



west virginia department of environmental protection

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

Jim Justice , Governor
Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Friday, July 21, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

ARSENAL RESOURCES LLC
6031 WALLACE ROAD EXTENSION SUITE 300

WEXFORD, PA 15090

Re: Permit approval for FRANKLIN JENNINGS 213
47-077-00624-00-00

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

Operator's Well Number: FRANKLIN JENNINGS 213
Farm Name: JENNINGS, FRANKLIN M. & PEGGY A.
U.S. WELL NUMBER: 47-077-00624-00-00
Horizontal 6A / New Drill
Date Issued: 7/21/2017

Promoting a healthy environment.

07/21/2017

PERMIT CONDITIONS

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

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.

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

1) Well Operator: Arsenal Resources 494519412 Preston Lyon Thornton
Operator ID County District Quadrangle

2) Operator's Well Number: 213 Well Pad Name: Franklin Jennings

3) Farm Name/Surface Owner: Franklin Jennings Public Road Access: Preston County Route 60/5

4) Elevation, current ground: 1733 Elevation, proposed post-construction: 1726

5) Well Type (a) Gas Oil _____ Underground Storage _____

Other _____

(b) If Gas Shallow Deep _____

Horizontal

6) Existing Pad: Yes or No No *MSK 4/12/2017*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale, 8,191' (TVD Heel) - 8,191' (TVD Toe), 107', 0.5 psi/ft Base of Marcellus Shale, 8,298' (TVD Heel) - 8,298' (TVD Toe)

8) Proposed Total Vertical Depth: 8,286'

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 19,653'

11) Proposed Horizontal Leg Length: 10,967'

12) Approximate Fresh Water Strata Depths: 1,000'

13) Method to Determine Fresh Water Depths: Offsetting wells reported water depths (077-00480, 077-00481, 077-00482, 077-00563, 077-00564)

14) Approximate Saltwater Depths: 1,600'

15) Approximate Coal Seam Depths: Elk Lick 270', Harlem 350', Bakerstown 428', Brush Creek 540', Upper Freeport 622', Lower Freeport 661', Upper Kittanning 743', Middle Kittanning 744', Lower Kittanning 823'

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

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

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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	GTS
Fresh Water	13.375	New	J-55	54.5#	1,050	1,050	CTS
Coal							
Intermediate	9.625	New	J-55	40#	1,900	1,900	CTS
Production	5.5	New	P-110	20#	19,653	19,653	TOC @ 1,750
Tubing							
Liners							

MJK 4/12/2017

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	Type 1, 3% Calcium	1.2
Fresh Water	13.375	17.5	0.38	2,730	0	Class A, 3% CaCl ₂	1.2
Coal							
Intermediate	9.625	12.25	0.395	3,950	0	Class A, 2% CaCl ₂	1.29
Production	5.5	8.5-8.75	0.361	12,640	9,500	Type 1	1.64/1.32
Tubing					5,000		
Liners					NA		

PACKERS

Kind:				
Sizes:				
Depths Set:				

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 grout 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): 23.33

22) Area to be disturbed for well pad only, less access road (acres): 8.01

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 2,000'; there will be no centralizers from 2,000 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 Type 1 cement, & no greater than 3% calcium chloride. The 5-1/2" production string will be cemented back to 1,750' (+/- 150' above the casing shoe for the 9-5/8") with Type 1 or Class A cement retarder (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 a 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 face to the bore-hole. The mud 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 are notices, we will re-run the previous stand of pipe to the surface and circulate 2X bottoms up while watching the shakers for signs of cuttings. Once at the base of the curve, the string will be continuously rotated while pumping 2X bottoms up. We will pull three stands and fill the hole until we reach the vertical section of the well.

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*Note: Attach additional sheets as needed.



Underground and Surface Coal Mines

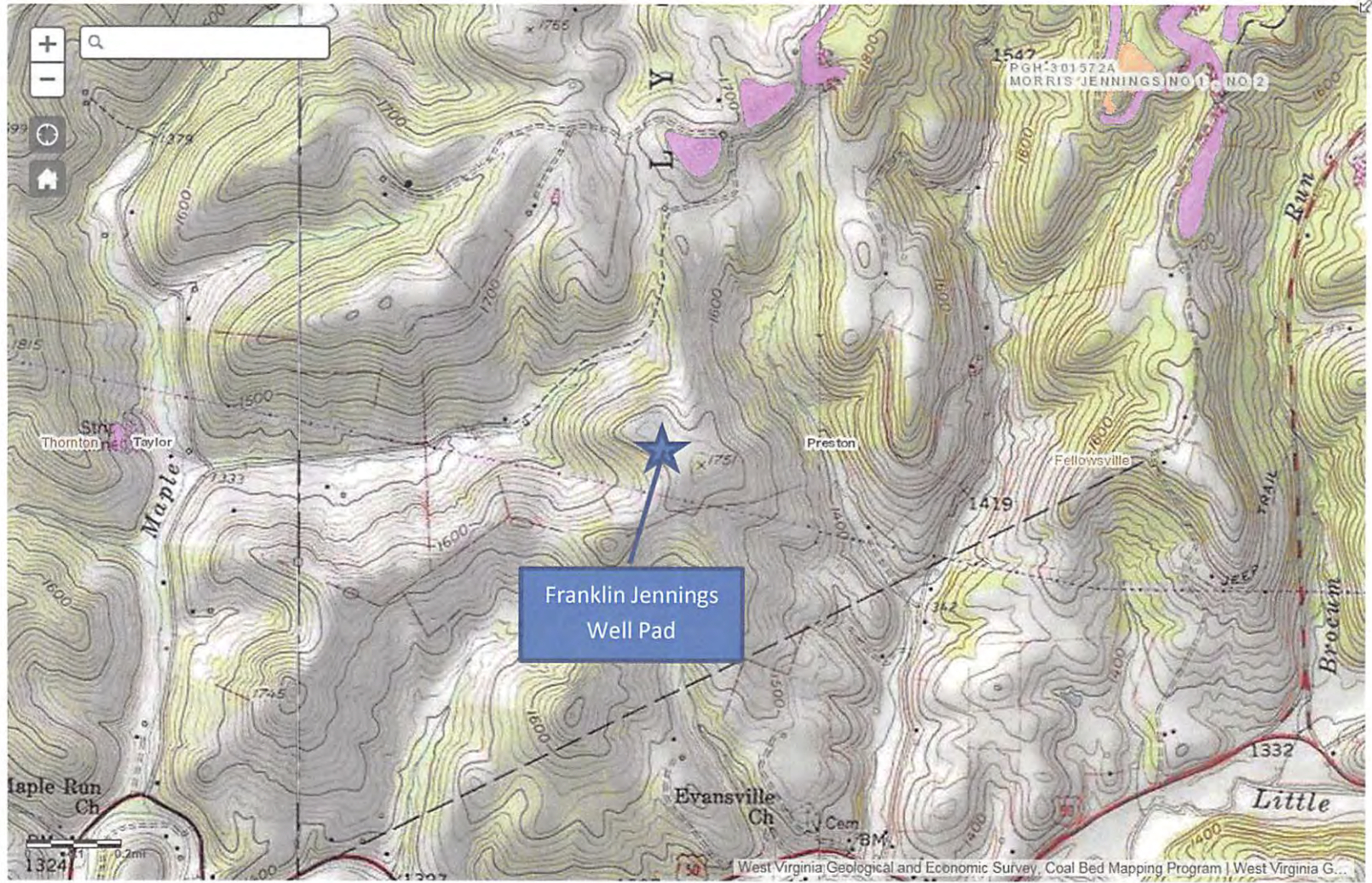
Zoom in and click on mine outline to get further information.

