



west virginia department of environmental protection

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

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

Friday, March 24, 2017
WELL WORK PERMIT
Vertical / Fracture

HG ENERGY, LLC (A)
5260 DUPONT ROAD

PARKERSBURG, WV 26101

Re: Permit approval for J. A. FOWLER NO. 214
47-043-03471-00-00

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

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

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



James A. Martin
Chief

Operator's Well Number: J. A. FOWLER NO. 214
Farm Name: MCCLURE, ANDY J. & REBECCA
U.S. WELL NUMBER: 47-043-03471-00-00
Vertical / Fracture
Date Issued: 3/24/2017

Promoting a healthy environment.

03/24/2017

PERMIT CONDITIONS

West Virginia Code §22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code §22-6-20, which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
2. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.
3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.
4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
5. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.
6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours.
7. Well work activities shall not constitute a hazard to the safety of persons.
8. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced, drilling ceased, completion of any other permitted well work and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

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

API 47-043-03471 County LINCOLN District DUVAL
Quad GRIFFITHSVILLE 7.5' Pad Name J.A. FOWLER Field/Pool Name GRIFFITHSVILLE
Farm name MCCLURE, ANDY J. & REBECCA Well Number 214
Operator (as registered with the OOG) H.G. ENERGY LLC
Address 5260 DuPONT ROAD City PARKERSBURG State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,231,370 M Easting 416,557 M
Landing Point of Curve Northing _____ Easting _____
Bottom Hole Northing 4,231,250 M Easting 416,625 M

Elevation (ft) 895' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
N/A

Date permit issued 6/17/2013 Date drilling commenced 11/4/14 Date drilling ceased 11/7/14
Date completion activities began 11/17/14 Date completion activities ceased 12/5/14
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 1120' Void(s) encountered (Y/N) depths Office of Oil and Gas
Coal depth(s) ft 468'- 473' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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MAR 06 2017
Reviewed by:
WV Department of
Environmental Protection

WR-35
Rev. 8/23/13

API 47-043 - 03471 Farm name MCCLURE, ANDY J. & REBECCA Well number 214

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	12 1/4"	11 5/8"	30'	Used	LS		Sand In
Surface	8 3/4"	7"	590'	New	LS	84'	Y
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 1/4"	4 1/2"	2583.1	New	J-55		Y
Tubing							
Packer type and depth set							

Comment Details Circulated est. 60 sks cement to surface on 7" cement job. Circulated est 7 sks cement to surface on 4 1/2" cement job.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Reg Neat	135	15.6	1.18	159	Surface	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	50:50 Pozmix	110/125	13.2/14.2	1.64/1.27	180/159	150'	8
Tubing							

Drillers TD (ft) ²⁸³¹ _____ Loggers TD (ft) ²⁸³³ _____

Deepest formation penetrated Berea Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) ⁶⁰⁰ _____

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

6 Centralizers every 84 from bottom on 4 1/2", Centralizer placed mid string on 7"

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

MAR 06 2017

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____ WV Department of Environmental Protection

API 47- 043 - 03471 Farm name MCCLURE, ANDY J. & REBECCA Well number 214

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>
<u>Berea</u>	<u>2430'- 2444'</u> TVD _____ MD _____
_____	_____
_____	_____
_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

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

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
Sand/Shale	0	468	0	468	
Pittsburgh Coal	468	473	468	473	
Sand/Shale	473	1648	473	1680	
Big Lime	1648	1854	1680	1896	
Big Injun	1854	2095	1896	2149	
Shale	2095	2345	2149	2404	
Coffee Shale	2345	2368	2404	2426	
Berea	2368	2387	2426	2448	
Shale	2387	2570	2448	2631	Drilled directional S 41° E a distance of 425'
TD	2570'		2631		

Please insert additional pages as applicable.

Drilling Contractor Decker Drilling
Address 11565 State Route 676 City Vincent State OH Zip 45784

Logging Company Weatherford International
Address 777 North River Avenue City Weston State WV Zip 26452

Cementing Company Universal Services
Address 5252 Rt 1428 City Allen State KY Zip 41601

Stimulating Company Producers Service Corp.
Address 109 South Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Roger Heldman Telephone 304-420-1107
Signature _____ Title Operations Manager Date 12/8/14

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MAR 06 2017

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WW-2A
(Rev. 6-14)

1.) Date: January 30, 2017
2.) Operator's Well Number J. A. Fowler 214
State County Permit
3.) API Well No.: 47- 043 - 03471

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

4) Surface Owner(s) to be served: 5) (a) Coal Operator
(a) Name Andy & Beckv McClure / Name NA
Address 109 Coon Whistle Hollow Address _____
Yawkev. WV 25573
(b) Name _____ (b) Coal Owner(s) with Declaration
Address _____ Name NA
Address _____
(c) Name _____ Name _____
Address _____ Address _____
6) Inspector Jeffery L. Smith (c) Coal Lessee with Declaration
Address 5369 Big Tyler Road Name NA
Cross Lanes, WV 25313 Address _____
Telephone 681-313-6743

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas

OR

Included is the information required by Chapter 22, Article 6, Section 8(d) of the Code of West Virginia (see page 2)

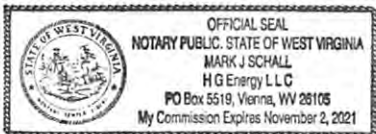
I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through ___ on the above named parties by:

- _____ Personal Service (Affidavit attached)
- Certified Mail (Postmarked postal receipt attached)
- _____ Publication (Notice of Publication attached)

I have read and understand Chapter 22-6 and 35 CSR 4, and I agree to the terms and conditions of any permit issued under this application.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



Well Operator: HG Energy, LLC
By: Diane White *Diane White* **RECEIVED**
Its: Agent **Office of Oil and Gas**
Address: 5260 Dupont Road
Parkersburg, WV 26101 **MAR 06 2017**
Telephone: 304-420-1119
Email: dwhite@haeneravllc.com

Subscribed and sworn before me this 30th day of January, 2017 **Department of Environmental Protection**
[Signature] Notary Public

My Commission Expires Nov. 2, 2021

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov **03/24/2017**

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
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:

Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
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* See Attached Sheet *

**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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Office of Oil and Gas

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.

WV Department of
Environmental Protection

Well Operator:
By: Its:

Diane White

 HG Energy, LLC

 Diane White, Agent

A303471 F

Form WW-2A1
(Rev. 1/11)

Operator's Well No. J. A. Fowler 214

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
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Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Freehold Company	Penzoil Company	1/8	35/225

Merger and Conveyance dated July 3, 1963, from South Penn Oil Company to Penzoil Company, Kanawha County, Book 153, Page 35,

Assignment, Conveyance and Bill of Sale dated December 28, 1998, from Pennzoil Company to Pennz Energy Exploration and Production, Wetzel County, Book 12, Page 177.

Certificate of Merger filed with the WV Secretary of State, December 31, 1999, whereby Pennz Energy Exploration and Production, successor in interest to; to Penzoil Company, merged with Devon Energy Production Company, LP, Wetzel County, Book 12, Page 278.

Deed, Assignment and Bill of Sale dated June 1, 2000, from Devon Energy Production Company, LP to East Resources, Inc., recorded in Wetzel County, Book 370, Page 580.

Assignment, Conveyance and Bill of Sale, dated January 1, 2011, from East Resources, Inc., to HG Energy, LLC, Wetzel County, Book 118A, Page 253.

Upon information and belief, Operator's lease and/or other real property rights permit it to conduct drilling operations for the subject well in the location shown on the plat, including the use of access roads, pipelines and utilities.

Upon information and belief, Operator's lease and/or other real property rights permit it to conduct drilling operations for the subject well in the location shown on the plat, including the use of access roads, pipelines and utilities.

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

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MAR 06 2017
WV Department of
Environmental Protection

Well Operator: HG Energy, LLC

By: Diane White Diane C. White
Its: Accountant

03/24/2017

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WW-9
(5/16)

API Number 47 - 043 - 03471
Operator's Well No. J. A. Fowler 214

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name HG Energy, LLC OP Code 494497948

Watershed (HUC 10) Porter Fork Quadrangle Griffithsville 7.5'

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

Will a pit be used? Yes No

If so, please describe anticipated pit waste: NA

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application (if selected provide a completed form WW-9-GPP)
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Any fluids encountered will be hauled for disposal to an authorized disposal site.)

