



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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Wednesday, February 16, 2022
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ARSENAL RESOURCES LLC
6031 WALLACE RD. EXTENSION
WEXFORD, PA 15090

Re: Permit Modification Approval for 215
47-091-01364-00-00

Extend and modify Lateral. Updated Leases. Total Measured Depth 21,711' to 22971.5'. Horizontal Lateral Length 13,524.4' to 14677.5'.

ARSENAL RESOURCES LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

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

James A. Martin
Chief

Operator's Well Number: 215
Farm Name: ROBERT L & JULIA A ARMSTONG
U.S. WELL NUMBER: 47-091-01364-00-00
Horizontal 6A New Drill
Date Modification Issued: 02/16/2022

Promoting a healthy environment.

02/18/2022

WW-6B
(04/15)

API NO. 47-091 -
OPERATOR WELL NO. Armstrong II 215
Well Pad Name: Armstrong II

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

1) Well Operator: Arsenal Resources 494519412 Taylor Court House Grafton
Operator ID County District Quadrangle

2) Operator's Well Number: Armstrong II 215 Well Pad Name: Armstrong II

3) Farm Name/Surface Owner: Robert and Julie Armstrong Public Road Access: CR13, CR 36 (Long Run Road) CR36/3

4) Elevation, current ground: 1288 Elevation, proposed post-construction: 1293'

5) Well Type (a) Gas Oil _____ Underground Storage _____
Other _____
(b) If Gas Shallow Deep _____
Horizontal

6) Existing Pad: Yes or No No, Adjacent to existing pad

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation - Marcellus Shale, Top = 7,682ft, Bottom-7,778ft, Anticipated Thickness = 96ft, Associated Pressure 0.5psi/ft

8) Proposed Total Vertical Depth: 7,789 ft

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 22,971.5 ft

11) Proposed Horizontal Leg Length: 14,677.5ft

12) Approximate Fresh Water Strata Depths: 30', 100', 150', 250', 850'

13) Method to Determine Fresh Water Depths: Offset wells reported water depths (091-01116, 091-00912, 091-01122, 091-01123, 091-01228, 091-00803)

14) Approximate Saltwater Depths: 2040'

15) Approximate Coal Seam Depths: Pittsburgh 46', Beekmantown-477.5', Brush Creek 523', Upper Freeport 663', Lower Freeport-748', Upper Kittanning-813', Middle Kittanning-885', Lower Kittanning-895'

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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Office of Oil and Gas
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WV Department of
Environmental Protection

WW-6B
(04/15)

4709101364
 API NO. 47-091 -
 OPERATOR WELL NO. Armstrong II 215
 Well Pad Name: Armstrong II

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		94	80	80	CTS
Fresh Water	13.375	New	J-55	54.50	950	950	CTS
Coal							
Intermediate	9.625	New	J-55	40	2,500	2,500	CTS
Production	5.5	New	P-110	20	22,971.5	22,971.5	TOC@2,250
Tubing							
Liners							

By: Bryan Hansen
10-5-21

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%CaCl2	1.2
Fresh Water	13.375	17.5	0.38	2,730	900	Class A 3%CaCl2	1.2
Coal							
Intermediate	9.625	12.25	0.395	3,950	1,500	Class A 3%CaCl2	1.29
Production	5.5	8.5-8.75	0.361	14,360	11,500	Class A / 50-50 Poz	1.29/1.34
Tubing					5,000		
Liners					NA		

PACKERS

Kind:				RECEIVED Office of Oil and Gas FEB 3 2022 WV Department of Environmental Protection
Sizes:				
Depths Set:				

WW-6B
(10/14)

API NO. 47- 091 - _____
OPERATOR WELL NO. Armstrong II 215
Well Pad Name: Armstrong II

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 11,500 psi.

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FEB 3 2022

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 7.43

Wy Department of
Environmental Protection

22) Area to be disturbed for well pad only, less access road (acres): 4.96

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 2,600'; there will be no centralizers from 2,600 to surface.

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

24" will be circulated to 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 2,350' (+/- 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 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 of 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 strands and load the hole. The weight indicator on the rig will be monitored for any occurrences of drag and if any are noticed, we will re-run the previous stand of pipe pulled across and circulate 2x bottoms up while watching shakers for signs of cuttings. Once at the base 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.

*Note: Attach additional sheets as needed.



ARSENAL

R E S O U R C E S

SITE SAFETY PLAN

ARMSTRONG II WELL PAD #215

911 Address:

90 Freewill Drive

Flemington, WV 26347

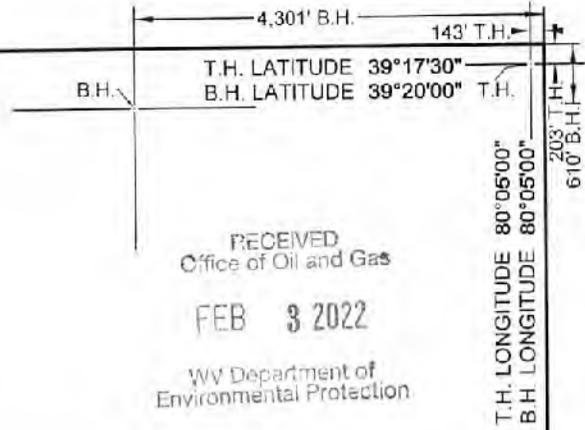
Bryan Harris
10-5-21

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Office of Oil and Gas

FEB 3 2022

WV Department of
Environmental Protection

**ARMSTRONG II LEASE
WELL NO. 215
ARSENAL RESOURCES**



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WV Department of
Environmental Protection

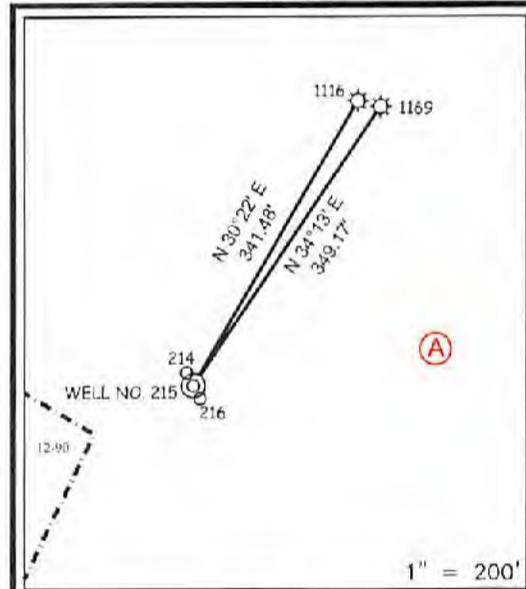
T.H. LONGITUDE 80°05'00"
B.H. LONGITUDE 80°05'00"
208' T.H.
610' B.H.

ARMSTRONG II- 215			
TAG	SURFACE OWNER	PARCEL	ACRES
A	ROBERT & JULIE ARMSTRONG	5-12-1	65.375
B	ROBERT L. JR. & PATRICIA LYNN CARPENTER	5-12-3	117.94
C	ARK LAND LLC	5-9-58	91.45
D	COALQUEST DEVELOPMENT LLC (C/O ARK LAND CO.)	5-9-57.1	120
E	COALQUEST DEVELOPMENT LLC	5-9-57	118.00
F	ARK LAND LLC	5-8-18	73.50
G	ARK LAND LLC	5-9-1	74.00
H	STATE OF W. V. INDUSTRIAL SCHOOL FOR BOYS	5-5-15	913.69
I	MARK A. CURREY	5-4-15	108.46
J	STATE OF W. V. (NORTHWESTERN TURNPIKE)	N/A	N/A
K	MARK A. CURREY ET AL	3-16-38	18.50

PARCEL	ADJOINING SURFACE OWNER	ACRES
5-12-33 1	HARRY V & PATRICIA J JOHNSON	89.30
5-12-35 2	MARIE ELEANOR QUEEN	2
5-12-34 1	DONNA R GOODNOW	4.825
5-12-90	ROBERT L & JULIE A ARMSTRONG	5
5-13-71 2	JOSEPH & LACEY N FREY	8.35
5-13-71 3	ARK LAND LLC	27.52
5-8-22	HAROLD THOMAS & MARY LOU ADKINS	34.77
5-8-21	DAYTON W & RUTH A GREEN C/O ARK LAND LLC	66.95
5-8-14	ARK LAND LLC	17
5-8-15	ARK LAND LLC	106.82
5-8-19	ARK LAND LLC	42.23
5-8-20	ARK LAND LLC	23
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5-5-14	TIMOTHY R & ROSS P GERARD	15.63
3-16-36	JASON KNOTTS	4.80
3-16-37	ARK LAND LLC	1.00
3-16-33	MARK A. CURREY, ET AL	35.00
3-16-39	NORA REYNOLDS, ET AL	1
3-16-40	JOHN WHITESCARVER	176.75
5-5-15.1	TAYLOR COUNTY FAIR ASSOCIATION	54.5
5-5-15.4	STATE OF WEST VIRGINIA (WV DEPT OF AGRICULTURE)	2.84
5-5-15.2	TAYLOR COUNTY FAIR ASSOCIATION	3.2
5-4-15	MARK A CURREY	108.46
5-9-2	ARK LAND LLC	33.1
5-9-4	COALQUEST DEVELOPMENT LLC	115.00
5-9-56	COALQUEST DEVELOPMENT LLC (C/O ARK LAND CO.)	55.75
5-9-63 3	COALQUEST DEVELOPMENT LLC (C/O ARK LAND CO.)	85.45
5-9-59	ARK LAND COMPANY	28.50
5-9-61	ARK LAND COMPANY	4
5-9-60	ARK LAND LLC	50.02

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 288,680.62 E. 1,603,259.68
 NAD'83 GEO. LAT-(N) 39,291109 LONG-(W) 80.098367
 NAD'83 UTM (M) N. 4,349,482.13 E. 579,006.70
LANDING POINT
 NAD'83 S.P.C.(FT) N. 289,607.7 E. 1,803,996.4
 NAD'83 GEO. LAT-(N) 39,293668 LONG-(W) 80.081256
 NAD'83 UTM (M) N. 4,349,766.3 E. 579,226.5
BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 303,477.6 E. 1,799,197.4
 NAD'83 GEO. LAT-(N) 39.331661 LONG-(W) 80.098538
 NAD'83 UTM (M) N. 4,353,969.8 E. 577,694.0

REFERENCES



NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS > 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE ARE 1"=2000'
- THERE IS ONE (1) HOUSE TRAILER AND ONE (1) HUNTING CABIN WITHIN WITHIN 625 FEET. NEITHER STRUCTURE APPEAR TO BE OCCUPIED AND THE HOUSE TRAILER APPEARS TO BE DILAPIDATED



12 Vannorn Drive | P.O. Box 150 | Glenview, WV 26031 | 304.462.5934
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
 254 East Beckley Bypass | Beckley, WV 25801 | 304.285.5196
 slswv.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 SEPTEMBER 28, 20 21
 REVISED JANUARY 20, 20 22
 OPERATORS WELL NO. 215
 API WELL NO. 47 - 091 - 01364
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 9111-Arsenal-SURV-Plat215-R01-220118-CPM.uwg

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 LIQUID INJECTION ___ WASTE DISPOSAL ___ IF "GAS" PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X

LOCATION: GROUND = 1291.10' ELEVATION PROPOSED = 1293.72' WATERSHED LONG RUN

DISTRICT COURTHOUSE COUNTY TAYLOR QUADRANGLE GRAFTON

SURFACE OWNER ROBERT L. & JULIE A. ARMSTRONG ACREAGE 65.375±

ROYALTY OWNER ROBERT L. & JULIE A. ARMSTRONG ET AL ACREAGE ~~65.375~~ **02/18/2022**

PROPOSED WORK: LEASE NO. SEE WW-6A1

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 TMD 22,971.5 / TVD 7,789'

WELL OPERATOR ARSENAL RESOURCES DESIGNATED AGENT GARY SHORT

ADDRESS 6031 WALLACE RD. EXT. SUITE 300 ADDRESS 633 WEST MAIN STREET

WEXFORD, PA 15090 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT

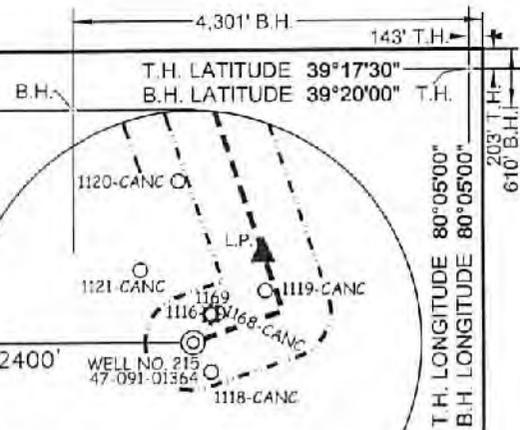
**ARMSTRONG II LEASE
WELL NO. 215
ARSENAL RESOURCES**

NAD'83 GRID NORTH

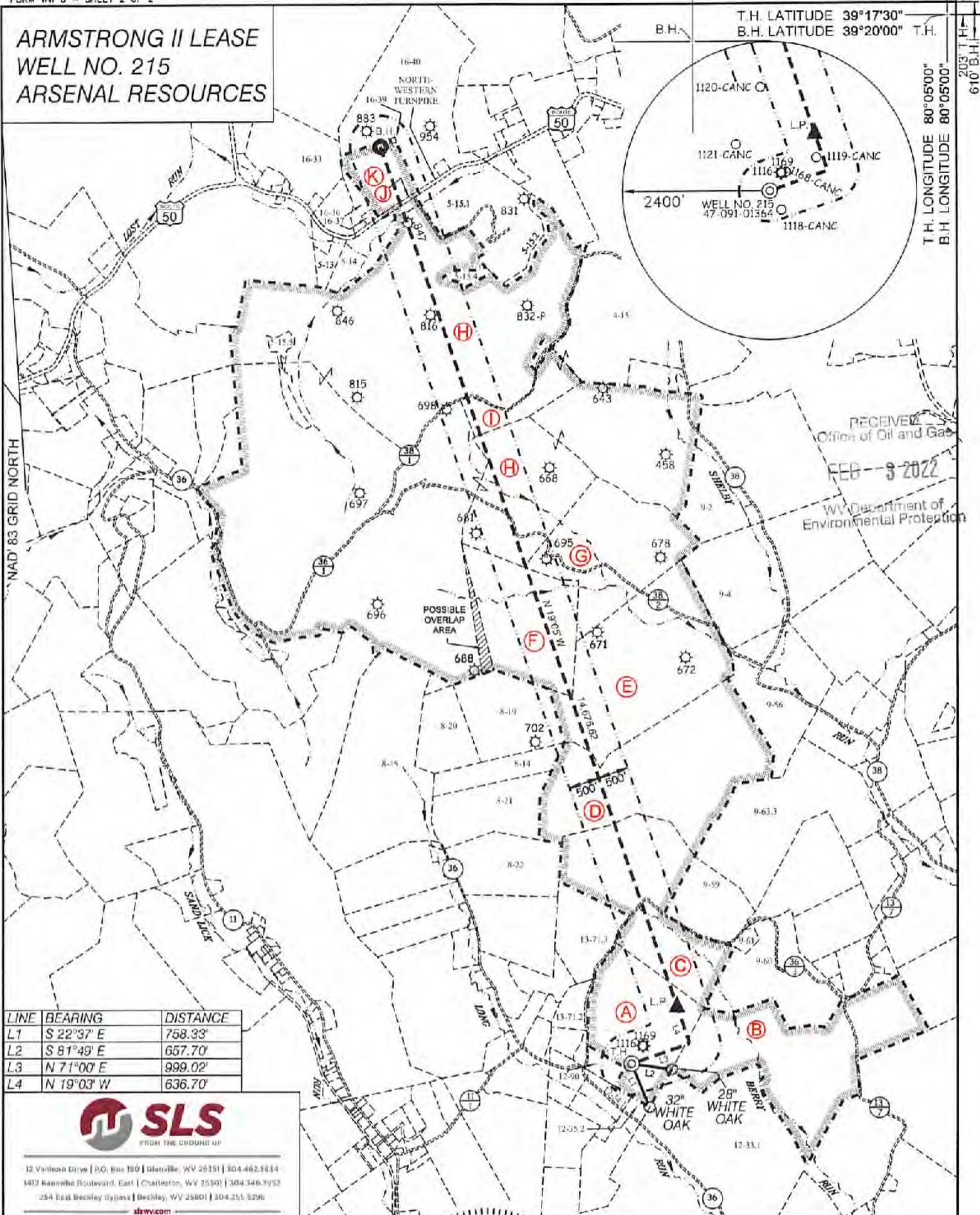
LINE	BEARING	DISTANCE
L1	S 22°37' E	758.33'
L2	S 81°49' E	657.70'
L3	N 71°00' E	999.02'
L4	N 19°03' W	636.70'



12 Vanhook Drive | P.O. Box 180 | Glenville, WV 26031 | 304-462-5834
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304-346-1932
254 East Beckley Bypass | Beckley, WV 25801 | 304-255-5296
slsw.com



T.H. LATITUDE 39°17'30"
B.H. LATITUDE 39°20'00"
T.H. LONGITUDE 80°05'00"
B.H. LONGITUDE 80°05'00"
203' T.H.
610' B.H.



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(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
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SCALE 1" = 2000' FILE NO. 9111-Arsenal-SURV-PA1215-R01-200118-CPL-003
 DATE SEPTEMBER 28, 20 21
 REVISED JANUARY 20, 20 22
 OPERATORS WELL NO. 215
 API WELL NO. 47 - 091 - 01364
 STATE COUNTY PERMIT

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

LEGEND

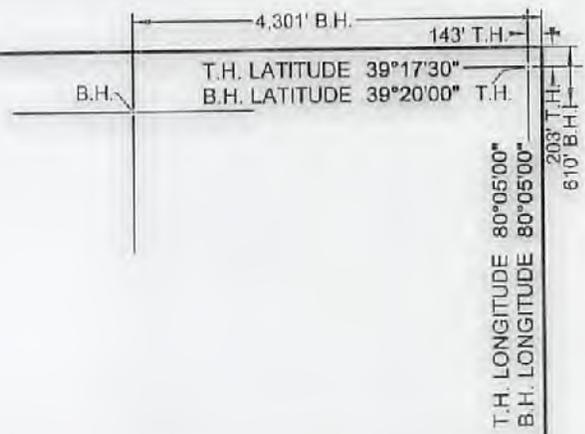
LEASE LINE	
SURFACE LINE	
WELL LATERAL	
OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
TAX MAP-PARCEL	00-00
SURFACE OWNER (SEE TABLE)	
LEASE # (SEE WW-6A1)	

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 ADDRESS 6031 WALLACE RD. EXT. SUITE 300 ADDRESS 633 WEST MAIN STREET
 WEXFORD, PA 15090 BRIDGEPORT, WV 26330

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02/18/2022

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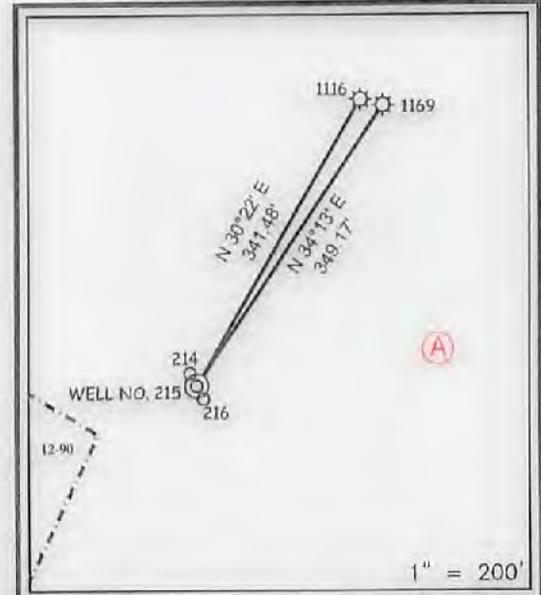


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5-9-60	ARK LAND LLC	50.02

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 NAD'83 UTM (M) N. 4,353,969.8 E. 577,694.0

REFERENCES



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13 Virginia Street, P.O. Box 803, Eliza, WV 25834 | 304.332.8811
 407 Kentucky Boulevard, Box 1, Chaplin, WV 26028 | 304.592.9929
 202 West 80th Street, Elkhart, WV 26039 | 304.332.8811
 sls.wv.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



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 DIVISION OF ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS



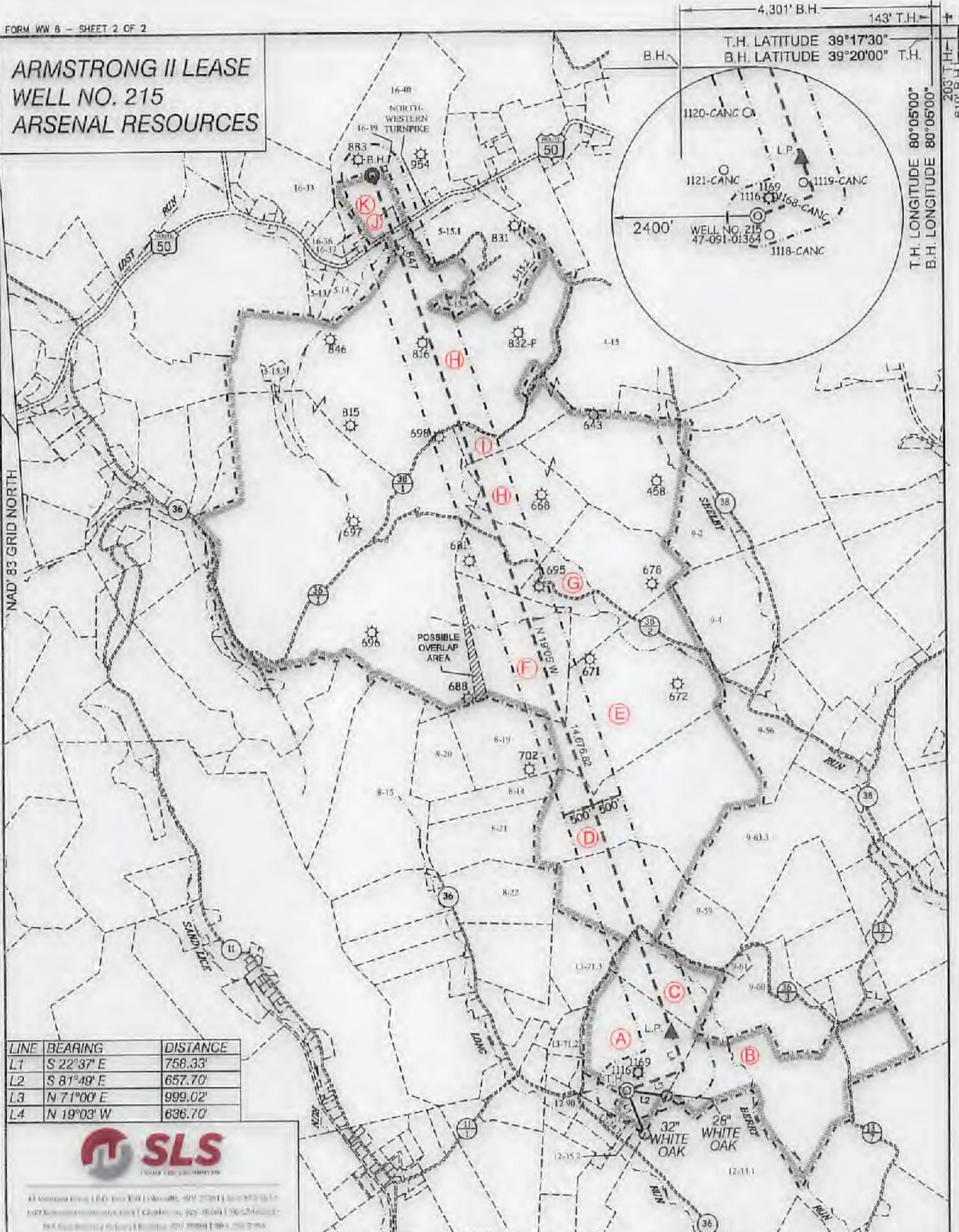
WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: GROUND = 1291.10' ELEVATION PROPOSED = 1293.72' WATERSHED LONG RUN
 DISTRICT COURTHOUSE COUNTY TAYLOR QUADRANGLE GRAFTON
 SURFACE OWNER ROBERT L. & JULIE A. ARMSTRONG ACREAGE 65.375±
 ROYALTY OWNER ROBERT L. & JULIE A. ARMSTRONG ET AL ACREAGE 65.375±
 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 TMD 22,971.5 / TVD 7,789'

WELL OPERATOR ARSENAL RESOURCES DESIGNATED AGENT GARY SHORT
 ADDRESS 6031 WALLACE RD. EXT. SUITE 300 WEXFORD, PA 15090 ADDRESS 633 WEST MAIN STREET BRIDGEPORT, WV 26330

COUNTY NAME PERMIT

0218/2022

**ARMSTRONG II LEASE
WELL NO. 215
ARSENAL RESOURCES**



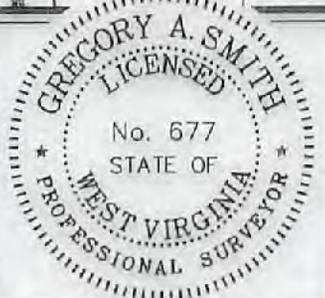
T.H. LATITUDE 39°17'30"
B.H. LATITUDE 39°20'00"

T.H. LONGITUDE 80°05'00"
B.H. LONGITUDE 80°05'00"

LINE	BEARING	DISTANCE
L1	S 22°37' E	758.33'
L2	S 81°49' E	657.70'
L3	N 71°00' E	999.02'
L4	N 19°03' W	636.70'



41 Veterans Blvd. (Rt. 100) East, WV 26011, 304-842-9111
1472 Commonwealth Blvd., Charleston, WV 25304, 1-800-525-5252
884 Oakbury Dr., Lewisburg, WV 26044, 304-758-2999
www.sls.com



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

P.S. 677 *Gregory A. Smith*

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-6A1)

02/18/2022

SCALE 1" = 2000' FILE NO. 9111-Arsenal-SURV-170215-101-220116-CPM.dwg
DATE SEPTEMBER 28, 20 21
REVISED JANUARY 20, 20 22
OPERATORS WELL NO. 215
API WELL NO. 47 - STATE 091 - COUNTY 01364 - PERMIT

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



WELL OPERATOR ARSENAL RESOURCES DESIGNATED AGENT GARY SHORT
ADDRESS 6031 WALLACE RD. EXT. SUITE 300 WEXFORD, PA 15090 ADDRESS 633 WEST MAIN STREET BRIDGEPORT, WV 26330

COUNTY NAME PERMIT

WW-6A1
(5/13)

Operator's Well No. Armstrong II 215

**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: Ross Schweitzer *RSchweitzer* 

Its: Sr. Director of Drilling, Construction & Permitting

ATTACHMENT TO WW-6A1, ARMSTRONG 215

Lease Number	Lessor	Lessee	Lease Royalty	Book/Page	Gross Acres
✓ A 00004370 5-12-1	ROBERT L ARMSTRONG AND JULIE ARMSTRONG HUSBAND AND WIFE PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC	PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC RIVER RIDGE ENERGY, LLC	0.125	55/708 30/698 8/541	65.375
✓ B 00003425 5-12-3	ROBERT L CARPENTER AND VIRGINIA H CARPENTER HIS WIFE PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC	PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC RIVER RIDGE ENERGY, LLC	0.125	41/678 30/698 8/541	117.94
✓ C 00004475 5-9-58	CHARLES F HUNSINGER AND HATTIE L HUNSINGER H/W PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC	PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC RIVER RIDGE ENERGY, LLC	0.125	58/19 30/698 8/541	91.45
✓ D 00005176 5-9-57.1	COALQUEST DEVELOPMENT LLC PDC MOUNTAINEER, LLC	PDC MOUNTAINEER LLC RIVER RIDGE ENERGY, LLC	0.125	64/392 8/541	120
✓ E 00003425 5-9-57	ROBERT L CARPENTER AND VIRGINIA H CARPENTER HIS WIFE PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC	PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC RIVER RIDGE ENERGY, LLC	0.125	41/678 30/698 8/541	118
✓ F 00008076 5-8-18	DORIS C STOUT IRREVOCABLE TRUST DATED DECEMBER 27, 2012 DANIEL L STOUT TRUSTEE	MAR KEY LLC	0.16	69/126	73.5
✓ G 00004049 5-9-1	MONA H COOPER A WIDOW, DONNA J AND CHARLES R MCELLOWNEY WIFE AND HUSBAND PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC	PETROLEUM DEVELOPMENT CORPORATION PDC MOUNTAINEER, LLC RIVER RIDGE ENERGY, LLC	0.125	42/13 30/698 8/541	74
✓ H 00008278 5-15-15	DR FLORENCE KUNST HOBACK AND J HOLLAND HOBACK HER HUSBAND EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	0.125	40/656 314/429 36/618	913.69