Coal Bed Mapping Project
Coverage Explanations
Map Help & Tips

Layer/Legend Tools Basemap

Use the slider bar to adjust transparency.

- Reference
- Political Boundaries
 - Tax Districts
 - Tax District Labels
 - Counties
 - County Labels
 - Planning & Development Regions
 - State Boundary
- Reference Quadrangles
 - 3.75' Quadrangles (Quarter Quads)
 - 3.75' Quadrangles (Quarter Quad) L
 - 7.5' Quadrangles
 - 7.5' Quadrangle Labels
 - 15' Quadrangles
 - 15' Quadrangle Labels
 - 100k Quadrangles
 - 100k Quadrangle Labels
 - 250k Quadrangles
 - 250k Quadrangle Labels
- WV Coal Mining
 - Underground Mining Labels
 - Underground Mining
 - Surface Mining
 - Surface Mined
 - Auger Mined
 - Highwall Mined



77-00604

**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 Preston County, WV prior to hydraulic fracturing at the following ARSENAL RESOURCES wells on the Franklin Jennings 213 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 8,300'TVD) and existing conventional natural gas wells in partially-depleted, relatively high permeability reservoirs at depths shallower than the Marcellus.

ARSENAL RESOURCES has determined there are no existing active or inactive wells within the 500' offset of the Franklin Jennings 213 wellbore.

Franklin Jennings 213 Area of Review

API	Operator	Status	Latitude	Longitude	Vertical TD	Producing Formation	Producing Zones Not Perforated
none	n/a	n/a	n/a	n/a	n/a	n/a	n/a

77-00624

WW-9
(4/16)

API Number 47 - ~~081~~ 77 - 00624

Operator's Well No. 213

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) Sandy Creek 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: Produced water

Will a synthetic liner be used in the pit? Yes No If so, what ml.? 60

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 to than be taken to a landfill

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Vert: Freshwater Horz: Synthetic Oil based mud

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

Additives to be used in drilling medium? Bentonite, soap and polymer sticks, soda ash, sodium bicarbonate, defoamer, base oil, emulsifiers, lime, and 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

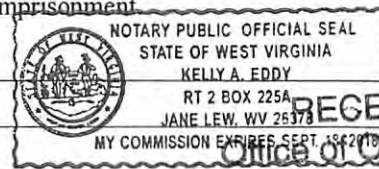
-Landfill or offsite name/permit number? Advanced Disposal Services, Chestnut Valley Landfill

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 [Signature]
Company Official (Typed Name) William Veigel
Company Official Title Designated Agent, Arsenal Resources



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Subscribed and sworn before me this 12th day of April, 2017

Kelly A. Eddy
Notary Public

My commission expires September 18, 2018

WV Department of Environmental Protection

07/21/2017

Arsenal Resources

Proposed Revegetation Treatment: Acres Disturbed 15.2 Prevegetation pH unknown

Lime 2.67 Tons/acre or to correct to pH 6.4

Fertilizer type 10-20-20

Fertilizer amount 1000 lbs/acre

Mulch 3-4 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: The Thrasher Group, Inc *Maureen J. Knutson*

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: Inspector

Date: 4/12/2017

Field Reviewed? Yes No

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77-00624

Franklin Jennings 213 Site Safety Plan



ARSENAL
R E S O U R C E S

SITE SAFETY PLAN

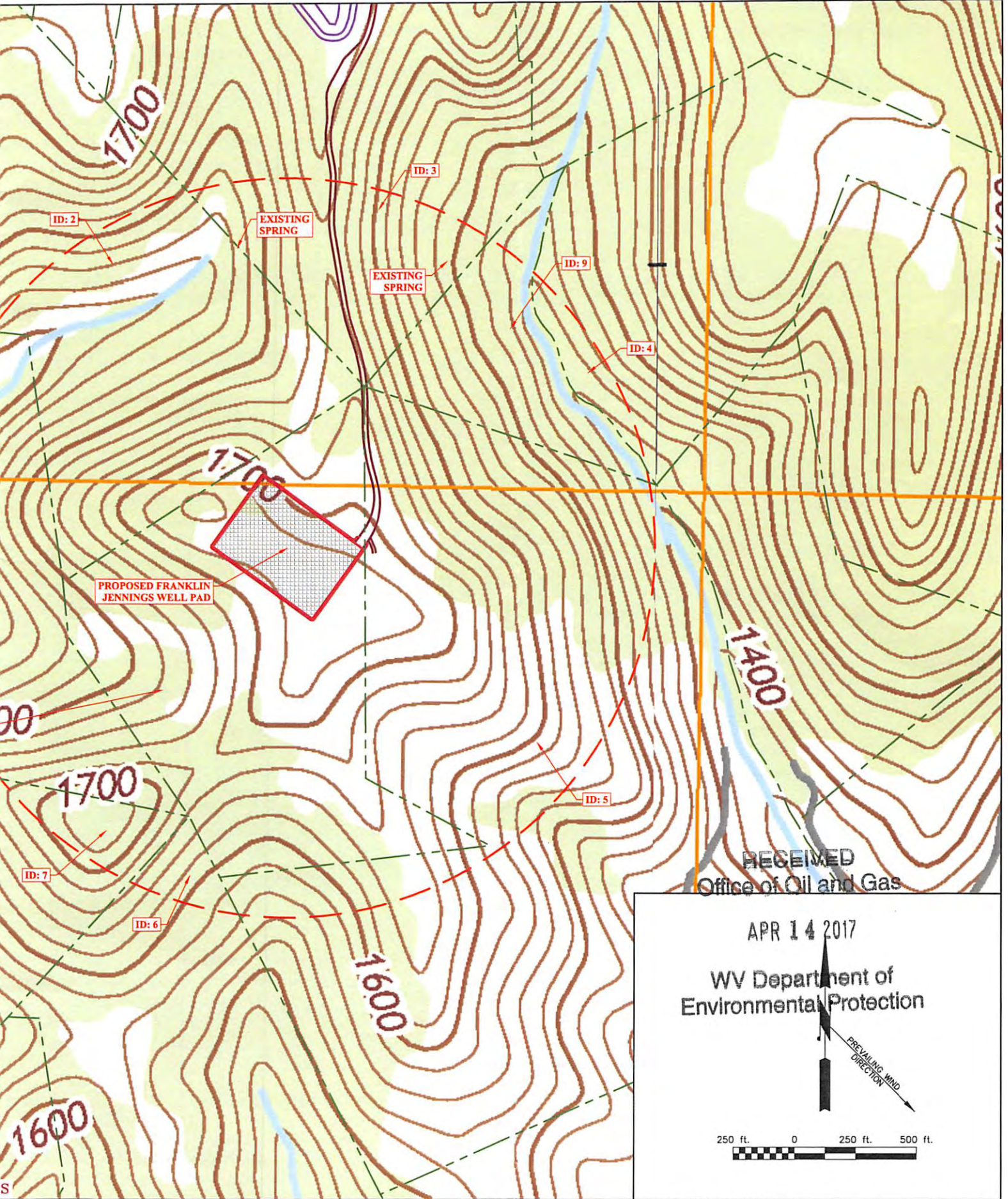
Lauren J. Kintowski
4/12/2017

Franklin Jennings Well Pad
213

911 Address:
919 May Road
Thornton, WV 26440

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PREVAILING WIND
DIRECTION

250 ft. 0 250 ft. 500 ft.