Will closed loop system be used? If so, describe: NA

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. NA

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

Additives to be used in drilling medium? NA

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

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

-Landfill or offsite name/permit number? _____

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

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on April 1, 2016, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

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

Company Official Signature Diane White

Company Official (Typed Name) Diane White

Company Official Title Agent

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MAR 06 2017

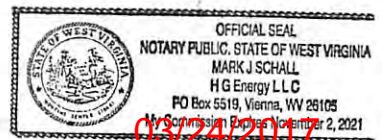
WV Department of
Environmental Protection

Subscribed and sworn before me this 30th day of January, 2017

[Handwritten Signature]

Notary Public

My commission expires Nov. 2, 2021



4303471F

Form WW-9

Operator's Well No. J. A. Fowler 214

Proposed Revegetation Treatment: Acres Disturbed 0.3 acre Prevegetation pH _____

Lime 2 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 500 lbs/acre

Mulch Straw 2 Tons/acre

Seed Mixtures

(Handwritten initials JS in a circle)

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Tall Fescue	40	Tall Fescue	40
Ladino Clover	5	Ladino Clover	5

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Jeffrey Smith

Comments: All sediment control to be removed prior to release.

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Office of Oil and Gas

MAR 06 2017

Title: Oil & Gas Inspector

Date: 01/30/2017

Field Reviewed? Yes No

WV Department of
Environmental Protection

03/24/2017

NO LAND APPLICATION

WW-9- GPP
Rev. 5/16

Page _____ of _____
API Number 47 - 043 - 03471
Operator's Well No. J. A. Fowler 214

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

Operator Name: HG Energy, LLC

Watershed (HUC 10): Porter Fork Quad: Griffithsville 7.5'

Farm Name: J. A. Fowler 214

- 1. List the procedures used for the treatment and discharge of fluids. Include a list of all operations that could contaminate the groundwater.

NA

- 2. Describe procedures and equipment used to protect groundwater quality from the list of potential contaminant sources above.

NA

- 3. List the closest water body, distance to closest water body, and distance from closest Well Head Protection Area to the discharge area.

NA

- 4. Summarize all activities at your facility that are already regulated for groundwater protection.

NA

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- 5. Discuss any existing groundwater quality data for your facility or an adjacent property.

NO LAND APPLICATION

4303471 F

WW-9- GPP
Rev. 5/16

Page _____ of _____
API Number 47 - 043 - 03471
Operator's Well No. J. A. Fowler 214

NA

6. Provide a statement that no waste material will be used for deicing or fill material on the property.

NA

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

NA

8. Provide provisions and frequency for inspections of all GPP elements and equipment.

NA

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Signature: Diane White

Date: 01/30/2017

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Environmental Protection

03/24/2017

Reclamation Plan For:

J.A. Fowler No.214 47-043-03471



NOTE
REFER TO THE WVDEP
EROSION AND SEDIMENT CONTROL
FIELD MANUAL VER. MAY 2012 FOR
BMPs CONTROLLING EROSION AND
SEDIMENT FROM SOIL-DISTURBING
OPERATIONS.

No Pit and Only
Minimal Earthwork
Will Be Required for
Proposed Well Work

NOTE:
This permit is to fracture an
existing well. No new construction
will be needed. All structures shown are
existing and will be maintained.



*Andy J. & Rebecca McClure
- Surface Owner*

135' of
8% Grade

315' of
0-5% Grade

(See Attached Detail
for Access Road to
State Route 3)

230' of
8% Grade

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Notes:

- Requested permit is for stimulation of existing well.
- Access road from WV SR 3 to location is existing. Structures will be maintained.
- All disturbed areas will be re-vegetated as outlined on Form WW-9.
- Maintain sediment barriers and drainage structures.

03/24/2017

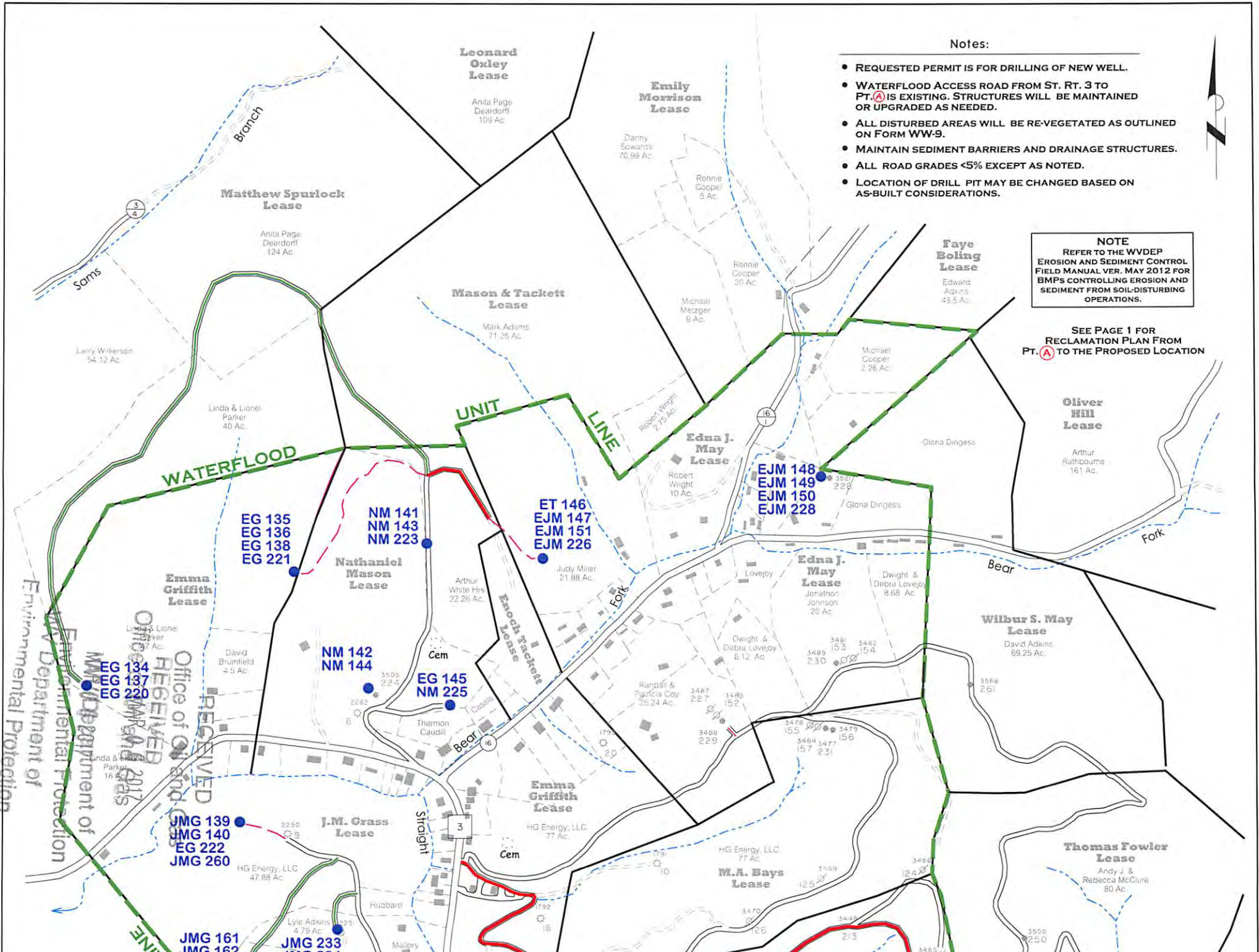
Note: Drawing not to Scale

Notes:

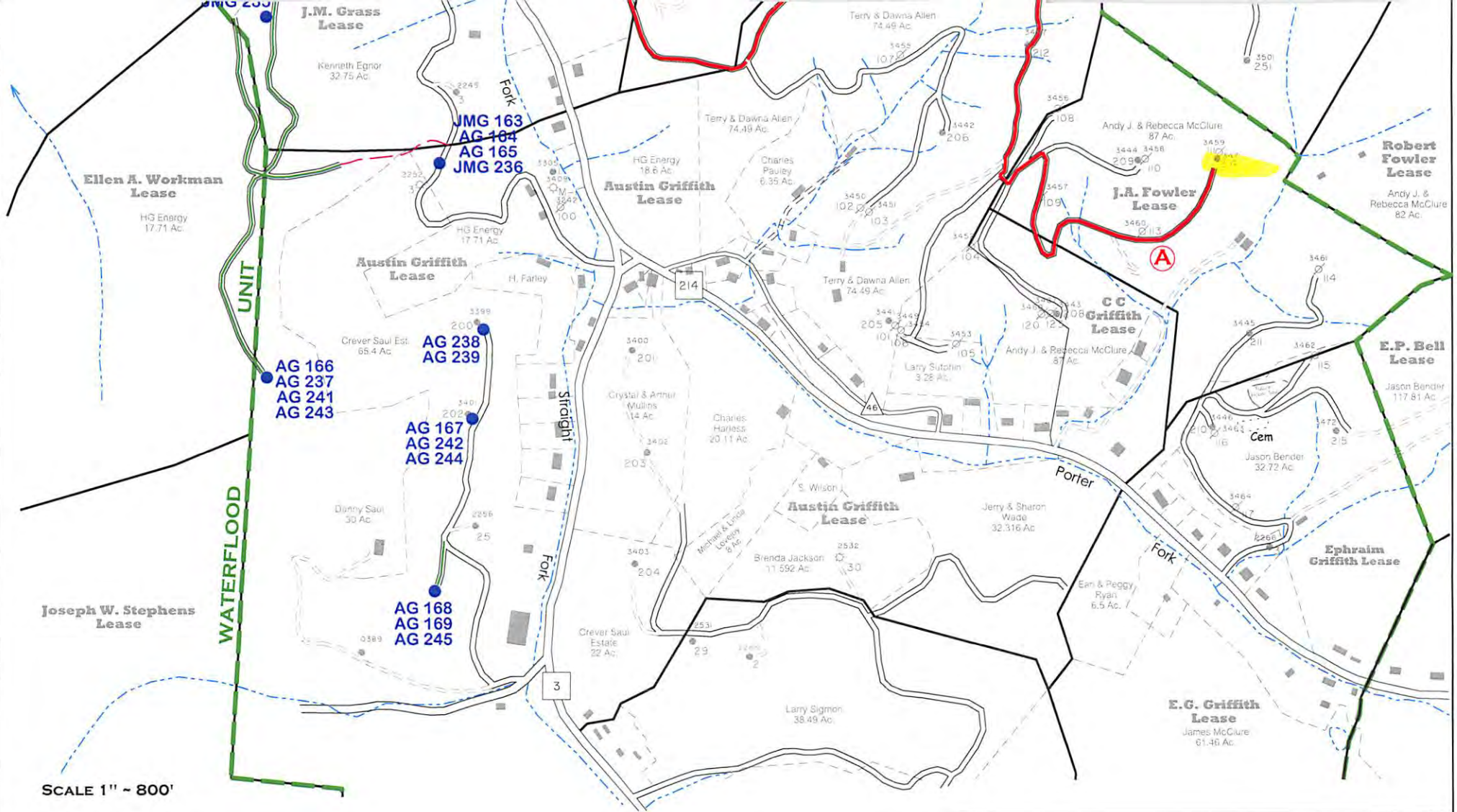
- REQUESTED PERMIT IS FOR DRILLING OF NEW WELL.
- WATERFLOOD ACCESS ROAD FROM ST. RT. 3 TO PT. A IS EXISTING. STRUCTURES WILL BE MAINTAINED OR UPGRADED AS NEEDED.
- ALL DISTURBED AREAS WILL BE RE-VEGETATED AS OUTLINED ON FORM WW-9.
- MAINTAIN SEDIMENT BARRIERS AND DRAINAGE STRUCTURES.
- ALL ROAD GRADES <5% EXCEPT AS NOTED.
- LOCATION OF DRILL PIT MAY BE CHANGED BASED ON AS-BUILT CONSIDERATIONS.

NOTE
 REFER TO THE WVDEP
 EROSION AND SEDIMENT CONTROL
 FIELD MANUAL VER. MAY 2012 FOR
 BMPs CONTROLLING EROSION AND
 SEDIMENT FROM SOIL-DISTURBING
 OPERATIONS.

SEE PAGE 1 FOR
 RECLAMATION PLAN FROM
 PT. A TO THE PROPOSED LOCATION



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 Office of Oil and Gas
 MAR 24 2017
 WV Department of Environmental Protection



SCALE 1" = 800'



GRIFFITHSVILLE WATERFLOOD



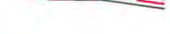





Lincoln County, W.Va.

RECLAMATION PLAN SHOWING ROAD SYSTEMS TO BE USED FOR 2017 DRILLING PROGRAM (NORTH)

NOTES

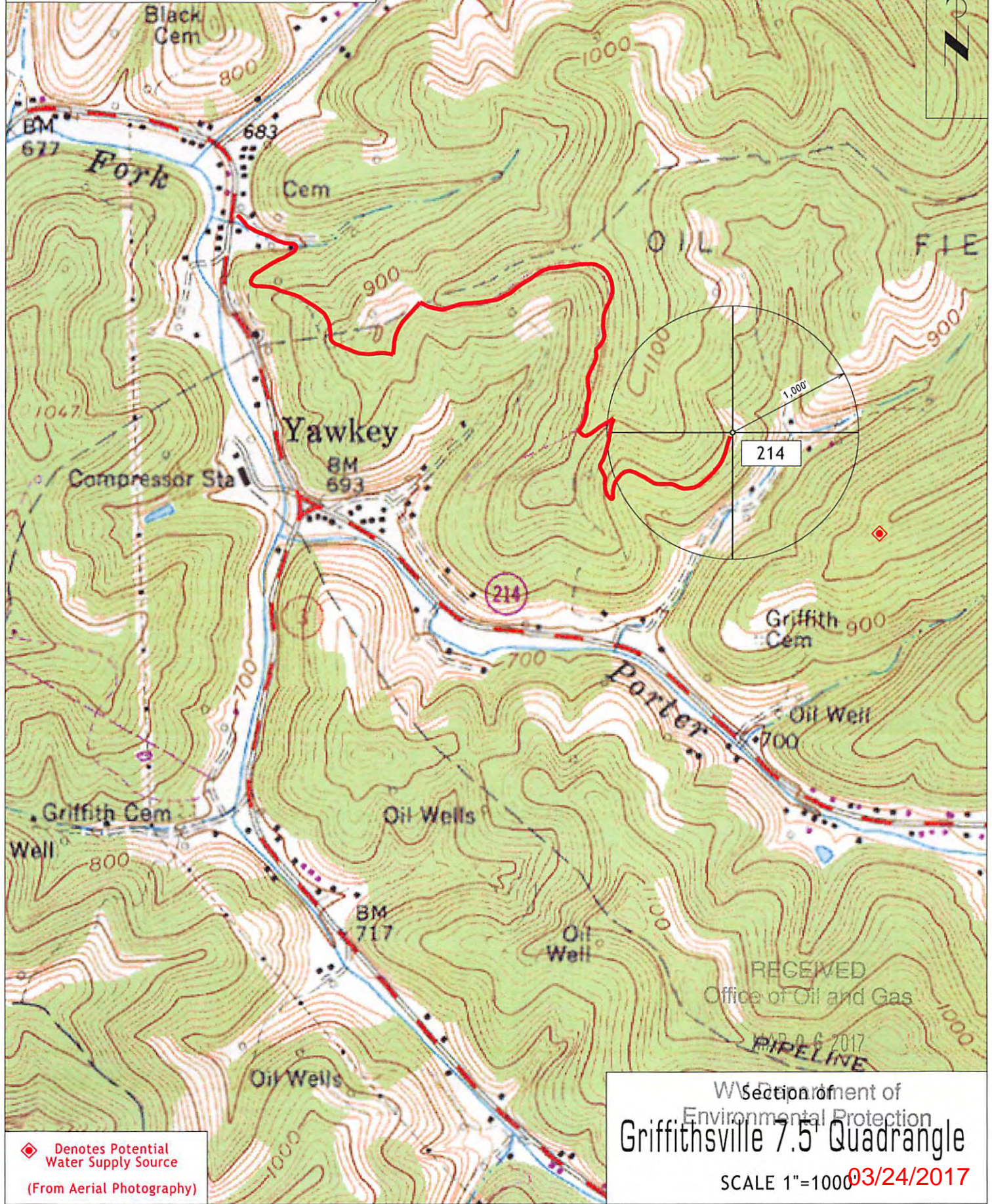
1. REFER TO THE WVDEP EROSION AND SEDIMENTATION CONTROL MANUAL (VER. MAY 20, 2013) FOR BMP'S CONTROLLING EROSION AND SEDIMENTATION FROM ALL SOIL-DISTURBING OPERATIONS.
2. SEE PAGE ONE OF RECLAMATION PLAN FOR DETAILS OF NEW ROAD CONSTRUCTION AND ROAD UPGRADES FROM POINT **A** TO DRILL SITE LOCATION.
3. EXISTING WATERFLOOD ACCESS ROADS WILL BE MAINTAINED IN PRESENT CONDITION. THESE ROADS WERE CONSTRUCTED UNDER CONDITIONS SET FORTH IN VARIOUS DRILLING PERMITS ISSUED BY WVDEP-OOG PRIOR TO 2015 (AS SHOWN). SEE PERMITS ON FILE FOR MORE DETAIL.

LEGEND

-  EXISTING WATERFLOOD ROADS TO BE USED.
-  OTHER EXISTING MAIN WATERFLOOD ROADS (POSSIBLE ACCESS).
-  EXISTING LEASE OR FARM ROADS TO BE UPGRADED.
-  NEW ROADS TO BE CONSTRUCTED.
-  AG 216
- 
-  LOCATION FOR PROPOSED WELLS
-  POTENTIAL WATER SUPPLY SOURCE TO BE SAMPLED (LOC. APPROX.)