ATTACHMENT TO WW-6A1, ARMSTRONG 215

Lease Number	Lessor	Lessee	Lease Royalty	Book/Page	Gross Acres
	GREYLOCK PRODUCTION LLC	MAR KEY LLC		37/8	
H	DR FLORENCE KUNST HOBACK AND J HOLLAND HOBACK HER HUSBAND	EASTERN AMERICAN ENERGY CORPORATION	0.125	37/663	913.69
00008290 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	TYGART EAST COMPANY	EASTERN AMERICAN ENERGY CORPORATION	0.125	38/599	913.69
00008292 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	THE BOARD OF TRUSTEES OF DAVIS AND ELKINS COLLEGE	EASTERN AMERICAN ENERGY CORPORATION	0.125	38/616	913.69
00008293 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	RITA M REYNOLDS WIDOW, REBECCA REYNOLDS SINGLE AND JOHN H REYNOLDS AND DIANA L REYNOLDS HIS WIFE	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/56	913.69
00008343 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	MILDRED P BAZZLE AND HANSEL BAZZLE HER HUSBAND	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/184	913.69
00008344 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	

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ATTACHMENT TO WW-6A1, ARMSTRONG 215

Lease Number	Lessor	Lessee	Lease Royalty	Book/Page	Gross Acres
H	ALONZO D PETERS AND MARY E PETERS HIS WIFE AND ALONZO D PETERS AS ATTORNEY IN FACT FOR WILDA P MALLOW	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/176	913.69
00008345 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	MARY E COYLE WIDOW	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/180	913.69
00008346 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	CONSTANCE P FROST UNMARRIED	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/188	913.69
00008347 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
H	J STRIDER MOLER SINGLE	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/505	913.69
00008348 5-15-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
I	JESSIE R MASON (WIDOW) AND SAMUEL FRED MASON II (SINGLE)	EASTERN AMERICAN ENERGY CORPORATION	0.125	44/196	108.46
00008294 5-4-15	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
J	CONSTANCE P FROST BY HER ATTORNEY-IN-FACT	PETROLEUM DEVELOPMENT CORPORATION	0.125	249/302	N/A

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ATTACHMENT TO WW-6A1, ARMSTRONG 215

Lease Number	Lessor	Lessee	Lease Royalty	Book/Page	Gross Acres
D0000368 CT RT 50/26	PDC MOUNTAINEER, LLC	RIVER RIDGE ENERGY, LLC		8/541	
J	RITA M REYNOLDS WIDOW, REBECCA REYNOLDS SINGLE AND JOHN H REYNOLDS AND DIANA L REYNOLDS HIS WIFE	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/56	N/A
00008343 CT RT 50/26	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
J	MILDRED P BAZZLE AND HANSEL BAZZLE HER HUSBAND	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/184	N/A
00008344 CT RT 50/26	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
J	ALONZO D PETERS AND MARY E PETERS HIS WIFE AND ALONZO D PETERS AS ATTORNEY IN FACT FOR WILDA P MALLOW	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/176	N/A
00008345 CT RT 50/26	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
J	MARY E COYLE WIDOW	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/180	N/A
00008346 CT RT 50/26	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
J	CONSTANCE P FROST UNMARRIED	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/188	N/A
00008347 CT RT 50/26	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC		314/429 36/618	

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ATTACHMENT TO WW-6A1, ARMSTRONG 215

Lease Number	Lessor	Lessee	Lease Royalty	Book/Page	Gross Acres
	GREYLOCK PRODUCTION LLC	MAR KEY LLC		37/8	
J	J STRIDER MOLER SINGLE	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/505	N/A
00008348 CT RT 50/26	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
K D0000368 00013955	CONSTANCE P FROST BY HER ATTORNEY-IN-FACT PDC MOUNTAINEER, LLC	PETROLEUM DEVELOPMENT CORPORATION RIVER RIDGE ENERGY, LLC	0.125	249/302 8/541	N/A
K 00008343 3-16-38	RITA M REYNOLDS WIDOW, REBECCA REYNOLDS SINGLE AND JOHN H REYNOLDS AND DIANA L REYNOLDS HIS WIFE EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC	0.125	45/56 314/429 36/618 37/8	18.5
K 00008344 3-16-38	MILDRED P BAZZLE AND HANSEL BAZZLE HER HUSBAND EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC	0.125	45/184 314/429 36/618 37/8	18.5
K 00008345 3-16-38	ALONZO D PETERS AND MARY E PETERS HIS WIFE AND ALONZO D PETERS AS ATTORNEY IN FACT FOR WILDA P MALLOW EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC	0.125	45/176 314/429 36/618 37/8	18.5
K	MARY E COYLE WIDOW	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/180	18.5

ATTACHMENT TO WW-6A1, ARMSTRONG 215

Lease Number	Lessor	Lessee	Lease Royalty	Book/Page	Gross Acres
00008346 3-16-38	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
K	CONSTANCE P FROST UNMARRIED	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/188	18.5
00008347 3-16-38	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	
K	J STRIDER MOLER SINGLE	EASTERN AMERICAN ENERGY CORPORATION	0.125	45/505	18.5
00008348 3-16-38	EASTERN AMERICAN ENERGY CORPORATION ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC	ENERGY CORPORATION OF AMERICA GREYLOCK PRODUCTION LLC MAR KEY LLC		314/429 36/618 37/8	

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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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02/18/2022

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

FEB 3 2022
WV Department of
Environmental Protection

02/18/2022

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 the 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	
Authorized Shares		Young Entrepreneur	Not Specified

Addresses	
Type	Address
Designated Office Address	633 W. MAIN STREET 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

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Principal Office Address	6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090 USA
Type	Address

Officers	
Type	Name/Address
Member	ARSENAL RESOURCES DEVELOPMENT 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	
Filed For	
2021	
2020	
2019	
2018	
2017	
2016	
2015	
2014	
2013	
2012	
Date filed	

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

Saturday, September 11, 2021 — 9:01 PM

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Business Organization Detail

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SENECA-UPSHUR PETROLEUM, LLC

Organization Information								
Org Type	Effective Date	Established Date	Filing Date	Charter	Class	Sec Type	Termination Date	Termination Reason
LLC Limited Liability Company	2/12/1973		2/12/1973	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	0
Charter State	WV	Excess Acres	0
At Will Term	A	Member Managed	MBR
At Will Term Years		Par Value	
Authorized Shares		Young Entrepreneur	Not Specified

Addresses	
Type	Address
Designated Office Address	633 W. MAIN STREET 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

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WV Department of
Environmental Protection

Principal Office Address	6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090 USA
Type	Address

Officers	
Type	Name/Address
Member	RIVER RIDGE ENERGY, LLC 6031 WALLACE ROAD EXTENSION, SUITE 300 WEXFORD, PA, 15090
Organizer	TAMMY J OWEN 300 SUMMERS STREET, STE 1500 PO BOX 2107 CHARLESTON, WV, 25328 USA
Type	Name/Address

DBA			
DBA Name	Description	Effective Date	Termination Date
KEYSPAN PRODUCTION & DEVELOPMENT COMPANY	TRADENAME	6/11/2004	
NATIONAL GRID	TRADENAME	8/17/2007	
NATIONAL GRID PRODUCTION AND DEVELOPMENT	TRADENAME	12/5/2008	5/9/2012
DBA Name	Description	Effective Date	Termination Date

Name Changes		RECEIVED Office of Oil and Gas FEB 3 2022 WV Department of Environmental Protection
Date	Old Name	
3/28/2011	SENECA-UPSHUR PETROLEUM, INC.	
Date	Old Name	

Date	Amendment
6/15/2016	AMENDMENT FILED CHANGING FROM A MANAGER-MANAGED CO. TO A MEMBER-MANAGED CO. >> REMOVED ROBERT KOZEL & STEPHEN A. BISHOP AS MANAGERS & ADDED SOLE MEMBER (C IMAGE).
3/28/2011	CONVERSION: FROM SENECA-UPSHUR PETROLEUM, INC. TO SENECA-UPSHUR PETROLEUM, LLC
7/25/1997	MERGER; MERGING LITTLE SWISS DRILLING COMPANY, A QUAL WV CORP AND PALACE VALLEY PETROLEUM COMPANY, A QUAL WV CORP WITH AND INTO SENECA-UPSHUR PETROLEUM, INC., A QUAL WV CORP, THE SURVIVOR.
Date	Amendment

Annual Reports

Filed For

2021

2020

2019

2018

2017

2016

2015

2014

2013

2012

2011

2010

2009

2008

2007

2006

2005

2004

2003

2002

2001

2000

1999

1998

Date filed

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

Saturday, September 11, 2021 — 9:02 PM

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People Powered. Asset Strong.

October 1, 2021

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; Armstrong II 214-216 Wells

Dear Mr. Martin:

In preparation of filing a permit application for the above referenced well, Arsenal Resources has conducted a thorough title examination in order to determine the ownership of the oil and gas underlying roadways crossed by the proposed well(s). 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 cursive script that reads 'Jon Sheldon'.

Jon Sheldon
Chief Operating Officer

RECEIVED
FEB 3 2022
WV Department of
Environmental Protection

6031 Wallace Road Ext, Suite 300
Waxford, PA 15090
P: 724-940-1100
F: 800-428-0981
www.arsenalresources.com

02/18/2022



2/1/2022

Diversified Resources Inc
4150 Belden Village Ave. NW Ste 410
Canton, OH 44718-2253

RE: Armstrong II Well Pad

Dear Sir/Madam,

Arsenal Resources has developed a Marcellus pad, Armstrong II 214, 215 and 216 wells, located in Taylor 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 7,800 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 Armstrong, 214, 215 and 216 wells during First Quarter of 2022. 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 724-940-1137 with any questions or comments. You may also contact the WV Office of Oil and Gas at 304-926-0449.

Sincerely,

A handwritten signature in cursive script that reads 'RSchweitzer'.

Ross Schweitzer
Sr. Director of Drilling, Construction and Permitting

AOR - Attachment "B"

RECEIVED
Office of Oil and Gas

FEB 3 2022

WV Department of
Environmental Protection

4709101364



February 1st, 2022

WVDEP
Office of Oil and Gas
ATTN: Laura Adkins
601 57th Street SE
Charleston, WV 25304

OK# 0000118095
45,150

RE: Armstrong II 215, API# 47-091-01364 – Expedited Modification due to well extension and spacing changes

Dear Laura:

Enclosed please find the modification for the Armstrong II 215, (API# 47-091-01364). This permit is being modified due to adjusting the well bore spacing and moving it ~150' to the east. The well head locations remained the same. The well is also being extended in lateral length. This well was originally permitted to 21,711' the modification is permitted to 22,971' and the additional leases are shown on the WW-6A1.

Included are the following update forms:

- Plat
- WW-6B, Well Work Permit Application/Casing
- Well Bore Schematic
- WW-6A1, Lease Information
- Roadway Letter
- Site Safety Plan
- AOR

RECEIVED
Office of Oil and Gas
FEB 3 2022
WV Department of
Environmental Protection

Should you have any questions or need any additional information, please feel free to contact me by phone or email. Thanks!

Sincerely,

Ross Schweitzer
Sr. Director of Drilling, Construction and Permitting
1-724-584-1192 mobile
rschweitzer@arsenalresources.com

02/18/2022

4709101364

MODIFICATION



ARSENAL
R E S O U R C E S

SITE SAFETY PLAN

ARMSTRONG II WELL PAD #215

911 Address:

90 Freewill Drive

Flemington, WV 26347

Bryan Harris
10-5-21

RECEIVED
Office of Oil and Gas

FEB 3 2022

WV Department of
Environmental Protection

ARMSTRONG II Well Pad #215 Site Safety Plan
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Section 1 – Contacts, Schedules, and Meetings

A. Emergency Contact Information

This section details the method of notification to the public if an H2S Gas, blowout, or flaring emergency would be encountered. This section also lists the H2S Safety Services and Equipment that will be brought on site in case of an H2S Emergency.

Emergency Contact Information

The 24-hour Emergency Contact Information including the name and phone numbers of persons to be notified shall be posted in the production trailer in a common area and in plain sight for reference. The Emergency Contact Information is identified in the following table:

Arsenal Resources – Emergency Contact Information		
Name	Position	24-Hour Phone #
Jon Sheldon	Chief Operating Officer	304-376-0719
Ross Schweitzer	Sr. Director of Drilling, Cons & Permitting	724-584-1192
Brandon Wedde	Sr Director of Completions & Production	724-719-1240
West Virginia DEP Office of Oil & Gas – Emergency Contact Information		
Name	Position	24-Hour Phone #
Bryan Harris	Local WVDEP Inspector, Taylor County	304-553-6087
	Office of Oil & Gas	304-926-0499
	WVDEP Emergency Spill Hotline	1-800-642-3074
Emergency Response Units		
National Response Center for Reporting Chemical or Oil Spills		800-424-8802
WVDEP Emergency Spill Center		800-642-3074
Ambulance, Fire, and Law Enforcement		911
Taylor County EMS		304-265-0904
Taylor County Emergency Service Center		304-265-2524
Taylor County Sheriff Department		304-265-3428

B. Public Facility Contact Information

According to information provided to Arsenal Resources by SLS there are six public facilities located within the one-mile radius of the site. These facilities are listed in the table below:

Bailey Memorial UMC	63 Bailey Church Rd	Rosemont	WV	26424	304-842-1141
Flemington Assembly Church of God	1001 West Veterans Memorial HWY	Flemington	WV	26347	304-506-3448
Victory Valley Church	Route 76	Rosemont	WV	26424	304-739-4787
USPS	1791 W Veterans Memorial Hwy	Rosemont	WV	26424	800-275-8777
D&K Custom Cutting	1686 E Veterans Memorial Hwy	Flemington	WV	26347	304-739-2686
Mustangs & Bullets	4041 Green Valley Rd	Bridgeport	WV	26330	304-842-4363

All landowners within a 1 Mile Radius are listed as part of the Well Safety Plan Map.

* - *ESRI Aerial Imaging was used to determine the location of Schools/Public Facilities/Houses within one mile of the project site.*

C. H2S Gas, Blow Out, and Flaring Emergency Notification and Evacuation Procedures

This section details the method of notification to the public if an H2S Gas, blowout, or flaring emergency would be encountered. This section also lists the H2S Safety Services and Equipment that will be brought on-site in case of an H2S Emergency.

Evacuation Plan

In the event of an emergency that requires evacuation, personnel are to vacate the well pad area in a calm and orderly fashion by exiting the pad via the access road onto CR 17.

The procedure to be used in alerting nearby persons in the event of any occurrence that could pose a threat to life or property will be arranged and completed with public officials in detail, prior to drilling into the hydrogen sulfide formations.

In the event of an actual emergency, the following steps will be immediately taken:

1. Arsenal Resources will immediately notify the appropriate parties from the Emergency Contacts Section of this plan and any other appropriate parties to conduct necessary evacuation notifications. The emergency officials will immediately warn each resident and transient's down-wind within the radius of exposure from the well site, and then warn all residents in the radius of exposure. Additional evacuation zones may be necessary as the situation warrants. Arsenal Resources will provide assistance to emergency authorities.
2. Arsenal Resources will dispatch sufficient personnel to assist with traffic control in the vicinity away from the potentially dangerous area as requested and directed by the emergency authorities in charge of the evacuation procedures. A guard will be stationed at the entrance of the well site to monitor essential and non-essential traffic.
3. General:
 - A. The area included within the radius of exposure is considered to be the zone of maximum potential hazard from a hydrogen sulfide gas escape. Immediate evacuation of public areas, in accordance with the provisions of this contingency plan, is imperative. When it is determined that conditions exist which create an additional area (beyond the initial zone of maximum potential hazard) vulnerable to possible hazard, public areas in the additional hazardous area will be evacuated in accordance

with the contingency plan.

- B. In the event of a disaster, after the public areas have been evacuated and traffic stopped, it is expected that local civil authorities will have arrived and within a few hours will have assumed direction of and control of the public, including all public areas. Arsenal Resources will cooperate with these authorities to the fullest extent and will exert every effort by careful advice to such authorities to prevent panic or rumors.
- C. Arsenal Resources will dispatch appropriate management personnel at the disaster site as soon as possible. The company's personnel will cooperate with and provide such information to civil authorities as they might require.
- D. One of the products of the combustion of hydrogen sulfide is sulfur dioxide (SO₂). Under certain conditions this gas may be equally as dangerous as H₂S. A pump type detector device, which determines the percent of SO₂ in air through concentrations in ppm, will be available. Although normal air movement is sufficient to dissipate this material to safe levels, the SO₂ detector should be utilized to check concentrations in the proximity of the well once every hour, or as necessary and the situation warrants. Also, if any low areas are suspected of having high concentrations, personnel should be made aware of these areas, and steps should be taken to determine whether or not these low areas are hazardous.

This evacuation plan will also be posted in the production trailer in a common area and in plain sight for personnel to reference if there is an emergency that requires evacuation. The evacuation plan will be reviewed in the pre-drill or weekly safety meetings with all personnel.

D. Pre-Spud Meeting.

The Pre-Spud Meeting Form included on the next page will be used during the pre-spud meeting to account for all parties that are present. The invited parties shall include Representatives from Arsenal Resources Drilling and HSE Departments, the regional WVDEP Inspector, and representatives from all contractor companies being utilized during the drilling process.

Meeting Date: _____

Pre-Spud Meeting

Armstrong II Well Pad #215

NAME

TITLE

NAME	TITLE
	Arsenal Resources DRILLING REPRESENTATIVE
	Arsenal Resources SITE SUPERVISOR/REPRESENTATIVE
	STATE INSPECTOR
	DRILLING CONTRACTOR REPRESENTATIVE

E. Daily Visitor Sign-In Sheets

Arsenal Resources utilizes a third-party security contractor to monitor the main entry to our sites from the start of the drilling process through the conclusion of flowback. The contractors will be utilizing their forms to document all individuals that access Arsenal Resources' well pad.

F. Safety Meetings

Safety Meetings: Arsenal Resources and selected contractors shall hold a "pre-drill" safety meeting to discuss Well Site Safety during operations at the project location.

Safety Meetings will be held on a daily basis, prior to starting different phases of the operation (e.g., completion or work over operations), or when safety issues arise or need to be addressed.

Attendance logs will be kept for all site safety meetings and maintained on site.

The local WV DEP inspector, Bryan Harris, or another Office of Oil and Gas representative and emergency responders from the area will be notified of and invited to the pre-drill and subsequent meeting.

Section 2 – Maps and Diagrams

A. Plan View Map

The following pages include a Plan view map of the location, access road, pit(s), flare lines, nearby dwellings, notation of the north direction and the prevailing wind direction.

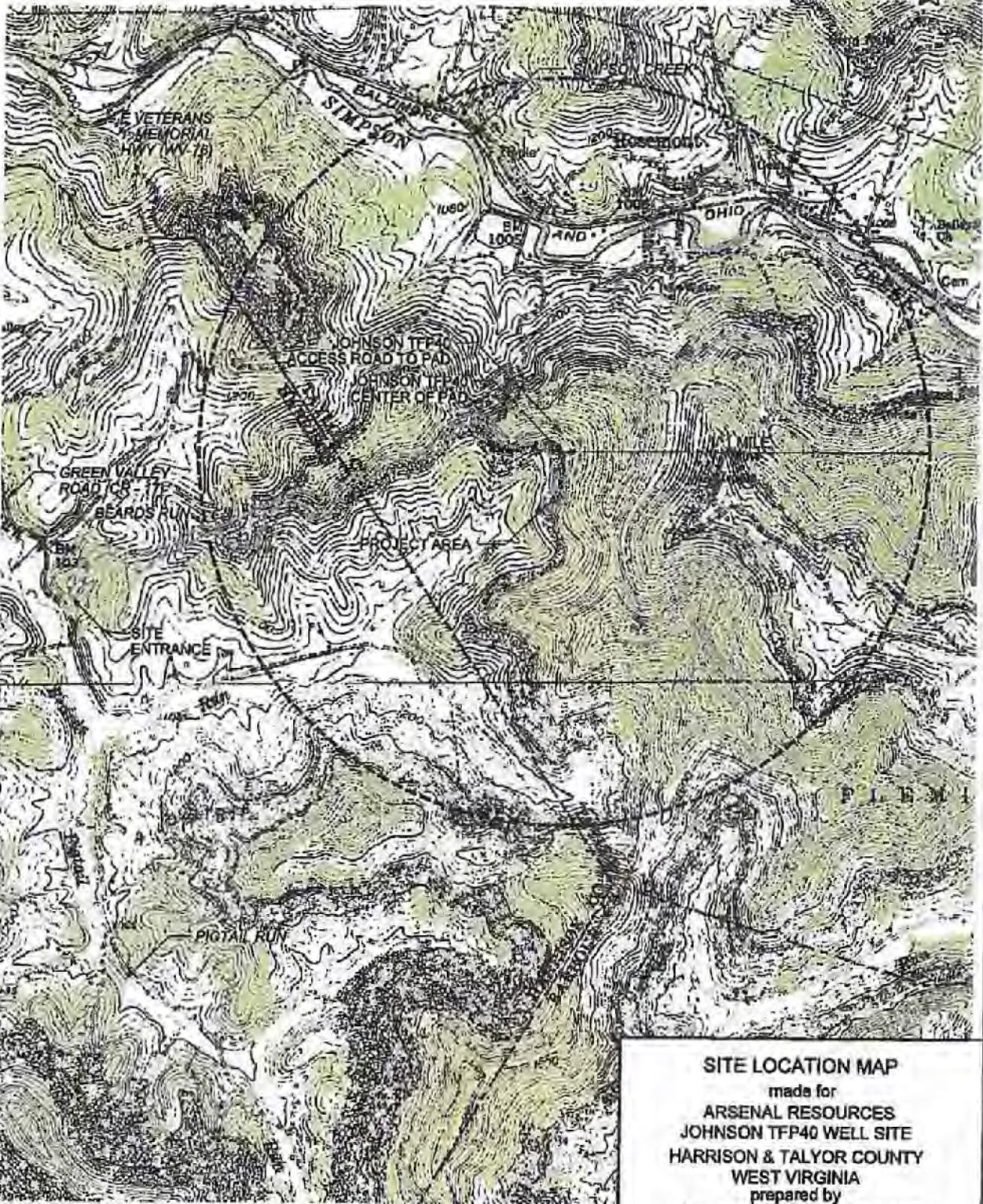
B. Topographic Map

This section includes a Topographic map of the well location, including a 1 mile radius of well location, and UTM NAD 83 coordinates of well site entrance, UTM NAD 83 coordinates of the point the access road intersects the public route, and public route numbers and/or route names.

SITE ACCESS ROAD ENTRANCE (NAD83)
 UTM (METER)
 N: 4345160.695
 E: 569526.426
 GEOGRAPHIC (DMS)
 LAT: 39° 15' 10.43"
 LONG: -80° 11' 3.15"

ACCESS ROAD TO PAD (NAD83)
 UTM (METER)
 N: 4345904.476
 E: 571674.923
 GEOGRAPHIC (DMS)
 LAT: 39° 15' 34.25"
 LONG: -80° 10' 9.22"

CENTER OF PAD (NAD83)
 UTM (METER)
 N: 4346803.620
 E: 571690.367
 GEOGRAPHIC (DMS)
 LAT: 39° 15' 30.97"
 LONG: -80° 10' 6.62"



K:\Mountaineer\Kingslake\2017\17078-007 - Johnson TFP40\Common\Site Location Map_11 (MILE)_SS311.dgn
 3:05:29 PM
 9/27/2016
 1:2000

REFERENCES: IMAGERY PROVIDED BY USGS;
 ROSEMONT & BROWNTOWN QUADRANGLES;
 WEST VIRGINIA 7.5 MINUTE SERIES

SCALE: 0 2000 R.

SITE LOCATION MAP
 made for
ARSENAL RESOURCES
JOHNSON TFP40 WELL SITE
HARRISON & TAYLOR COUNTY
WEST VIRGINIA
 prepared by
DIEFFENBAUCH & HRITZ, LLC
 1095 Chaplin Rd Suite 200, Morgantown, WV 26601
 Phone: 304-985-5555 Fax: 304-985-5557

02/18/2022

C. Evacuation Plan Procedures

In the event of an H₂S emergency, the following steps will be immediately taken:

1. Arsenal Resources will immediately notify the appropriate parties from the Emergency Contacts Section of this plan and any other appropriate parties to conduct necessary evacuation notifications. The emergency officials will immediately warn each resident and transient's down-wind within the radius of exposure from the well site, and then warn all residents in the radius of exposure. Additional evacuation zones may be necessary as the situation warrants. Arsenal Resources will provide assistance to emergency authorities.
2. Arsenal Resources will dispatch sufficient personnel to assist with traffic control in the vicinity away from the potentially dangerous area as requested and directed by the emergency authorities in charge of the evacuation procedures. A guard will be stationed at the entrance of the well site to monitor essential and non-essential traffic.

General:

- A. The area included within the radius of exposure is considered to be the zone of maximum potential hazard from a hydrogen sulfide gas escape. Immediate evacuation of public areas, in accordance with the provisions of this contingency plan, is imperative. When it is determined that conditions exist which create an additional area (beyond the initial zone of maximum potential hazard) vulnerable to possible hazard, public areas in the additional hazardous area will be evacuated in accordance with the contingency plan.
- B. In the event of a disaster, after the public areas have been evacuated and traffic stopped, it is expected that local civil authorities will have arrived and within a few hours will have assumed direction of and control of the public, including all public areas. Arsenal Resources will cooperate with these authorities to the fullest extent and will exert every effort by careful advice to such authorities to prevent panic or rumors.
- C. Arsenal Resources will dispatch appropriate management personnel at the disaster site as soon as possible. The company's personnel will cooperate with and provide such information to civil authorities as they might require.
- D. One of the products of the combustion of hydrogen sulfide is sulfur dioxide (SO₂). Under certain conditions this gas may be equally as dangerous as H₂S. A pump type detector device, which determines the percent of SO₂ in air through concentrations in ppm, will be available. Although normal air movement is sufficient to dissipate this material to safe levels, the SO₂ detector should be utilized to check concentrations in the proximity of the well once every hour, or as necessary and the situation warrants. Also, if any low areas are suspected of having high concentrations, personnel should be made aware of these areas, and steps should be taken to determine whether or not these low areas are hazardous.

Section 3 - Well Work

This section includes written descriptions of well work and procedure to be used during the drilling, completion, and production phases, including schematic plan views of each, as well as casing sheets.

Project Description

This project includes the construction of several temporary and permanent features including a 8,383 foot long, 16 foot wide gravel access road to a 182,660 square foot gravel well pad with associated erosion and sediment control BMP's. An additional 238 foot long access road is to be constructed from the gravel well pad to a 40,280 square foot gravel AST and Manifold pad. Once the well pad is constructed, the well is to be drilled as a horizontal well for natural gas extraction purposes.

General Drilling Program

1. Move in and rig up rat hole rig and drill 36" conductor hole and run 24" conductor casing to approximately 80' depth. Cement to surface via pump truck thru swedge and up the backside and drill 16" mouse hole per rig specifications. Rig down move off rat hole rig.
2. Move in and rig up a double or triple drilling rig, rig up flow lines and steel pits, and drill 17 1/2" hole to a depth of 300' – 1000' depending on local fresh water depth. Drilling medium will be on fresh water. Run new, J-55, 54.5#, 13 3/8" casing and hardware to near bottom and cement to surface with Class A, 3% CaCl2 cement. Wait at least 8 hrs. on cement prior to drilling. If no cement circulation, call the inspector, run a CBL to determine cement top, then grout from the top back to surface. Wait on top grout 8hrs if grout is needed prior to drilling. Nipple up casing with annular BOP and test.
3. *Open Mine Contingency Plan:* when an open mine is encountered, Arsenal Resources will run 20" (H-40, 94#) and hardware as a mine string. The mine string will be set between 30 to 50 feet below the base of the open mine encountered. The mine string will have a cement balance job on the bottom (below the open mine), and the top will be surface-grouted to ground level. Then drill down to the proposed surface depth and set 13 -3/8" casing as originally planned.
4. Rig up directional drillers (if they are scheduled to nudge the surface) and trip in hole with 12 1/4" bit and drill on fresh water to the depth of 50 feet below the base of the 5th Sand, at approximately 1,500-2,800 feet. Any change from permitted depth will result in immediate notification to the OOG inspector for approval and subsequent modification to other well casing plans on the same pad will be made immediately to the OOG inspector. Run new, J-55 40#, 9 5/8" casing and hardware to near bottom and cement to surface with Class A cement. Wait at least 8 hrs. on cement prior to drilling.
5. Trip in hole with directional tools and 8 3/4" bit, continue drilling on fresh water to KOP. Then switch to a synthetic base mud system, and drill and build angle at 9 degree doglegs and land well at approximately 90 degrees horizontal in the lower Marcellus. Trip for directional issues or bit as needed, and drill 8 3/4" or 8 1/2" hole.
6. Drill 8 3/4" or 8 1/2" hole to planned total depth. Condition and prep the hole for casing run, and trip out of the hole. Lay down drilling assembly, and rig up casing crew and handling equipment. Run 5.5" 20# P-110, production casing the entire

measured depth of the well. Rig down casing crew and equipment, and rig up cementing crew. Cement production casing in 2 stages, with the lead and tail consisting of various densities of Class A cement slurry. The top of the production cement will be brought to approximately 150' within the intermediate casing shoe.