DATE:
DATE:
DATE:

THRASHER
THE THRASHER GROUP INC.
CIVIL • ENVIRONMENTAL • CONSULTING • FIELD SERVICES
600 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
PHONE (304) 624-4108 • FAX (304) 624-7831

PHASE No.
CONTRACT No.
PROJECT No.
101-030-3133





ARSENAL RESOURCES
SITE SAFETY PLANS FOR THE
FRANKLIN JENNINGS WELL PAD
PRESTON COUNTY, WEST VIRGINIA
POTENTIAL WATER SOURCES

SHEET No.
W
07/21/2017

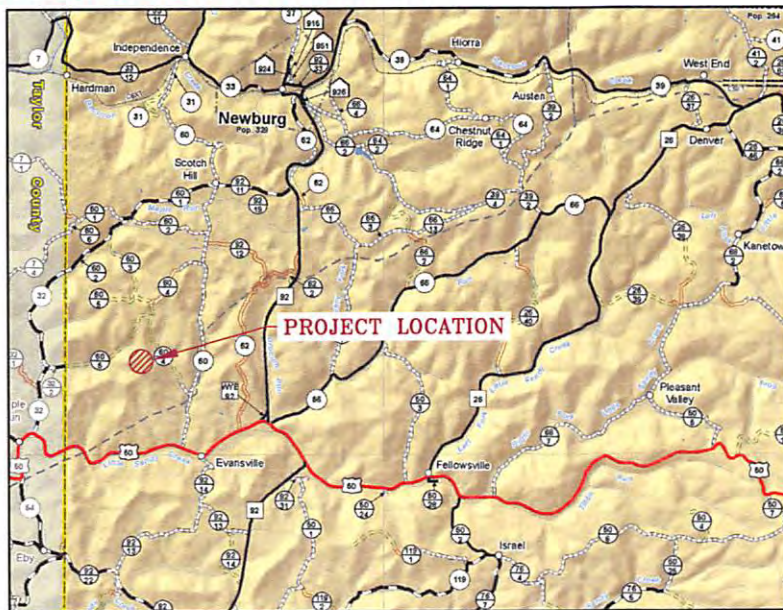
EXISTING PARCEL OWNER AND ADDRESS TABLE

ID	OWNER	ADDRESS	TAX MAP INFO		
			DISTRICT	MAP	PARCEL
1	JENNINGS FRANKLIN M & PEGGY A	463 EVANSVILLE PIKE, THORNTON, WV 26440	4	9	6
2	JENNINGS FRANKLIN M & PEGGY A; JENNINGS GARETH LYNN ET AL	463 EVANSVILLE PIKE, THORNTON, WV 26440	3	17	40
3	JENNINGS FRANKLIN M & PEGGY A	463 EVANSVILLE PIKE, THORNTON, WV 26440	3	17	34
4	JENNINGS FRANKLIN MAURICE	463 EVANSVILLE PIKE, THORNTON, WV 26440	3	17	41
5	JENNINGS FRANKLIN M & PEGGY A	463 EVANSVILLE PIKE, THORNTON, WV 26440	3	20	3
6	JENNINGS G LYNN & RHONDA L	1215 GEORGE WASHINGTON HWY, THORNTON, WV 26440	4	9	4
7	NESTOR RICHARD A & MARY T	2930 KUMP STATION RD, TANEYTOWN, MD 21787	4	9	3
8	BINGHAM CAROLYN WINIFRED & NEWLON CHARLES HERMAN II	550 JOYCE AVE, LEWISBURG, TN 37091	3	20	2
9	JENNINGS FRANKLIN M & PEGGY A	463 EVANSVILLE PIKE, THORNTON, WV 26440	3	17	48

LEGEND

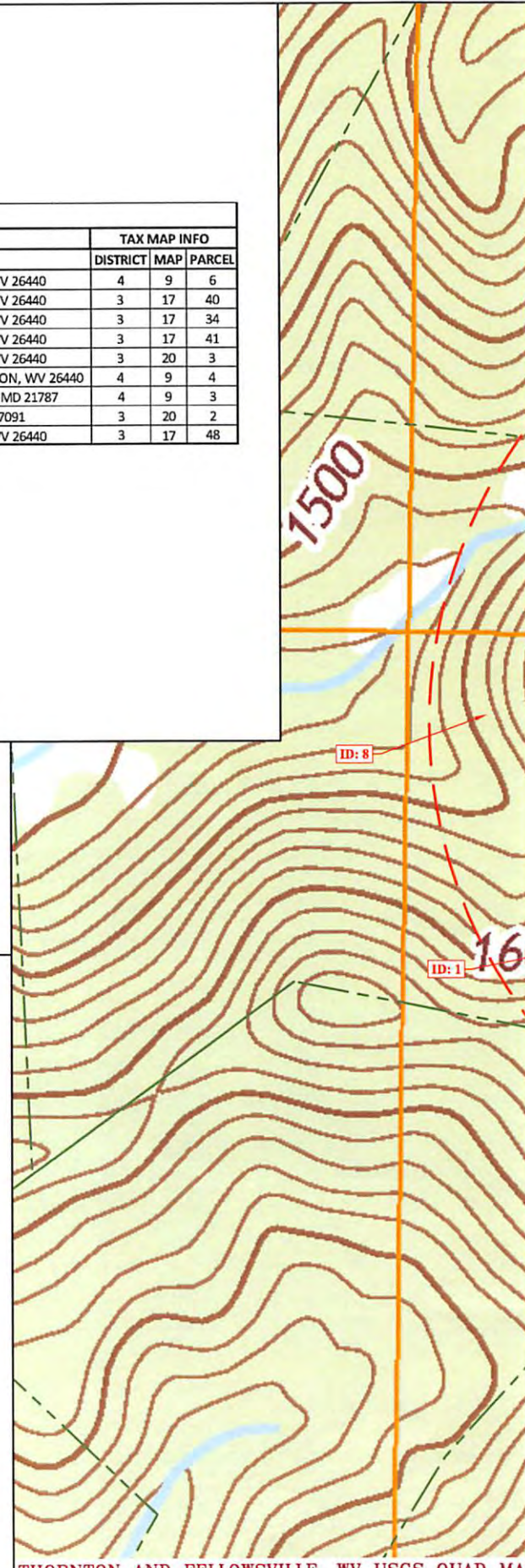
-  1,500-FT RADIUS FROM WELL PAD (AREAS INSIDE LIMITS WILL BE SAMPLED)
-  PROPOSED WELL PAD
-  PROPERTY LINE
-  PARCEL ID # (SEE TABLE)