4303471F

SUBJECT WELL
J.A. Fowler No.214
47-043-03471



 Denotes Potential Water Supply Source
 (From Aerial Photography)

W Section of
 Environmental Protection
Griffithsville 7.5' Quadrangle
 SCALE 1"=1000' 03/24/2017

Longitude = 81° 57' 12.5"

10,565'

430 3471 F

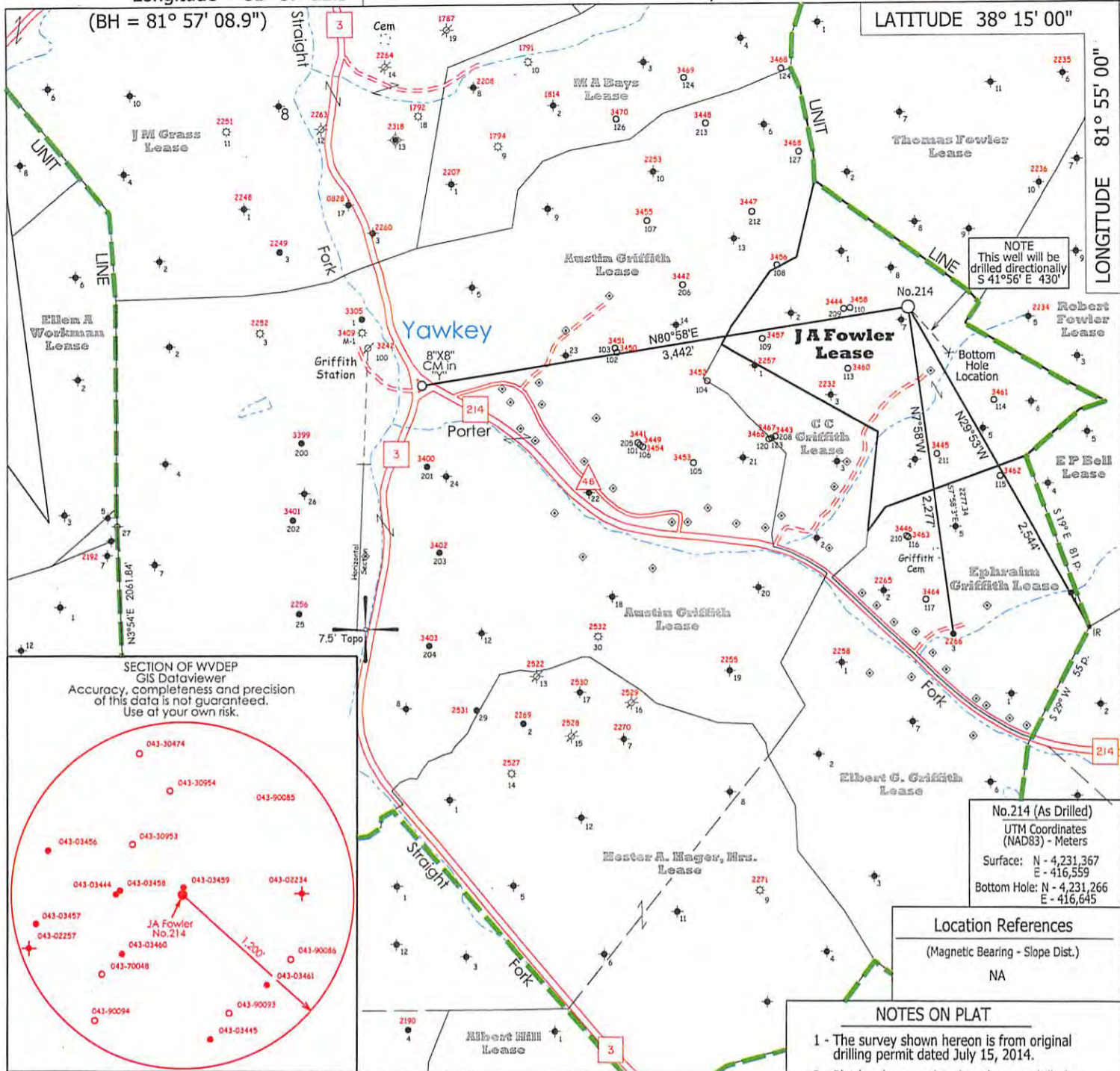
(BH = 81° 57' 08.9")

LATITUDE 38° 15' 00"

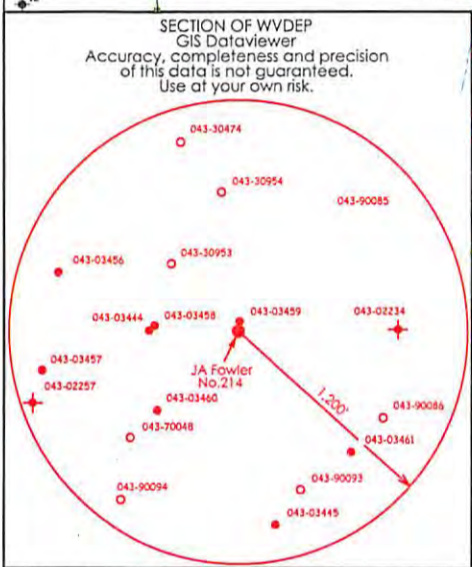
LONGITUDE 81° 55' 00"

8,625'

(Bottom Hole = 38° 13' 31.5") Latitude = 38° 13' 34.8"



NOTE
This well will be drilled directionally
S 41°56' E 430'



No.214 (As Drilled)
UTM Coordinates (NAD83) - Meters
Surface: N - 4,231,367
E - 416,559
Bottom Hole: N - 4,231,266
E - 416,645

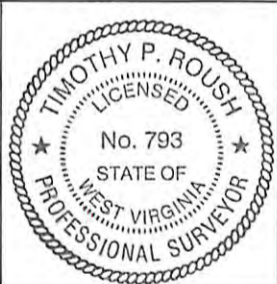
Location References
(Magnetic Bearing - Slope Dist.)
NA

- NOTES ON PLAT
- 1 - The survey shown hereon is from original drilling permit dated July 15, 2014.
 - 2 - Plat has been updated to show as-drilled Latitude/Longitude information and current surface owner information.
 - 3 - Latitude and Longitude established by DGPS Survey (Ref. NAD 1927).

◆ - DENOTES A POSSIBLE WATER SUPPLY SOURCE LOCATED FROM CIRCA 2003 AERIAL PHOTOGRAPHY - NOT BY SURVEY. OTHER SOURCES MAY BE PRESENT.
+ - DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

FILE NO. _____
MAP NO. _____ N S E W _____
SCALE _____ 1" = 1000'
MINIMUM DEGREE OF ACCURACY _____ Sub-Meter
PROVEN SOURCE OF ELEVATION _____ DGPS Survey
(Sub-Meter Mapping Grade)

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 DEPARTMENT OF MINES.
(SIGNED) Timothy P. Roush
TIMOTHY P. ROUSH PS 793



WEST VIRGINIA
Division of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, West Virginia 25301



DATE _____ January 26, 2017
FARM _____ J.A. Fowler No.214
API WELL NO. _____ 47-043-03471F

WELL TYPE: OIL GAS _____ LIQUID INJECTION _____ WASTE DISPOSAL _____
(IF "GAS") PRODUCTION _____ STORAGE _____ DEEP _____ SHALLOW _____
LOCATION: ELEVATION _____ 895' _____ WATERSHED _____ Porter Fork _____
DISTRICT _____ Duval _____ COUNTY _____ Lincoln _____
QUADRANGLE _____ Griffithsville 7.5' _____
SURFACE OWNER _____ Andy J. & Rebecca McClure _____ ACREAGE _____ 87 Ac. _____
OIL & GAS ROYALTY OWNER _____ HG Energy, LLC., et al _____ LEASE ACREAGE _____ 64 Ac. _____
LEASE NO. _____ 71086-50 _____

PROPOSED WORK: DRILL _____ CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION _____ PERFORATE NEW FORMATION _____ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____
TARGET FORMATION _____ Berea _____ ESTIMATED DEPTH TVD - 2,570' MD - 2,631'

WELL OPERATOR _____ HG Energy LLC. _____ DESIGNATED AGENT _____ Diane White _____
ADDRESS _____ 5260 DuPont Road _____ ADDRESS _____ 5260 DuPont Road _____
Parkersburg, WV 26101 _____ Parkersburg, WV 26101 _____

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03/24/2017

MAR 06 2017

WV Department of Environmental Protection

FORM IV-6

Longitude = 81° 57' 12.5"