Once drilling operations have finished, the Armstrong II #215 will be handed over to completions. Arsenal Resources will complete the well, using wireline perforating, and slickwater fracturing. The number of stages will be determined once the lateral has been drilled. Each stage will consist of 500,000 lbs. of sand and approximately 420,000 gallons of water.

Well Equipment Set Up Procedure

1. Well set up starts by meeting with completions, flow back, set up contractor, and production supervisor.
2. A discussion is made on where to set surface equipment, GPU's Tanks and lines.
3. Procedure for equipment setup is to level off and gravel GPU and Tank area. Build concrete pad for GPU's and construct tank containment, and then set GPU's and Tanks. Install header pipe and dump lines to tanks. Install Sand traps, Lock-out casing valve and install prefabricated well head fittings, and dig up and install 3" lines to well heads. X-Ray all welds on gas lines; install skillets and block of lines for Hydrostatic test, test pipe. Drain pipe, remove plugs and skillets, bolt piping back up. Finish hooking up ESD Controls.
4. Welding is done in one corner of locations, utilizing flow backs LEL and our Personal LEL Monitors

Wellbore Casing and Cement Information

Geology information pertaining to the depths of freshwater, saltwater, coal, voids, etc., as listed on the Well Permit Application have been identified in the table below:

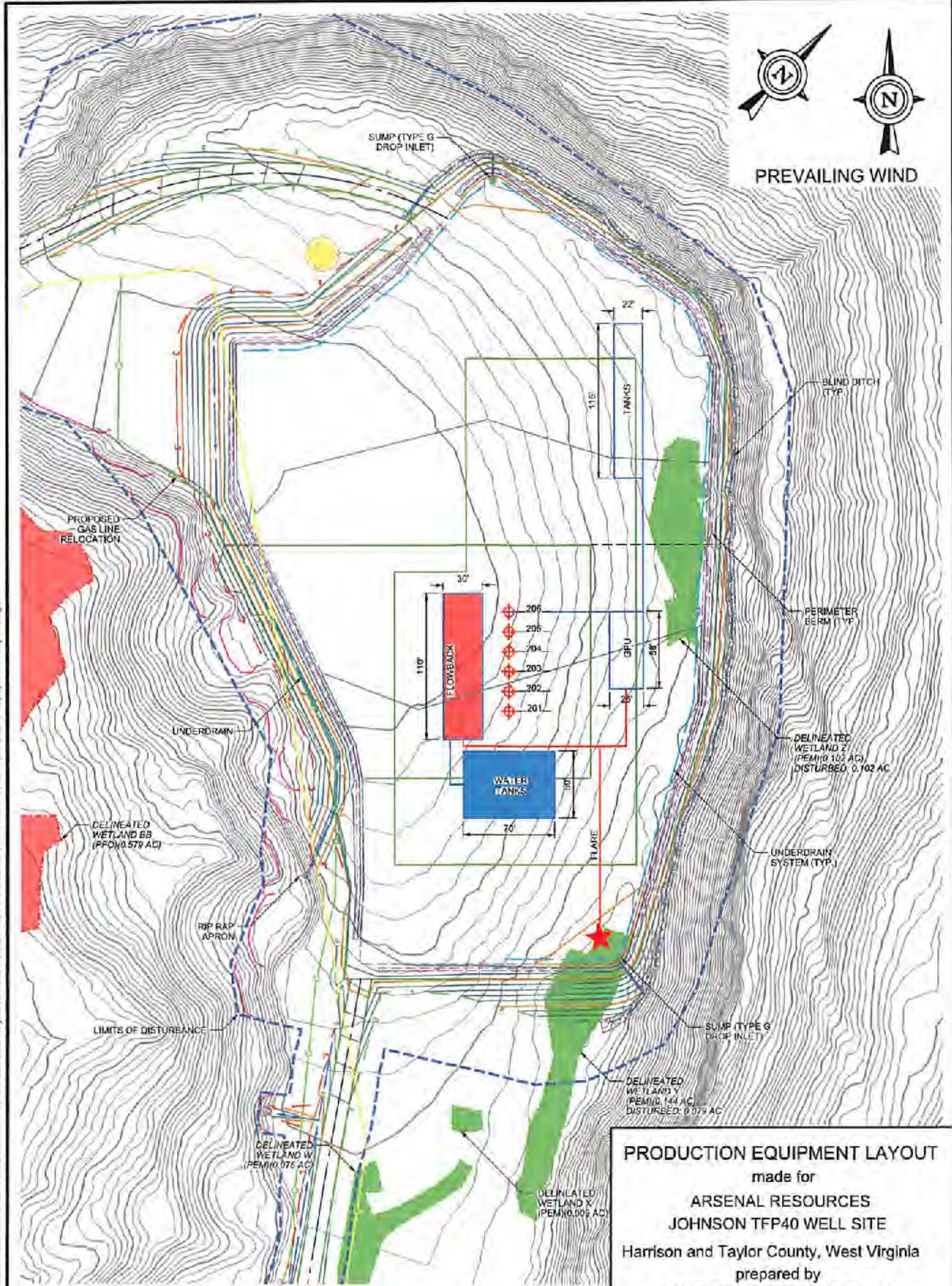
Geologic Information	
Approximate freshwater strata depths	30', 100', 150', 250', 850'
Approximate saltwater depths	2,040'
Approximate coal seam depths	48', 477.5', 523', 693', 748', 813', 868', 898'
Approximate void depths (coal, karst, other)	None

1. Casing and Cementing Standards listed on the Well Work Permit Application Casing and Tubing Program Table have been identified in the table below:

Casing & Tubing Program						
Casing Type	Size	Grade	Weight /FT	For Drilling	Left in Well	Fill Up
Conductor	24"		94#	80'	80'	CTS
Fr. Water	13.375"	J-55	54.5#	950'	950'	CTS
Intermediate	9.625"	J-55	40#	2,500'	2,500'	CTS
Production	5.5"	P-110	20#	21,711'	21,711'	TOC @ 2,250'
Tubing						

All casing and cement will meet current API standards any special conditions required of the permit that were set forth upon approval.

1:100 9/25/2018 8:20:30 AM K:\Mountbairn\kys\lone\2017\17078-007 - Johnson TFP40\Common\Production Equipment Layout.dgn

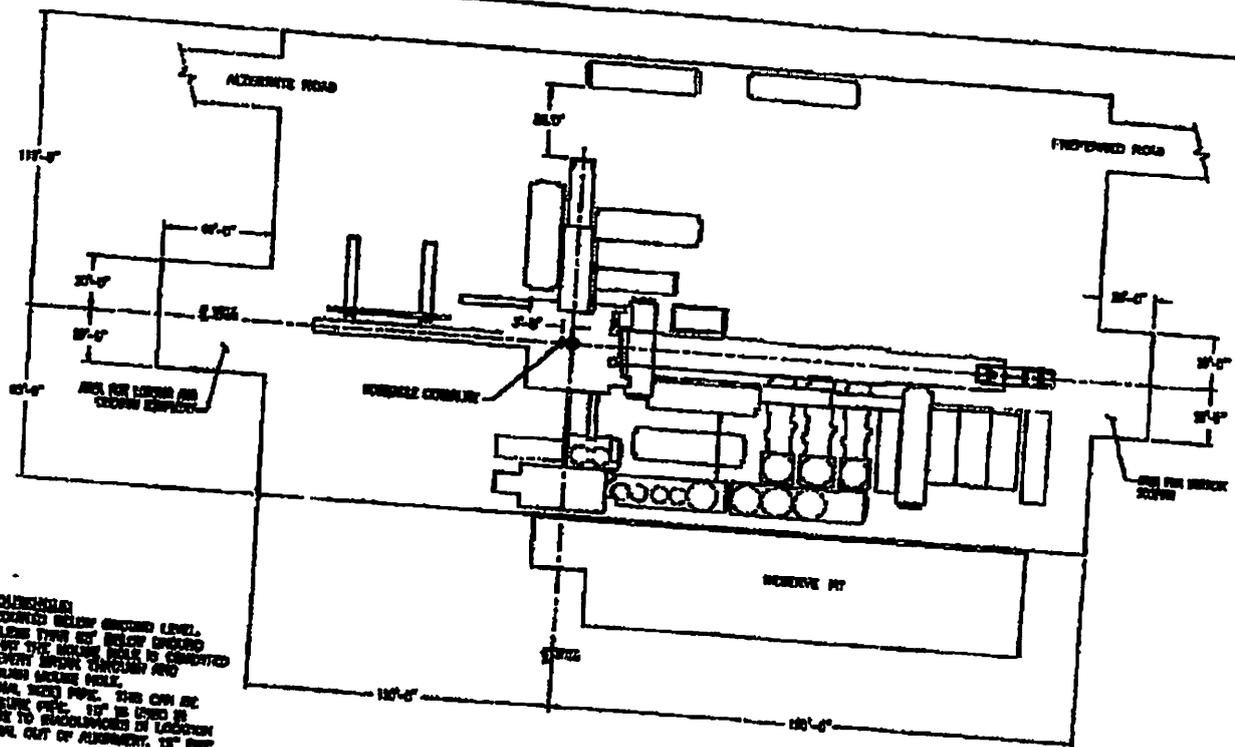


PRODUCTION EQUIPMENT LAYOUT

made for
ARSENAL RESOURCES
JOHNSON TFP40 WELL SITE
Harrison and Taylor County, West Virginia
prepared by
DIEFFENBAUCH & HRITZ, LLC
1095 Chaplin Rd Suite 200, Morgantown, WV 26501
Phone: 304-985-5555 Fax: 304-985-5557



02/18/2022



- NOTES FOR EXISTING CONSTRUCTION**
1. 75' OF MASONRY WALL REQUIRED BELOW FINISH LEVEL.
 2. IF CONCRETE PIPE IS LESS THAN 60" BELOW FINISH LEVEL, IT IS RECOMMENDED THAT THE MASONRY WALL BE CONCRETE IN PLACE IN ORDER TO PREVENT SEWER SURGE AND CIRCULATION THROUGH UNDERGROUND MASONRY WALL.
 3. USE 12" GALVANIZED STEEL PIPE. THIS CAN BE SPIN WELD OR LOW PRESSURE PVC. 12" IS USED IN SOME APPLICATIONS BUT DUE TO SHOCKWAVE IN LOCATION OF INSTALLATION AND POTENTIAL OUT OF ALIGNMENT, 12" PIPE IS RECOMMENDED.
 4. CONCRETE MASONRY WALL IS 1 1/2" OR 3/4" WIDE.



NO.	DESCRIPTION	DATE

SEE SET 1 FOR THE COMPONENT LAYOUT

WILHELMERICH & PAYNE
 ARCHITECTS
 INTERNATIONAL BUILDING CO.

SITE LAYOUT

DATE: 1968
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 PROJECT NO.: 210-00-01

B. LEPC Submission

The following page contains a Statement detailing that the plan will be provided to the local emergency planning committee or county emergency services office within at least 7 days from land disturbance or well work.



Arsenal Resources acknowledges that a copy of this Site Safety Plan will be submitted to the Local Emergency Planning Committee or county emergency services office as listed in the contacts section of this plan, within at least 7 days from land disturbance or well work.

R. Schweitzer

Ross Schweitzer
Sr. Director of Drilling, Construction and Permitting

Section 4 – Chemical Inventory and Safety Data Sheets (SDS)

A. SDS Availability / Location

The SDS sheets will be provided and maintained by the selected contractor(s) and for personnel to reference.

The location of the SDS sheets, how they are referenced, and maintained shall be detailed in each of the operations meetings and the pre-drill or weekly safety meetings with all personnel.

B. Inventory of Mud Materials

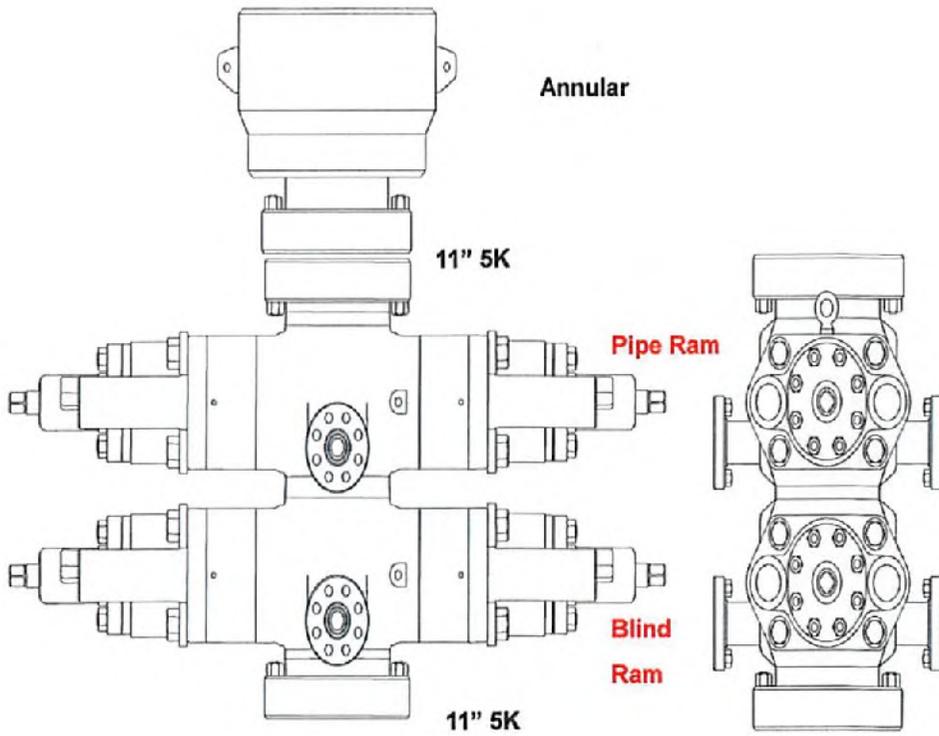
1. Inventory: At least 70,965 pounds of barite will be kept on location plus additional weight at the warehouse. At least 2,075 bbls of drilling fluid will be onsite and additional fluid will be stored both on location and at the warehouse.
2. The number and type of mixing units for mixing the mud on site shall be provided by the selected contractor and kept in the production trailer in a designated archive area for reference.
3. The selected driller shall use IADC well control methods. These shall include the Driller's Method, Wait and Weight, Dynamic Volumetric, Migration/Bleed, and Lubrication/Bleed. The primary methods are Driller's Method and Wait and Weight.

Section 5 -BOP and Well Control

A. BOP Equipment

The following pages include schematics and information on the BOP equipment.

11" 5K Double Ram BOP



Choke & Kill, BOP



- Choke & Kill, BOP
- Rotary hose
- Hydraulic hose
- Hammer Unions
- Industrial hose
- Fire hose
- Metal hose, Expansion Joints
- Ducting hose
- Automotive hose
- Crimp Fittings & Machines
- Frac Fittings, Notched KCs
- Cam & Groove, Universal, Shank Fittings
- Valves
- Black Pipe
- Quick Couplings
- Gauges
- Belts, Sheaves, & Bushings
- Steel Adapters
- Brass Adapters

MW Choke & Kill

Designed as a flexible connection to the choke manifold.

Tube: petroleum resistant for oil based drilling fluids

Cover: ozone, petroleum, and abrasion resistant

Reinforcement: high tensile steel wire spiral layers

Thermal Blanket: 1500°

continuous ratings, non-flammable, non-conductive

Armor Wall: .144"

Max Length: 150 feet

 -20° F / +212° F
-29° C / +100° C



Item	ID inch	OD inch	WP psi	Test psi	Weight lbs./ft.
CK-48 Red	3	4.94	5,000	10,000	14.9
CK-56 Red	3½	5.44			17.7
CK-64 Red	4	6.31			26.4
CK-48 Armor	3	6.5			20.8
CK-56 Armor	3½	7			23.1
CK-64 Armor	4	8			26.3
CK-4810K Red	3	5.31	10,000	15,000	22.3
CK-5610K Red	3½	5.81			25.0
CK-6410K Red	4	4.75			36.1
CK-4810K Armor	3	6.5			26.0
CK-5610K Armor	3½	7			29.0
CK-6410K Armor	4	8			32.8

MW BOP Control Line

For blowout preventer lines.

Tube: for hydraulic BOP actuation

Thermal Blanket: 1500°

continuous rating, non-flammable, non-conductive

Armor Wall: .08"

Popular with a larger hex and longer threads for easier installation of hammer unions.

 -20° F / +212° F
-29° C / +100° C



Item	ID inch	OD inch	WP psi	Test psi	Weight lbs./ft.
BOP-16 Armor	1	2.06	5,000	10,000	3.9
BOP-32 Armor	2	3.75			11.7
BOP-16	1	1.77			2.1
BOP-32	2	3.09			10.2

Carbon or stainless steel nipples are available and 1/2", 3/4", 1-1/4", and 1-1/2" sizes are available too.



Section 5, continued

B. BOP Testing

Procedure and Schedule for Testing the BOP Stack: For the bottom and horizontal wellbore drilling phase, the BOP equipment shall be function tested upon initial installation, weekly, and after each bit trip. The BOP equipment shall be pressure tested upon initial installation and every twenty-one (21) days thereafter. All pressure tests shall be performed for thirty (30) minutes. Annular preventers should be tested to seventy percent (70%) of the rated capacity and ram preventers should be tested to eighty percent (80%) of the rated capacity.

BOP Schedule: A schedule of BOP equipment installation and operation shall be kept for each applicable string in the Detailed Daily Reports that are kept in the production trailer in a designated archive location for reference.

Adjustments and variances are only permitted with consent of the area drilling/completion manager and WVDEP Inspector.

The Testing will follow the requirements of 35-8 5.7.c.2.

C. BOP Equipment and Assembly Installation Schedule

1. The 13 3/8" Rotating Head will be installed when nipping up on the 13 3/8" casing. It will divert returns to the pit while drilling this section.

2. The 9 5/8" BOP stack will be installed when nipping up on the 13 3/8" casing. The BOP will be pressure tested using a test plug. The BOP will be tested to a pressure of 250 psi low and 5,000 psi high and the annular to 250 psi low and 2,500 psi high prior to drilling out 8 5/8" casing.

3. When the 10,000 psi BOP stack is in use, a 10,000 psi upper and lower Kelly cock will be employed. They will be tested when the BOP stack is tested.

D. Personnel with Well Control Training

A list of all personnel with approved well control training and current certification recognized by the International Association of Drilling Contractors (IADC) shall be provided to the Office prior to the pre-spud meeting. Current Arsenal Resources employee with Wild Well Control training is Ross Schweitzer.

E. Well Event Record Keeping

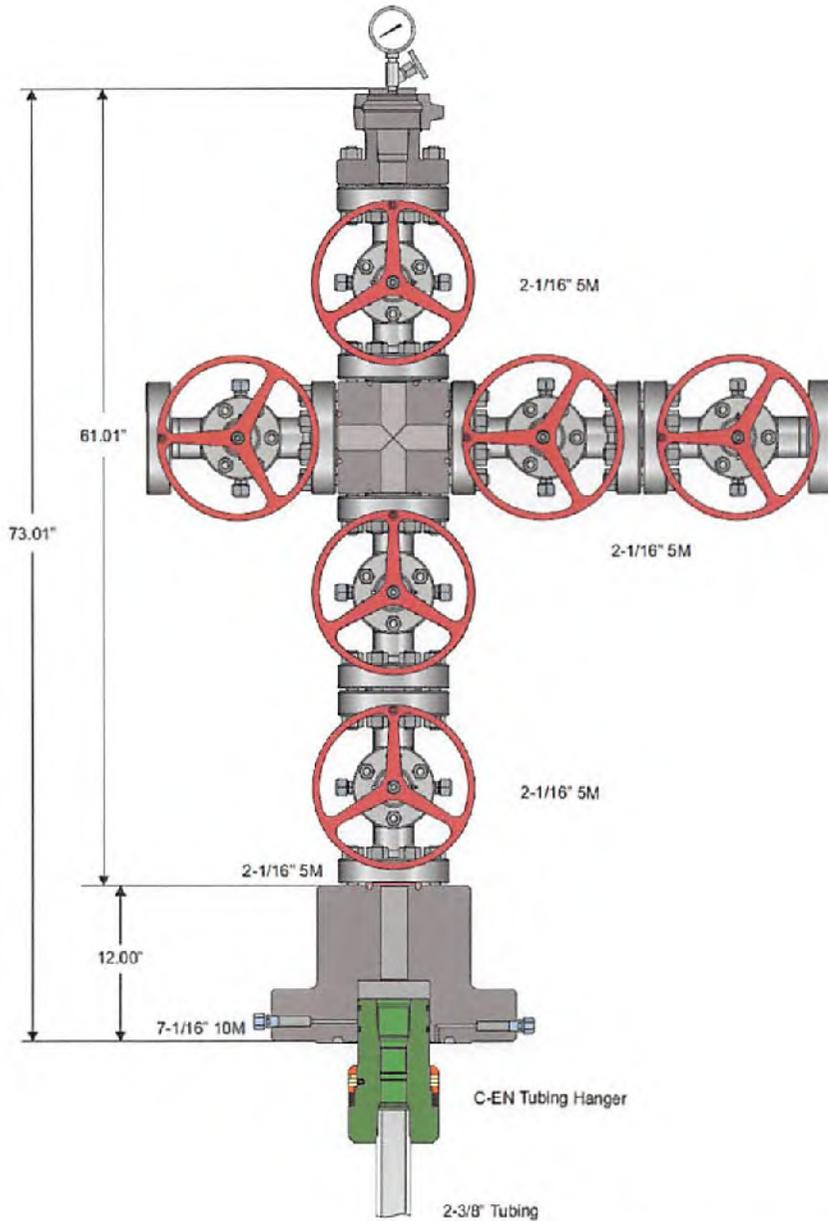
Detailed Log: A detailed daily record of events shall be kept during the drilling operation noting any significant event (e.g., lost circulation, presence of hydrogen sulfide, fluid entry, kicks and abnormal pressures). The daily reports will be kept in the production trailer in a designated archive location for reference.

F. Inspector Notification

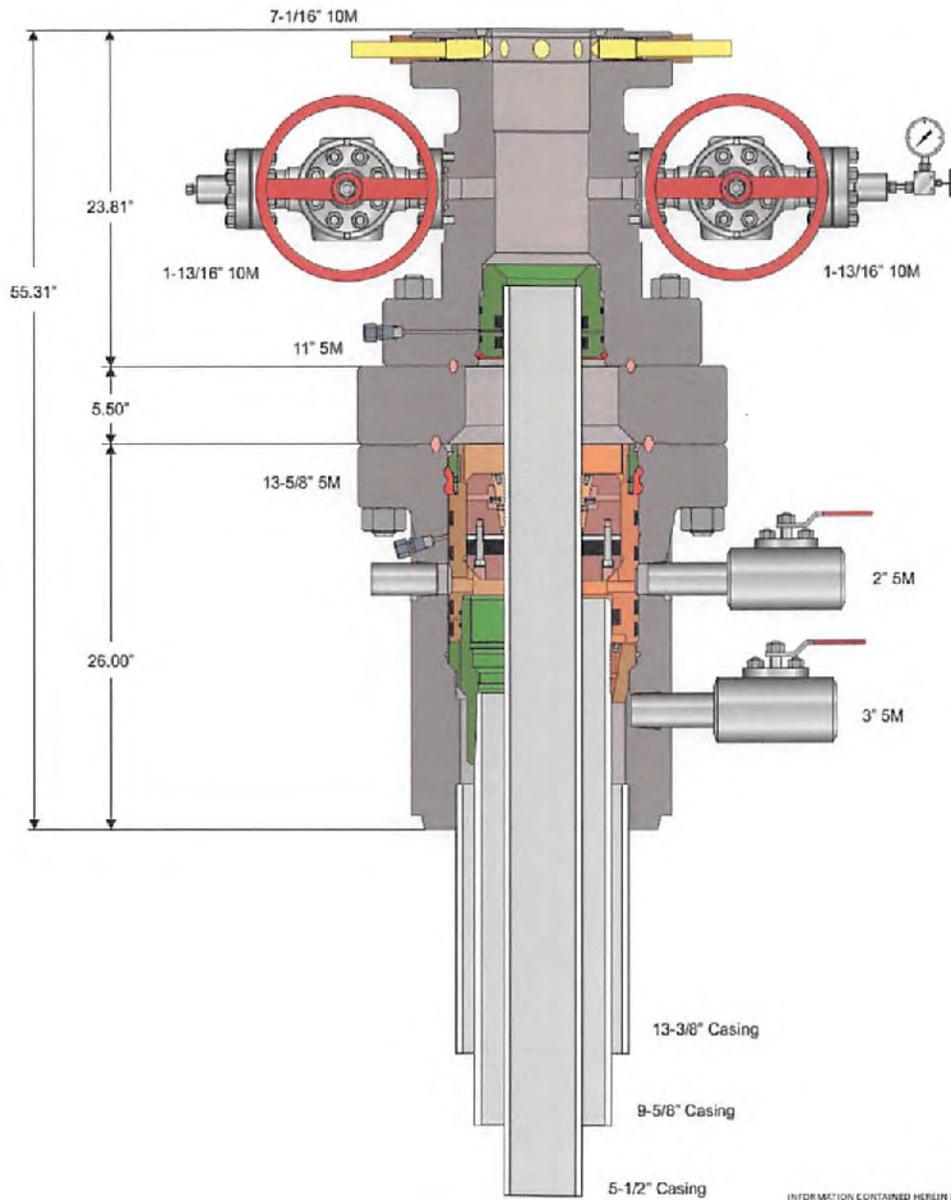
A detailed record of significant drilling events will be recorded in Arsenal Resources well log book. The state inspector will be notified upon any significant drilling events including the encounter of Hydrogen Sulfide Gas, lost circulation, fluid entry, abnormal pressures, etc.

G. Wellhead Assembly

The following pages contain sketches of the anticipated wellhead assemblies that will be used.



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H. Well Kill Procedures

- 1. Inventory: At least 70,965 pounds of barite will be kept on location plus additional weight at the warehouse. At least 2,075 bbls of drilling fluid will be onsite and additional fluid will be stored both on location and at the warehouse.**
- 2. The number and type of mixing units for mixing the mud on site shall be provided by the selected contractor and kept in the production trailer in a designated archive area for reference.**
- 3. The selected driller shall use IADC well control methods. These shall include the Driller's Method, Wait and Weight, Dynamic Volumetric, Migration/Bleed, and Lubrication/Bleed. The primary methods are Driller's Method and Wait and Weight.**

Section 6 – Hydrogen Sulfide (H2S)

A. Hydrogen Sulfide (H2S) Detection and Warning Equipment

Arsenal Resources has a MeshGuard LEL and H2S Monitoring system installed on the rig. The system triggers audio and visual alarms if it detects LEL or H2S at action levels.

The system consists of the following:

- 1 H₂S Fixed Monitor w/2 relays (relays location in doghouse & company man trailer)
- 4 H₂S Sensors (sensors located on rig floor, cellar, shakers, and mud tank)
- 2 Explosion Proof Alarms (Light and Siren)

Arsenal Resources employees will utilize MGC multi-gas detectors. The selected contractor foreman shall immediately notify the WV DEP Office of Oil and Gas Inspector and the Office when Hydrogen Sulfide is encountered.

B. H2S Personnel Training

Personnel involved with the monitoring, detection or warning of the presence of Hydrogen Sulfide shall be provided training in a special training session detailing how to use the equipment and issue the necessary warning prior to the operations commencing. This is special Hydrogen Sulfide detection training that will be conducted by the selected contractor.

C. Inspector Notification of H2S Presence

The selected contractor shall immediately contact the WV DEP Office of Oil and Gas Inspector by phone when Hydrogen Sulfide is detected and alert the guard station that no entry to the site shall be granted to unauthorized personnel during that time until the presence of Hydrogen Sulfide is no longer detected and the site is deemed safe by the WV DEP Office of Oil and Gas Inspector or Office Representative.

D. Establishment of Protective Zones

Evacuation and Notification of General Public if an H2S Emergency Occurs:

In the event of an accident that requires notification to the residents within 2,500 feet of the well site, local emergency responders and the Taylor County Emergency Services shall be notified by phone and coordinate alerting the residents by phone or in person and advise them of the appropriate action.

The selected contractor shall maintain the 2,500 foot protection zone during all applicable events such as hydrogen sulfide, blow-outs and flaring by alerting the local emergency responders and the Taylor County Emergency Services and having them coordinate notifications and evacuation of the protection zone.