PRESTON COUNTY, WV HIGHWAY MAP



1 MILE 0 1 MILE 2 MILES

HIGHWAY MAP SCALE



THORNTON AND FELLOWSVILLE, WV USGS QUAD MA



ARSENAL
RESOURCES

07/21/2017

SCALE: _____

DRAWN: _____

CHECKED: _____

APPROVED: _____

SURVEY DATE: _____

SURVEY BY: _____

FIELD BOOK No.: _____

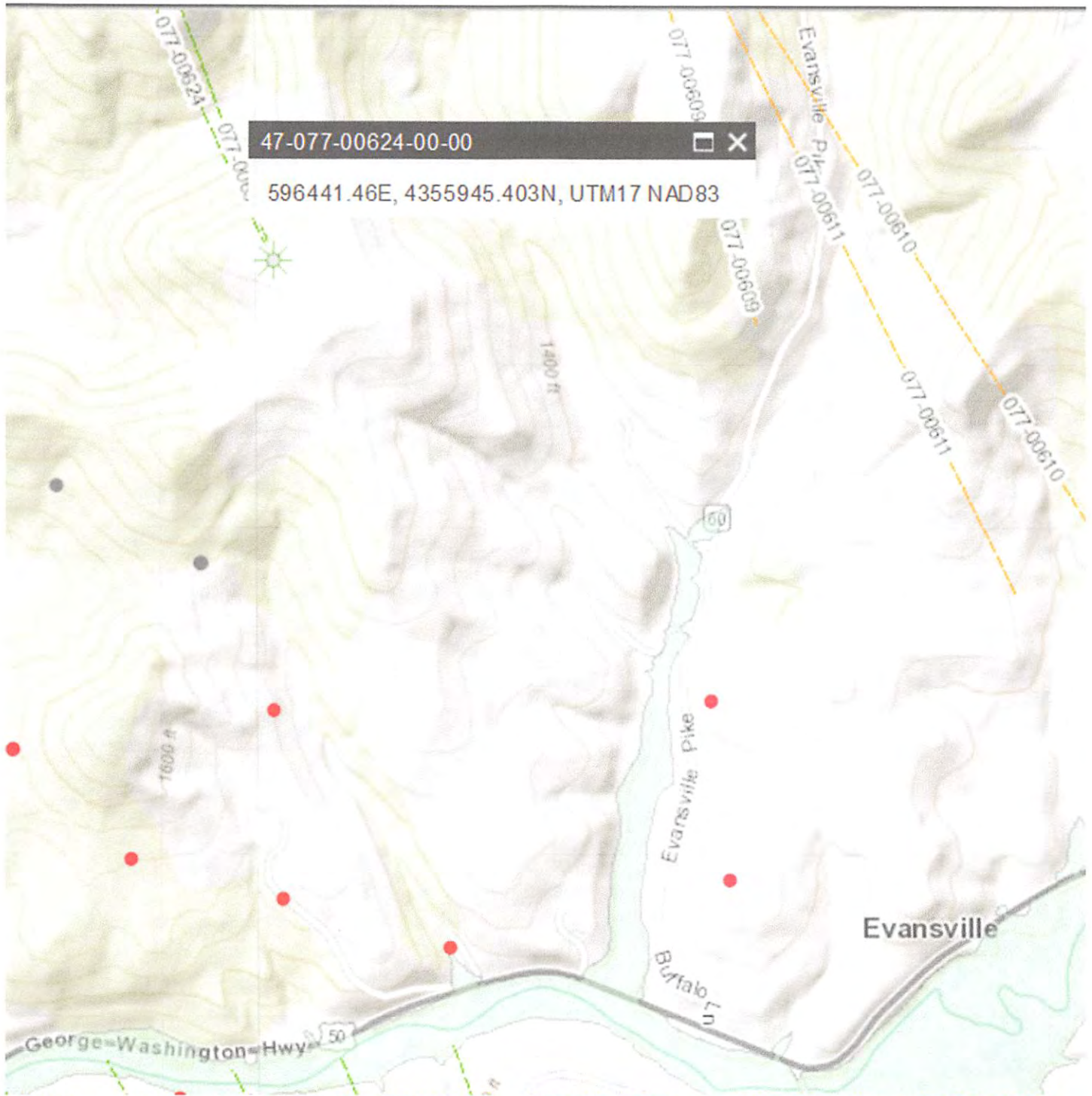
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NO.	BY	DATE	DESCRIPTION

LAYOUT TAB: W-WaterResources
 CAD FILE: R:\030-3133-FRANKLIN JENNINGS WELL PAD-MOUNTAINEER KEYSTONE-Drawing\Site Safety\3133-TopoMap.dwg
 PLOT DATE/TIME: 4/10/2017 3:04 PM

Adkins, Laura L

Subject: Sent from Snipping Tool



<http://deparcgis1/oogis/index.html?x=596441.46&y=4355945.403&datum=NAD83&pntlabel=47-077-00624-00-00>

THRASHER

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

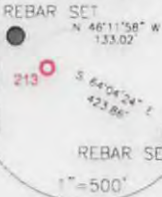
NOTES ON SURVEY

- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	FRANKLIN M. & PEGGY A. JENNINGS	P/D 04-9-6	41
2	FRANKLIN M., PEGGY A. JENNINGS & GARETH LYNN JENNINGS	03-17-40	84.68
3	EVERETT & LUCINDA ST. CLAIR	03-17-33	141.6
4	WILLIAM C. LAREW JR.	03-17-30	57
5	CHRISTOPHER R. & EDDY C. JENNINGS	03-17-27.2	18.88
6	WILLIAM LAREW JR.	03-17-23.1	20.82
7	GLENN C. & KEITH LAREW	03-17-11	45
8	ALDEN BLAINI & ELDORA JENNINGS	03-17-10	80.25
9	ALDEN BLAINI & ELDORA JENNINGS	6-14-3	86.94

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

REFERENCES



EXISTING WELLS WITHIN 3,000'



SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,355,945.403 EASTING: 596,441.460
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,356,021.565 EASTING: 596,355.648
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,359,050.475 EASTING: 594,943.312