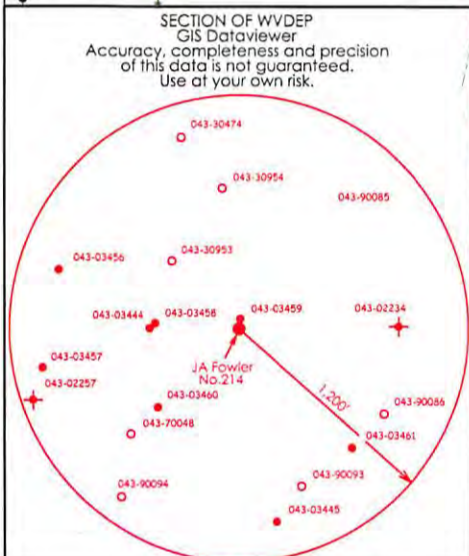
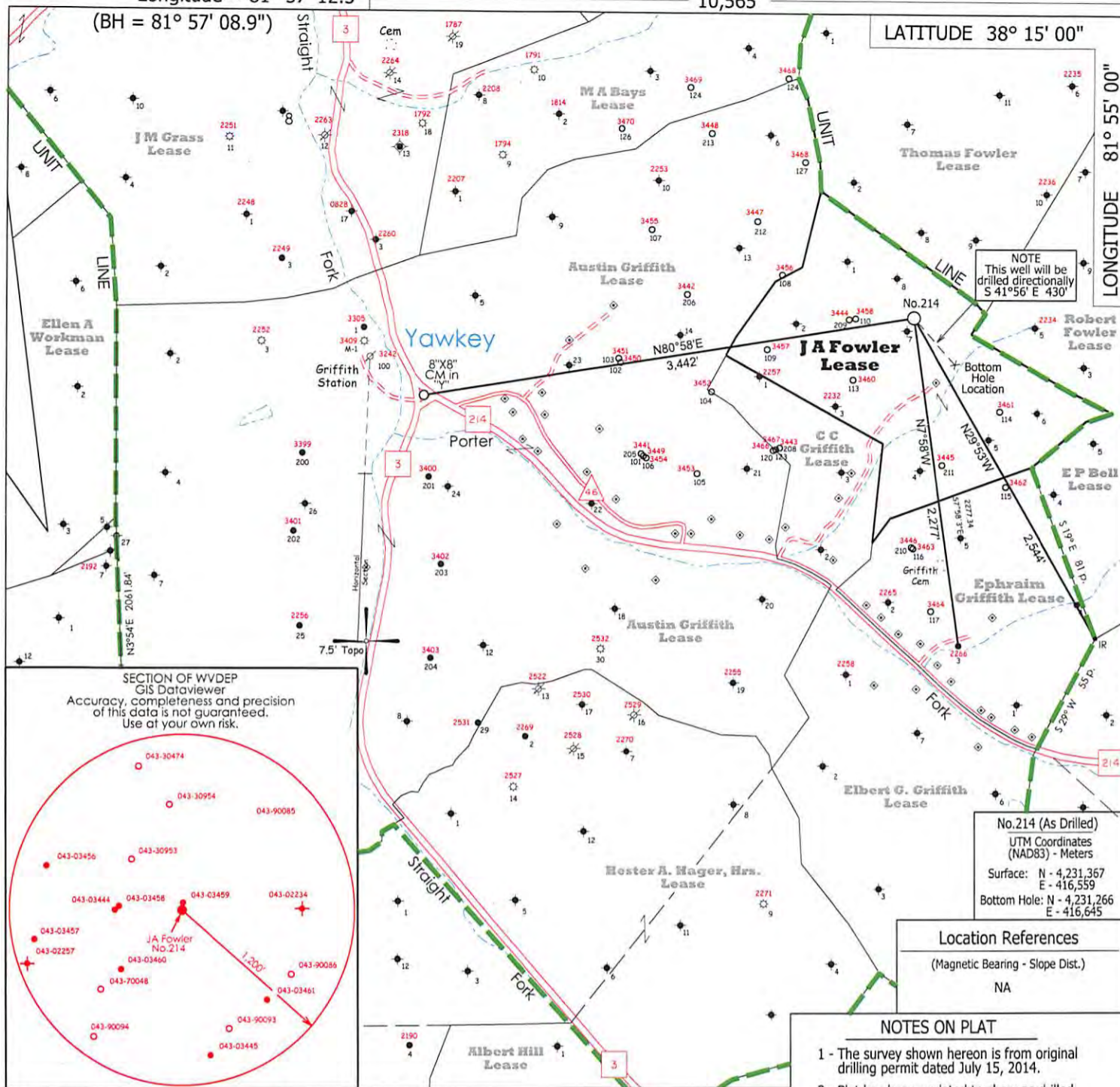
10,565'

LATITUDE 38° 15' 00"

LONGITUDE 81° 55' 00"

8,625'

(Bottom Hole = 38° 13' 31.5" Latitude = 38° 13' 34.8"



No.214 (As Drilled)
 UTM Coordinates (NAD83) - Meters
 Surface: N - 4,231,367 E - 416,559
 Bottom Hole: N - 4,231,266 E - 416,645

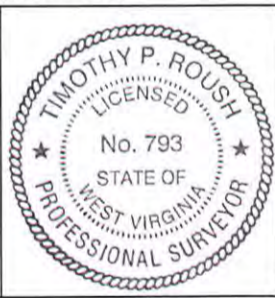
Location References
 (Magnetic Bearing - Slope Dist.)
 NA

- NOTES ON PLAT
- 1 - The survey shown herein is from original drilling permit dated July 15, 2014.
 - 2 - Plat has been updated to show as-drilled Latitude/Longitude information and current surface owner information.
 - 3 - Latitude and Longitude established by DGPS Survey (Ref. NAD 1927).

◆ - DENOTES A POSSIBLE WATER SUPPLY SOURCE LOCATED FROM CIRCA 2003 AERIAL PHOTOGRAPHY - NOT BY SURVEY. OTHER SOURCES MAY BE PRESENT.
 + - DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

FILE NO. _____
 MAP NO. _____ N S E W _____
 SCALE _____ 1" = 1000'
 MINIMUM DEGREE OF ACCURACY _____ Sub-Meter
 PROVEN SOURCE OF ELEVATION _____ DGPS Survey
 (Sub-Meter Mapping Grade)

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 DEPARTMENT OF MINES.
 (SIGNED) *Timothy P. Roush*
 TIMOTHY P. ROUSH PS 793



WEST VIRGINIA
 Division of Environmental Protection
 Office of Oil and Gas
 601 57th Street
 Charleston, West Virginia 25301



DATE _____ January 26, 2017
 FARM _____ J.A. Fowler No.214
 API WELL NO. _____ 47-043-03471

WELL TYPE: OIL GAS _____ LIQUID INJECTION _____ WASTE DISPOSAL _____
 (IF "GAS") PRODUCTION _____ STORAGE _____ DEEP _____ SHALLOW _____
 LOCATION: ELEVATION _____ 895' _____ WATERSHED _____ Porter Fork _____
 DISTRICT _____ Duval _____ COUNTY _____ Lincoln _____
 QUADRANGLE _____ Griffithsville 7.5' _____
 SURFACE OWNER _____ Andy J. & Rebecca McClure _____ ACREAGE _____ 87 Ac. _____
 OIL & GAS ROYALTY OWNER _____ HG Energy, LLC., et al _____ LEASE ACREAGE _____ 64 Ac. _____ **03/24/2017**
 LEASE NO. _____ 71086-50 _____
 PROPOSED WORK: DRILL _____ CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR
 STIMULATE PLUG OFF OLD FORMATION _____ PERFORATE NEW
 FORMATION _____ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____
 PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____
 TARGET FORMATION _____ Berea _____ ESTIMATED DEPTH TVD - 2,570' MD - 2,631'
 WELL OPERATOR _____ HG Energy LLC. _____ DESIGNATED AGENT _____ Diane White
 ADDRESS _____ 5260 DuPont Road _____ ADDRESS _____ 5260 DuPont Road
 Parkersburg, WV 26101 _____ Parkersburg, WV 26101

FORM IV-6

4303471F

HG Energy, LLC

Lincoln County, West Virginia

JA Fowler #214

JA Fowler 214

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

12 November, 2014



MAR 06 2017

WV Department of
Environmental Protection
03/24/2017

4303471 F



Survey Report - Geographic

Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well JA Fowler 214
Project:	Lincoln County, West Virginia	TVD Reference:	Well @ 920.0usft (Decker #9)
Site:	JA Fowler #214	MD Reference:	Well @ 920.0usft (Decker #9)
Well:	JA Fowler 214	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Project	Lincoln County, West Virginia		
Map System:	Universal Transverse Mercator	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	JA Fowler #214				
Site Position:		Northing:	13,882,378.33 usft	Latitude:	38° 13' 34.800 N
From:	Lat/Long	Easting:	1,366,605.80 usft	Longitude:	81° 57' 12.600 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	JA Fowler 214					
Well Position	+N/-S	0.0 usft	Northing:	13,882,378.33 usft	Latitude:	38° 13' 34.800 N
	+E/-W	0.0 usft	Easting:	1,366,605.80 usft	Longitude:	81° 57' 12.600 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	912.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/28/2014	-7.44	66.08	51,826