E. H2S PPE

Personal Protective Equipment (PPE):

During operations, all personnel shall have on hard hats, safety goggles, fire retardant clothing, steel toe boots and earplugs at all times. Additional PPE may be required for specialized tasks.

Each individual's required PPE will be detailed in the Job Safety Analysis report that is kept in the production trailer in a designated archive area for reference, and shall be reviewed by each individual prior to the start of their shift.

Personnel without the required PPE will not be granted access to the site.

H2S Safety Services Equipment List:

In the event of an H2S Emergency, Total Safety or TekSolv will be contacted to provide the following:

Hydrogen Sulfide Safety Package

Respiratory Safety Systems

<u>QTY</u>	<u>DESCRIPTION</u>
8	30-minute pressure demand SCBA with Pigtail.
4	4 supplied Air Respirators with 5 minute escape bottles.

Detection and Alarm Safety System

1	Personal H ₂ S monitors
1	Portable Tri-Gas Hand Held Meter (O ₂ , LEL, H ₂ S)
1	Gastech Manual Impingement Pump Type Detector
2	Boxes H ₂ S Tubes Various Ranges
2	Boxes SO ₂ Tubes Various Ranges
1	Calibration Gas
1	Set Paper Work for Records: Training, Cal, Inspection, other

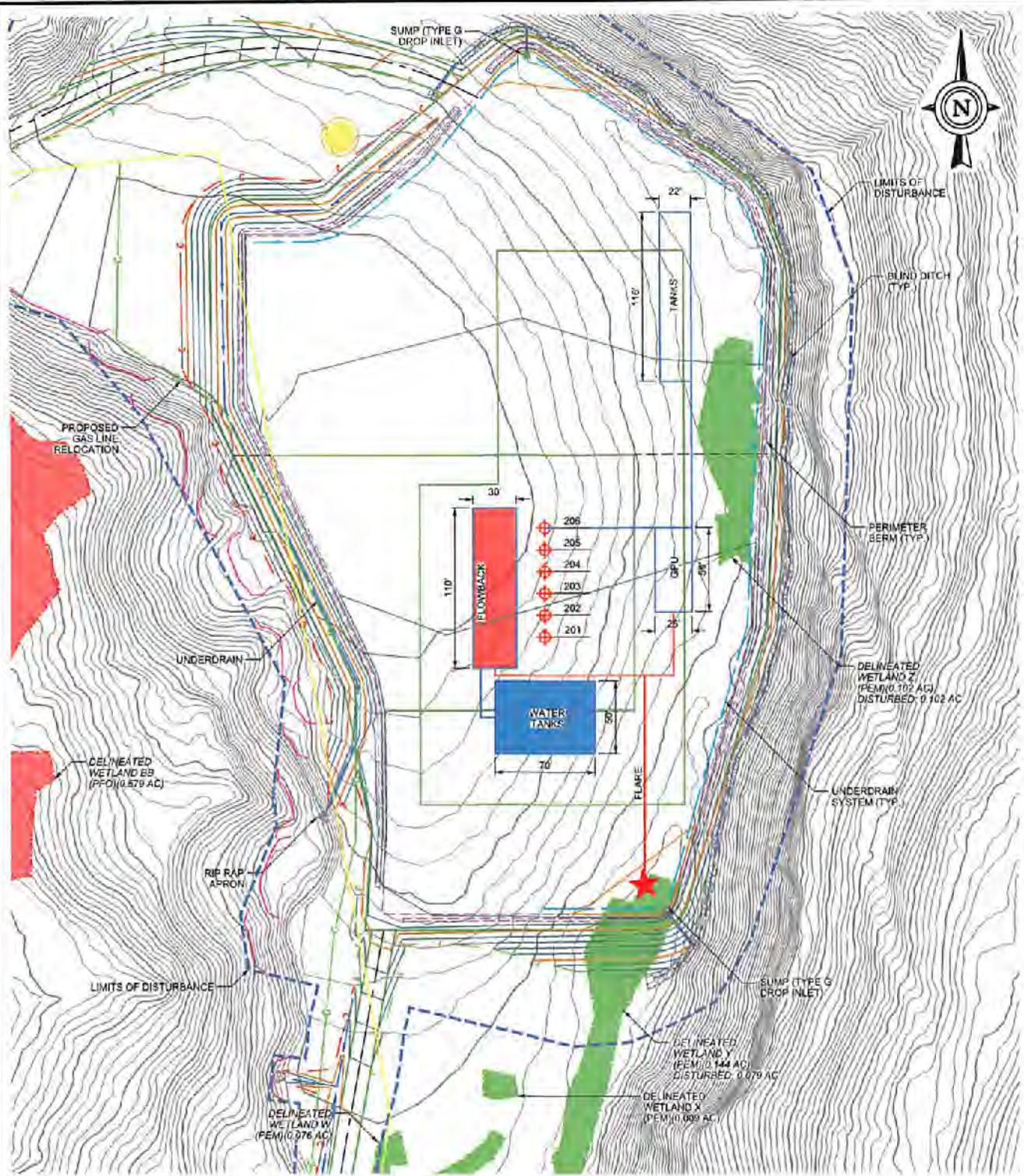
Additional Safety Related Equipment

<u>QTY</u>	<u>Description</u>
2	Windssocks with Pole and Bracket
1	Set Well Condition Sign w/Green, Yellow, Red Flags
1	Primary Safe Briefing Area Sign
1	Secondary Safe Briefing Area Sign
1	Oxygen Resuscitator

Section 7 – Flaring

- A. Description and Plan including schematic of installation for duration of flaring activities:
1. Flare Line will be constructed using three inch flare line tubing and anchored with cement anchor blocks. The line will have a dual choke assembly manifold with adjustable manual chokes. A detailed Pad Flaring Diagram is located in Section 7.
 2. The selected contractor will designate the system to light the flare and the dedication of the back-up igniters.
 3. The Taylor County Emergency Services and local Volunteer Fire Department shall be notified by the selected contractor foreman prior to lighting the flare when possible, and as soon after lighting the flare as reasonably possible.
 4. A minimum distance of 100 feet will be maintained to the nearest flammable material beyond the end of the flare line. The flare line has been placed in order to avoid any distance less than 100 feet to the nearest wooded area. The flare line minimum distances to the nearest flammable material shall be detailed in each of the operations meetings and the pre-drill or weekly safety meetings with all personnel.
 5. The estimated flaring operations for this site are anticipated to last no longer than two weeks.

K:\Mountaineer KeyStone\2017\17078-007 - Johnson TFP40\Common\Flowback Schematic Layout.dgn 8:51:13 AM 9/21/2019 1:00



WELL NO.	STATE PLAN COORDINATE (WVN NAD 83)	LAT./LONG COORDINATE	LAT./LONG COORDINATE (NAD 83) (DMS)	UTM COORDINATE (NAD83-ZONE 17-METER)	EXISTING ELEV (NAVD83) (FT)	PROPOSED ELEV. (NAV D83) (FT)
WELL 201	NORTHING 276971.7231	LAT. 39.238499°	LAT. 39°15'30.62"	NORTHING 4345792.144	1335.00'	1333.5'
	EASTING 1779051.6624	LONG. -80.169050°	LONG. -80°10'08.61"	EASTING 571890.548		
WELL 202	NORTHING 276986.7231	LAT. 39.238540°	LAT. 39°15'30.73"	NORTHING 4345796.710	1335.90'	1333.5'
	EASTING 1779051.6624	LONG. -80.169080°	LONG. -80°10'08.62"	EASTING 571890.472		
WELL 203	NORTHING 277001.7231	LAT. 39.238582°	LAT. 39°15'30.84"	NORTHING 4345802.284	1337.00'	1333.5'
	EASTING 1779051.6624	LONG. -80.169080°	LONG. -80°10'08.62"	EASTING 571890.897		
WELL 204	NORTHING 277016.7231	LAT. 39.238623°	LAT. 39°15'31.04"	NORTHING 4345808.854	1337.75'	1333.5'
	EASTING 1779051.6624	LONG. -80.169081°	LONG. -80°10'08.62"	EASTING 571890.321		
WELL 205	NORTHING 277031.7231	LAT. 39.238664°	LAT. 39°15'31.19"	NORTHING 4345810.420		
	EASTING 1779051.6624	LONG. -80.169061°	LONG. -80°10'08.62"	EASTING 571890.245	1338.25'	1333.5'
WELL 206	NORTHING 277046.7231	LAT. 39.238705°	LAT. 39°15'31.34"	NORTHING 4345814.994		
	EASTING 1779051.6624	LONG. -80.169082°	LONG. -80°10'08.62"	EASTING 571890.169	1338.75'	1333.5'

FLOWBACK SCHEMATIC LAYOUT
 made for
ARSENAL RESOURCES
JOHNSON TFP40 WELL SITE
 Harrison and Taylor County, West Virginia
 prepared by
DIEFFENBAUCH & HRITZ, LLC
 1095 Chaplin Rd Suite 200, Morgantown, WV 26501
 Phone: 304-985-5555 Fax: 304-985-5557



02/18/2022

Section 8 – Collision Avoidance

A. Established Definitions

Protocol and established safeguard designed to prevent underground collisions during any drilling on multi-well pads.

B. Description of Risk

Arsenal Resources uses an anti-collision protocol on all wells as a safeguard designed to prevent underground collision during any drilling on multi-well pads.

C. Plan Components

1. All surveys will be MWD/EM survey tools in all hole sections, and surveys will be taken every stand (Around 90'). If the SF < 1 surveys will be taken on a more frequent basis, most likely every 30'. We will discuss with the WVDEP Oil and Gas Inspector.
2. All directional and MWD tools will be visually inspected by directional MWD personnel and Arsenal Resources site representatives at a minimum.
3. Surface nudges will be planned by the directional company as needed to maintain a safe SF.
4. The same survey tools that we use in the vertical section will be used.
5. The directional company uses a AC software to maintain a safe SF. Compass is the current company's software.
6. Arsenal Resources will maintain the state minimum SF factors in all whole sections.
 - a. Minimum SF standards (thresholds) required – SF > 1.5 shall be obtained early as practical and maintained. Survey every stand (90').
 - b. SF > 2 applies when in proximity to any fractured or any producing well that exists on the well pad. Survey every stand (90'). **Additional risk management might be needed as well and will be addressed as needed.
7. Lateral Section
 - a. Arsenal Resources will work with the directional companies to maintain delineation, grid connections, and ensure magnetic interference correction is being followed. The onsite Arsenal Resources representative and the directional company's MWD personnel will be responsible for QC/QA.

8. For any existing horizontal or vertical well found adjacent to the lateral section Arsenal Resources will maintain over a 2 SF and will review each well on a case by case basis with a pre-drilled AC program along with continually updating the plan while drilling.
9. Arsenal Resources will attach the wall map showing all wells on the pad spaced at 10' - 15' apart. If there is a fractured well, (live) well, Arsenal Resources will note it in the drawing.
10. When there is an existing wellbore on the pad, Arsenal Resources will attach notes and or surveys for the well.
11. If a collision should occur, the wellbores would be shut in immediately and the well would need to be killed with kill mud. If a survey shows imminent risk for a collision, Arsenal Resources will stop drilling and confirm with a gyro, then evaluate the situation on a case by case basis. If Arsenal Resources can steer away with MWD or a gyro we will, or we will plug back if needed.
12. Arsenal Resources will notify the WVDEP Oil and Gas inspector immediately of any underground collision or if the SF level 1 is determined.
13. Arsenal Resources will provide other supportive resources as needed.



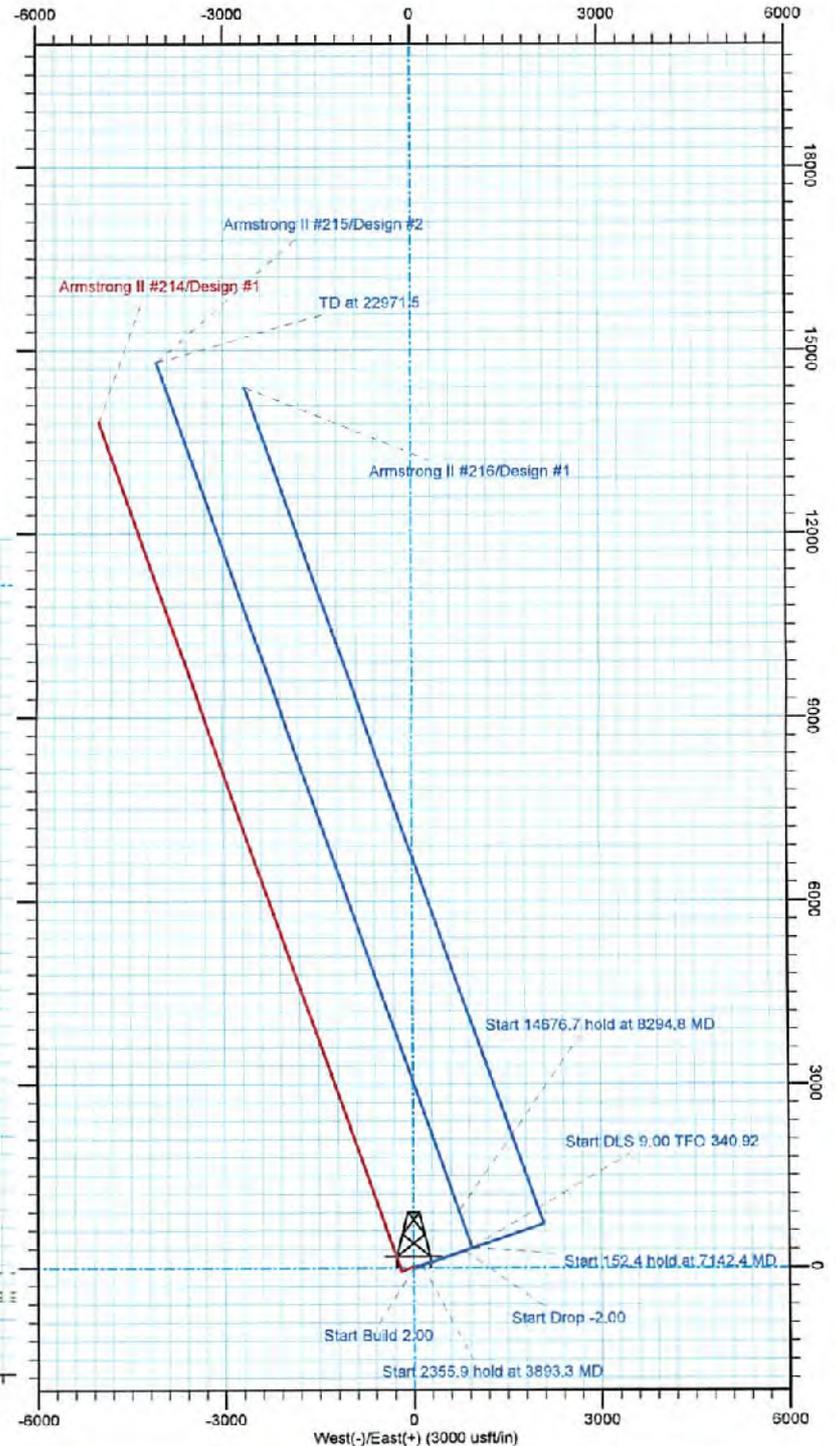
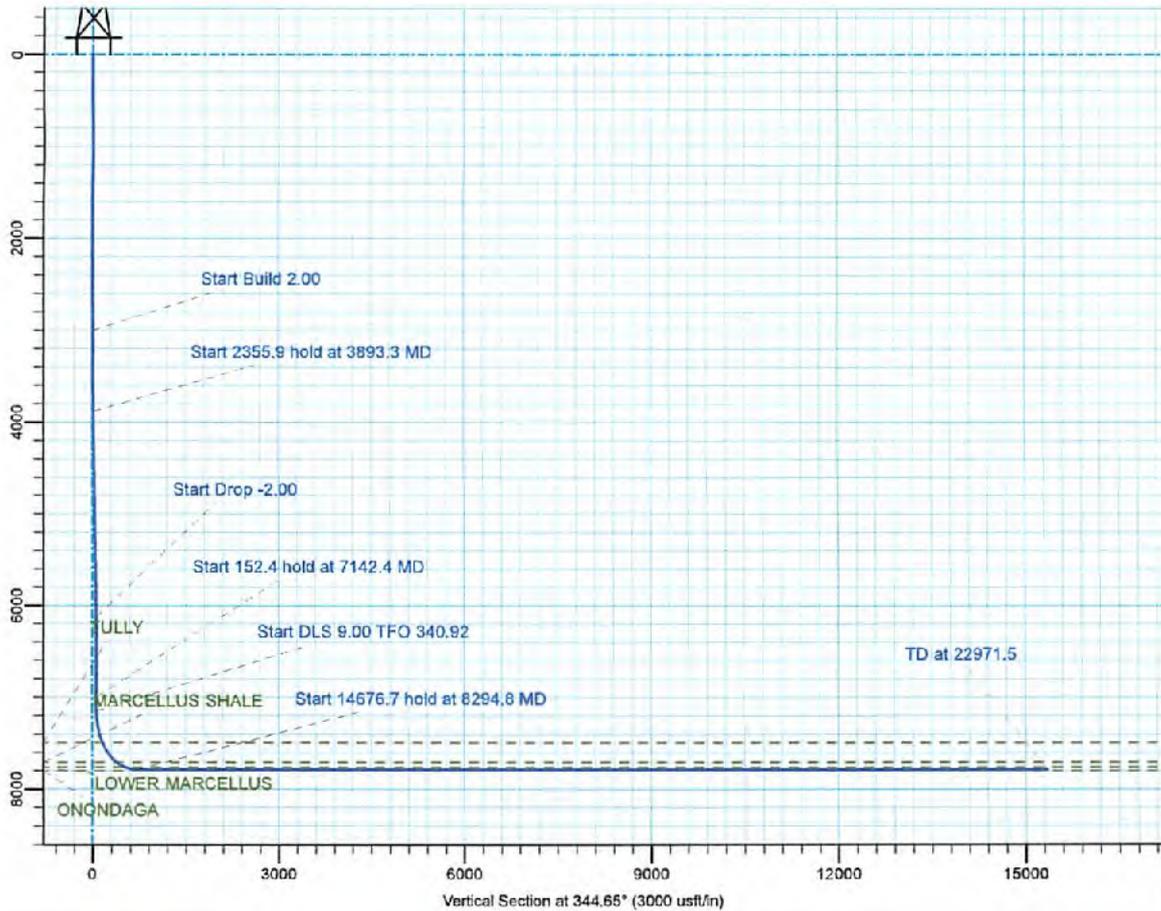
Arsenal Resources

Taylor County, West Virginia
Armstrong II #215

Anti-collision - None needed - no other wells on pad currently

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
3000.0	0.00	0.00	3000.0	0.0	0.0	0.0	0.0	Start Build 2.00
3893.3	17.87	71.00	3878.9	45.0	130.6	8.8	138.1	Start 2355.9 hold at 3893.3 MD
6249.1	17.87	71.00	6121.1	280.3	814.0	54.8	860.9	Start Drop -2.00
7142.4	0.00	360.00	7000.0	325.3	944.6	63.6	999.0	Start 152.4 hold at 7142.4 MD
7294.8	0.00	0.00	7152.4	325.3	944.6	63.6	999.0	Start DLS 9.00 TFO 340.92
8294.8	90.00	340.92	7789.0	926.9	736.4	698.9	1635.6	Start 14676.7 hold at 8294.8 MD
22971.5	90.00	340.92	7789.0	14797.0	-4062.3	15344.4	16312.3	TD at 22971.5





ARSENAL
R E S O U R C E S

Arsenal Resources

Taylor County, West Virginia

Armstong Pad

Armstrong II #215

Wellbore #1

Plan: Design #2

KLX Well Planning Report

14 September, 2021



02/18/2022



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II#215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Project	Taylor County, West Virginia		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	Armstrong Pad				
Site Position:		Northing:	288,680.62 usft	Latitude:	39° 17' 27.993 N
From:	Map	Easting:	1,803,259.68 usft	Longitude:	80° 5' 1.815 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.37 °

Well	Armstrong II #215					
Well Position	+N/-S	0.0 usft	Northing:	288,680.62 usft	Latitude:	39° 17' 27.993 N
	+E/-W	0.0 usft	Easting:	1,803,259.68 usft	Longitude:	80° 5' 1.815 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	1,293.0 usft

Wellbore	Wellbore #1				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2021	9/2/2021	-9.63	65.78	51,638.30000000

Design	Design #2				
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Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	344.65	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,893.3	17.87	71.00	3,878.9	45.0	130.6	2.00	2.00	0.00	71.00	
6,249.1	17.87	71.00	6,121.1	280.3	814.0	0.00	0.00	0.00	0.00	
7,142.4	0.00	360.00	7,000.0	325.3	944.6	2.00	-2.00	0.00	180.00	VP Armstrong II #2
7,294.8	0.00	360.00	7,152.4	325.3	944.6	0.00	0.00	0.00	360.00	
8,294.8	90.00	340.92	7,789.0	926.9	736.4	9.00	9.00	-1.91	340.92	
22,971.5	90.00	340.92	7,789.0	14,797.0	-4,062.3	0.00	0.00	0.00	0.00	PBHL Armstrong II :



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II#215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	2.00	71.00	3,100.0	0.6	1.7	0.1	2.00	2.00	0.00
3,200.0	4.00	71.00	3,199.8	2.3	6.6	0.4	2.00	2.00	0.00
3,300.0	6.00	71.00	3,299.5	5.1	14.8	1.0	2.00	2.00	0.00
3,400.0	8.00	71.00	3,398.7	9.1	26.4	1.8	2.00	2.00	0.00
3,500.0	10.00	71.00	3,497.5	14.2	41.2	2.8	2.00	2.00	0.00
3,600.0	12.00	71.00	3,595.6	20.4	59.2	4.0	2.00	2.00	0.00
3,700.0	14.00	71.00	3,693.1	27.7	80.5	5.4	2.00	2.00	0.00
3,800.0	16.00	71.00	3,789.6	36.1	104.9	7.1	2.00	2.00	0.00
Start 2355.9 hold at 3893.3 MD									
3,893.3	17.87	71.00	3,878.9	45.0	130.6	8.8	2.00	2.00	0.00
3,900.0	17.87	71.00	3,885.3	45.7	132.6	8.9	0.00	0.00	0.00
4,000.0	17.87	71.00	3,980.4	55.6	161.6	10.9	0.00	0.00	0.00
4,100.0	17.87	71.00	4,075.6	65.6	190.6	12.8	0.00	0.00	0.00
4,200.0	17.87	71.00	4,170.8	75.6	219.6	14.8	0.00	0.00	0.00
4,300.0	17.87	71.00	4,266.0	85.6	248.6	16.7	0.00	0.00	0.00
4,400.0	17.87	71.00	4,361.2	95.6	277.6	18.7	0.00	0.00	0.00
4,500.0	17.87	71.00	4,456.3	105.6	306.6	20.6	0.00	0.00	0.00
4,600.0	17.87	71.00	4,551.5	115.6	335.6	22.6	0.00	0.00	0.00
4,700.0	17.87	71.00	4,646.7	125.6	364.6	24.6	0.00	0.00	0.00
4,800.0	17.87	71.00	4,741.9	135.6	393.6	26.5	0.00	0.00	0.00
4,900.0	17.87	71.00	4,837.1	145.5	422.6	28.5	0.00	0.00	0.00
5,000.0	17.87	71.00	4,932.2	155.5	451.6	30.4	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II #215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,100.0	17.87	71.00	5,027.4	165.5	480.6	32.4	0.00	0.00	0.00	
5,200.0	17.87	71.00	5,122.6	175.5	509.7	34.3	0.00	0.00	0.00	
5,300.0	17.87	71.00	5,217.8	185.5	538.7	36.3	0.00	0.00	0.00	
5,400.0	17.87	71.00	5,312.9	195.5	567.7	38.2	0.00	0.00	0.00	
5,500.0	17.87	71.00	5,408.1	205.5	596.7	40.2	0.00	0.00	0.00	
5,600.0	17.87	71.00	5,503.3	215.5	625.7	42.1	0.00	0.00	0.00	
5,700.0	17.87	71.00	5,598.5	225.5	654.7	44.1	0.00	0.00	0.00	
5,800.0	17.87	71.00	5,693.7	235.4	683.7	46.0	0.00	0.00	0.00	
5,900.0	17.87	71.00	5,788.8	245.4	712.7	48.0	0.00	0.00	0.00	
6,000.0	17.87	71.00	5,884.0	255.4	741.7	49.9	0.00	0.00	0.00	
6,100.0	17.87	71.00	5,979.2	265.4	770.7	51.9	0.00	0.00	0.00	
6,200.0	17.87	71.00	6,074.4	275.4	799.7	53.9	0.00	0.00	0.00	
Start Drop -2.00										
6,249.1	17.87	71.00	6,121.1	280.3	814.0	54.8	0.00	0.00	0.00	
6,300.0	16.85	71.00	6,169.7	285.2	828.3	55.8	2.00	-2.00	0.00	
6,400.0	14.85	71.00	6,265.9	294.1	854.1	57.5	2.00	-2.00	0.00	
6,500.0	12.85	71.00	6,363.0	301.9	876.8	59.0	2.00	-2.00	0.00	
6,600.0	10.85	71.00	6,460.8	308.6	896.2	60.3	2.00	-2.00	0.00	
6,700.0	8.85	71.00	6,559.3	314.2	912.3	61.4	2.00	-2.00	0.00	
6,800.0	6.85	71.00	6,658.4	318.6	925.3	62.3	2.00	-2.00	0.00	
6,900.0	4.85	71.00	6,757.9	321.9	934.9	63.0	2.00	-2.00	0.00	
7,000.0	2.85	71.00	6,857.6	324.1	941.2	63.4	2.00	-2.00	0.00	
7,100.0	0.85	71.00	6,957.6	325.2	944.3	63.6	2.00	-2.00	0.00	
Start 152.4 hold at 7142.4 MD										
7,142.4	0.00	360.00	7,000.0	325.3	944.6	63.6	2.00	-2.00	0.00	
7,200.0	0.00	0.00	7,057.6	325.3	944.6	63.6	0.00	0.00	0.00	
Start DLS 9.00 TFO 340.92										
7,294.8	0.00	0.00	7,152.4	325.3	944.6	63.6	0.00	0.00	0.00	
7,300.0	0.47	340.92	7,157.6	325.3	944.6	63.6	9.00	9.00	0.00	
7,350.0	4.97	340.92	7,207.5	327.5	943.8	66.0	9.00	9.00	0.00	
7,400.0	9.47	340.92	7,257.1	333.5	941.7	72.3	9.00	9.00	0.00	
7,450.0	13.97	340.92	7,306.1	343.1	938.4	82.4	9.00	9.00	0.00	
7,500.0	18.47	340.92	7,354.1	356.3	933.9	96.3	9.00	9.00	0.00	
7,550.0	22.97	340.92	7,400.8	373.0	928.1	114.0	9.00	9.00	0.00	
7,600.0	27.47	340.92	7,446.0	393.1	921.1	135.2	9.00	9.00	0.00	
7,650.0	31.97	340.92	7,489.4	416.5	913.0	159.9	9.00	9.00	0.00	
TULLY										
7,654.2	32.34	340.92	7,493.0	418.6	912.3	162.2	9.00	9.00	0.00	
7,700.0	36.47	340.92	7,530.8	443.1	903.8	188.0	9.00	9.00	0.00	
7,750.0	40.97	340.92	7,569.8	472.6	893.6	219.2	9.00	9.00	0.00	
7,800.0	45.47	340.92	7,606.2	505.0	882.4	253.4	9.00	9.00	0.00	
7,850.0	49.97	340.92	7,639.8	539.9	870.3	290.3	9.00	9.00	0.00	
7,900.0	54.47	340.92	7,670.5	577.3	857.4	329.7	9.00	9.00	0.00	
7,950.0	58.97	340.92	7,697.9	616.8	843.7	371.4	9.00	9.00	0.00	
MARCELLUS SHALE										
7,968.1	60.59	340.92	7,707.0	631.5	838.6	387.0	9.00	9.00	0.00	
8,000.0	63.47	340.92	7,722.0	658.2	829.4	415.1	9.00	9.00	0.00	
8,050.0	67.97	340.92	7,742.5	701.2	814.5	460.6	9.00	9.00	0.00	
8,100.0	72.47	340.92	7,759.4	745.7	799.1	507.5	9.00	9.00	0.00	
LOWER MARCELLUS										
8,119.4	74.21	340.92	7,765.0	763.2	793.1	526.0	9.00	9.00	0.00	
8,150.0	76.97	340.92	7,772.6	791.2	783.4	555.6	9.00	9.00	0.00	
8,200.0	81.47	340.92	7,782.0	837.6	767.3	604.6	9.00	9.00	0.00	