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2270



<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034</p>	<p>MINIMUM DEGREE OF ACCURACY: 1/200</p> <p>PROVEN SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)</p>	<p>FRANKLIN JENNINGS</p> <p>OPERATOR'S WELL #: 213</p> <p>API WELL #: 47 STATE 77 COUNTY PERMIT 00624H6A</p>
	<p>WELL TYPE: OIL WASTE DISPOSAL PRODUCTION DEEP GAS <input checked="" type="checkbox"/> LIQUID INJECTION STORAGE SHALLOW <input checked="" type="checkbox"/></p> <p>WATERSHED: SANDY CREEK ELEVATION: 1725.8'</p> <p>DISTRICT: LYON COUNTY: PRESTON QUADRANGLE: THORNTON</p> <p>SURFACE OWNER: FRANKLIN M. & PEGGY A. JENNINGS ACREAGE: 41.00</p> <p>OIL & GAS ROYALTY OWNER: FRANKLIN M. & PEGGY A. JENNINGS ACREAGE: 41.00</p> <p>DRILL <input checked="" type="checkbox"/> DRILL DEEPER REDRILL FRACTURE OR STIMULATE <input checked="" type="checkbox"/> PLUG OFF OLD FORMATION PERFORATE NEW FORMATION</p> <p>CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY)</p> <p>TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 8,286 TVD 19,654 TMD</p>	<p>WELL OPERATOR: ARSENAL RESOURCES ADDRESS: 6031 WALLACE ROAD EXTENSION #300 CITY: WEXFORD STATE: PA ZIP CODE: 15090</p> <p>DESIGNATED AGENT: WILLIAM VEIGEL ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200 CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330</p>
<p>LEGEND:</p> <ul style="list-style-type: none"> ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ⊙ EXISTING / PRODUCING WELLHEAD ⊘ ABANDONED WELL ⊗ PLUGGED & ABANDONED WELL △ CUT CONDUCTOR --- LEASE BOUNDARY --- 500' DHP BUFFER --- DOWN HOLE PATH --- DHP BUFFER 	<p>REVISIONS:</p> <p>DATE: 03-31-17</p> <p>DRAWN BY: R. DOERR</p> <p>SCALE: 1" = 2000'</p> <p>DRAWING NO: 030-3133</p> <p>WELL LOCATION PLAT</p>	

**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

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 that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

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Well Operator: Arsenal Resources
 By: William Veigel *WV Department of*
 Its: Designated Agent *Environmental Protection*

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

Organization Information									
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				

Organization Information									
Business Purpose	2111 - Mining, Quarrying, Oil & Gas Extraction - Oil and Gas Extraction - Crude Oil and Natural Gas Extraction				Capital Stock				
Charter County					Control Number	99Q1F			
Charter State	WV				Excess Acres				
At Will Term	A				Member Managed	MBR			
At Will Term Years					Par Value	RECEIVED Office of Oil and Gas APR 14 2017			
WV Department of Environmental Protection									

Authorized Shares

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

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

Annual Reports	RECEIVED Office of Oil and Gas
Date filed	APR 14 2017

WV Department of
Environmental Protection

07/21/2017
2/23/2017

6/20/2016
6/30/2015
4/28/2014
6/28/2013
5/8/2012
Date filed

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

Thursday, February 23, 2017 — 9:08 AM

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~~CONFIDENTIAL~~
77-00624

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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07/21/2017
US_ACTIVE-117570062

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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77-00624

People Powered. Asset Strong.

April 6, 2017

Mr. James Martin, Chief of Oil and Gas
WV DEP
601 57th Street, SE
Charleston, WV 25301

RE: Ownership of Roadways; Franklin Jennings 213

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 wells. The findings of the title examinations show that that the roadways crossed by the proposed wells are right of ways, with the oil and gas being owned and covered by the leaseholds identified on the plat for the proposed wells.

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 black ink, appearing to read 'Ryan Brode'.

Ryan Brode
Title Attorney

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WV Department of
Environmental Protection
6031 Wexford Plaza, Suite 300
Wexford, PA 15090
P: 724-431-1700
F: 800-428-0981
www.arsenalresources.com

07/21/2017

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

Date of Notice Certification: 04/13/2017

API No. 47- 077 - 00624
Operator's Well No. 213
Well Pad Name: Franklin Jennings

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>596441.460</u>
County: <u>Preston</u>		Northing: <u>4355945.403</u>
District: <u>Lyon</u>	Public Road Access: <u>May Road</u>	
Quadrangle: <u>Thornton</u>	Generally used farm name: <u>Franklin M. & Peggy A. Jennings</u>	
Watershed: <u>Sandy Creek</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.

<p>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:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
---	---

Required Attachments:

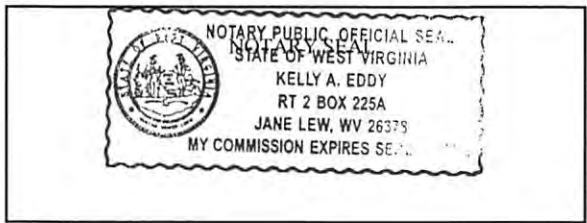
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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.

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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>65 Professional Place</u>
By:	<u>William Veigel</u>		<u>Bridgeport, WV 26330</u>
Its:	<u>Designated Agent</u>	Facsimile:	<u>304-848-9134</u>
Telephone:	<u>724-940-1204</u>	Email:	<u>ecarder@arsenalresources.com</u>



Subscribed and sworn before me this 12th day of April 2017.
Kelly A. Eddy Notary Public
 My Commission Expires September 18

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.

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 07/31/2017

WW-6A
(9-13)

API NO. 47- 77 - 60624
OPERATOR WELL NO. 213
Well Pad Name: Franklin Jennings

**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: 04/13/2017 **Date Permit Application Filed:** 04/13/2017

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: Franklin M. & Peggy A. Jennings
 Address: 463 Evansville Pike
Thornton, WV 26440
 Name: _____
 Address: _____

COAL OWNER OR LESSEE
 Name: see attached
 Address: _____

COAL OPERATOR
 Name: none
 Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance) ✓
 Name: Christopher R. Jennings
 Address: P.O. Box 86
Newburg, WV 26410
 Name: Franklin M. & Peggy A. Jennings ✓
 Address: 463 Evansville Pike
Thornton, WV 26440

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
 Name: see attached
 Address: _____

SURFACE OWNER(s) (Impoundments or Pits) ✓
 Name: Franklin M. & Peggy A. Jennings
 Address: 463 Evansville Pike
Thornton, WV 26440

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
 Name: none
 Address: _____

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*Please attach additional forms APR 14 2017

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07/21/2017

Arsenal Resources
Franklin Jennings 213

Coal Owner or Lessee

Franklin M. and Peggy A. Jennings ✓
463 Evansville Pike
Thornton, WV 26440

ACIN ✓
5260 Irwin Road
Huntington, WV 25705

Water Purveyors

Franklin M. and Peggy A. Jennings ✓
463 Evansville Pike
Thornton, WV 26440

G Lynn & Rhoda L Jennings ✓
1215 George Washington Hwy
Thornton, WV 26440

Richard A & Mary T Nestor ✓
2930 Kump Station Road
Taneytown, MD 21787

Carolyn W. Bingham & Charles H. Newlon II ✓
550 Joyce Avenue
Lewisburg, TN 37091

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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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/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 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. (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 or 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 57th St. SE
Charleston, WV 25304
(304) 926-0450

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Office of Oil and Gas

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.**

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WV Department of
Environmental Protection 07/21/2017

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.

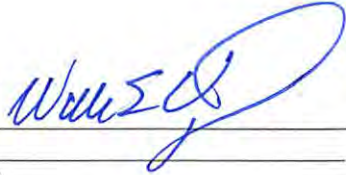
A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment 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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Notice is hereby given by:

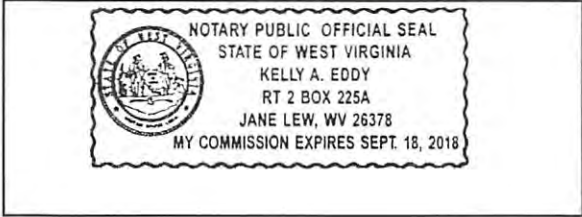
Well Operator: Arsenal Resources
Telephone: 724-940-1204
Email: ecarder@arsenalresources.com



Address: 6031 Wallace Road Extension 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.