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0		139.00

Survey Program	Date 11/10/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
600.0	2,631.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	13,882,378.33	1,366,605.80	38° 13' 34.800 N	81° 57' 12.600 W
600.0	0.00	0.00	600.0	0.0	0.0	13,882,378.33	1,366,605.80	38° 13' 34.800 N	81° 57' 12.600 W
FIRST SURVEY @ 600' MD / 600' TVD									
625.0	0.90	139.00	625.0	-0.1	0.1	13,882,378.19	1,366,605.93	38° 13' 34.799 N	81° 57' 12.598 W
655.0	1.20	138.80	655.0	-0.6	0.5	13,882,377.77	1,366,606.29	38° 13' 34.792 N	81° 57' 12.594 W
685.0	1.90	132.20	685.0	-1.1	1.1	13,882,377.20	1,366,606.87	38° 13' 34.789 N	81° 57' 12.588 W
715.0	2.60	147.20	715.0	-2.0	1.8	13,882,376.30	1,366,607.60	38° 13' 34.780 N	81° 57' 12.577 W
745.0	3.80	141.90	744.9	-3.4	2.8	13,882,374.94	1,366,608.59	38° 13' 34.767 N	81° 57' 12.565 W
775.0	5.10	144.40	774.8	-5.3	4.2	13,882,373.07	1,366,609.98	38° 13' 34.748 N	81° 57' 12.547 W
805.0	6.30	138.30	804.7	-7.6	6.0	13,882,370.76	1,366,611.85	38° 13' 34.726 N	81° 57' 12.523 W
835.0	7.20	138.00	834.5	-10.2	8.4	13,882,368.13	1,366,614.20	38° 13' 34.700 N	81° 57' 12.493 W
865.0	8.20	136.10	864.2	-13.1	11.1	13,882,365.20	1,366,616.94	38° 13' 34.671 N	81° 57' 12.459 W

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West Virginia Department of Environmental Protection

4303471F



Survey Report - Geographic

Company: HG Energy, LLC
 Project: Lincoln County, West Virginia
 Site: JA Fowler #214
 Well: JA Fowler 214
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well JA Fowler 214
 TVD Reference: Well @ 920.0usft (Decker #9)
 MD Reference: Well @ 920.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM Compass

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
895.0	8.80	131.20	893.9	-16.2	14.4	13,882,362.14	1,366,620.15	38° 13' 34.641 N	81° 57' 12.418 W
925.0	9.70	126.80	923.5	-19.2	18.1	13,882,359.12	1,366,623.90	38° 13' 34.612 N	81° 57' 12.371 W
955.0	10.17	127.70	953.0	-22.4	22.2	13,882,355.98	1,366,628.02	38° 13' 34.581 N	81° 57' 12.319 W
985.0	11.40	129.70	982.5	-25.9	26.6	13,882,352.47	1,366,632.40	38° 13' 34.547 N	81° 57' 12.263 W
1,015.0	12.70	131.30	1,011.8	-29.9	31.4	13,882,348.40	1,366,637.16	38° 13' 34.507 N	81° 57' 12.203 W
1,045.0	13.80	130.90	1,041.0	-34.5	36.5	13,882,343.88	1,366,642.34	38° 13' 34.463 N	81° 57' 12.138 W
1,075.0	14.70	136.60	1,070.1	-39.6	41.9	13,882,338.77	1,366,647.66	38° 13' 34.413 N	81° 57' 12.070 W
1,105.0	16.40	140.50	1,099.0	-45.6	47.2	13,882,332.74	1,366,652.97	38° 13' 34.354 N	81° 57' 12.003 W
1,135.0	18.00	144.80	1,127.7	-52.7	52.5	13,882,325.68	1,366,658.33	38° 13' 34.285 N	81° 57' 11.935 W
1,165.0	18.10	143.30	1,156.2	-60.2	58.0	13,882,318.16	1,366,663.79	38° 13' 34.211 N	81° 57' 11.865 W
1,195.0	17.70	143.60	1,184.7	-67.6	63.5	13,882,310.75	1,366,669.28	38° 13' 34.138 N	81° 57' 11.796 W
1,225.0	17.50	143.50	1,213.3	-74.9	68.9	13,882,303.45	1,366,674.67	38° 13' 34.067 N	81° 57' 11.727 W
1,255.0	17.30	142.90	1,242.0	-82.1	74.2	13,882,296.27	1,366,680.05	38° 13' 33.996 N	81° 57' 11.659 W
1,285.0	17.20	142.70	1,270.6	-89.2	79.6	13,882,289.18	1,366,685.42	38° 13' 33.927 N	81° 57' 11.590 W
1,315.0	17.20	142.90	1,299.3	-96.2	85.0	13,882,282.12	1,366,690.79	38° 13' 33.857 N	81° 57' 11.522 W
1,345.0	17.40	143.30	1,327.9	-103.4	90.3	13,882,274.98	1,366,696.14	38° 13' 33.787 N	81° 57' 11.454 W
1,375.0	17.60	142.20	1,356.5	-110.5	95.8	13,882,267.80	1,366,701.61	38° 13' 33.717 N	81° 57' 11.385 W
1,405.0	17.80	142.80	1,385.1	-117.8	101.4	13,882,260.57	1,366,707.16	38° 13' 33.646 N	81° 57' 11.314 W
1,435.0	18.00	142.00	1,413.7	-125.1	107.0	13,882,253.26	1,366,712.78	38° 13' 33.574 N	81° 57' 11.243 W
1,465.0	17.80	142.00	1,442.2	-132.3	112.7	13,882,246.00	1,366,718.46	38° 13' 33.503 N	81° 57' 11.171 W
1,495.0	17.60	142.20	1,470.8	-139.5	118.3	13,882,238.80	1,366,724.06	38° 13' 33.432 N	81° 57' 11.100 W
1,525.0	17.40	141.00	1,499.4	-146.6	123.9	13,882,231.73	1,366,729.67	38° 13' 33.363 N	81° 57' 11.028 W
1,555.0	17.30	142.90	1,528.0	-153.6	129.4	13,882,224.68	1,366,735.18	38° 13' 33.294 N	81° 57' 10.956 W
1,585.0	17.30	142.70	1,556.7	-160.8	134.8	13,882,217.58	1,366,740.57	38° 13' 33.224 N	81° 57' 10.890 W
1,615.0	17.20	141.70	1,585.3	-167.8	140.2	13,882,210.55	1,366,746.03	38° 13' 33.155 N	81° 57' 10.821 W
1,645.0	17.20	141.30	1,614.0	-174.7	145.7	13,882,203.61	1,366,751.55	38° 13' 33.087 N	81° 57' 10.751 W
1,675.0	16.70	137.60	1,642.7	-181.4	151.4	13,882,196.96	1,366,757.23	38° 13' 33.022 N	81° 57' 10.678 W
1,705.0	16.20	136.50	1,671.5	-187.6	157.2	13,882,190.74	1,366,763.02	38° 13' 32.961 N	81° 57' 10.605 W
1,735.0	16.10	133.90	1,700.3	-193.5	163.1	13,882,184.82	1,366,768.89	38° 13' 32.903 N	81° 57' 10.531 W
1,765.0	17.10	133.90	1,729.0	-199.5	169.3	13,882,178.88	1,366,775.07	38° 13' 32.845 N	81° 57' 10.453 W
1,795.0	18.00	136.10	1,757.6	-205.9	175.7	13,882,172.48	1,366,781.46	38° 13' 32.782 N	81° 57' 10.372 W
1,825.0	18.50	134.00	1,786.1	-212.5	182.3	13,882,165.84	1,366,788.10	38° 13' 32.717 N	81° 57' 10.288 W
1,855.0	18.80	133.10	1,814.5	-219.1	189.3	13,882,159.23	1,366,795.05	38° 13' 32.653 N	81° 57' 10.200 W
1,885.0	18.90	134.70	1,842.9	-225.8	196.2	13,882,152.51	1,366,802.04	38° 13' 32.587 N	81° 57' 10.111 W
1,915.0	18.80	139.90	1,871.3	-232.9	202.8	13,882,145.39	1,366,808.60	38° 13' 32.517 N	81° 57' 10.028 W
1,945.0	17.90	146.10	1,899.8	-240.5	208.5	13,882,137.86	1,366,814.29	38° 13' 32.443 N	81° 57' 9.956 W
1,975.0	17.60	147.70	1,928.4	-248.1	213.5	13,882,130.20	1,366,819.28	38° 13' 32.368 N	81° 57' 9.892 W
2,005.0	18.00	146.00	1,956.9	-255.8	218.5	13,882,122.53	1,366,824.30	38° 13' 32.293 N	81° 57' 9.828 W
2,035.0	17.40	145.70	1,985.5	-263.4	223.6	13,882,114.98	1,366,829.42	38° 13' 32.219 N	81° 57' 9.763 W
2,065.0	16.70	144.30	2,014.2	-270.6	228.7	13,882,107.77	1,366,834.46	38° 13' 32.148 N	81° 57' 9.699 W
2,095.0	16.00	143.70	2,043.0	-277.4	233.6	13,882,100.94	1,366,839.43	38° 13' 32.081 N	81° 57' 9.636 W
2,125.0	15.20	140.50	2,071.9	-283.8	238.6	13,882,094.57	1,366,844.38	38° 13' 32.018 N	81° 57' 9.573 W
2,155.0	14.50	140.10	2,100.9	-289.7	243.5	13,882,088.66	1,366,849.29	38° 13' 31.960 N	81° 57' 9.511 W
2,185.0	13.80	139.80	2,130.0	-295.3	248.2	13,882,083.04	1,366,854.01	38° 13' 31.905 N	81° 57' 9.451 W
2,215.0	13.10	138.70	2,159.1	-300.6	252.8	13,882,077.76	1,366,858.56	38° 13' 31.854 N	81° 57' 9.393 W
2,245.0	12.50	136.00	2,188.4	-305.5	257.3	13,882,072.87	1,366,863.06	38° 13' 31.806 N	81° 57' 9.336 W
2,275.0	11.90	136.40	2,217.7	-310.0	261.6	13,882,068.29	1,366,867.45	38° 13' 31.761 N	81° 57' 9.280 W
2,305.0	11.00	135.10	2,247.1	-314.3	265.8	13,882,064.02	1,366,871.60	38° 13' 31.719 N	81° 57' 9.228 W
2,335.0	10.40	133.60	2,276.6	-318.2	269.8	13,882,060.13	1,366,875.58	38° 13' 31.681 N	81° 57' 9.177 W
2,365.0	9.50	132.80	2,306.1	-321.8	273.6	13,882,056.58	1,366,879.36	38° 13' 31.646 N	81° 57' 9.130 W
2,395.0	9.30	127.30	2,335.7	-324.9	277.3	13,882,053.43	1,366,883.10	38° 13' 31.616 N	81° 57' 9.082 W
2,425.0	9.80	127.70	2,365.3	-327.9	281.3	13,882,050.40	1,366,887.05	38° 13' 31.586 N	81° 57' 9.032 W
2,455.0	10.00	127.20	2,394.9	-331.1	285.3	13,882,047.26	1,366,891.15	38° 13' 31.555 N	81° 57' 8.981 W
2,485.0	9.50	125.70	2,424.5	-334.1	289.4	13,882,044.24	1,366,895.23	38° 13' 31.526 N	81° 57' 8.929 W
2,515.0	8.70	126.20	2,454.1	-336.9	293.3	13,882,041.46	1,366,899.07	38° 13' 31.499 N	81° 57' 8.880 W