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II#215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,250.0	85.97	340.92	7,787.4	884.6	751.1	654.2	9.00	9.00	0.00	
Start 14676.7 hold at 8294.8 MD										
8,294.8	90.00	340.92	7,789.0	926.9	736.4	698.9	9.00	9.00	0.00	
8,300.0	90.00	340.92	7,789.0	931.8	734.7	704.1	0.00	0.00	0.00	
8,400.0	90.00	340.92	7,789.0	1,026.3	702.0	803.8	0.00	0.00	0.00	
8,500.0	90.00	340.92	7,789.0	1,120.8	669.3	903.6	0.00	0.00	0.00	
8,600.0	90.00	340.92	7,789.0	1,215.3	636.6	1,003.4	0.00	0.00	0.00	
8,700.0	90.00	340.92	7,789.0	1,309.8	604.0	1,103.2	0.00	0.00	0.00	
8,800.0	90.00	340.92	7,789.0	1,404.3	571.3	1,203.0	0.00	0.00	0.00	
8,900.0	90.00	340.92	7,789.0	1,498.8	538.6	1,302.8	0.00	0.00	0.00	
9,000.0	90.00	340.92	7,789.0	1,593.3	505.9	1,402.6	0.00	0.00	0.00	
9,100.0	90.00	340.92	7,789.0	1,687.8	473.2	1,502.4	0.00	0.00	0.00	
9,200.0	90.00	340.92	7,789.0	1,782.4	440.5	1,602.1	0.00	0.00	0.00	
9,300.0	90.00	340.92	7,789.0	1,876.9	407.8	1,701.9	0.00	0.00	0.00	
9,400.0	90.00	340.92	7,789.0	1,971.4	375.1	1,801.7	0.00	0.00	0.00	
9,500.0	90.00	340.92	7,789.0	2,065.9	342.4	1,901.5	0.00	0.00	0.00	
9,600.0	90.00	340.92	7,789.0	2,160.4	309.7	2,001.3	0.00	0.00	0.00	
9,700.0	90.00	340.92	7,789.0	2,254.9	277.0	2,101.1	0.00	0.00	0.00	
9,800.0	90.00	340.92	7,789.0	2,349.4	244.3	2,200.9	0.00	0.00	0.00	
9,900.0	90.00	340.92	7,789.0	2,443.9	211.6	2,300.7	0.00	0.00	0.00	
10,000.0	90.00	340.92	7,789.0	2,538.4	178.9	2,400.4	0.00	0.00	0.00	
10,100.0	90.00	340.92	7,789.0	2,632.9	146.2	2,500.2	0.00	0.00	0.00	
10,200.0	90.00	340.92	7,789.0	2,727.4	113.5	2,600.0	0.00	0.00	0.00	
10,300.0	90.00	340.92	7,789.0	2,821.9	80.8	2,699.8	0.00	0.00	0.00	
10,400.0	90.00	340.92	7,789.0	2,916.4	48.1	2,799.6	0.00	0.00	0.00	
10,500.0	90.00	340.92	7,789.0	3,010.9	15.4	2,899.4	0.00	0.00	0.00	
10,600.0	90.00	340.92	7,789.0	3,105.4	-17.3	2,999.2	0.00	0.00	0.00	
10,700.0	90.00	340.92	7,789.0	3,199.9	-50.0	3,099.0	0.00	0.00	0.00	
10,800.0	90.00	340.92	7,789.0	3,294.4	-82.7	3,198.8	0.00	0.00	0.00	
10,900.0	90.00	340.92	7,789.0	3,388.9	-115.4	3,298.5	0.00	0.00	0.00	
11,000.0	90.00	340.92	7,789.0	3,483.4	-148.1	3,398.3	0.00	0.00	0.00	
11,100.0	90.00	340.92	7,789.0	3,577.9	-180.8	3,498.1	0.00	0.00	0.00	
11,200.0	90.00	340.92	7,789.0	3,672.4	-213.5	3,597.9	0.00	0.00	0.00	
11,300.0	90.00	340.92	7,789.0	3,766.9	-246.1	3,697.7	0.00	0.00	0.00	
11,400.0	90.00	340.92	7,789.0	3,861.4	-278.8	3,797.5	0.00	0.00	0.00	
11,500.0	90.00	340.92	7,789.0	3,955.9	-311.5	3,897.3	0.00	0.00	0.00	
11,600.0	90.00	340.92	7,789.0	4,050.4	-344.2	3,997.1	0.00	0.00	0.00	
11,700.0	90.00	340.92	7,789.0	4,144.9	-376.9	4,096.8	0.00	0.00	0.00	
11,800.0	90.00	340.92	7,789.0	4,239.4	-409.6	4,196.6	0.00	0.00	0.00	
11,900.0	90.00	340.92	7,789.0	4,334.0	-442.3	4,296.4	0.00	0.00	0.00	
12,000.0	90.00	340.92	7,789.0	4,428.5	-475.0	4,396.2	0.00	0.00	0.00	
12,100.0	90.00	340.92	7,789.0	4,523.0	-507.7	4,496.0	0.00	0.00	0.00	
12,200.0	90.00	340.92	7,789.0	4,617.5	-540.4	4,595.8	0.00	0.00	0.00	
12,300.0	90.00	340.92	7,789.0	4,712.0	-573.1	4,695.6	0.00	0.00	0.00	
12,400.0	90.00	340.92	7,789.0	4,806.5	-605.8	4,795.4	0.00	0.00	0.00	
12,500.0	90.00	340.92	7,789.0	4,901.0	-638.5	4,895.1	0.00	0.00	0.00	
12,600.0	90.00	340.92	7,789.0	4,995.5	-671.2	4,994.9	0.00	0.00	0.00	
12,700.0	90.00	340.92	7,789.0	5,090.0	-703.9	5,094.7	0.00	0.00	0.00	
12,800.0	90.00	340.92	7,789.0	5,184.5	-736.6	5,194.5	0.00	0.00	0.00	
12,900.0	90.00	340.92	7,789.0	5,279.0	-769.3	5,294.3	0.00	0.00	0.00	
13,000.0	90.00	340.92	7,789.0	5,373.5	-802.0	5,394.1	0.00	0.00	0.00	
13,100.0	90.00	340.92	7,789.0	5,468.0	-834.7	5,493.9	0.00	0.00	0.00	
13,200.0	90.00	340.92	7,789.0	5,562.5	-867.4	5,593.7	0.00	0.00	0.00	



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II #215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,300.0	90.00	340.92	7,789.0	5,657.0	-900.1	5,693.4	0.00	0.00	0.00
13,400.0	90.00	340.92	7,789.0	5,751.5	-932.8	5,793.2	0.00	0.00	0.00
13,500.0	90.00	340.92	7,789.0	5,846.0	-965.5	5,893.0	0.00	0.00	0.00
13,600.0	90.00	340.92	7,789.0	5,940.5	-998.2	5,992.8	0.00	0.00	0.00
13,700.0	90.00	340.92	7,789.0	6,035.0	-1,030.9	6,092.6	0.00	0.00	0.00
13,800.0	90.00	340.92	7,789.0	6,129.5	-1,063.6	6,192.4	0.00	0.00	0.00
13,900.0	90.00	340.92	7,789.0	6,224.0	-1,096.2	6,292.2	0.00	0.00	0.00
14,000.0	90.00	340.92	7,789.0	6,318.5	-1,128.9	6,392.0	0.00	0.00	0.00
14,100.0	90.00	340.92	7,789.0	6,413.0	-1,161.6	6,491.7	0.00	0.00	0.00
14,200.0	90.00	340.92	7,789.0	6,507.5	-1,194.3	6,591.5	0.00	0.00	0.00
14,300.0	90.00	340.92	7,789.0	6,602.0	-1,227.0	6,691.3	0.00	0.00	0.00
14,400.0	90.00	340.92	7,789.0	6,696.5	-1,259.7	6,791.1	0.00	0.00	0.00
14,500.0	90.00	340.92	7,789.0	6,791.0	-1,292.4	6,890.9	0.00	0.00	0.00
14,600.0	90.00	340.92	7,789.0	6,885.6	-1,325.1	6,990.7	0.00	0.00	0.00
14,700.0	90.00	340.92	7,789.0	6,980.1	-1,357.8	7,090.5	0.00	0.00	0.00
14,800.0	90.00	340.92	7,789.0	7,074.6	-1,390.5	7,190.3	0.00	0.00	0.00
14,900.0	90.00	340.92	7,789.0	7,169.1	-1,423.2	7,290.1	0.00	0.00	0.00
15,000.0	90.00	340.92	7,789.0	7,263.6	-1,455.9	7,389.8	0.00	0.00	0.00
15,100.0	90.00	340.92	7,789.0	7,358.1	-1,488.6	7,489.6	0.00	0.00	0.00
15,200.0	90.00	340.92	7,789.0	7,452.6	-1,521.3	7,589.4	0.00	0.00	0.00
15,300.0	90.00	340.92	7,789.0	7,547.1	-1,554.0	7,689.2	0.00	0.00	0.00
15,400.0	90.00	340.92	7,789.0	7,641.6	-1,586.7	7,789.0	0.00	0.00	0.00
15,500.0	90.00	340.92	7,789.0	7,736.1	-1,619.4	7,888.8	0.00	0.00	0.00
15,600.0	90.00	340.92	7,789.0	7,830.6	-1,652.1	7,988.6	0.00	0.00	0.00
15,700.0	90.00	340.92	7,789.0	7,925.1	-1,684.8	8,088.4	0.00	0.00	0.00
15,800.0	90.00	340.92	7,789.0	8,019.6	-1,717.5	8,188.1	0.00	0.00	0.00
15,900.0	90.00	340.92	7,789.0	8,114.1	-1,750.2	8,287.9	0.00	0.00	0.00
16,000.0	90.00	340.92	7,789.0	8,208.6	-1,782.9	8,387.7	0.00	0.00	0.00
16,100.0	90.00	340.92	7,789.0	8,303.1	-1,815.6	8,487.5	0.00	0.00	0.00
16,200.0	90.00	340.92	7,789.0	8,397.6	-1,848.3	8,587.3	0.00	0.00	0.00
16,300.0	90.00	340.92	7,789.0	8,492.1	-1,881.0	8,687.1	0.00	0.00	0.00
16,400.0	90.00	340.92	7,789.0	8,586.6	-1,913.7	8,786.9	0.00	0.00	0.00
16,500.0	90.00	340.92	7,789.0	8,681.1	-1,946.3	8,886.7	0.00	0.00	0.00
16,600.0	90.00	340.92	7,789.0	8,775.6	-1,979.0	8,986.4	0.00	0.00	0.00
16,700.0	90.00	340.92	7,789.0	8,870.1	-2,011.7	9,086.2	0.00	0.00	0.00
16,800.0	90.00	340.92	7,789.0	8,964.6	-2,044.4	9,186.0	0.00	0.00	0.00
16,900.0	90.00	340.92	7,789.0	9,059.1	-2,077.1	9,285.8	0.00	0.00	0.00
17,000.0	90.00	340.92	7,789.0	9,153.6	-2,109.8	9,385.6	0.00	0.00	0.00
17,100.0	90.00	340.92	7,789.0	9,248.1	-2,142.5	9,485.4	0.00	0.00	0.00
17,200.0	90.00	340.92	7,789.0	9,342.7	-2,175.2	9,585.2	0.00	0.00	0.00
17,300.0	90.00	340.92	7,789.0	9,437.2	-2,207.9	9,685.0	0.00	0.00	0.00
17,400.0	90.00	340.92	7,789.0	9,531.7	-2,240.6	9,784.7	0.00	0.00	0.00
17,500.0	90.00	340.92	7,789.0	9,626.2	-2,273.3	9,884.5	0.00	0.00	0.00
17,600.0	90.00	340.92	7,789.0	9,720.7	-2,306.0	9,984.3	0.00	0.00	0.00
17,700.0	90.00	340.92	7,789.0	9,815.2	-2,338.7	10,084.1	0.00	0.00	0.00
17,800.0	90.00	340.92	7,789.0	9,909.7	-2,371.4	10,183.9	0.00	0.00	0.00
17,900.0	90.00	340.92	7,789.0	10,004.2	-2,404.1	10,283.7	0.00	0.00	0.00
18,000.0	90.00	340.92	7,789.0	10,098.7	-2,436.8	10,383.5	0.00	0.00	0.00
18,100.0	90.00	340.92	7,789.0	10,193.2	-2,469.5	10,483.3	0.00	0.00	0.00
18,200.0	90.00	340.92	7,789.0	10,287.7	-2,502.2	10,583.1	0.00	0.00	0.00
18,300.0	90.00	340.92	7,789.0	10,382.2	-2,534.9	10,682.8	0.00	0.00	0.00
18,400.0	90.00	340.92	7,789.0	10,476.7	-2,567.6	10,782.6	0.00	0.00	0.00
18,500.0	90.00	340.92	7,789.0	10,571.2	-2,600.3	10,882.4	0.00	0.00	0.00
18,600.0	90.00	340.92	7,789.0	10,665.7	-2,633.0	10,982.2	0.00	0.00	0.00



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II#215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
18,700.0	90.00	340.92	7,789.0	10,760.2	-2,665.7	11,082.0	0.00	0.00	0.00	
18,800.0	90.00	340.92	7,789.0	10,854.7	-2,698.4	11,181.8	0.00	0.00	0.00	
18,900.0	90.00	340.92	7,789.0	10,949.2	-2,731.1	11,281.6	0.00	0.00	0.00	
19,000.0	90.00	340.92	7,789.0	11,043.7	-2,763.8	11,381.4	0.00	0.00	0.00	
19,100.0	90.00	340.92	7,789.0	11,138.2	-2,796.4	11,481.1	0.00	0.00	0.00	
19,200.0	90.00	340.92	7,789.0	11,232.7	-2,829.1	11,580.9	0.00	0.00	0.00	
19,300.0	90.00	340.92	7,789.0	11,327.2	-2,861.8	11,680.7	0.00	0.00	0.00	
19,400.0	90.00	340.92	7,789.0	11,421.7	-2,894.5	11,780.5	0.00	0.00	0.00	
19,500.0	90.00	340.92	7,789.0	11,516.2	-2,927.2	11,880.3	0.00	0.00	0.00	
19,600.0	90.00	340.92	7,789.0	11,610.7	-2,959.9	11,980.1	0.00	0.00	0.00	
19,700.0	90.00	340.92	7,789.0	11,705.2	-2,992.6	12,079.9	0.00	0.00	0.00	
19,800.0	90.00	340.92	7,789.0	11,799.7	-3,025.3	12,179.7	0.00	0.00	0.00	
19,900.0	90.00	340.92	7,789.0	11,894.3	-3,058.0	12,279.4	0.00	0.00	0.00	
20,000.0	90.00	340.92	7,789.0	11,988.8	-3,090.7	12,379.2	0.00	0.00	0.00	
20,100.0	90.00	340.92	7,789.0	12,083.3	-3,123.4	12,479.0	0.00	0.00	0.00	
20,200.0	90.00	340.92	7,789.0	12,177.8	-3,156.1	12,578.8	0.00	0.00	0.00	
20,300.0	90.00	340.92	7,789.0	12,272.3	-3,188.8	12,678.6	0.00	0.00	0.00	
20,400.0	90.00	340.92	7,789.0	12,366.8	-3,221.5	12,778.4	0.00	0.00	0.00	
20,500.0	90.00	340.92	7,789.0	12,461.3	-3,254.2	12,878.2	0.00	0.00	0.00	
20,600.0	90.00	340.92	7,789.0	12,555.8	-3,286.9	12,978.0	0.00	0.00	0.00	
20,700.0	90.00	340.92	7,789.0	12,650.3	-3,319.6	13,077.7	0.00	0.00	0.00	
20,800.0	90.00	340.92	7,789.0	12,744.8	-3,352.3	13,177.5	0.00	0.00	0.00	
20,900.0	90.00	340.92	7,789.0	12,839.3	-3,385.0	13,277.3	0.00	0.00	0.00	
21,000.0	90.00	340.92	7,789.0	12,933.8	-3,417.7	13,377.1	0.00	0.00	0.00	
21,100.0	90.00	340.92	7,789.0	13,028.3	-3,450.4	13,476.9	0.00	0.00	0.00	
21,200.0	90.00	340.92	7,789.0	13,122.8	-3,483.1	13,576.7	0.00	0.00	0.00	
21,300.0	90.00	340.92	7,789.0	13,217.3	-3,515.8	13,676.5	0.00	0.00	0.00	
21,400.0	90.00	340.92	7,789.0	13,311.8	-3,548.5	13,776.3	0.00	0.00	0.00	
21,500.0	90.00	340.92	7,789.0	13,406.3	-3,581.2	13,876.0	0.00	0.00	0.00	
21,600.0	90.00	340.92	7,789.0	13,500.8	-3,613.9	13,975.8	0.00	0.00	0.00	
21,700.0	90.00	340.92	7,789.0	13,595.3	-3,646.5	14,075.6	0.00	0.00	0.00	
21,800.0	90.00	340.92	7,789.0	13,689.8	-3,679.2	14,175.4	0.00	0.00	0.00	
21,900.0	90.00	340.92	7,789.0	13,784.3	-3,711.9	14,275.2	0.00	0.00	0.00	
22,000.0	90.00	340.92	7,789.0	13,878.8	-3,744.6	14,375.0	0.00	0.00	0.00	
22,100.0	90.00	340.92	7,789.0	13,973.3	-3,777.3	14,474.8	0.00	0.00	0.00	
22,200.0	90.00	340.92	7,789.0	14,067.8	-3,810.0	14,574.6	0.00	0.00	0.00	
22,300.0	90.00	340.92	7,789.0	14,162.3	-3,842.7	14,674.4	0.00	0.00	0.00	
22,400.0	90.00	340.92	7,789.0	14,256.8	-3,875.4	14,774.1	0.00	0.00	0.00	
22,500.0	90.00	340.92	7,789.0	14,351.4	-3,908.1	14,873.9	0.00	0.00	0.00	
22,600.0	90.00	340.92	7,789.0	14,445.9	-3,940.8	14,973.7	0.00	0.00	0.00	
22,700.0	90.00	340.92	7,789.0	14,540.4	-3,973.5	15,073.5	0.00	0.00	0.00	
22,800.0	90.00	340.92	7,789.0	14,634.9	-4,006.2	15,173.3	0.00	0.00	0.00	
22,900.0	90.00	340.92	7,789.0	14,729.4	-4,038.9	15,273.1	0.00	0.00	0.00	
TD at 22971.5										
22,971.5	90.00	340.92	7,789.0	14,797.0	-4,062.3	15,344.4	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Armstrong II#215
Company:	Arsenal Resources	TVD Reference:	WELL @ 1318.0usft
Project:	Taylor County, West Virginia	MD Reference:	WELL @ 1318.0usft
Site:	Armstrong Pad	North Reference:	Grid
Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
VP Armstrong II #215 - hit/miss target - Shape - Point	0.00	360.00	7,000.0	325.3	944.6	289,005.90	1,804,204.26	39° 17' 31.269 N	80° 4' 49.827 W
PBHL Armstrong II #2 - plan hits target center - Point	0.00	360.00	7,789.0	14,797.0	-4,062.3	303,477.57	1,799,197.39	39° 19' 53.978 N	80° 5' 54.738 W

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
7,654.2	7,493.0	TULLY		0.00		
7,968.1	7,707.0	MARCELLUS SHALE		0.00		
8,119.4	7,765.0	LOWER MARCELLUS		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,000.0	3,000.0	0.0	0.0	Start Build 2.00	
3,893.3	3,878.9	45.0	130.6	Start 2355.9 hold at 3893.3 MD	
6,249.1	6,121.1	280.3	814.0	Start Drop -2.00	
7,142.4	7,000.0	325.3	944.6	Start 152.4 hold at 7142.4 MD	
7,294.8	7,152.4	325.3	944.6	Start DLS 9.00 TFO 340.92	
8,294.8	7,789.0	926.9	736.4	Start 14676.7 hold at 8294.8 MD	
22,971.5	7,789.0	14,797.0	-4,062.3	TD at 22971.5	



ARSENAL
R E S O U R C E S

Arsenal Resources

**Taylor County, West Virginia
Armstrong Pad
Armstrong II #215**

**Wellbore #1
Design #2**

KLX Anticollision Report

14 September, 2021



02/18/2022

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference	Design #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.0 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 9/14/2021	
From (usft)	To (usft)	Survey (Wellbore)
0.0	22,971.1	Design #2 (Wellbore #1)
		Tool Name
		MWD
		Description
		OWSG MWD - Standard

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Armstrong Pad						
Armstrong II #214 - Wellbore #1 - Design #1	3,000.0	3,000.0	15.0	-6.1	0.712	Level 1, CC, ES, SF
Armstrong II #216 - Wellbore #1 - Design #1	500.0	500.0	15.0	11.9	4.782	CC
Armstrong II #216 - Wellbore #1 - Design #1	600.0	599.9	15.4	11.5	3.989	ES
Armstrong II #216 - Wellbore #1 - Design #1	22,200.0	22,382.8	1,201.9	685.6	2.328	SF

Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	+E/W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-27.80	13.3	-7.0	15.0			
100.0	100.0	100.0	100.0	0.1	0.1	-27.80	13.3	-7.0	15.0	14.7	55.793	
200.0	200.0	200.0	200.0	0.5	0.5	-27.80	13.3	-7.0	15.0	14.0	15.216	
300.0	300.0	300.0	300.0	0.9	0.9	-27.80	13.3	-7.0	15.0	13.3	8.809	
400.0	400.0	400.0	400.0	1.2	1.2	-27.80	13.3	-7.0	15.0	12.6	6.199	
500.0	500.0	500.0	500.0	1.6	1.6	-27.80	13.3	-7.0	15.0	11.9	4.782	
600.0	600.0	600.0	600.0	1.9	1.9	-27.80	13.3	-7.0	15.0	11.1	3.893	
700.0	700.0	700.0	700.0	2.3	2.3	-27.80	13.3	-7.0	15.0	10.4	3.282	
800.0	800.0	800.0	800.0	2.6	2.6	-27.80	13.3	-7.0	15.0	9.7	2.837	
900.0	900.0	900.0	900.0	3.0	3.0	-27.80	13.3	-7.0	15.0	9.0	2.498	
1,000.0	1,000.0	1,000.0	1,000.0	3.4	3.4	-27.80	13.3	-7.0	15.0	8.3	2.232	
1,100.0	1,100.0	1,100.0	1,100.0	3.7	3.7	-27.80	13.3	-7.0	15.0	7.6	2.017	
1,200.0	1,200.0	1,200.0	1,200.0	4.1	4.1	-27.80	13.3	-7.0	15.0	6.8	1.839	
1,300.0	1,300.0	1,300.0	1,300.0	4.4	4.4	-27.80	13.3	-7.0	15.0	6.1	1.691	
1,400.0	1,400.0	1,400.0	1,400.0	4.8	4.8	-27.80	13.3	-7.0	15.0	5.4	1.564	
1,500.0	1,500.0	1,500.0	1,500.0	5.2	5.2	-27.80	13.3	-7.0	15.0	4.7	1.455	Level 3
1,600.0	1,600.0	1,600.0	1,600.0	5.5	5.5	-27.80	13.3	-7.0	15.0	4.0	1.361	Level 3
1,700.0	1,700.0	1,700.0	1,700.0	5.9	5.9	-27.80	13.3	-7.0	15.0	3.3	1.278	Level 3
1,800.0	1,800.0	1,800.0	1,800.0	6.2	6.2	-27.80	13.3	-7.0	15.0	2.6	1.204	Level 2
1,900.0	1,900.0	1,900.0	1,900.0	6.6	6.6	-27.80	13.3	-7.0	15.0	1.8	1.139	Level 2
2,000.0	2,000.0	2,000.0	2,000.0	6.9	6.9	-27.80	13.3	-7.0	15.0	1.1	1.080	Level 2
2,100.0	2,100.0	2,100.0	2,100.0	7.3	7.3	-27.80	13.3	-7.0	15.0	0.4	1.027	Level 2
2,200.0	2,200.0	2,200.0	2,200.0	7.7	7.7	-27.80	13.3	-7.0	15.0	-0.3	0.979	Level 1

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #214 - Wellbore #1 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning		
2,300.0	2,300.0	2,300.0	2,300.0	8.0	8.0	-27.80	13.3	-7.0	15.0	-1.0	0.935	Level 1		
2,400.0	2,400.0	2,400.0	2,400.0	8.4	8.4	-27.80	13.3	-7.0	15.0	-1.8	0.895	Level 1		
2,500.0	2,500.0	2,500.0	2,500.0	8.7	8.7	-27.80	13.3	-7.0	15.0	-2.5	0.858	Level 1		
2,600.0	2,600.0	2,600.0	2,600.0	9.1	9.1	-27.80	13.3	-7.0	15.0	-3.2	0.825	Level 1		
2,700.0	2,700.0	2,700.0	2,700.0	9.5	9.5	-27.80	13.3	-7.0	15.0	-3.9	0.793	Level 1		
2,800.0	2,800.0	2,800.0	2,800.0	9.8	9.8	-27.80	13.3	-7.0	15.0	-4.6	0.764	Level 1		
2,900.0	2,900.0	2,900.0	2,900.0	10.2	10.2	-27.80	13.3	-7.0	15.0	-5.3	0.737	Level 1		
3,000.0	3,000.0	3,000.0	3,000.0	10.5	10.5	-27.80	13.3	-7.0	15.0	-6.1	0.712	Level 1, CC, ES, SF		
3,100.0	3,100.0	3,099.8	3,099.8	10.9	10.9	-111.43	12.6	-8.6	15.8	-6.0	0.726	Level 1		
3,200.0	3,199.8	3,199.0	3,198.8	11.2	11.2	-138.30	10.5	-13.3	21.6	-0.8	0.964	Level 1		
3,300.0	3,299.5	3,297.7	3,297.3	11.6	11.5	-156.38	7.7	-19.8	34.8	11.7	1.507			
3,400.0	3,398.7	3,395.8	3,395.2	11.9	11.9	-165.19	5.0	-26.2	52.8	29.1	2.224			
3,500.0	3,497.5	3,493.2	3,492.3	12.3	12.2	-169.94	2.2	-32.5	74.8	50.4	3.065			
3,600.0	3,595.6	3,589.8	3,588.6	12.7	12.6	-172.77	-0.6	-38.8	100.6	75.4	4.006			
3,700.0	3,693.1	3,685.4	3,684.0	13.1	12.9	-174.58	-3.2	-45.0	129.6	103.8	5.034			
3,800.0	3,789.6	3,779.9	3,778.2	13.5	13.2	-175.81	-5.9	-51.2	162.1	135.7	6.140			
3,893.3	3,878.9	3,867.0	3,865.1	13.9	13.5	-176.63	-8.3	-56.9	195.4	168.4	7.235			
3,900.0	3,885.3	3,873.2	3,871.3	13.9	13.5	-176.68	-8.5	-57.3	197.9	170.9	7.316			
4,000.0	3,980.4	3,968.0	3,963.9	14.3	13.9	-177.34	-11.1	-63.3	235.2	207.5	8.490			
4,100.0	4,075.6	4,058.7	4,058.4	14.8	14.2	-177.82	-13.7	-69.4	272.5	244.1	9.610			
4,200.0	4,170.8	4,151.5	4,148.9	15.3	14.5	-178.18	-16.3	-75.4	309.8	280.8	10.579			
4,300.0	4,266.0	4,244.2	4,241.4	15.7	14.8	-178.47	-19.0	-81.5	347.1	317.5	11.699			
4,400.0	4,361.2	4,337.0	4,334.0	16.2	15.2	-178.70	-21.6	-87.5	384.4	354.1	12.574			
4,500.0	4,456.3	4,429.8	4,426.5	16.8	15.5	-178.89	-24.2	-93.6	421.8	390.8	13.506			
4,600.0	4,551.5	4,522.5	4,519.0	17.3	16.8	-179.05	-26.8	-99.6	459.1	427.4	14.497			
4,700.0	4,646.7	4,615.3	4,611.6	17.8	16.2	-179.18	-29.4	-105.7	496.4	464.1	15.350			
4,800.0	4,741.9	4,708.1	4,704.1	18.3	16.5	-179.30	-32.1	-111.7	533.8	500.8	16.167			
4,900.0	4,837.1	4,800.8	4,796.6	18.9	16.8	-179.40	-34.7	-117.8	571.1	537.4	16.950			
5,000.0	4,932.2	4,893.6	4,889.2	19.4	17.2	-179.49	-37.3	-123.8	608.4	574.1	17.701			
5,100.0	5,027.4	4,988.4	4,981.7	20.0	17.5	-179.56	-39.9	-129.9	645.8	610.7	18.422			
5,200.0	5,122.6	5,079.1	5,074.2	20.6	17.8	-179.63	-42.5	-135.9	683.1	647.4	19.115			
5,300.0	5,217.8	5,171.9	5,166.7	21.1	18.2	-179.70	-45.1	-142.0	720.6	684.0	19.780			
5,400.0	5,312.9	5,264.7	5,259.3	21.7	18.5	-179.75	-47.8	-148.0	757.8	720.7	20.420			
5,500.0	5,408.1	5,357.4	5,351.8	22.3	18.9	-179.80	-50.4	-154.1	795.1	757.3	21.035			
5,600.0	5,503.3	5,450.2	5,444.3	22.9	19.2	-179.85	-53.0	-160.1	832.5	794.0	21.628			
5,700.0	5,598.5	5,542.9	5,536.9	23.4	19.5	-179.89	-55.6	-166.2	869.8	830.6	22.198			
5,800.0	5,693.7	5,635.7	5,629.4	24.0	19.9	-179.93	-58.2	-172.2	907.2	867.3	22.748			
5,900.0	5,788.8	5,728.5	5,721.9	24.6	20.2	-179.97	-60.8	-178.3	944.5	903.9	23.279			
6,000.0	5,884.0	5,830.6	5,823.8	25.2	20.6	180.00	-63.7	-184.8	981.8	940.4	23.746			
6,100.0	5,979.2	5,974.7	5,967.8	25.8	21.1	179.97	-66.8	-189.6	1,015.9	973.5	23.968			
6,200.0	6,074.4	6,081.3	6,074.4	26.4	21.5	179.97	-69.8	-189.8	1,048.7	1,003.5	24.248			
6,249.1	6,121.1	6,128.0	6,121.1	26.7	21.6	179.97	-69.8	-189.8	1,061.8	1,018.3	24.400			
6,300.0	6,169.7	6,176.6	6,169.7	27.0	21.8	179.98	-69.8	-189.8	1,076.9	1,033.1	24.544			
6,400.0	6,265.9	6,272.8	6,265.9	27.6	22.1	179.98	-69.8	-189.8	1,104.2	1,059.7	24.762			
6,500.0	6,363.0	6,369.9	6,363.0	28.1	22.5	179.98	-69.8	-189.8	1,128.2	1,082.9	24.898			
6,600.0	6,460.8	6,467.7	6,460.8	28.6	22.8	179.98	-69.8	-189.8	1,148.7	1,102.7	24.956			
6,700.0	6,559.3	6,566.3	6,559.3	29.1	23.2	179.98	-69.8	-189.8	1,165.8	1,119.1	24.939			
6,800.0	6,658.4	6,665.3	6,658.4	29.5	23.5	179.98	-69.8	-189.8	1,179.5	1,132.0	24.951			
6,900.0	6,757.9	6,764.8	6,757.9	29.9	23.9	179.98	-69.8	-189.8	1,189.7	1,141.5	24.696			
7,000.0	6,857.6	6,864.6	6,857.6	30.2	24.2	179.98	-69.8	-189.8	1,195.4	1,147.5	24.477			
7,100.0	6,957.6	6,964.6	6,957.6	30.5	24.6	179.98	-69.8	-189.8	1,199.6	1,150.0	24.197			
7,142.4	7,000.0	7,006.9	7,000.0	30.7	24.7	-109.02	-69.8	-189.8	1,199.9	1,150.0	24.061			