Subscribed and sworn before me this 12th day of April, 2017.

Kelly A. Eddy Notary Public

My Commission Expires September 18, 2018

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**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY**

Notice Time Requirement: Notice shall be provided at least SEVEN (7) days but no more than FORTY-FIVE (45) days prior to entry

Date of Notice: 10/17/2016 **Date of Planned Entry:** 10/24/2016

Delivery method pursuant to West Virginia Code § 22-6A-10a

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

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Franklin M. and Peggy A. Jennings
 Address: 463 Evansville Pike
Thomton, WV 26440
 Name: _____
 Address: _____
 Name: _____
 Address: _____

COAL OWNER OR LESSEE

Name: Franklin M. and Peggy A. Jennings ✓
 Address: 463 Evansville Pike
Thomton, WV 26440

MINERAL OWNER(s)

Name: Franklin M. and Peggy A. Jennings
 Address: 463 Evansville Pike
Thomton, WV 26440

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: <u>WV</u>	Approx. Latitude & Longitude: <u>39.347316; -79.680032</u>
County: <u>Preston</u>	Public Road Access: <u>May Road</u>
District: <u>Lyon</u>	Watershed: <u>Little Sandy Creek</u>
Quadrangle: <u>Thomton 7.5</u>	Generally used farm name: <u>Franklin M. and Peggy A. Jennings</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Mountaineer Keystone, LLC
 Telephone: 724-940-1202
 Email: amiller@mkeystone.com

Address: 6031 Wallace Road Extension, Suite 300
Wexford, PA 15090
 Facsimile: 800-428-0981

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.

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 07/21/2017

077-00624

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 10/24/2016 **Date of Planned Entry:** 10/31/2016

Delivery method pursuant to West Virginia Code § 22-6A-10a

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

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Christopher R. Jennings (access road)

Address: P.O. Box 86
Newburg, WV 26410

Name: _____

Address: _____

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: _____

Address: _____

MINERAL OWNER(s)

Name: _____

Address: _____

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: <u>WV</u>	Approx. Latitude & Longitude: <u>39.347316; -79.880032</u>
County: <u>Preston</u>	Public Road Access: <u>May Road</u>
District: <u>Lyon</u>	Watershed: <u>Little Sandy Creek</u>
Quadrangle: <u>Thomton 7.5'</u>	Generally used farm name: <u>Franklin M. and Peggy A. Jennings</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: <u>Mountaineer Keystone, LLC</u>	Address: <u>6031 Wallace Road Extension, Suite 300</u>
Telephone: <u>724-940-1202</u>	<u>Wexford, PA 15090</u>
Email: <u>amiller@mkeystone.com</u>	Facsimile: <u>800-428-0981</u>

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.

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 10/17/2016 **Date of Planned Entry:** 10/24/2016

Delivery method pursuant to West Virginia Code § 22-6A-10a

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

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: _____
Address: _____

Name: _____
Address: _____

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: ACIN
Address: 5260 Irwin Road
Huntington, WV 25705

MINERAL OWNER(s)

Name: _____
Address: _____

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: WV
County: Preston
District: Lyon
Quadrangle: Thomton 7.5'

Approx. Latitude & Longitude: 39.347316; -79.860032
Public Road Access: May Road
Watershed: Little Sandy Creek
Generally used farm name: Franklin M. and Peggy A. Jennings

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Mountaineer Keystone, LLC
Telephone: 724-940-1202
Email: amiller@mkeystone.com

Address: 6031 Wallace Road Extension, Suite 300
Wexford, PA 15090
Facsimile: 800-428-0981

Oil and Gas Privacy Notice:

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Office of Oil and Gas
Franklin Jennings
WV Department of
Environmental Protection
07/21/2017

**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: 04/13/2017 **Date Permit Application Filed:** 04/13/2017

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

- | | | | |
|-------------------------------------|---------------------------------|--------------------------|-----------------|
| <input checked="" type="checkbox"/> | CERTIFIED MAIL | <input type="checkbox"/> | 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: Franklin M. & Peggy A. Jennings
Address: 463 Evansville Pike
Thomton, WV 26440

Name: Christopher R. Jennings
Address: P.O. Box 86
Newburg, WV 26410

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>596441.460</u>
County:	<u>Preston</u>		Northing:	<u>4355945.403</u>
District:	<u>Lyon</u>	Public Road Access:	<u>May Road</u>	
Quadrangle:	<u>Thomton</u>	Generally used farm name:	<u>Franklin M. & Peggy A. Jennings</u>	
Watershed:	<u>Sandy Creek</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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator: Arsenal Resources
Telephone: 724-940-1204
Email: ecarder@arsenalresources.com

Address: 6031 Wallace Road Extension 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 of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

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77-00624



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

February 14, 2017

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

Subject: DOH Permit for the Franklin Jennings Pad, Preston County
Franklin Jennings 213H ✓
47-077-00624

Dear Mr. Martin,

The West Virginia Division of Highways has issued Permit #04-2017-0033 for the subject site to Mountaineer Keystone, LLC for access to the State Road for the well site located off of Preston County 60/5 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

Cc: Mountaineer Keystone, LLC
CH, OM, D-4
File

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WV Department of
Environmental Protection

Franklin Jennings - Well No. 213			
FRACTURING ADDITIVES			
	PURPOSE	TRADE NAME	CAS #
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

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PRESTON COUNTY, WV HIGHWAY MAP



ARSENAL RESOURCES CONSTRUCTION PLANS FOR THE FRANKLIN JENNINGS WELL PAD LYON DISTRICT, PRESTON COUNTY, WV FEBRUARY 2017



SHEET INDEX

SHEET	DESCRIPTION
1	TITLE SHEET
2	EXISTING CONDITIONS
3	OVERALL SITE PLAN
4-8	WELL PAD ACCESS ROAD PLAN & PROFILE
9-10	WELL PAD ACCESS ROAD SECTIONS
11	FLOWBACK PIT ACCESS ROAD PLAN & PROFILE
12	FLOWBACK PIT ACCESS ROAD SECTIONS
13	WELL PAD PLAN
14	WELL PAD PROFILE
15	WELL PAD SECTIONS
16	FLOWBACK PIT & STAGING AREA PLAN
17	FLOWBACK PIT PROFILE
18-20	FLOWBACK PIT SECTIONS
21	TOPSOIL STOCKPILE 1 PLAN
22	TOPSOIL STOCKPILE 2 & 3 PLAN
23	OVERALL GEOMETRIC LAYOUT
24	WELL PAD GEOMETRIC LAYOUT
25	FLOWBACK PIT & STAGING AREA LAYOUT
26	RECLAMATION PLAN
27	GENERAL NOTES
28	QUANTITIES
29-30	TYPICAL SECTIONS
31-36	DETAILS