4303471F



Survey Report - Geographic

Company: HG Energy, LLC	Local Co-ordinate Reference: Well JA Fowler 214
Project: Lincoln County, West Virginia	TVD Reference: Well @ 920.0usft (Decker #9)
Site: JA Fowler #214	MD Reference: Well @ 920.0usft (Decker #9)
Well: JA Fowler 214	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: EDM Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,545.0	7.90	122.50	2,483.8	-339.3	296.8	13,882,039.01	1,366,902.64	38° 13' 31.475 N	81° 57' 8.835 W
2,575.0	7.30	119.30	2,513.5	-341.4	300.2	13,882,036.97	1,366,906.04	38° 13' 31.455 N	81° 57' 8.792 W
2,631.0	7.30	119.30	2,569.0	-344.8	306.4	13,882,033.49	1,366,912.25	38° 13' 31.421 N	81° 57' 8.714 W

TD @ 2631' MD / 2569' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.0	600.0	0.0	0.0	FIRST SURVEY @ 600' MD / 600' TVD
2,631.0	2,569.0	-344.8	306.4	TD @ 2631' MD / 2569' TVD

Checked By: _____ Approved By: _____ Date: _____

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WV Department of
Environmental Protection

03/24/2017

HG Energy, LLC

Lincoln County, West Virginia

JA Fowler #214

JA Fowler 214

Wellbore #1

Design: Wellbore #1

HG Energy EOW Report

12 November, 2014

WV Department of
Environmental Protection

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MAR 06 2017



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HG Energy EOW Report



Company: HG Energy, LLC	Local Co-ordinate Reference: Well JA Fowler 214
Project: Lincoln County, West Virginia	TVD Reference: Well @ 920.0usft (Decker #9)
Site: JA Fowler #214	MD Reference: Well @ 920.0usft (Decker #9)
Well: JA Fowler 214	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: EDM Compass

Project Lincoln County, West Virginia	
Map System: Universal Transverse Mercator	System Datum: Mean Sea Level
Geo Datum: NAD83 West Virginia - HARN	
Map Zone: Zone 17N (84 W to 78 W)	

Site JA Fowler #214		
Site Position:	Northing: 13,882,378.33 usft	Latitude: 38° 13' 34.800 N
From: Lat/Long	Easting: 1,366,605.80 usft	Longitude: 81° 57' 12.600 W
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: -0.59 °

Well JA Fowler 214		
Well Position +N-S 0.0 usft	Northing: 13,882,378.33 usft	Latitude: 38° 13' 34.800 N
+E-W 0.0 usft	Easting: 1,366,605.80 usft	Longitude: 81° 57' 12.600 W
Position Uncertainty 0.0 usft	Wellhead Elevation: 0.0 usft	Ground Level: 912.0 usft

Wellbore Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/28/2014	-7.44	66.08	51,826

Design Wellbore #1				
Audit Notes:				
Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.0		
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.0	0.0	0.0	139.00

Survey Program	Date 11/10/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
600.0	2,631.0	MWD (Wellbore #1)	MWD default	MWD - Standard

4303471F

HG Energy EOW Report



Company: HG Energy, LLC
 Project: Lincoln County, West Virginia
 Site: JA Fowler #214
 Well: JA Fowler 214
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well JA Fowler 214
 TVD Reference: Well @ 920.0usft (Decker #9)
 MD Reference: Well @ 920.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM Compass

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.0	0.00	
FIRST SURVEY @ 600' MD / 600 TVD										
625.0	0.90	139.00	625.0	-0.1	0.1	0.2	3.60	0.2	139.00	
655.0	1.20	138.80	655.0	-0.6	0.5	0.7	1.00	0.7	138.92	
685.0	1.90	132.20	685.0	-1.1	1.1	1.6	2.40	1.6	136.75	
715.0	2.60	147.20	715.0	-2.0	1.8	2.7	3.03	2.7	138.52	
745.0	3.80	141.90	744.9	-3.4	2.8	4.4	4.12	4.4	140.62	
775.0	5.10	144.40	774.8	-5.3	4.2	6.7	4.38	6.7	141.56	
805.0	6.30	138.30	804.7	-7.6	6.0	9.7	4.48	9.7	141.40	
835.0	7.20	138.00	834.5	-10.2	8.4	13.2	3.00	13.2	140.53	
865.0	8.20	136.10	864.2	-13.1	11.1	17.2	3.44	17.2	139.70	
895.0	8.80	131.20	893.9	-16.2	14.4	21.6	3.13	21.6	138.45	
925.0	9.70	126.80	923.5	-19.2	18.1	26.4	3.81	26.4	136.71	
955.0	10.17	127.70	953.0	-22.4	22.2	31.4	1.65	31.5	135.17	
985.0	11.40	129.70	982.5	-25.9	26.6	37.0	4.28	37.1	134.20	
1,015.0	12.70	131.30	1,011.8	-29.9	31.4	43.2	4.47	43.4	133.67	
1,045.0	13.80	130.90	1,041.0	-34.5	36.5	50.0	3.68	50.2	133.32	
1,075.0	14.70	136.60	1,070.1	-39.6	41.9	57.3	5.55	57.6	133.38	
1,105.0	16.40	140.50	1,099.0	-45.6	47.2	65.4	6.65	65.6	134.03	
1,135.0	18.00	144.80	1,127.7	-52.7	52.5	74.2	6.81	74.4	135.06	
1,165.0	18.10	143.30	1,156.2	-60.2	58.0	83.5	1.58	83.6	136.06	
1,195.0	17.70	143.60	1,184.7	-67.6	63.5	92.7	1.37	92.7	136.79	
1,225.0	17.50	143.50	1,213.3	-74.9	68.9	101.7	0.67	101.7	137.39	
1,255.0	17.30	142.90	1,242.0	-82.1	74.2	110.6	0.90	110.7	137.86	
1,285.0	17.20	142.70	1,270.6	-89.2	79.6	119.5	0.39	119.5	138.23	
1,315.0	17.20	142.90	1,299.3	-96.2	85.0	128.4	0.20	128.4	138.55	

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HG Energy EOW Report



Company: HG Energy, LLC
 Project: Lincoln County, West Virginia
 Site: JA Fowler #214
 Well: JA Fowler 214
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well JA Fowler 214
 TVD Reference: Well @ 920.0usft (Decker #9)
 MD Reference: Well @ 920.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM Compass

