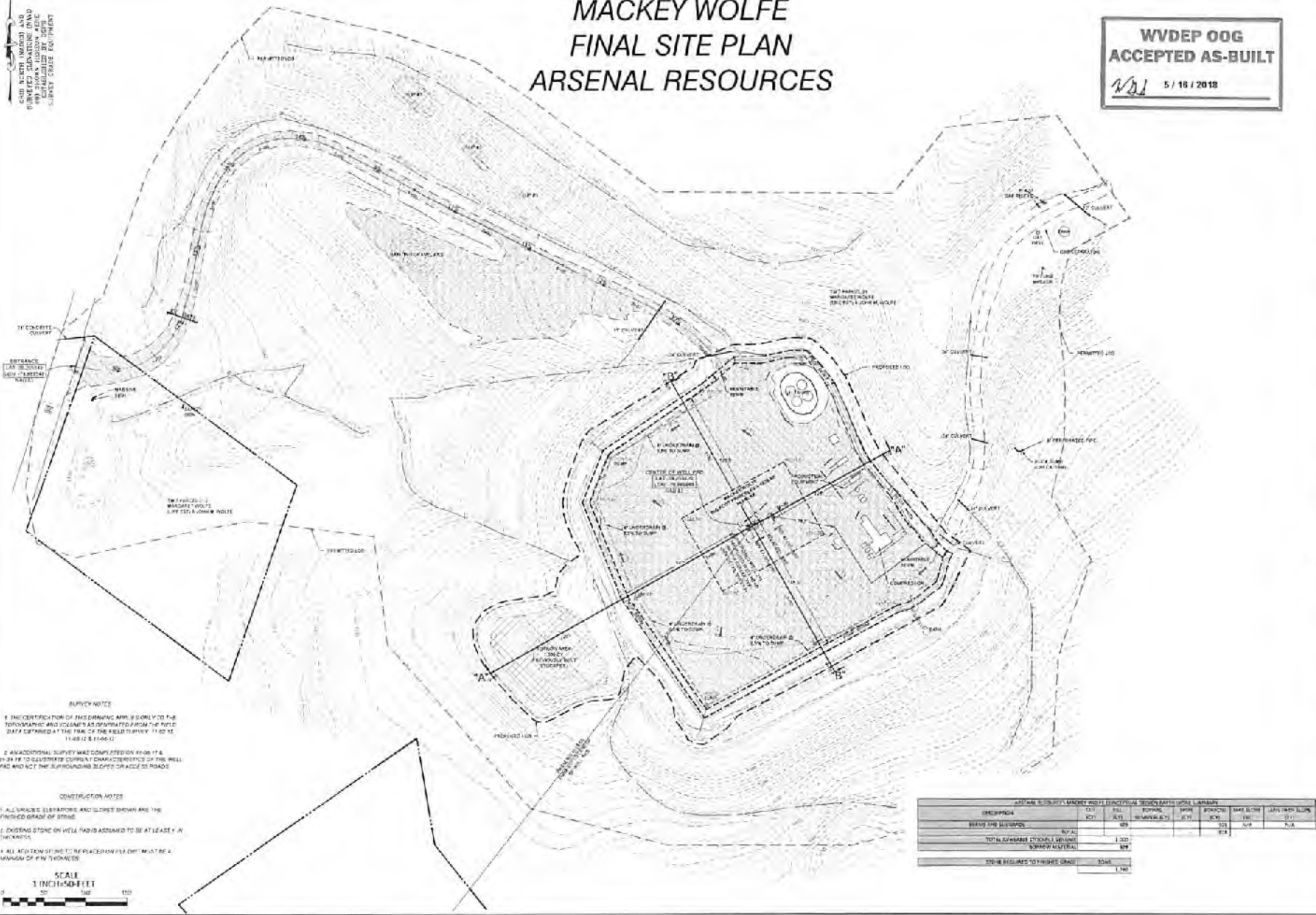


4700103361

# MACKEY WOLFE FINAL SITE PLAN ARSENAL RESOURCES

WVDEP OOG  
ACCEPTED AS-BUILT  
5/16/2018

THIS SHEET INDICATES THE LOCATION OF ALL SURVEY MONUMENTS AND CONTROL POINTS. MONUMENTS SHALL BE CONSIDERED TO BE UNLESS OTHERWISE NOTED BY SURVEY OR ASSESSMENT EQUIPMENT.



**SURVEY NOTES**

1. THE CERTIFICATION OF THIS DRAWING APPLIES ONLY TO THE TOPOGRAPHIC AND ELEVATION DATA OBTAINED FROM THE FIELD DATA DETERMINED AT THE TIME OF THE FIELD SURVEY 11/02/16 (114812 & 114811).
2. AN ADDITIONAL SURVEY WAS COMPLETED BY 11/08/17 & 11/09/17 TO DETERMINE CURRENT CHARACTERISTICS OF THE WELL PAD AND NOT THE SURROUNDING SLOPES OR ACCESS ROADS.

**CONSTRUCTION NOTES**

1. ALL SPACES, ELEVATIONS AND SLOPES SHOWN ARE THE FINISHED GRADE OF STONE.
2. ENDING STONE ON WELL PAD IS ASSIGNED TO BE AT LEAST 1/4" THICKNESS.
3. ALL AT-TOP STONE TO BE PLACED ON FILL OR AT LEAST A MINIMUM OF 1/4" THICKNESS.



DESCRIPTION	QTY	UNIT	REMARKS	DATE	BY	CHKD	DATE	BY
GRAVEL AND AGGREGATE	1,000	CU YD						
TOTAL QUANTITIES	1,000	CU YD						
STONE REQUIRED TO FILL GROUND	1,000	CU YD						

**INDEX SHEET**  
**MACKEY WOLFE**  
**FINAL SITE PLAN**  
**COVE DISTRICT**  
**BARBOUR COUNTY, WV**

**ARSENAL RESOURCES**

**SLS**  
 LAND & CONCRETE DEVELOPMENT  
 1000 W. MAIN ST. #100  
 MARTINSBURG, WV 26151

THIS DOCUMENT WAS PREPARED BY SLS LAND & CONCRETE DEVELOPMENT FOR ARSENAL RESOURCES

DATE: 05-08-2018  
 SCALE: 1" = 50'  
 DESIGNED BY: K.L.B.  
 FILE NO.: 7960  
 SHEET 3 OF 15