DRIVING DIRECTIONS FROM NEWBURG, WV

1. TRAVEL EAST ON PRESTON COUNTY ROUTE (CR) 33 FOR APPROXIMATELY 0.3 MILES
2. TURN RIGHT ONTO REEDSVILLE PIKE (WV 92)
3. TRAVEL SOUTH APPROXIMATELY 1.3 MILES ON WV 92
4. TURN RIGHT ONTO SCOTCH HILL ROAD (CR 9211)
5. TRAVEL WEST APPROXIMATELY 0.8 MILES ON CR 9211
6. TURN LEFT ONTO OLD EVANSVILLE PIKE (CR 60)
7. TRAVEL SOUTH APPROXIMATELY 0.9 MILES ON CR 60
8. TURN RIGHT ONTO MAY ROAD (CR 604)
9. TRAVEL SOUTH APPROXIMATELY 0.8 MILES ON CR 604
10. BEAR LEFT TO REMAIN ON CR 604
11. CONTINUE SOUTH APPROXIMATELY 0.1 MILES ON CR 604
12. TURN LEFT ONTO CR 605
13. TRAVEL WEST APPROXIMATELY 200 FEET ON CR 605
14. TURN RIGHT ONTO FRANKLIN JENNINGS WELL PAD ACCESS ROAD

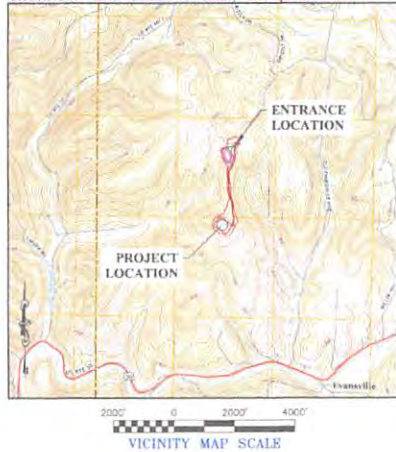
SITE COORDINATES

Coordinate Label	Well Pad Center	Flowback Pit Center	Access Road Beginning
WV93-N Latitude	N 39 347797"	N 39 353587"	N 39 354184"
WV93-N Longitude	W 79 880266"	W 79 879843"	W 79 878939"
WV93-N Northing	388816.728 ft	311155.938 ft	311483.018 ft
WV93-N Easting	1810907.789 ft	1861002.684 ft	1861330.987 ft
UTM 83-17 Northing	4355915.294 m	4358622.712 m	4358775.555 m
UTM 83-17 Easting	596448.740 m	596504.225 m	596584.288 m

SURFACE HOLE COORDINATES

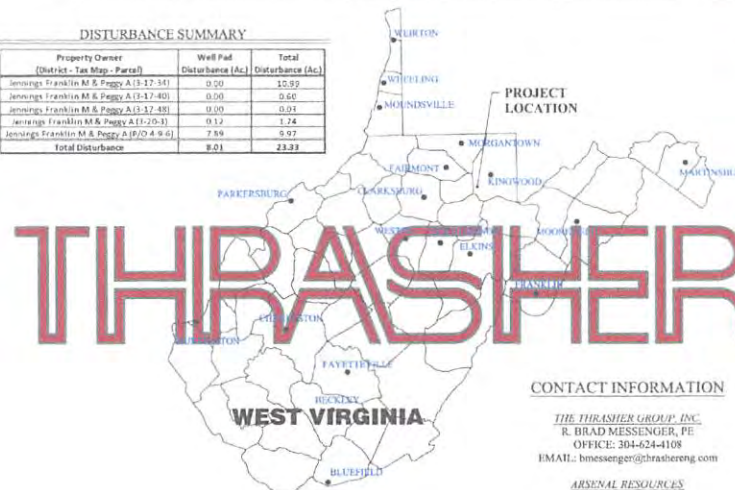
Coordinate Label	Well Number					
	201	202	203	205	211	212
WV93-N Latitude	N 39 347707"	N 39 346583"	N 39 346050"	N 39 345935"	N 39 347505"	N 39 347510"
WV93-N Longitude	W 79 880267"	W 79 880224"	W 79 880180"	W 79 880137"	W 79 880810"	W 79 880769"
WV93-N Northing	308730.749 ft	308721.987 ft	308713.236 ft	308704.484 ft	308912.051 ft	308924.839 ft
WV93-N Easting	1810910.891 ft	1810527.068 ft	1810095.241 ft	1810297.417 ft	1860802.270 ft	1860811.011 ft
UTM 83-17 Northing	4355883.274 m	4355800.067 m	4355878.050 m	4355875.451 m	4355937.895 m	4355945.403 m
UTM 83-17 Easting	596485.486 m	596489.250 m	596493.004 m	596456.758 m	596436.245 m	596441.460 m

THORNTON AND FELLOWSVILLE, WV QUAD MAPS



DISTURBANCE SUMMARY

Property Owner (District - Tax Map - Parcel)	Well Pad Disturbance (Ac)	Total Disturbance (Ac)
Jennings Franklin M & Peggy A (13-17-34)	0.00	10.99
Jennings Franklin M & Peggy A (13-17-40)	0.00	0.60
Jennings Frank M & Peggy A (13-17-45)	0.00	0.04
Jennings Franklin M & Peggy A (13-19-3)	0.12	1.26
Jennings Franklin M & Peggy A (13-19-6)	7.89	0.97
Total Disturbance	8.01	23.83



CONTACT INFORMATION

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EMAIL: bmessenger@thrashereng.com

ARSENAL RESOURCES
EDDIE CARDER
OFFICE: 724-940-1204
EMAIL: carder@arsenalresources.com

- APPROVED FOR PERMITS DATE: 02/14/17 BY: RBM
- APPROVED FOR BID DATE: BY:
- APPROVED FOR CONSTRUCTION DATE: BY:

REVISION NUMBER	REVISED SHEETS	BY	DATE	DESCRIPTION
1	3-5, 16 & 30	JFW	05/08/17	ADDED EMERGENCY LIFELINE TO FLOWBACK PIT, & REVISED WELL PAD SUMP & WELL PAD TRENCH DRAIN DETAILS.