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II #215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #214 - Wellbore #1 - Design #1													Offset Site Error:	0.0 usft
Survey Program: D-MWD													Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning		
7,200.0	7,057.6	7,064.5	7,057.6	30.8	24.9	-109.02	-65.8	-189.8	1,199.9	1,149.6	23.671			
7,294.8	7,152.4	7,159.3	7,152.4	31.1	25.2	-109.02	-65.8	-189.8	1,199.9	1,149.0	23.564			
7,300.0	7,157.8	7,164.5	7,157.8	31.1	25.3	-89.94	-65.8	-189.8	1,199.9	1,149.0	23.547			
7,350.0	7,207.5	7,214.4	7,207.4	31.3	25.4	-89.94	-63.6	-190.6	1,199.9	1,148.6	23.390			
7,400.0	7,257.1	7,264.3	7,256.9	31.4	25.6	-89.94	-67.7	-192.6	1,199.9	1,148.3	23.236			
7,450.0	7,306.1	7,314.3	7,306.8	31.6	25.8	-89.94	-48.1	-195.9	1,199.9	1,147.9	23.086			
7,500.0	7,354.1	7,364.2	7,353.8	31.7	26.0	-89.94	-34.9	-200.5	1,199.9	1,147.6	22.939			
7,550.0	7,400.8	7,414.1	7,400.5	31.8	26.1	-89.94	-18.3	-206.2	1,199.9	1,147.3	22.796			
7,600.0	7,446.0	7,464.0	7,445.6	32.0	26.3	-89.95	1.8	-213.2	1,199.9	1,146.9	22.653			
7,650.0	7,489.4	7,514.0	7,489.0	32.1	26.4	-89.95	25.1	-221.2	1,199.9	1,146.6	22.512			
7,700.0	7,530.8	7,563.9	7,530.3	32.2	26.6	-89.95	51.6	-230.4	1,199.9	1,146.2	22.369			
7,750.0	7,569.8	7,613.8	7,569.3	32.3	26.7	-89.95	81.1	-240.6	1,199.9	1,145.9	22.226			
7,800.0	7,606.2	7,663.8	7,606.7	32.4	26.9	-89.96	113.4	-251.8	1,199.9	1,145.5	22.078			
7,850.0	7,639.8	7,713.7	7,639.4	32.5	27.0	-89.96	148.3	-263.8	1,199.9	1,145.1	21.925			
7,900.0	7,670.5	7,763.7	7,670.0	32.6	27.2	-89.96	185.5	-276.7	1,199.8	1,144.7	21.767			
7,950.0	7,697.9	7,813.6	7,697.5	32.7	27.4	-89.97	225.0	-290.3	1,199.8	1,144.3	21.601			
8,000.0	7,722.0	7,863.6	7,721.6	32.8	27.6	-89.97	266.3	-304.6	1,199.8	1,143.8	21.428			
8,050.0	7,742.5	7,913.6	7,742.2	32.9	27.9	-89.98	309.3	-319.5	1,199.8	1,143.3	21.246			
8,100.0	7,769.4	7,963.5	7,769.2	33.0	28.1	-89.98	353.7	-334.8	1,199.8	1,142.8	21.057			
8,150.0	7,772.6	8,013.5	7,772.4	33.1	28.4	-89.99	399.3	-350.6	1,199.8	1,142.3	20.860			
8,200.0	7,782.0	8,063.5	7,781.8	33.3	28.7	-89.99	445.5	-366.6	1,199.8	1,141.7	20.656			
8,250.0	7,787.4	8,113.5	7,787.4	33.4	29.0	-90.00	492.6	-382.8	1,199.8	1,141.1	20.447			
8,294.8	7,789.0	8,163.3	7,789.0	33.5	29.3	-90.00	534.9	-397.5	1,199.8	1,140.5	20.256			
8,300.0	7,789.0	8,163.5	7,789.0	33.6	29.3	-90.00	539.8	-399.2	1,199.8	1,140.5	20.233			
8,400.0	7,789.0	8,263.5	7,789.0	34.0	30.0	-90.00	634.3	-431.8	1,199.7	1,139.1	19.777			
8,500.0	7,789.0	8,363.5	7,789.0	34.5	30.7	-90.00	728.8	-464.5	1,199.7	1,137.5	19.290			
8,600.0	7,789.0	8,463.5	7,789.0	35.2	31.6	-90.00	823.3	-497.2	1,199.7	1,135.8	18.780			
8,700.0	7,789.0	8,563.5	7,789.0	35.9	32.5	-90.00	917.9	-529.9	1,199.7	1,133.9	18.255			
8,800.0	7,789.0	8,663.5	7,789.0	36.7	33.5	-90.00	1,012.4	-562.5	1,199.6	1,132.0	17.723			
8,900.0	7,789.0	8,763.5	7,789.0	37.6	34.6	-90.00	1,106.9	-595.2	1,199.6	1,129.8	17.191			
9,000.0	7,789.0	8,863.5	7,789.0	38.6	35.7	-90.00	1,201.4	-627.9	1,199.6	1,127.6	16.664			
9,100.0	7,789.0	8,963.5	7,789.0	39.6	36.8	-90.00	1,295.9	-660.6	1,199.6	1,125.3	16.149			
9,200.0	7,789.0	9,063.5	7,789.0	40.7	38.0	-90.00	1,390.4	-693.2	1,199.5	1,122.9	15.640			
9,300.0	7,789.0	9,163.5	7,789.0	41.9	39.3	-90.00	1,484.9	-725.9	1,199.5	1,120.3	15.149			
9,400.0	7,789.0	9,263.5	7,789.0	43.1	40.6	-90.00	1,579.4	-758.6	1,199.5	1,117.8	14.674			
9,500.0	7,789.0	9,363.5	7,789.0	44.3	41.9	-90.00	1,673.9	-791.3	1,199.5	1,115.1	14.215			
9,600.0	7,789.0	9,463.5	7,789.0	45.6	43.2	-90.00	1,768.5	-823.9	1,199.5	1,112.4	13.775			
9,700.0	7,789.0	9,563.5	7,789.0	46.9	44.6	-90.00	1,863.0	-856.6	1,199.4	1,109.6	13.353			
9,800.0	7,789.0	9,663.5	7,789.0	48.3	46.0	-90.00	1,957.5	-889.3	1,199.4	1,106.8	12.948			
9,900.0	7,789.0	9,763.5	7,789.0	49.6	47.4	-90.00	2,052.0	-922.0	1,199.4	1,103.9	12.561			
10,000.0	7,789.0	9,863.5	7,789.0	51.0	48.9	-90.00	2,146.5	-954.6	1,199.4	1,101.0	12.191			
10,100.0	7,789.0	9,963.5	7,789.0	52.5	50.4	-90.00	2,241.0	-987.3	1,199.3	1,098.0	11.837			
10,200.0	7,789.0	10,063.5	7,789.0	53.9	51.9	-90.00	2,335.5	-1,020.0	1,199.3	1,095.0	11.499			
10,300.0	7,789.0	10,163.5	7,789.0	55.4	53.4	-90.00	2,430.0	-1,052.7	1,199.3	1,092.0	11.176			
10,400.0	7,789.0	10,263.5	7,789.0	56.8	54.9	-90.00	2,524.5	-1,085.3	1,199.3	1,088.9	10.868			
10,500.0	7,789.0	10,363.5	7,789.0	58.3	56.4	-90.00	2,619.1	-1,118.0	1,199.2	1,085.8	10.574			
10,600.0	7,789.0	10,463.5	7,789.0	59.8	58.0	-90.00	2,713.6	-1,150.7	1,199.2	1,082.7	10.293			
10,700.0	7,789.0	10,563.5	7,789.0	61.4	59.5	-90.00	2,808.1	-1,183.3	1,199.2	1,079.6	10.024			
10,800.0	7,789.0	10,663.5	7,789.0	62.9	61.1	-90.00	2,902.6	-1,216.0	1,199.2	1,076.4	9.768			
10,900.0	7,789.0	10,763.5	7,789.0	64.4	62.7	-90.00	2,997.1	-1,248.7	1,199.1	1,073.2	9.522			
11,000.0	7,789.0	10,863.5	7,789.0	66.0	64.3	-90.00	3,091.6	-1,281.4	1,199.1	1,070.0	9.288			
11,100.0	7,789.0	10,963.5	7,789.0	67.6	65.9	-90.00	3,186.1	-1,314.0	1,199.1	1,066.8	9.063			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II #215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #214 - Wellbore #1 - Design #1												Offset Site Error:	0.0 usft
Survey Program: D-MWD												Offset Well Error:	0.0 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning	
11,200.0	7,789.0	11,063.5	7,789.0	69.1	67.5	-90.00	3,280.6	-1,346.7	1,199.1	1,063.6	8.848		
11,300.0	7,789.0	11,163.5	7,789.0	70.7	69.1	-90.00	3,375.2	-1,379.4	1,199.1	1,060.3	8.842		
11,400.0	7,789.0	11,263.5	7,789.0	72.3	70.7	-90.00	3,469.7	-1,412.1	1,199.0	1,057.0	8.444		
11,500.0	7,789.0	11,363.5	7,789.0	73.9	72.4	-90.00	3,564.2	-1,444.7	1,199.0	1,053.8	8.255		
11,600.0	7,789.0	11,463.5	7,789.0	75.5	74.0	-90.00	3,658.7	-1,477.4	1,199.0	1,050.5	8.073		
11,700.0	7,789.0	11,563.5	7,789.0	77.1	75.7	-90.00	3,753.2	-1,510.1	1,199.0	1,047.2	7.898		
11,800.0	7,789.0	11,663.5	7,789.0	78.8	77.3	-90.00	3,847.7	-1,542.8	1,198.9	1,043.8	7.730		
11,900.0	7,789.0	11,763.5	7,789.0	80.4	79.0	-90.00	3,942.2	-1,575.4	1,198.9	1,040.5	7.569		
12,000.0	7,789.0	11,863.5	7,789.0	82.0	80.6	-90.00	4,036.7	-1,608.1	1,198.9	1,037.2	7.414		
12,100.0	7,789.0	11,963.5	7,789.0	83.7	82.3	-90.00	4,131.2	-1,640.8	1,198.9	1,033.8	7.264		
12,200.0	7,789.0	12,063.5	7,789.0	85.3	83.9	-90.00	4,225.8	-1,673.5	1,198.8	1,030.5	7.121		
12,300.0	7,789.0	12,163.5	7,789.0	87.0	85.6	-90.00	4,320.3	-1,706.1	1,198.8	1,027.1	6.982		
12,400.0	7,789.0	12,263.5	7,789.0	88.6	87.3	-90.00	4,414.8	-1,738.8	1,198.8	1,023.7	6.848		
12,500.0	7,789.0	12,363.5	7,789.0	90.3	89.0	-90.00	4,509.3	-1,771.5	1,198.8	1,020.4	6.720		
12,600.0	7,789.0	12,463.5	7,789.0	91.9	90.7	-90.00	4,603.8	-1,804.2	1,198.7	1,017.0	6.595		
12,700.0	7,789.0	12,563.5	7,789.0	93.6	92.3	-90.00	4,698.3	-1,836.8	1,198.7	1,013.6	6.475		
12,800.0	7,789.0	12,663.5	7,789.0	95.3	94.0	-90.00	4,792.8	-1,869.5	1,198.7	1,010.2	6.359		
12,900.0	7,789.0	12,763.5	7,789.0	97.0	95.7	-90.00	4,887.3	-1,902.2	1,198.7	1,006.8	6.247		
13,000.0	7,789.0	12,863.5	7,789.0	98.6	97.4	-90.00	4,981.8	-1,934.8	1,198.7	1,003.4	6.139		
13,100.0	7,789.0	12,963.5	7,789.0	100.3	99.1	-90.00	5,076.4	-1,967.5	1,198.6	1,000.0	6.034		
13,200.0	7,789.0	13,063.5	7,789.0	102.0	100.8	-90.00	5,170.9	-2,000.2	1,198.6	996.6	5.933		
13,300.0	7,789.0	13,163.5	7,789.0	103.7	102.5	-90.00	5,265.4	-2,032.9	1,198.6	993.2	5.834		
13,400.0	7,789.0	13,263.5	7,789.0	105.4	104.2	-90.00	5,359.9	-2,065.5	1,198.6	989.7	5.739		
13,500.0	7,789.0	13,363.5	7,789.0	107.1	105.9	-90.00	5,454.4	-2,098.2	1,198.5	986.3	5.647		
13,600.0	7,789.0	13,463.5	7,789.0	108.8	107.6	-90.00	5,548.9	-2,130.9	1,198.5	982.9	5.558		
13,700.0	7,789.0	13,563.5	7,789.0	110.4	109.3	-90.00	5,643.4	-2,163.6	1,198.5	979.4	5.471		
13,800.0	7,789.0	13,663.5	7,789.0	112.1	111.0	-90.00	5,737.9	-2,196.2	1,198.5	976.0	5.387		
13,900.0	7,789.0	13,763.5	7,789.0	113.8	112.7	-90.00	5,832.4	-2,228.9	1,198.4	972.5	5.305		
14,000.0	7,789.0	13,863.5	7,789.0	115.5	114.5	-90.00	5,927.0	-2,261.6	1,198.4	969.1	5.226		
14,100.0	7,789.0	13,963.5	7,789.0	117.2	116.2	-90.00	6,021.5	-2,294.3	1,198.4	965.6	5.149		
14,200.0	7,789.0	14,063.5	7,789.0	119.0	117.9	-90.00	6,116.0	-2,326.9	1,198.4	962.2	5.074		
14,300.0	7,789.0	14,163.5	7,789.0	120.7	119.6	-90.00	6,210.5	-2,359.6	1,198.3	958.7	5.001		
14,400.0	7,789.0	14,263.5	7,789.0	122.4	121.3	-90.00	6,305.0	-2,392.3	1,198.3	955.3	4.930		
14,500.0	7,789.0	14,363.5	7,789.0	124.1	123.0	-90.00	6,399.5	-2,425.0	1,198.3	951.8	4.861		
14,600.0	7,789.0	14,463.5	7,789.0	125.8	124.8	-90.00	6,494.0	-2,457.6	1,198.3	948.3	4.794		
14,700.0	7,789.0	14,563.5	7,789.0	127.5	126.5	-90.00	6,588.5	-2,490.3	1,198.3	944.9	4.729		
14,800.0	7,789.0	14,663.5	7,789.0	129.2	128.2	-90.00	6,683.1	-2,523.0	1,198.2	941.4	4.666		
14,900.0	7,789.0	14,763.5	7,789.0	130.9	129.9	-90.00	6,777.6	-2,555.7	1,198.2	937.9	4.604		
15,000.0	7,789.0	14,863.5	7,789.0	132.6	131.7	-90.00	6,872.1	-2,588.3	1,198.2	934.5	4.543		
15,100.0	7,789.0	14,963.5	7,789.0	134.4	133.4	-90.00	6,966.6	-2,621.0	1,198.2	931.0	4.485		
15,200.0	7,789.0	15,063.5	7,789.0	136.1	135.1	-90.00	7,061.1	-2,653.7	1,198.1	927.5	4.427		
15,300.0	7,789.0	15,163.5	7,789.0	137.8	136.8	-90.00	7,155.6	-2,686.4	1,198.1	924.0	4.371		
15,400.0	7,789.0	15,263.5	7,789.0	139.5	138.6	-90.00	7,250.1	-2,719.0	1,198.1	920.5	4.317		
15,500.0	7,789.0	15,363.5	7,789.0	141.2	140.3	-90.00	7,344.6	-2,751.7	1,198.1	917.1	4.264		
15,600.0	7,789.0	15,463.5	7,789.0	143.0	142.0	-90.00	7,439.1	-2,784.4	1,198.0	913.6	4.212		
15,700.0	7,789.0	15,563.5	7,789.0	144.7	143.8	-90.00	7,533.7	-2,817.0	1,198.0	910.1	4.161		
15,800.0	7,789.0	15,663.5	7,789.0	146.4	145.5	-90.00	7,628.2	-2,849.7	1,198.0	906.6	4.111		
15,900.0	7,789.0	15,763.5	7,789.0	148.1	147.2	-90.00	7,722.7	-2,882.4	1,198.0	903.1	4.063		
16,000.0	7,789.0	15,863.5	7,789.0	149.9	149.0	-90.00	7,817.2	-2,915.1	1,198.0	899.6	4.016		
16,100.0	7,789.0	15,963.5	7,789.0	151.6	150.7	-90.00	7,911.7	-2,947.7	1,197.9	896.1	3.969		
16,200.0	7,789.0	16,063.5	7,789.0	153.3	152.4	-90.00	8,006.2	-2,980.4	1,197.9	892.6	3.924		
16,300.0	7,789.0	16,163.5	7,789.0	155.1	154.2	-90.00	8,100.7	-3,013.1	1,197.9	889.1	3.880		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstong Pad - Armstrong II #214 - Wellbore #1 - Design #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning	
16,400.0	7,789.0	16,263.5	7,789.0	156.8	155.9	-90.00	8,195.2	-3,045.8	1,197.9	885.6	3.837		
16,500.0	7,789.0	16,363.5	7,789.0	158.5	157.6	-90.00	8,269.7	-3,078.4	1,197.8	882.1	3.794		
16,600.0	7,789.0	16,463.5	7,789.0	160.3	159.4	-90.00	8,364.3	-3,111.1	1,197.8	878.6	3.753		
16,700.0	7,789.0	16,563.5	7,789.0	162.0	161.1	-90.00	8,478.8	-3,143.8	1,197.8	875.1	3.712		
16,800.0	7,789.0	16,663.5	7,789.0	163.7	162.9	-90.00	8,573.3	-3,176.5	1,197.8	871.6	3.673		
16,900.0	7,789.0	16,763.5	7,789.0	165.5	164.6	-90.00	8,667.8	-3,209.1	1,197.7	868.1	3.634		
17,000.0	7,789.0	16,863.5	7,789.0	167.2	166.3	-90.00	8,762.3	-3,241.8	1,197.7	864.6	3.596		
17,100.0	7,789.0	16,963.5	7,789.0	168.9	168.1	-90.00	8,856.8	-3,274.5	1,197.7	861.1	3.559		
17,200.0	7,789.0	17,063.5	7,789.0	170.7	169.8	-90.00	8,951.3	-3,307.2	1,197.7	857.6	3.522		
17,300.0	7,789.0	17,163.5	7,789.0	172.4	171.6	-90.00	9,045.8	-3,339.8	1,197.6	854.1	3.486		
17,400.0	7,789.0	17,263.5	7,789.0	174.1	173.3	-90.00	9,140.3	-3,372.5	1,197.6	850.6	3.451		
17,500.0	7,789.0	17,363.5	7,789.0	175.9	175.1	-90.00	9,234.9	-3,405.2	1,197.6	847.1	3.417		
17,600.0	7,789.0	17,463.5	7,789.0	177.6	176.8	-90.00	9,329.4	-3,437.9	1,197.6	843.6	3.383		
17,700.0	7,789.0	17,563.5	7,789.0	179.4	176.5	-90.00	9,423.9	-3,470.5	1,197.6	840.1	3.350		
17,800.0	7,789.0	17,663.5	7,789.0	181.1	180.3	-90.00	9,518.4	-3,503.2	1,197.5	836.6	3.318		
17,900.0	7,789.0	17,763.5	7,789.0	182.8	182.0	-90.00	9,612.9	-3,535.9	1,197.5	833.1	3.286		
18,000.0	7,789.0	17,863.5	7,789.0	184.5	183.8	-90.00	9,707.4	-3,568.5	1,197.5	829.5	3.255		
18,100.0	7,789.0	17,963.5	7,789.0	186.3	185.5	-90.00	9,801.9	-3,601.2	1,197.5	826.0	3.224		
18,200.0	7,789.0	18,063.5	7,789.0	188.1	187.3	-90.00	9,896.4	-3,633.9	1,197.4	822.5	3.194		
18,300.0	7,789.0	18,163.5	7,789.0	189.8	189.0	-90.00	9,991.0	-3,666.6	1,197.4	819.0	3.164		
18,400.0	7,789.0	18,263.5	7,789.0	191.5	190.8	-90.00	10,085.5	-3,699.2	1,197.4	815.5	3.135		
18,500.0	7,789.0	18,363.5	7,789.0	193.3	192.5	-90.00	10,180.0	-3,731.9	1,197.4	812.0	3.107		
18,600.0	7,789.0	18,463.5	7,789.0	195.0	194.3	-90.00	10,274.5	-3,764.6	1,197.3	808.5	3.079		
18,700.0	7,789.0	18,563.5	7,789.0	196.8	196.0	-90.00	10,369.0	-3,797.3	1,197.3	804.9	3.051		
18,800.0	7,789.0	18,663.5	7,789.0	198.5	197.8	-90.00	10,463.5	-3,829.9	1,197.3	801.4	3.024		
18,900.0	7,789.0	18,763.5	7,789.0	200.3	199.5	-90.00	10,558.0	-3,862.6	1,197.3	797.9	2.998		
19,000.0	7,789.0	18,863.5	7,789.0	202.0	201.2	-90.00	10,652.5	-3,895.3	1,197.2	794.4	2.972		
19,100.0	7,789.0	18,963.5	7,789.0	203.7	203.0	-90.00	10,747.0	-3,928.0	1,197.2	790.9	2.946		
19,200.0	7,789.0	19,063.5	7,789.0	205.5	204.7	-90.00	10,841.5	-3,960.6	1,197.2	787.3	2.921		
19,300.0	7,789.0	19,163.5	7,789.0	207.2	206.5	-90.00	10,936.0	-3,993.3	1,197.2	783.8	2.896		
19,400.0	7,789.0	19,263.5	7,789.0	209.0	208.2	-90.00	11,030.5	-4,026.0	1,197.2	780.3	2.872		
19,500.0	7,789.0	19,363.5	7,789.0	210.7	210.0	-90.00	11,125.0	-4,058.7	1,197.1	776.8	2.848		
19,600.0	7,789.0	19,463.5	7,789.0	212.5	211.7	-90.00	11,219.5	-4,091.3	1,197.1	773.3	2.824		
19,700.0	7,789.0	19,563.5	7,789.0	214.2	213.5	-90.00	11,314.0	-4,124.0	1,197.1	769.7	2.801		
19,800.0	7,789.0	19,663.5	7,789.0	216.0	215.2	-90.00	11,408.5	-4,156.7	1,197.1	766.2	2.778		
19,900.0	7,789.0	19,763.5	7,789.0	217.7	217.0	-90.00	11,503.0	-4,189.4	1,197.0	762.7	2.756		
20,000.0	7,789.0	19,863.5	7,789.0	219.5	218.7	-90.00	11,597.5	-4,222.0	1,197.0	759.2	2.734		
20,100.0	7,789.0	19,963.5	7,789.0	221.2	220.5	-90.00	11,692.0	-4,254.7	1,197.0	755.6	2.712		
20,200.0	7,789.0	20,063.5	7,789.0	223.0	222.3	-90.00	11,786.5	-4,287.4	1,197.0	752.1	2.691		
20,300.0	7,789.0	20,163.5	7,789.0	224.7	224.0	-90.00	11,881.0	-4,320.0	1,196.9	748.6	2.670		
20,400.0	7,789.0	20,263.5	7,789.0	226.5	225.8	-90.00	11,975.5	-4,352.7	1,196.9	745.0	2.649		
20,500.0	7,789.0	20,363.5	7,789.0	228.2	227.5	-90.00	12,070.0	-4,385.4	1,196.9	741.5	2.628		
20,600.0	7,789.0	20,463.5	7,789.0	230.0	229.3	-90.00	12,164.5	-4,418.1	1,196.9	738.0	2.608		
20,700.0	7,789.0	20,563.5	7,789.0	231.7	231.0	-90.00	12,259.0	-4,450.7	1,196.8	734.5	2.588		
20,800.0	7,789.0	20,663.5	7,789.0	233.5	232.8	-90.00	12,353.5	-4,483.4	1,196.8	730.9	2.569		
20,900.0	7,789.0	20,763.5	7,789.0	235.2	234.5	-90.00	12,448.0	-4,516.1	1,196.8	727.4	2.550		
21,000.0	7,789.0	20,863.5	7,789.0	237.0	236.3	-90.00	12,542.5	-4,548.8	1,196.8	723.9	2.531		
21,100.0	7,789.0	20,963.5	7,789.0	238.7	238.0	-90.00	12,637.0	-4,581.4	1,196.8	720.4	2.512		
21,200.0	7,789.0	21,063.5	7,789.0	240.5	239.8	-90.00	12,731.5	-4,614.1	1,196.7	716.8	2.494		
21,300.0	7,789.0	21,163.5	7,789.0	242.2	241.5	-90.00	12,826.0	-4,646.8	1,196.7	713.3	2.476		
21,400.0	7,789.0	21,263.5	7,789.0	244.0	243.3	-90.00	12,920.5	-4,679.5	1,196.7	709.8	2.458		
21,500.0	7,789.0	21,363.5	7,789.0	245.7	245.0	-90.00	13,015.0	-4,712.1	1,196.7	706.2	2.440		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #214 - Wellbore #1 - Design #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning	
21,600.0	7,789.0	21,463.5	7,789.0	247.5	246.8	-90.00	13,109.8	-4,744.8	1,196.6	702.7	2.423		
21,700.0	7,789.0	21,563.5	7,789.0	249.2	248.5	-90.00	13,204.3	-4,777.5	1,196.6	699.2	2.406		
21,800.0	7,789.0	21,663.5	7,789.0	251.0	250.3	-90.00	13,298.9	-4,810.2	1,196.6	695.6	2.389		
21,900.0	7,789.0	21,763.5	7,789.0	252.7	252.1	-90.00	13,393.4	-4,842.8	1,196.6	692.1	2.372		
22,000.0	7,789.0	21,863.5	7,789.0	254.5	253.8	-90.00	13,487.9	-4,875.5	1,196.5	688.6	2.356		
22,100.0	7,789.0	21,963.5	7,789.0	256.2	255.6	-90.00	13,582.4	-4,908.2	1,196.5	685.0	2.339		
22,200.0	7,789.0	22,063.5	7,789.0	258.0	257.3	-90.00	13,676.9	-4,940.9	1,196.5	681.5	2.323		
22,300.0	7,789.0	22,163.5	7,789.0	259.7	259.1	-90.00	13,771.4	-4,973.5	1,196.5	678.0	2.308		
22,350.6	7,789.0	22,214.1	7,789.0	260.6	259.9	-90.00	13,819.2	-4,990.1	1,196.5	676.2	2.300		
22,400.0	7,789.0	22,215.3	7,789.0	261.5	259.9	-90.00	13,820.3	-4,990.4	1,197.4	677.1	2.301		
22,500.0	7,789.0	22,215.3	7,789.0	263.2	259.9	-90.00	13,820.3	-4,990.4	1,205.6	687.7	2.328		
22,600.0	7,789.0	22,215.3	7,789.0	265.0	259.9	-90.00	13,820.3	-4,990.4	1,221.9	709.9	2.366		
22,700.0	7,789.0	22,215.3	7,789.0	266.7	259.9	-90.00	13,820.3	-4,990.4	1,246.0	742.8	2.476		
22,800.0	7,789.0	22,215.3	7,789.0	268.5	259.9	-90.00	13,820.3	-4,990.4	1,277.6	785.5	2.596		
22,900.0	7,789.0	22,215.3	7,789.0	270.2	259.9	-90.00	13,820.3	-4,990.4	1,316.0	837.0	2.748		
22,971.5	7,789.0	22,215.3	7,789.0	271.3	259.9	-90.00	13,820.3	-4,990.4	1,347.3	878.6	2.874		

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstong Pad - Armstrong II #216 - Wellbore #1 - Design #1													Offset Site Error:	0.0 usft
Survey Program: D-MWD													Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	152.20	-13.3	7.0	15.0					
100.0	100.0	100.0	100.0	0.1	0.1	152.20	-13.3	7.0	15.0	14.7	55.792			
200.0	200.0	200.0	200.0	0.5	0.5	152.20	-13.3	7.0	15.0	14.0	15.216			
300.0	300.0	300.0	300.0	0.9	0.9	152.20	-13.3	7.0	15.0	13.3	8.809			
400.0	400.0	400.0	400.0	1.2	1.2	152.20	-13.3	7.0	15.0	12.6	6.199			
500.0	500.0	500.0	500.0	1.6	1.6	152.20	-13.3	7.0	15.0	11.9	4.782	CC		
600.0	600.0	599.9	599.9	1.9	1.9	145.76	-12.7	8.6	15.4	11.5	3.989	ES		
700.0	700.0	699.5	699.4	2.3	2.3	128.98	-11.0	13.5	17.4	12.9	3.826			
800.0	800.0	799.7	799.1	2.6	2.6	110.49	-8.1	21.7	23.2	17.9	4.410			
900.0	900.0	897.1	895.9	3.0	3.0	97.15	-4.1	32.9	33.4	27.5	5.611			
1,000.0	1,000.0	994.6	992.2	3.4	3.4	88.91	0.9	47.2	47.8	41.2	7.197			
1,100.0	1,100.0	1,091.0	1,086.8	3.7	3.8	83.85	6.9	64.3	66.0	58.7	9.015			
1,200.0	1,200.0	1,186.0	1,179.5	4.1	4.2	80.60	13.9	84.1	87.7	79.7	10.980			
1,300.0	1,300.0	1,279.6	1,270.0	4.4	4.7	78.43	21.8	106.4	112.7	104.1	13.053			
1,400.0	1,400.0	1,371.4	1,358.0	4.8	5.2	76.91	30.5	131.0	140.9	131.8	15.191			
1,500.0	1,500.0	1,461.4	1,443.5	5.2	5.7	75.81	39.9	167.7	172.2	162.3	17.390			
1,600.0	1,600.0	1,549.5	1,526.2	5.5	6.2	74.99	49.9	186.3	206.5	196.0	19.637			
1,700.0	1,700.0	1,640.5	1,610.9	5.9	6.8	74.34	61.0	217.7	243.0	231.8	21.720			
1,800.0	1,800.0	1,733.5	1,697.4	6.2	7.5	73.85	72.4	249.9	279.7	267.8	23.804			
1,900.0	1,900.0	1,826.5	1,783.9	6.5	8.1	73.47	83.7	282.2	316.4	303.8	25.079			
2,000.0	2,000.0	1,819.6	1,870.4	6.9	8.8	73.17	95.1	314.4	353.1	339.8	26.478			
2,100.0	2,100.0	2,012.5	1,956.9	7.3	9.4	72.92	106.5	346.6	389.8	375.8	27.728			
2,200.0	2,200.0	2,105.5	2,043.3	7.7	10.1	72.72	117.8	378.8	426.6	411.8	28.850			
2,300.0	2,300.0	2,198.5	2,129.8	8.0	10.8	72.55	129.2	411.1	463.3	447.8	29.864			
2,400.0	2,400.0	2,291.5	2,216.3	8.4	11.5	72.41	140.6	443.3	500.0	483.8	30.782			
2,500.0	2,500.0	2,384.5	2,302.8	8.7	12.2	72.28	151.9	475.5	536.7	519.8	31.618			
2,600.0	2,600.0	2,477.5	2,389.3	9.1	12.9	72.17	163.3	507.8	573.5	555.8	32.383			
2,700.0	2,700.0	2,570.5	2,475.8	9.5	13.5	72.08	174.7	540.0	610.2	591.8	33.084			
2,800.0	2,800.0	2,663.5	2,562.3	9.8	14.2	71.99	186.0	572.2	646.9	627.8	33.729			
2,900.0	2,900.0	2,756.5	2,649.8	10.2	14.9	71.92	197.4	604.5	683.7	663.8	34.325			
3,000.0	3,000.0	2,849.5	2,735.3	10.5	15.5	71.85	208.8	636.7	720.4	699.8	34.877			
3,100.0	3,100.0	2,943.2	2,822.4	10.9	16.3	0.78	220.2	669.1	755.5	734.1	35.320			
3,200.0	3,199.8	3,038.0	2,910.6	11.2	17.0	0.72	231.8	702.0	787.4	765.2	35.882			
3,300.0	3,299.5	3,133.8	2,999.7	11.6	17.8	0.67	243.6	735.2	815.9	793.0	36.468			
3,400.0	3,398.7	3,230.6	3,089.7	11.9	18.5	0.62	255.3	769.8	841.0	817.4	36.993			
3,500.0	3,497.5	3,328.2	3,180.5	12.3	19.2	0.59	267.2	802.6	862.7	838.3	37.573			
3,600.0	3,595.6	3,426.5	3,271.9	12.7	20.0	0.55	279.3	836.6	881.0	855.9	38.197			
3,700.0	3,693.1	3,525.4	3,363.9	13.1	20.7	0.52	291.3	870.9	895.9	870.0	38.868			
3,800.0	3,789.6	3,624.7	3,456.3	13.5	21.5	0.50	303.5	905.3	907.3	880.6	39.582			
3,893.3	3,878.9	3,717.7	3,542.7	13.9	22.2	0.48	314.8	937.6	914.9	897.4	40.336			
3,900.0	3,885.3	3,724.4	3,549.0	13.9	22.2	0.48	315.7	939.9	915.3	897.8	40.388			
4,000.0	3,980.4	3,824.2	3,641.8	14.3	23.0	0.46	327.8	974.5	921.7	893.5	41.156			
4,100.0	4,075.6	3,924.0	3,734.6	14.8	23.8	0.44	340.0	1,009.1	928.2	899.1	41.918			
4,200.0	4,170.8	4,023.8	3,827.4	15.3	24.5	0.42	352.2	1,043.6	934.6	904.7	42.681			
4,300.0	4,266.0	4,123.6	3,920.2	15.7	25.3	0.40	364.4	1,078.2	941.1	910.4	43.443			
4,400.0	4,361.2	4,223.4	4,013.0	16.2	26.0	0.38	376.6	1,112.8	947.5	916.0	44.205			
4,500.0	4,456.3	4,323.1	4,105.8	16.8	26.8	0.36	388.8	1,147.4	953.9	921.6	44.967			
4,600.0	4,551.5	4,422.9	4,198.6	17.3	27.5	0.34	401.0	1,182.0	960.4	927.3	45.729			
4,700.0	4,646.7	4,522.7	4,291.4	17.8	28.3	0.32	413.2	1,216.6	966.8	932.9	46.491			
4,800.0	4,741.9	4,622.5	4,384.3	18.3	29.1	0.30	425.4	1,251.1	973.3	938.5	47.253			
4,900.0	4,837.1	4,722.3	4,477.1	18.9	29.9	0.29	437.6	1,285.7	979.7	944.2	48.015			
5,000.0	4,932.2	4,822.1	4,569.9	19.4	30.6	0.27	449.8	1,320.3	986.1	949.8	48.777			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #216 - Wellbore #1 - Design #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning	
5,100.0	5,027.4	4,921.9	4,662.7	20.0	31.4	0.25	462.0	1,354.9	992.6	955.4	26.693		
5,200.0	5,122.6	5,021.7	4,755.5	20.5	32.1	0.23	474.2	1,389.5	998.0	961.0	26.284		
5,300.0	5,217.8	5,121.5	4,848.3	21.1	32.9	0.22	486.4	1,424.1	1,005.5	966.6	25.892		
5,400.0	5,312.9	5,221.3	4,941.1	21.7	33.6	0.20	498.6	1,458.6	1,011.9	972.2	25.515		
5,500.0	5,408.1	5,321.1	5,033.9	22.3	34.4	0.18	510.8	1,493.2	1,018.3	977.9	25.152		
5,600.0	5,503.3	5,420.9	5,126.7	22.9	35.2	0.17	522.9	1,527.8	1,024.8	983.5	24.804		
5,700.0	5,598.5	5,520.7	5,219.5	23.4	35.9	0.15	535.1	1,562.4	1,031.2	989.1	24.468		
5,800.0	5,693.7	5,620.4	5,312.4	24.0	36.7	0.14	547.3	1,597.0	1,037.7	994.7	24.144		
5,900.0	5,788.8	5,720.2	5,405.2	24.6	37.5	0.12	559.5	1,631.6	1,044.1	1,000.3	23.832		
6,000.0	5,884.0	5,820.0	5,498.0	25.2	38.2	0.11	571.7	1,666.1	1,050.6	1,005.9	23.531		
6,100.0	5,979.2	5,919.8	5,590.8	25.8	39.0	0.09	583.9	1,700.7	1,057.0	1,011.5	23.241		
6,200.0	6,074.4	6,019.5	5,683.6	26.4	39.7	0.08	596.1	1,735.3	1,063.4	1,017.1	22.960		
6,249.1	6,121.1	6,068.6	5,729.2	26.7	40.1	0.07	602.1	1,752.3	1,066.6	1,019.9	22.826		
6,300.0	6,169.7	6,119.4	5,776.4	27.0	40.5	0.06	608.3	1,769.9	1,070.3	1,023.2	22.699		
6,400.0	6,265.9	6,218.9	5,868.9	27.6	41.3	0.05	620.5	1,804.4	1,080.3	1,032.3	22.513		
6,500.0	6,363.0	6,318.0	5,961.1	28.1	42.0	0.03	632.6	1,838.7	1,093.7	1,044.9	22.408		
6,600.0	6,460.8	6,416.5	6,052.7	28.6	42.8	0.02	644.6	1,872.9	1,110.6	1,060.9	22.380		
6,700.0	6,559.3	6,515.4	6,142.9	29.1	43.7	0.00	660.0	1,916.6	1,130.2	1,079.5	22.298		
6,800.0	6,658.4	6,615.5	6,229.9	29.5	44.6	-0.02	677.1	1,965.1	1,148.5	1,096.6	22.124		
6,900.0	6,757.9	6,714.7	6,317.7	29.9	45.6	-0.04	691.4	2,005.7	1,164.5	1,111.5	21.988		
7,000.0	6,857.6	6,814.7	6,405.7	30.2	46.6	-0.05	702.8	2,037.8	1,178.2	1,124.4	21.890		
7,100.0	6,957.8	6,914.7	6,493.3	30.5	47.2	-0.06	711.0	2,061.1	1,189.6	1,135.1	21.830		
7,142.4	7,000.0	6,957.4	6,581.1	30.7	47.5	-0.06	713.5	2,068.1	1,193.7	1,139.0	21.817		
7,200.0	7,057.6	7,014.7	6,668.5	30.8	47.8	-0.06	715.9	2,075.0	1,198.0	1,143.0	21.798		
7,294.8	7,152.4	7,109.4	6,755.4	31.1	48.1	-0.06	717.4	2,079.4	1,200.6	1,145.4	21.734		
7,300.0	7,157.6	7,114.7	6,757.6	31.1	48.1	-0.06	717.4	2,079.4	1,200.6	1,145.4	21.734		
7,350.0	7,207.6	7,164.7	6,844.6	31.3	48.2	-0.06	719.7	2,078.6	1,200.6	1,145.1	21.614		
7,400.0	7,257.1	7,214.7	6,931.7	31.4	48.3	-0.06	725.6	2,076.5	1,200.6	1,144.8	21.495		
7,450.0	7,306.1	7,263.7	7,018.7	31.6	48.4	-0.06	735.2	2,073.2	1,200.6	1,144.5	21.379		
7,500.0	7,354.1	7,311.7	7,105.7	31.7	48.5	-0.06	748.5	2,068.7	1,200.6	1,144.2	21.263		
7,550.0	7,400.8	7,358.4	7,192.7	31.8	48.6	-0.06	765.2	2,062.9	1,200.6	1,143.9	21.149		
7,600.0	7,446.0	7,403.0	7,279.7	32.0	48.7	-0.06	785.3	2,055.9	1,200.6	1,143.6	21.035		
7,650.0	7,489.4	7,446.4	7,366.7	32.1	48.8	-0.06	808.8	2,047.8	1,200.6	1,143.3	20.921		
7,700.0	7,530.8	7,487.5	7,453.7	32.2	48.8	-0.06	835.4	2,038.6	1,200.6	1,142.9	20.805		
7,750.0	7,569.8	7,524.5	7,540.7	32.3	48.9	-0.06	865.0	2,028.3	1,200.6	1,142.6	20.687		
7,800.0	7,606.2	7,561.0	7,627.7	32.4	49.0	-0.06	897.4	2,017.1	1,200.6	1,142.3	20.564		
7,850.0	7,639.8	7,594.6	7,714.7	32.5	49.1	-0.06	932.3	2,005.0	1,200.6	1,141.9	20.437		
7,900.0	7,670.5	7,627.1	7,801.7	32.6	49.1	-0.06	969.7	1,992.1	1,200.6	1,141.5	20.305		
7,950.0	7,697.9	7,654.5	7,888.7	32.7	49.2	-0.06	1,009.2	1,978.4	1,200.6	1,141.1	20.166		
8,000.0	7,722.0	7,679.0	7,975.7	32.8	49.2	-0.06	1,050.7	1,964.1	1,200.6	1,140.7	20.020		
8,050.0	7,742.5	7,704.5	8,062.7	32.9	49.3	-0.06	1,093.8	1,949.2	1,200.6	1,140.2	19.866		
8,100.0	7,759.4	7,729.0	8,149.7	33.0	49.4	-0.06	1,138.2	1,933.8	1,200.6	1,139.7	19.706		
8,150.0	7,772.6	7,747.1	8,236.7	33.1	49.4	-0.06	1,183.8	1,918.0	1,200.6	1,139.2	19.539		
8,200.0	7,782.0	7,756.5	8,323.7	33.3	49.5	-0.06	1,230.2	1,901.9	1,200.6	1,138.6	19.365		
8,250.0	7,787.4	7,761.9	8,410.7	33.4	49.6	-0.06	1,277.2	1,885.7	1,200.6	1,138.0	19.187		
8,294.8	7,789.0	7,763.5	8,497.7	33.6	49.7	-0.06	1,319.5	1,871.0	1,200.6	1,137.5	19.024		
8,300.0	7,789.0	7,763.5	8,497.7	33.6	49.7	-0.06	1,324.4	1,869.4	1,200.6	1,137.4	19.004		
8,400.0	7,789.0	7,763.5	8,584.7	34.0	49.9	-0.06	1,418.9	1,836.6	1,200.6	1,136.1	18.614		
8,500.0	7,789.0	7,763.5	8,671.7	34.5	50.1	-0.06	1,513.4	1,803.9	1,200.6	1,134.6	18.196		
8,600.0	7,789.0	7,763.5	8,758.7	35.2	50.4	-0.06	1,607.9	1,771.2	1,200.6	1,133.0	17.757		
8,700.0	7,789.0	7,763.5	8,845.7	35.9	50.7	-0.06	1,702.4	1,738.5	1,200.6	1,131.2	17.303		
8,800.0	7,789.0	7,763.5	8,932.7	36.7	51.1	-0.06	1,796.9	1,705.8	1,200.6	1,129.3	16.841		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #216 - Wellbore #1 - Design #1												Offset Site Error:	0.0 usft
Survey Program: D-MWD												Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning	
8,900.0	7,789.0	9,150.7	7,789.0	37.6	51.5	90.00	1,891.4	1,673.1	1,200.6	1,127.3	16.375		
9,000.0	7,789.0	9,250.7	7,789.0	38.6	52.0	90.00	1,985.9	1,640.4	1,200.6	1,125.1	15.912		
9,100.0	7,789.0	9,350.7	7,789.0	39.6	52.6	90.00	2,080.4	1,607.7	1,200.6	1,122.9	15.453		
9,200.0	7,789.0	9,450.7	7,789.0	40.7	53.2	90.00	2,174.9	1,575.0	1,200.6	1,120.6	15.003		
9,300.0	7,789.0	9,550.7	7,789.0	41.9	53.8	90.00	2,269.4	1,542.3	1,200.6	1,118.1	14.563		
9,400.0	7,789.0	9,650.7	7,789.0	43.1	54.5	90.00	2,363.9	1,509.6	1,200.6	1,115.6	14.135		
9,500.0	7,789.0	9,750.7	7,789.0	44.3	55.3	90.00	2,458.5	1,476.9	1,200.6	1,113.1	13.721		
9,600.0	7,789.0	9,850.7	7,789.0	45.6	56.2	90.00	2,553.0	1,444.2	1,200.6	1,110.4	13.320		
9,700.0	7,789.0	9,950.7	7,789.0	46.9	57.1	90.00	2,647.5	1,411.5	1,200.6	1,107.7	12.934		
9,800.0	7,789.0	10,050.7	7,789.0	48.3	58.0	90.00	2,742.0	1,378.8	1,200.6	1,105.0	12.563		
9,900.0	7,789.0	10,150.7	7,789.0	49.6	59.0	90.00	2,836.5	1,346.1	1,200.6	1,102.2	12.206		
10,000.0	7,789.0	10,250.7	7,789.0	51.0	60.0	90.00	2,931.0	1,313.4	1,200.5	1,099.3	11.863		
10,100.0	7,789.0	10,350.7	7,789.0	52.5	61.1	90.00	3,025.5	1,280.7	1,200.5	1,096.5	11.534		
10,200.0	7,789.0	10,450.7	7,789.0	53.9	62.3	90.00	3,120.0	1,248.0	1,200.5	1,093.5	11.219		
10,300.0	7,789.0	10,550.7	7,789.0	55.4	63.4	90.00	3,214.5	1,215.3	1,200.5	1,090.5	10.918		
10,400.0	7,789.0	10,650.7	7,789.0	56.8	64.6	90.00	3,309.0	1,182.6	1,200.5	1,087.6	10.628		
10,500.0	7,789.0	10,750.7	7,789.0	58.3	65.9	90.00	3,403.5	1,149.9	1,200.5	1,084.5	10.352		
10,600.0	7,789.0	10,850.7	7,789.0	59.8	67.1	90.00	3,498.0	1,117.2	1,200.5	1,081.5	10.086		
10,700.0	7,789.0	10,950.7	7,789.0	61.4	68.4	90.00	3,592.5	1,084.5	1,200.5	1,078.4	9.832		
10,800.0	7,789.0	11,050.7	7,789.0	62.9	69.8	90.00	3,687.0	1,051.8	1,200.5	1,075.3	9.589		
10,900.0	7,789.0	11,150.7	7,789.0	64.4	71.1	90.00	3,781.5	1,019.1	1,200.5	1,072.2	9.356		
11,000.0	7,789.0	11,250.7	7,789.0	66.0	72.5	90.00	3,876.0	986.4	1,200.5	1,069.0	9.132		
11,100.0	7,789.0	11,350.7	7,789.0	67.6	73.9	90.00	3,970.5	953.7	1,200.5	1,065.9	8.918		
11,200.0	7,789.0	11,450.7	7,789.0	69.1	75.3	90.00	4,065.0	921.0	1,200.5	1,062.7	8.712		
11,300.0	7,789.0	11,550.7	7,789.0	70.7	76.7	90.00	4,159.5	888.3	1,200.5	1,059.5	8.514		
11,400.0	7,789.0	11,650.7	7,789.0	72.3	78.2	90.00	4,254.0	855.6	1,200.5	1,056.3	8.325		
11,500.0	7,789.0	11,750.7	7,789.0	73.9	79.6	90.00	4,348.5	822.9	1,200.5	1,053.0	8.143		
11,600.0	7,789.0	11,850.7	7,789.0	75.5	81.1	90.00	4,443.0	790.2	1,200.5	1,049.8	7.968		
11,700.0	7,789.0	11,950.7	7,789.0	77.1	82.6	90.00	4,537.5	757.5	1,200.5	1,046.5	7.799		
11,800.0	7,789.0	12,050.7	7,789.0	78.8	84.1	90.00	4,632.0	724.8	1,200.5	1,043.3	7.637		
11,900.0	7,789.0	12,150.7	7,789.0	80.4	85.6	90.00	4,726.5	692.1	1,200.5	1,040.0	7.481		
12,000.0	7,789.0	12,250.7	7,789.0	82.0	87.2	90.00	4,821.0	659.4	1,200.5	1,036.7	7.331		
12,100.0	7,789.0	12,350.7	7,789.0	83.7	88.7	90.00	4,915.5	626.7	1,200.5	1,033.4	7.186		
12,200.0	7,789.0	12,450.7	7,789.0	85.3	90.2	90.00	5,010.0	594.0	1,200.4	1,030.1	7.047		
12,300.0	7,789.0	12,550.7	7,789.0	87.0	91.8	90.00	5,104.5	561.3	1,200.4	1,026.8	6.912		
12,400.0	7,789.0	12,650.7	7,789.0	88.6	93.4	90.00	5,199.0	528.6	1,200.4	1,023.4	6.781		
12,500.0	7,789.0	12,750.7	7,789.0	90.3	94.9	90.00	5,293.5	495.9	1,200.4	1,020.1	6.658		
12,600.0	7,789.0	12,850.7	7,789.0	91.9	96.5	90.00	5,388.0	463.2	1,200.4	1,016.8	6.537		
12,700.0	7,789.0	12,950.7	7,789.0	93.6	98.1	90.00	5,482.5	430.5	1,200.4	1,013.4	6.420		
12,800.0	7,789.0	13,050.7	7,789.0	95.3	99.7	90.00	5,577.0	397.8	1,200.4	1,010.1	6.307		
12,900.0	7,789.0	13,150.7	7,789.0	97.0	101.3	90.00	5,671.5	365.1	1,200.4	1,006.7	6.197		
13,000.0	7,789.0	13,250.7	7,789.0	98.6	102.9	90.00	5,766.0	332.4	1,200.4	1,003.3	6.091		
13,100.0	7,789.0	13,350.7	7,789.0	100.3	104.5	90.00	5,860.5	299.7	1,200.4	1,000.0	5.989		
13,200.0	7,789.0	13,450.7	7,789.0	102.0	106.1	90.00	5,955.0	267.0	1,200.4	996.6	5.890		
13,300.0	7,789.0	13,550.7	7,789.0	103.7	107.7	90.00	6,049.5	234.3	1,200.4	993.2	5.794		
13,400.0	7,789.0	13,650.7	7,789.0	105.4	109.4	90.00	6,144.0	201.6	1,200.4	989.8	5.701		
13,500.0	7,789.0	13,750.7	7,789.0	107.1	111.0	90.00	6,238.5	168.9	1,200.4	986.4	5.610		
13,600.0	7,789.0	13,850.7	7,789.0	108.8	112.6	90.00	6,333.0	136.2	1,200.4	983.0	5.523		
13,700.0	7,789.0	13,950.7	7,789.0	110.4	114.3	90.00	6,427.5	103.5	1,200.4	979.6	5.438		
13,800.0	7,789.0	14,050.7	7,789.0	112.1	115.9	90.00	6,522.0	70.8	1,200.4	976.2	5.355		
13,900.0	7,789.0	14,150.7	7,789.0	113.8	117.6	90.00	6,616.5	38.1	1,200.4	972.8	5.275		
14,000.0	7,789.0	14,250.7	7,789.0	115.5	119.2	90.00	6,711.0	5.4	1,200.4	969.4	5.197		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #216 - Wellbore #1 - Design #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning		
14,100.0	7,789.0	14,350.7	7,789.0	117.2	120.9	90.00	6,805.6	-27.3	1,200.4	966.0	5.121			
14,200.0	7,789.0	14,450.7	7,789.0	119.0	122.5	90.00	6,900.1	-60.0	1,200.4	962.6	5.048			
14,300.0	7,789.0	14,550.7	7,789.0	120.7	124.2	90.00	6,984.6	-92.7	1,200.4	959.1	4.976			
14,400.0	7,789.0	14,650.7	7,789.0	122.4	126.8	90.00	7,089.1	-126.4	1,200.4	955.7	4.906			
14,500.0	7,789.0	14,750.7	7,789.0	124.1	127.5	90.00	7,183.6	-158.1	1,200.3	952.3	4.839			
14,600.0	7,789.0	14,850.7	7,789.0	125.8	129.2	90.00	7,276.1	-190.8	1,200.3	948.8	4.773			
14,700.0	7,789.0	14,950.7	7,789.0	127.5	130.8	90.00	7,372.6	-223.5	1,200.3	945.4	4.708			
14,800.0	7,789.0	15,050.7	7,789.0	129.2	132.5	90.00	7,467.1	-256.2	1,200.3	942.0	4.646			
14,900.0	7,789.0	15,150.7	7,789.0	130.9	134.2	90.00	7,561.6	-288.9	1,200.3	938.5	4.585			
15,000.0	7,789.0	15,250.7	7,789.0	132.6	135.9	90.00	7,656.1	-321.6	1,200.3	935.1	4.525			
15,100.0	7,789.0	15,350.7	7,789.0	134.4	137.6	90.00	7,750.6	-354.3	1,200.3	931.6	4.467			
15,200.0	7,789.0	15,450.7	7,789.0	136.1	139.2	90.00	7,845.1	-387.0	1,200.3	928.2	4.411			
15,300.0	7,789.0	15,550.7	7,789.0	137.8	140.9	90.00	7,939.6	-419.7	1,200.3	924.7	4.356			
15,400.0	7,789.0	15,650.7	7,789.0	139.5	142.6	90.00	8,034.1	-452.4	1,200.3	921.3	4.302			
15,500.0	7,789.0	15,750.7	7,789.0	141.2	144.3	90.00	8,128.6	-485.1	1,200.3	917.8	4.249			
15,600.0	7,789.0	15,850.7	7,789.0	143.0	146.0	90.00	8,223.1	-517.8	1,200.3	914.4	4.198			
15,700.0	7,789.0	15,950.7	7,789.0	144.7	147.7	90.00	8,317.6	-550.5	1,200.3	910.9	4.148			
15,800.0	7,789.0	16,050.7	7,789.0	146.4	149.4	90.00	8,412.1	-583.2	1,200.3	907.4	4.099			
15,900.0	7,789.0	16,150.7	7,789.0	148.1	151.1	90.00	8,506.6	-615.9	1,200.3	904.0	4.051			
16,000.0	7,789.0	16,250.7	7,789.0	149.9	152.8	90.00	8,601.1	-648.6	1,200.3	900.5	4.004			
16,100.0	7,789.0	16,350.7	7,789.0	151.6	154.5	90.00	8,695.6	-681.3	1,200.3	897.1	3.958			
16,200.0	7,789.0	16,450.7	7,789.0	153.3	156.2	90.00	8,790.1	-714.0	1,200.3	893.6	3.914			
16,300.0	7,789.0	16,550.7	7,789.0	155.1	157.9	90.00	8,884.6	-746.7	1,200.3	890.1	3.870			
16,400.0	7,789.0	16,650.7	7,789.0	156.8	159.6	90.00	8,979.1	-779.4	1,200.3	886.6	3.827			
16,500.0	7,789.0	16,750.7	7,789.0	158.5	161.3	90.00	9,073.6	-812.1	1,200.3	883.2	3.785			
16,600.0	7,789.0	16,850.7	7,789.0	160.3	163.0	90.00	9,168.1	-844.8	1,200.3	879.7	3.744			
16,700.0	7,789.0	16,950.7	7,789.0	162.0	164.7	90.00	9,262.6	-877.5	1,200.3	876.2	3.704			
16,800.0	7,789.0	17,050.7	7,789.0	163.7	166.4	90.00	9,357.1	-910.2	1,200.2	872.8	3.665			
16,900.0	7,789.0	17,150.7	7,789.0	165.5	168.1	90.00	9,451.6	-942.9	1,200.2	869.3	3.626			
17,000.0	7,789.0	17,250.7	7,789.0	167.2	169.8	90.00	9,546.1	-975.6	1,200.2	865.8	3.589			
17,100.0	7,789.0	17,350.7	7,789.0	168.9	171.5	90.00	9,640.6	-1,008.3	1,200.2	862.3	3.552			
17,200.0	7,789.0	17,450.7	7,789.0	170.7	173.3	90.00	9,735.1	-1,041.0	1,200.2	858.8	3.516			
17,300.0	7,789.0	17,550.7	7,789.0	172.4	175.0	90.00	9,829.6	-1,073.7	1,200.2	855.4	3.480			
17,400.0	7,789.0	17,650.7	7,789.0	174.1	176.7	90.00	9,924.1	-1,106.4	1,200.2	851.9	3.445			
17,500.0	7,789.0	17,750.7	7,789.0	175.9	178.4	90.00	10,018.6	-1,139.1	1,200.2	848.4	3.411			
17,600.0	7,789.0	17,850.7	7,789.0	177.6	180.1	90.00	10,113.1	-1,171.8	1,200.2	844.9	3.378			
17,700.0	7,789.0	17,950.7	7,789.0	179.4	181.8	90.00	10,207.6	-1,204.5	1,200.2	841.4	3.345			
17,800.0	7,789.0	18,050.7	7,789.0	181.1	183.6	90.00	10,302.1	-1,237.2	1,200.2	837.9	3.313			
17,900.0	7,789.0	18,150.7	7,789.0	182.8	185.3	90.00	10,396.6	-1,269.9	1,200.2	834.4	3.281			
18,000.0	7,789.0	18,250.7	7,789.0	184.6	187.0	90.00	10,491.1	-1,302.6	1,200.2	831.0	3.250			
18,100.0	7,789.0	18,350.7	7,789.0	186.3	188.7	90.00	10,585.6	-1,335.3	1,200.2	827.5	3.220			
18,200.0	7,789.0	18,450.7	7,789.0	188.1	190.4	90.00	10,680.2	-1,368.0	1,200.2	824.0	3.190			
18,300.0	7,789.0	18,550.7	7,789.0	189.8	192.2	90.00	10,774.7	-1,400.7	1,200.2	820.5	3.161			
18,400.0	7,789.0	18,650.7	7,789.0	191.5	193.9	90.00	10,869.2	-1,433.4	1,200.2	817.0	3.132			
18,500.0	7,789.0	18,750.7	7,789.0	193.3	195.6	90.00	10,963.7	-1,466.1	1,200.2	813.5	3.104			
18,600.0	7,789.0	18,850.7	7,789.0	195.0	197.3	90.00	11,058.2	-1,498.8	1,200.2	810.0	3.076			
18,700.0	7,789.0	18,950.7	7,789.0	196.8	199.1	90.00	11,152.7	-1,531.5	1,200.2	806.5	3.049			
18,800.0	7,789.0	19,050.7	7,789.0	198.5	200.8	90.00	11,247.2	-1,564.2	1,200.2	803.0	3.022			
18,900.0	7,789.0	19,150.7	7,789.0	200.3	202.5	90.00	11,341.7	-1,596.9	1,200.2	799.5	2.996			
19,000.0	7,789.0	19,250.7	7,789.0	202.0	204.3	90.00	11,436.2	-1,629.6	1,200.2	796.0	2.970			
19,100.0	7,789.0	19,350.7	7,789.0	203.7	206.0	90.00	11,530.7	-1,662.3	1,200.1	792.5	2.944			
19,200.0	7,789.0	19,450.7	7,789.0	205.5	207.7	90.00	11,625.2	-1,695.0	1,200.1	789.0	2.919			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