ONE CALL UTILITY SYSTEM CONTACT INFO

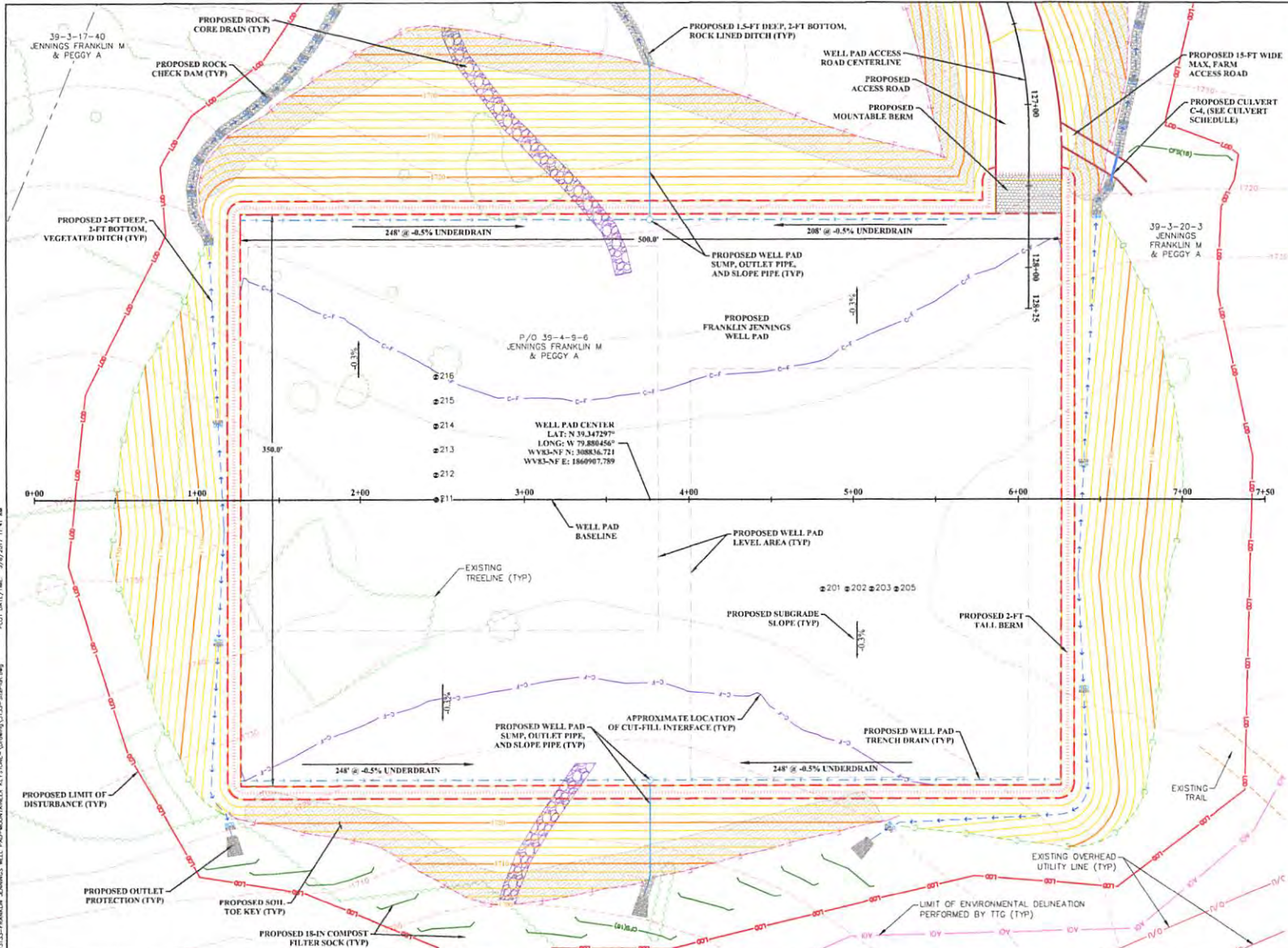


CONTRACTOR SHALL NOTIFY THE ONE-CALL SYSTEM OF THE INTENDED EXCAVATION OR DEMOLITION NOT LESS THAN FORTY-EIGHT (48) HOURS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL FEDERAL OR STATE HOLIDAYS, NOR MORE THAN TEN (10) WORK DAYS PRIOR TO THE BEGINNING OF SUCH WORK.

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DATE PLOTTED: 03/03/2017 10:00:00 AM PROJECT: WELLS PAD DISTURBANCE SUMMARY SHEET: 13-17-34-36



PLAN LEGEND

(Pink dashed line)	ENVIRONMENTAL DELINEATION AREA OF INTEREST
(Blue dashed line)	DELIMITED STREAM - EPHEMERAL
(Green dashed line)	DELIMITED STREAM - INTERMITTENT
(Yellow dashed line)	DELIMITED WETLAND - PALUSTRINE EMERGENT (PEM)
(Light green dashed line)	WET WETLAND BUFFER
(Red dashed line)	LIMIT OF DISTURBANCE
(Orange dashed line)	PROPOSED CONTOURS
(Blue dashed line)	PROPOSED 50:1 TOE KEY (SEE DETAILS)
(Red dashed line)	PROPOSED CUT LIMIT
(Blue dashed line)	PROPOSED FILL LIMIT
(Green dashed line)	APPROXIMATE CUT-FILL INTERFACE - ZERO CUT LINE
(Yellow dashed line)	PROPOSED 18-IN COMPOST FILTER SOCK (CFS)
(Light green dashed line)	PROPOSED 24-IN COMPOST FILTER SOCK (CFS)
(Red dashed line)	PROPOSED FLAT BOTTOM DITCH
(Blue dashed line)	PROPOSED ROCK LINED DITCH
(Green dashed line)	PROPOSED WELL PAD TRENCH DRAIN
(Blue dashed line)	PROPOSED HDPE CULVERT
(Red dashed line)	PROPOSED ROCK CORE DRAIN
(Blue dashed line)	PROPOSED OUTLET PROTECTION
(Red dashed line)	PROPOSED EDGE OF WELL PAD LEVEL AREA
(Blue dashed line)	PROPOSED WELL PAD BEAM
(Red dashed line)	PROPOSED EDGE OF ACCESS ROAD
(Green dashed line)	PROPOSED EDGE OF STAGING AREA
(Blue dashed line)	PROPOSED FLOWBACK PIT ACCESS ROAD BERM
(Red dashed line)	PROPOSED EDGE OF FLOWBACK PIT
(Green dashed line)	PROPOSED EDGE OF TOPSOIL STOCKPILE
(Blue dashed line)	PROPOSED CHAIN LINK FENCE
(Red dashed line)	PROPOSED ORANGE CONSTRUCTION FENCE
(Blue dashed line)	PROPOSED DO NOT DISTURB AREA

- ### NOTES
- ASSUMED 12-IN TOPSOIL DEPTH.
 - ALL PROPOSED CUT AND STRUCTURAL FILL SLOPES ARE AS FOLLOWS UNLESS OTHERWISE NOTED.
 - FLOWBACK PIT EXTERIOR - 2H:1V
 - FLOWBACK PIT INTERIOR - 2.5H:1V
 - STAGING AREA & STAGING AREA ACCESS ROAD - 2H:1V
 - WELL PAD & WELL PAD ACCESS ROAD - 2.5H:1V
 - TOPSOIL STOCKPILES - 3H:1V
 - PROPOSED CONTOURS SHOWN INSIDE THE WELL PAD BERM REPRESENT THE SUBGRADE SURFACE. THE STONE SURFACE SHALL BE GRADED IN ACCORDANCE WITH THE DETAILS AND TYPICAL SECTIONS SHOWN WITHIN THESE PLANS. PROPOSED CONTOURS IN ALL OTHER LOCATIONS REPRESENT FINISH GRADE.
 - THE KEY IS SHOWN FOR REFERENCE ONLY. THE KEY SHALL BE LOCATED AND CONSTRUCTED IN ACCORDANCE WITH THE NOTES AND DETAILS WITHIN THESE PLANS.

APPROVED WVDEP OOG
WJL 5/10/2017



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NO.	BY	DATE	DESCRIPTION



SCALE:	DATE:
DRAWN:	DATE:
CHECKED:	DATE:
APPROVED:	DATE:
SURVEY BY:	
FIELD BOOK No.:	



PHASE No.:	
CONTRACT No.:	
PROJECT No.:	101-030-3133

ARSENAL RESOURCES
CONSTRUCTION PLANS FOR THE
FRANKLIN JENNINGS WELL PAD
PRESTON COUNTY, WEST VIRGINIA
WELL PAD PLAN

SHEET No.
13