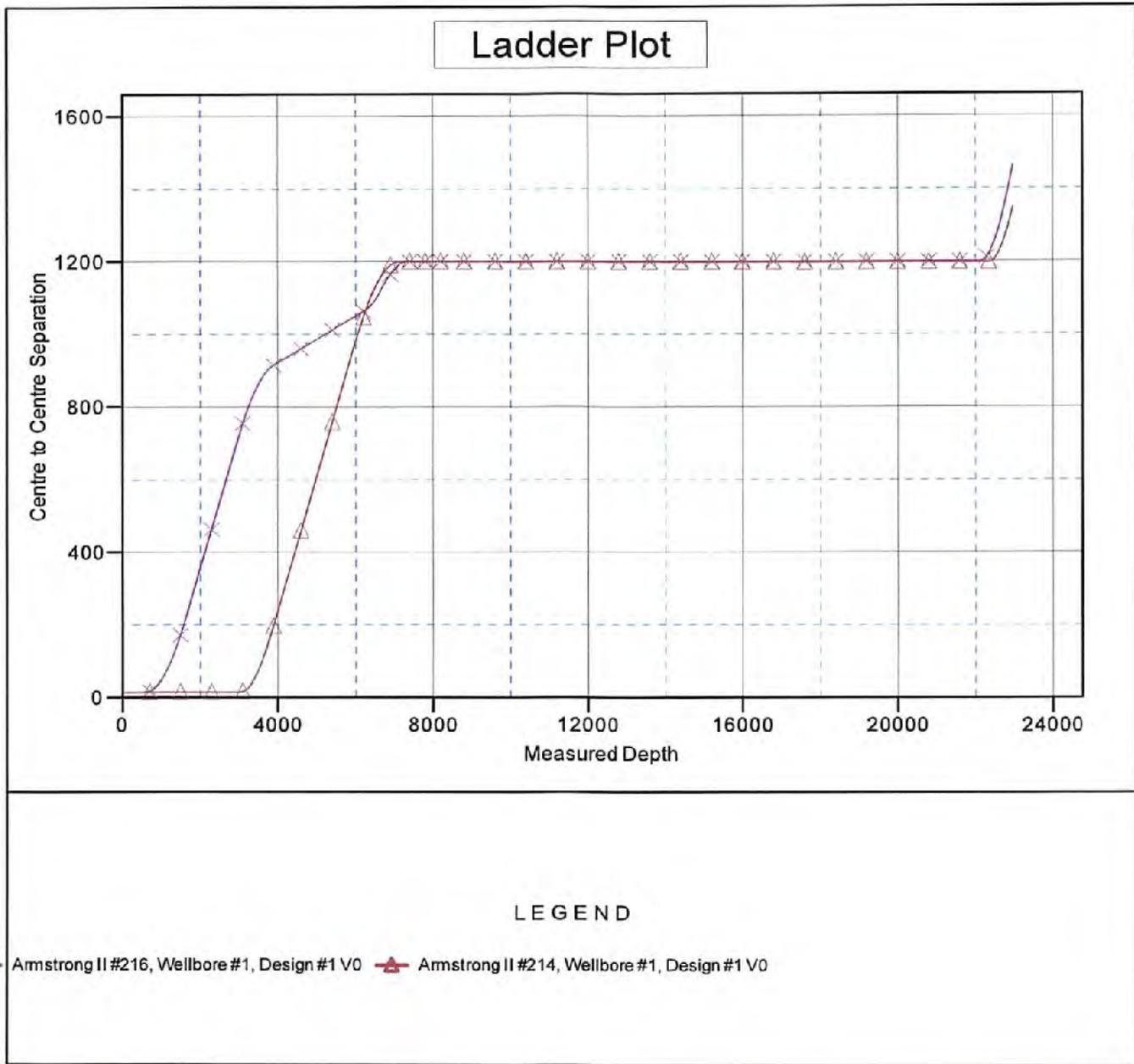
Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II#215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Armstrong Pad - Armstrong II #216 - Wellbore #1 - Design #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore +N-S (usft)	Centre +E-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning	
19,300.0	7,789.0	19,550.7	7,789.0	207.2	209.4	90.00	11,719.7	-1,727.7	1,200.1	785.5	2.895		
19,400.0	7,789.0	19,650.7	7,789.0	209.0	211.2	90.00	11,814.2	-1,760.4	1,200.1	782.0	2.871		
19,500.0	7,789.0	19,750.7	7,789.0	210.7	212.9	90.00	11,908.7	-1,793.1	1,200.1	778.5	2.847		
19,600.0	7,789.0	19,850.7	7,789.0	212.5	214.6	90.00	12,003.2	-1,825.8	1,200.1	775.0	2.823		
19,700.0	7,789.0	19,950.7	7,789.0	214.2	216.4	90.00	12,097.7	-1,858.5	1,200.1	771.5	2.800		
19,800.0	7,789.0	20,050.7	7,789.0	216.0	218.1	90.00	12,192.2	-1,891.2	1,200.1	768.0	2.778		
19,900.0	7,789.0	20,150.7	7,789.0	217.7	219.8	90.00	12,286.7	-1,923.9	1,200.1	764.5	2.755		
20,000.0	7,789.0	20,250.7	7,789.0	219.5	221.6	90.00	12,381.2	-1,956.6	1,200.1	761.0	2.733		
20,100.0	7,789.0	20,350.7	7,789.0	221.2	223.3	90.00	12,475.7	-1,989.3	1,200.1	757.5	2.712		
20,200.0	7,789.0	20,450.7	7,789.0	223.0	225.0	90.00	12,570.2	-2,022.0	1,200.1	754.0	2.690		
20,300.0	7,789.0	20,550.7	7,789.0	224.7	226.8	90.00	12,664.7	-2,054.7	1,200.1	750.5	2.669		
20,400.0	7,789.0	20,650.7	7,789.0	226.5	228.5	90.00	12,759.2	-2,087.4	1,200.1	747.0	2.649		
20,500.0	7,789.0	20,750.7	7,789.0	228.2	230.3	90.00	12,853.7	-2,120.1	1,200.1	743.5	2.629		
20,600.0	7,789.0	20,850.7	7,789.0	230.0	232.0	90.00	12,948.2	-2,152.8	1,200.1	740.0	2.609		
20,700.0	7,789.0	20,950.7	7,789.0	231.7	233.7	90.00	13,042.7	-2,185.5	1,200.1	736.5	2.589		
20,800.0	7,789.0	21,050.7	7,789.0	233.5	235.5	90.00	13,137.2	-2,218.2	1,200.1	733.0	2.569		
20,900.0	7,789.0	21,150.7	7,789.0	235.2	237.2	90.00	13,231.7	-2,250.9	1,200.1	729.5	2.550		
21,000.0	7,789.0	21,250.7	7,789.0	237.0	239.9	90.00	13,326.2	-2,283.6	1,200.1	726.0	2.531		
21,100.0	7,789.0	21,350.7	7,789.0	238.7	240.7	90.00	13,420.7	-2,316.3	1,200.1	722.5	2.513		
21,200.0	7,789.0	21,450.7	7,789.0	240.5	242.4	90.00	13,515.2	-2,349.0	1,200.1	719.0	2.495		
21,300.0	7,789.0	21,550.7	7,789.0	242.2	244.2	90.00	13,609.7	-2,381.7	1,200.1	715.5	2.476		
21,400.0	7,789.0	21,650.7	7,789.0	244.0	245.9	90.00	13,704.2	-2,414.4	1,200.0	712.0	2.459		
21,500.0	7,789.0	21,750.7	7,789.0	245.7	247.6	90.00	13,798.7	-2,447.1	1,200.0	708.5	2.441		
21,600.0	7,789.0	21,850.7	7,789.0	247.5	249.4	90.00	13,893.2	-2,479.8	1,200.0	704.9	2.424		
21,700.0	7,789.0	21,950.7	7,789.0	249.2	251.1	90.00	13,987.7	-2,512.5	1,200.0	701.4	2.407		
21,800.0	7,789.0	22,050.7	7,789.0	251.0	252.9	90.00	14,082.2	-2,545.2	1,200.0	697.9	2.390		
21,900.0	7,789.0	22,150.7	7,789.0	252.7	254.6	90.00	14,176.7	-2,577.9	1,200.0	694.4	2.373		
22,000.0	7,789.0	22,250.7	7,789.0	254.5	256.3	90.00	14,271.2	-2,610.6	1,200.0	690.9	2.357		
22,100.0	7,789.0	22,350.7	7,789.0	256.2	258.1	90.00	14,365.7	-2,643.3	1,200.0	687.4	2.341		
22,132.0	7,789.0	22,382.8	7,789.0	256.8	258.6	90.00	14,396.0	-2,653.7	1,200.0	686.3	2.336		
22,200.0	7,789.0	22,382.8	7,789.0	258.0	258.6	90.00	14,396.1	-2,653.8	1,201.9	685.6	2.328 SF		
22,300.0	7,789.0	22,382.8	7,789.0	259.7	258.6	90.00	14,396.1	-2,653.8	1,211.7	694.5	2.343		
22,400.0	7,789.0	22,382.8	7,789.0	261.6	258.6	90.00	14,396.1	-2,653.8	1,229.5	714.8	2.389		
22,500.0	7,789.0	22,382.8	7,789.0	263.2	258.6	90.00	14,396.1	-2,653.8	1,255.1	745.9	2.495		
22,600.0	7,789.0	22,382.8	7,789.0	265.0	258.6	90.00	14,396.1	-2,653.8	1,289.0	786.7	2.569		
22,700.0	7,789.0	22,382.8	7,789.0	266.7	258.6	90.00	14,396.1	-2,653.8	1,327.6	835.3	2.702		
22,800.0	7,789.0	22,382.8	7,789.0	268.5	258.6	90.00	14,396.1	-2,653.8	1,373.3	893.6	2.853		
22,900.0	7,789.0	22,382.8	7,789.0	270.2	258.6	90.00	14,396.1	-2,653.8	1,424.7	957.4	3.049		
22,971.5	7,789.0	22,382.8	7,789.0	271.3	258.6	90.00	14,396.1	-2,653.8	1,464.4	1,005.3	3.197		

Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II #215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 1318.0usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 79° 30' 0.000 W

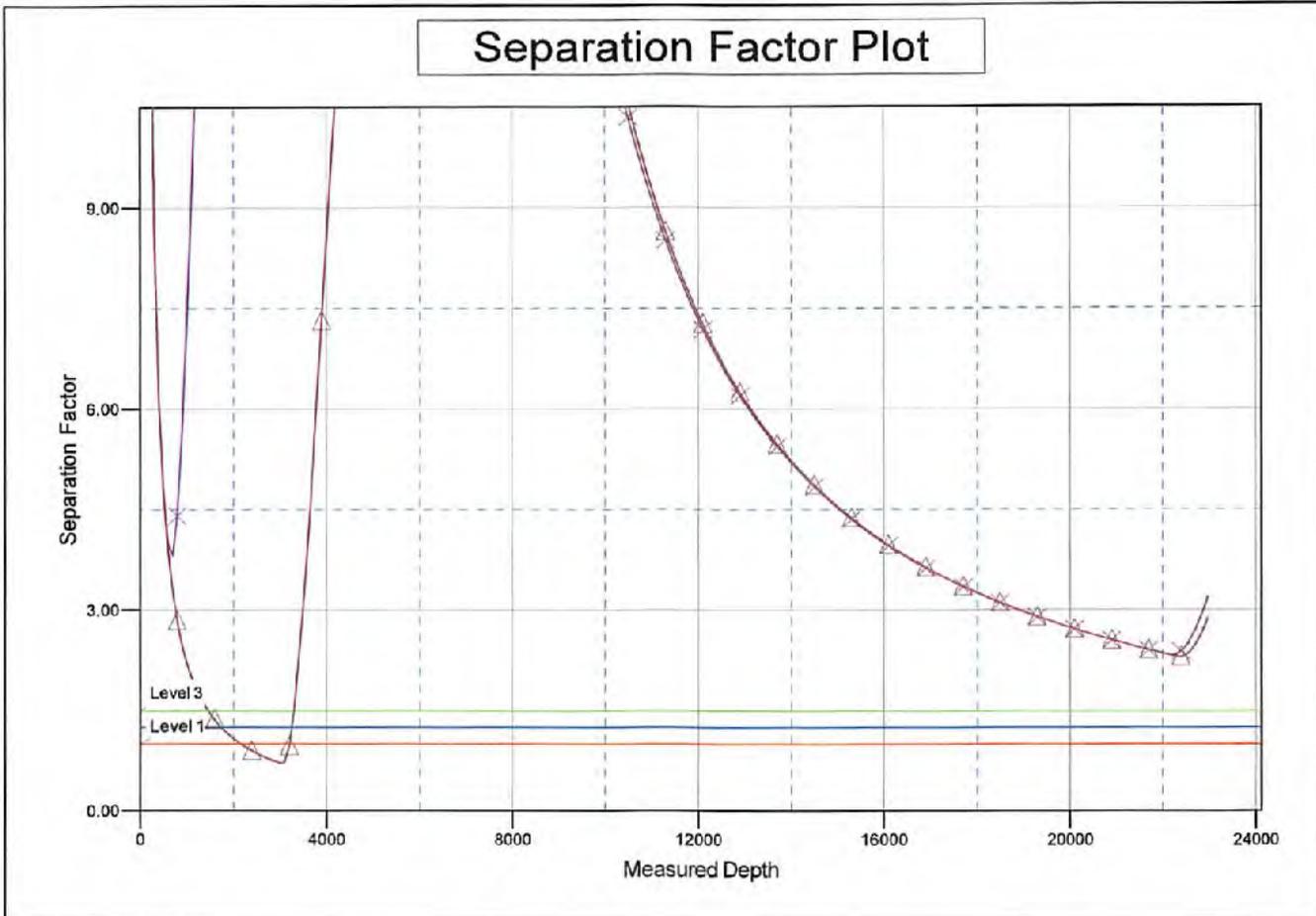
Coordinates are relative to: Armstrong II #215
 Coordinate System is US State Plane 1983, West Virginia Northern Zone
 Grid Convergence at Surface is: -0.37°



Company:	Arsenal Resources	Local Co-ordinate Reference:	Well Armstrong II #215
Project:	Taylor County, West Virginia	TVD Reference:	WELL @ 1318.0usft
Reference Site:	Armstrong Pad	MD Reference:	WELL @ 1318.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Armstrong II #215	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 1318.0usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 79° 30' 0.000 W

Coordinates are relative to: Armstrong II #215
 Coordinate System is US State Plane 1983, West Virginia Northern Zone
 Grid Convergence at Surface is: -0.37°



LEGEND

x Armstrong II #216, Wellbore #1, Design #1 V0
 ▲ Armstrong II #214, Wellbore #1, Design #1 V0



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 Taylor County, WV prior to hydraulic fracturing at Armstrong II and Well Number 215.

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 7,750' TVD) and existing conventional natural gas wells in the partially-depleted, relatively high permeability Benson formations (approximately 5,000' 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.



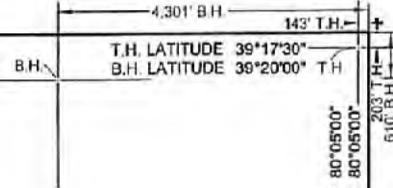
2. Reporting

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.

Area of Review Report - **Armstrong II** Pad, **215 Mod** Lateral, **Taylor** County, WV

Well Name	API Number	Operator Name / Address	Well Type	Latitude	Longitude	Total Depth	Perforated Formation(s)	Producing Zones not Perforated
St Comm of Public Inst #4	091-00847	Diversified Production LLC	Existing	39.328349	-80.097139	4723	Benson, Riley, Bayard, Fourth	NA
St Comm of Public Inst #2	091-00816	Diversified Production LLC	Existing	39.324143	-80.095458	4745	Riley	NA
State Board of Control 34	091-00698	Greylock Opco LLC	Existing	39.320083	-80.094711	4970	Benson, Riley	NA
Mona H Cooper et al #3	091-00695	Diversified Production LLC	Existing	39.313558	-80.088736	4732	Benson, Riley, Keener	NA
Robert & Julie Armstrong 1HM	091-01169	Arsenal Resources LLC	Existing	39.291898	-80.083136	7657	Marcellus	NA
Robert & J Armstrong 1	091-01116	Arsenal Resources LLC	Existing	39.291926	-80.08322	8042	Marcellus	NA

**ARMSTRONG II LEASE
WELL NO. 215
ARSENAL RESOURCES**

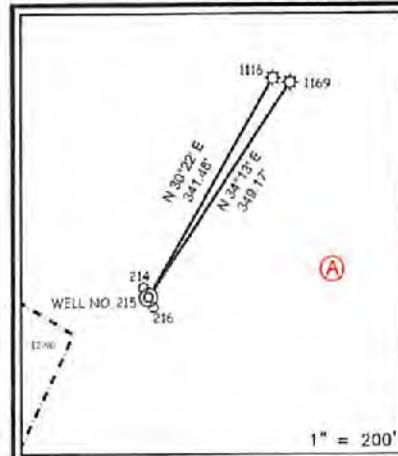


ARMSTRONG II-215			
TAG	SURFACE OWNER	PARCEL	ACRES
A	ROBERT & JULIE ARMSTRONG	5-12-1	65.375
B	ROBERT L. JR. & PATRICIA LYNN CARPENTER	5-12-3	117.94
C	ARK LAND LLC	5-9-58	91.45
D	COALQUEST DEVELOPMENT LLC (C/O ARK LAND CO.)	5-9-57.1	129
E	COALQUEST DEVELOPMENT LLC	5-9-57	118.00
F	ARK LAND LLC	5-8-18	73.50
G	ARK LAND LLC	5-9-1	74.00
H	STATE OF W.V. INDUSTRIAL SCHOOL FOR BOYS	5-5-15	913.69
I	MARK A. CURREY	5-4-15	108.46
J	STATE OF W.V. (NORTHWESTERN TURNPIKE)	N/A	N/A
K	MARK A. CURREY ET AL	3-16-38	18.50

PARCEL	ADJOINING SURFACE OWNER	ACRES
5-12-33.1	HARRY V & PATRICIA J JOHNSON	89.30
5-12-35.2	MARIE ELEANOR QUEEN	2
5-12-34.1	DONNA R. GOODNOW	4.825
5-12-90	ROBERT L. & JULIE A. ARMSTRONG	5
5-13-71.2	JOSEPH & LACEY N. FREY	8.35
5-13-71.3	ARK LAND LLC	27.52
5-8-22	HAROLD THOMAS & MARY LOU ADKINS	34.77
5-8-21	DAYTON W & RUTH A GREEN C/O ARK LAND LLC	66.95
5-8-14	ARK LAND LLC	17
5-8-15	ARK LAND LLC	106.82
5-8-19	ARK LAND LLC	42.23
5-8-20	ARK LAND LLC	23
5-5-13	LARRY MCDANIEL (HEIRS) IN C/O MICHAEL E. MCDANIEL	4.98
5-5-14	TIMOTHY R. & BOSS P. GERARD	15.63
3-16-36	JASON KNOTTES	4.80
3-16-37	ARK LAND LLC	1.00
3-16-33	MARK A. CURREY, ET AL	35.00
3-16-39	NORA REYNOLDS, ET AL	1
3-16-40	JOHN WHITESCARVER	176.75
5-5-15.1	TAYLOR COUNTY FAIR ASSOCIATION	54.5
5-5-15.4	STATE OF WEST VIRGINIA (WV DEPT OF AGRICULTURE)	2.84
5-5-15.2	TAYLOR COUNTY FAIR ASSOCIATION	3.2
5-4-15	MARK A. CURREY	108.46
5-9-2	ARK LAND LLC	33.1
5-9-4	COALQUEST DEVELOPMENT LLC	115.00
5-9-50	COALQUEST DEVELOPMENT LLC (C/O ARK LAND CO.)	55.75
5-9-63.3	COALQUEST DEVELOPMENT LLC (C/O ARK LAND CO.)	85.45
5-9-59	ARK LAND COMPANY	28.50
5-9-61	ARK LAND COMPANY	4
5-9-60	ARK LAND LLC	50.02

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C. (FT) N. 286,680.62 E. 1,803,259.66
 NAD'83 GEO. LAT. (N) 39.291108 LONG. (W) 80.063837
 NAD'83 UTM (M) N. 4,349,482.13 E. 579,006.70
LANDING POINT
 NAD'83 S.P.C. (FT) N. 289,607.7 E. 1,803,996.4
 NAD'83 GEO. LAT. (N) 39.293668 LONG. (W) 80.001256
 NAD'83 UTM (M) N. 4,349,768.3 E. 579,226.5
BOTTOM HOLE
 NAD'83 S.P.C. (FT) N. 303,477.6 E. 1,799,197.4
 NAD'83 GEO. LAT. (N) 39.331661 LONG. (W) 80.096538
 NAD'83 UTM (M) N. 4,353,969.6 E. 577,604.0

REFERENCES



NOTES ON SURVEY

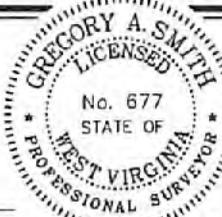
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS > 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPD MARK SCALE ARE 1"=2000'
- THERE IS ONE (1) HOUSE TRAILER AND ONE (1) HUNTING CABIN WITHIN 625 FEET. NEITHER STRUCTURE APPEAR TO BE OCCUPIED AND THE HOUSE TRAILER APPEARS TO BE DILAPIDATED.



12 Venture Drive | P.O. Box 104 | Shepherds, WV 26151 | TEL: 802 8630
 1112 Babcock Boulevard | East LT | Martinsburg, WV 26101 | TEL: 246 3114
 274 E. 10th Street | Boone | Boone, WV 26001 | TEL: 262 51 2740
 www.sls.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 SEPTEMBER 28, 20 21
 REVISED JANUARY 20, 20 22
 OPERATORS WELL NO. 215
 API WELL NO. 47 - 091 - 01364
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 0111-A-arc01-SURV-Pad2 (5-9-01) 220118-CPR (map)
 HORIZONTAL & VERTICAL SCALE 1" = 2000'
 CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

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

WELL TYPE: OIL GAS LIQUID WASTE IF "GAS" PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: GROUND = 1291.10' PROPOSED = 1293.72' WATERSHED LONG RUN
 DISTRICT COURTHOUSE COUNTY TAYLOR QUADRANGLE GRAFTON
 SURFACE OWNER ROBERT L. & JULIE A. ARMSTRONG ACREAGE 65.375±
 ROYALTY OWNER ROBERT L. & JULIE A. ARMSTRONG ET AL ACREAGE 65.375±
 PROPOSED WORK: LEASE NO. SEE WW-8A1
 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 TMD 22,971.5 / TVD 7,789'

WELL OPERATOR ARSENAL RESOURCES DESIGNATED AGENT GARY SHORT
 ADDRESS 6031 WALLACE RD. EXT. SUITE 300 WEXFORD, PA 15090 ADDRESS 633 WEST MAIN STREET BRIDGEPORT, WV 26330

02/18/2022



2/1/2022

Diversified Resources Inc
4150 Belden Village Ave. NW Ste 410
Canton, OH 44718-2253

RE: Armstrong II Well Pad

Dear Sir/Madam,

Arsenal Resources has developed a Marcellus pad, Armstrong II 214, 215 and 216 wells, located in Taylor 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 7,800 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 Armstrong, 214, 215 and 216 wells during First Quarter of 2022. 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 724-940-1137 with any questions or comments. You may also contact the WV Office of Oil and Gas at 304-926-0449.

Sincerely,

A handwritten signature in black ink that reads 'RSchweitzer'.

Ross Schweitzer
Sr. Director of Drilling, Construction and Permitting

AOR - Attachment "B"

RECEIVED
Office of Oil and Gas

FEB 3 2022

WV Department of
Environmental Protection

02/18/2022



Stansberry, Wade A <wade.a.stansberry@wv.gov>

Expedited Modification H6A Horizontal Well Work Permit API: 47-091-01364)

1 message

Stansberry, Wade A <wade.a.stansberry@wv.gov>

Wed, Feb 16, 2022 at 2:25 PM

To: Ross Schweitzer <rschweitzer@arsenalresources.com>, C Kinsey <ckinsey@wvassessor.com>, "Harris, Bryan O" <bryan.o.harris@wv.gov>

I have attached a copy of the newly issued well [permit](#) number. This will serve as your copy.

47-091-01364- CB FERRELL 110

If you have any questions, then [please](#) contact us here at the Office of Oil and Gas.

Thank you,

Wade A. Stansberry
Environmental Resource Specialist 3
West Virginia Department of Environmental Protection
Office of Oil & Gas
601 57th St. SE
Charleston, WV 25304
(304) 926-0499 ext. 41115
(304) 926-0452 fax
Wade.A.Stansberry@wv.gov

 **47-091-01364 mod.pdf**
2180K

02/18/2022