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
1,345.0	17.40	143.30	1,327.9	-103.4	90.3	137.3	0.78	137.3	138.84
1,375.0	17.60	142.20	1,356.5	-110.5	95.8	146.3	1.29	146.3	139.08
1,405.0	17.80	142.80	1,385.1	-117.8	101.4	155.4	0.90	155.4	139.28
1,435.0	18.00	142.00	1,413.7	-125.1	107.0	164.6	1.06	164.6	139.46
1,465.0	17.80	142.00	1,442.2	-132.3	112.7	173.8	0.67	173.8	139.59
1,495.0	17.60	142.20	1,470.8	-139.5	118.3	182.9	0.70	182.9	139.72
1,525.0	17.40	141.00	1,499.4	-146.6	123.9	191.9	1.38	191.9	139.81
1,555.0	17.30	142.90	1,528.0	-153.6	129.4	200.8	1.92	200.9	139.90
1,585.0	17.30	142.70	1,556.7	-160.8	134.8	209.7	0.20	209.8	140.02
1,615.0	17.20	141.70	1,585.3	-167.6	140.2	218.6	1.04	218.7	140.11
1,645.0	17.20	141.30	1,614.0	-174.7	145.7	227.5	0.39	227.5	140.17
1,675.0	16.70	137.60	1,642.7	-181.4	151.4	236.2	3.96	236.3	140.14
1,705.0	16.20	136.50	1,671.5	-187.6	157.2	244.7	1.96	244.8	140.03
1,735.0	16.10	133.90	1,700.3	-193.5	163.1	253.0	2.43	253.1	139.88
1,765.0	17.10	133.90	1,729.0	-199.5	169.3	261.6	3.33	261.6	139.66
1,795.0	18.00	136.10	1,757.6	-205.9	175.7	270.6	3.73	270.6	139.52
1,825.0	18.50	134.00	1,786.1	-212.5	182.3	280.0	2.75	280.0	139.37
1,855.0	18.80	133.10	1,814.5	-219.1	189.3	289.5	1.39	289.5	139.18
1,885.0	18.90	134.70	1,842.9	-225.8	196.2	299.2	1.76	299.2	139.01
1,915.0	18.80	139.90	1,871.3	-232.9	202.8	308.9	5.61	308.9	138.96
1,945.0	17.90	146.10	1,899.8	-240.5	208.5	318.3	7.16	318.3	139.07
1,975.0	17.60	147.70	1,928.4	-248.1	213.5	327.3	1.91	327.3	139.29
2,005.0	18.00	146.00	1,956.9	-255.8	218.5	336.4	2.19	336.4	139.50
2,035.0	17.40	145.70	1,985.5	-263.4	223.6	345.5	2.02	345.5	139.66
2,065.0	16.70	144.30	2,014.2	-270.6	228.7	354.2	2.70	354.2	139.80
2,095.0	16.00	143.70	2,043.0	-277.4	233.6	362.6	2.40	362.7	139.90
2,125.0	15.20	140.50	2,071.9	-283.8	238.6	370.7	3.92	370.7	139.94

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 Department
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HG Energy EOW Report



Company: HG Energy, LLC
 Project: Lincoln County, West Virginia
 Site: JA Fowler #214
 Well: JA Fowler 214
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well JA Fowler 214
 TVD Reference: Well @ 920.0usft (Decker #9)
 MD Reference: Well @ 920.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM Compass

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
2,155.0	14.50	140.10	2,100.9	-289.7	243.5	378.4	2.36	378.4	139.95
2,185.0	13.80	139.80	2,130.0	-295.3	248.2	385.7	2.35	385.7	139.95
2,215.0	13.10	138.70	2,159.1	-300.6	252.8	392.7	2.48	392.7	139.94
2,245.0	12.50	136.00	2,188.4	-305.5	257.3	399.3	2.82	399.4	139.90
2,275.0	11.90	136.40	2,217.7	-310.0	261.6	405.6	2.02	405.7	139.84
2,305.0	11.00	135.10	2,247.1	-314.3	265.8	411.6	3.12	411.6	139.78
2,335.0	10.40	133.60	2,276.6	-318.2	269.8	417.1	2.20	417.2	139.71
2,365.0	9.50	132.80	2,306.1	-321.8	273.6	422.3	3.04	422.3	139.63
2,395.0	9.30	127.30	2,335.7	-324.9	277.3	427.1	3.07	427.2	139.52
2,425.0	9.80	127.70	2,365.3	-327.9	281.3	432.0	1.68	432.0	139.38
2,455.0	10.00	127.20	2,394.9	-331.1	285.3	437.1	0.73	437.1	139.24
2,485.0	9.50	125.70	2,424.5	-334.1	289.4	442.0	1.87	442.0	139.10
2,515.0	8.70	126.20	2,454.1	-336.9	293.3	446.6	2.68	446.6	138.96
2,545.0	7.90	122.50	2,483.8	-339.3	296.8	450.8	3.21	450.8	138.82
2,575.0	7.30	119.30	2,513.5	-341.4	300.2	454.6	2.45	454.6	138.67
2,631.0	7.30	119.30	2,569.0	-344.8	306.4	461.3	0.00	461.3	138.37

TD @ 2631' MD / 2569' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.0	600.0	0.0	0.0	FIRST SURVEY @ 600' MD / 600' TVD
2,631.0	2,569.0	-344.8	306.4	TD @ 2631' MD / 2569' TVD

Checked By: _____ Approved By: _____ Date: _____

WV Department of Oil and Gas
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JA Fowler 214
Lincoln County, West Virginia
Q141156 & AM-141140
Design #1

Company Name: HG Energy, LLC
JA Fowler 214
Lincoln County, West Virginia
Rig: Decker #9
Created By: Jerry Arsenault
Date: 11/10/2014

PROJECT DETAILS: Lincoln County, West Virginia

Geodetic System: Universal Transverse Mercator
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level

DESIGN TARGET DETAILS

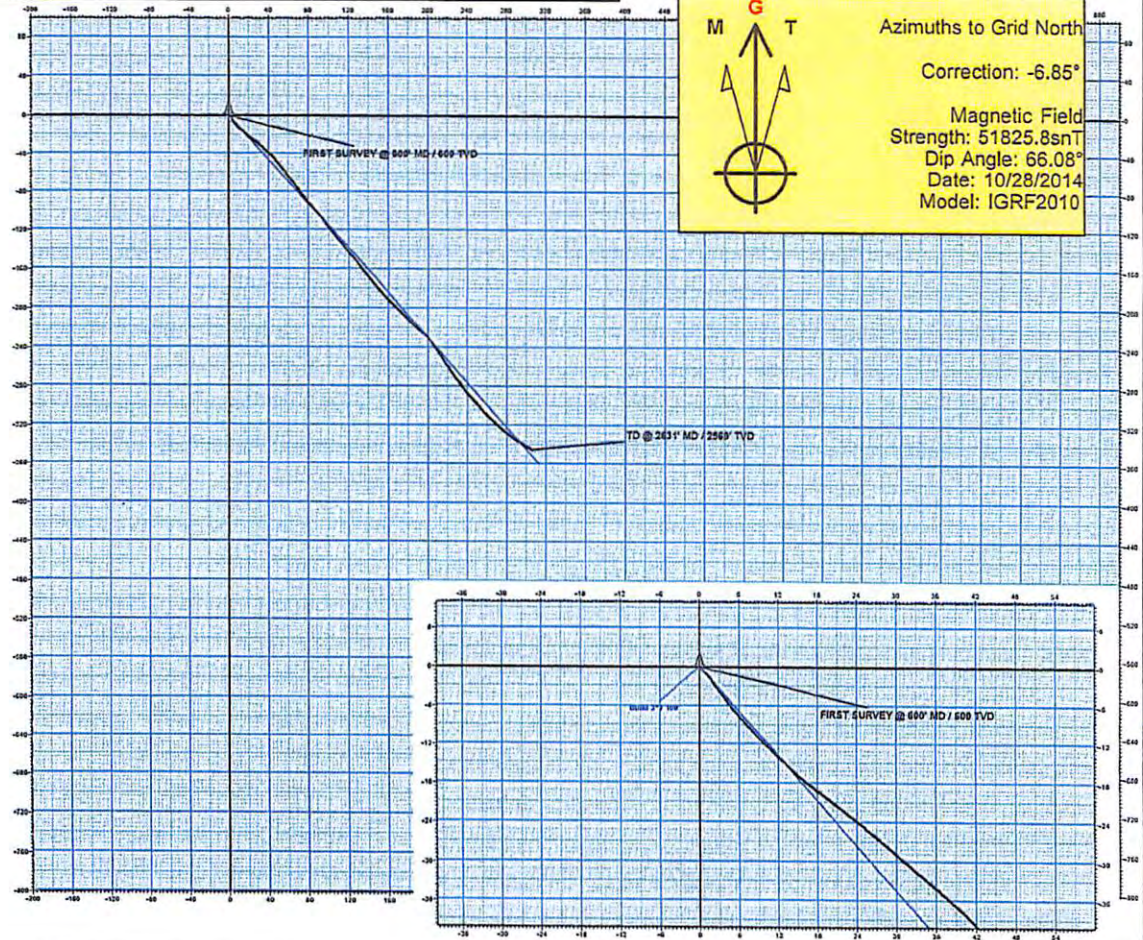
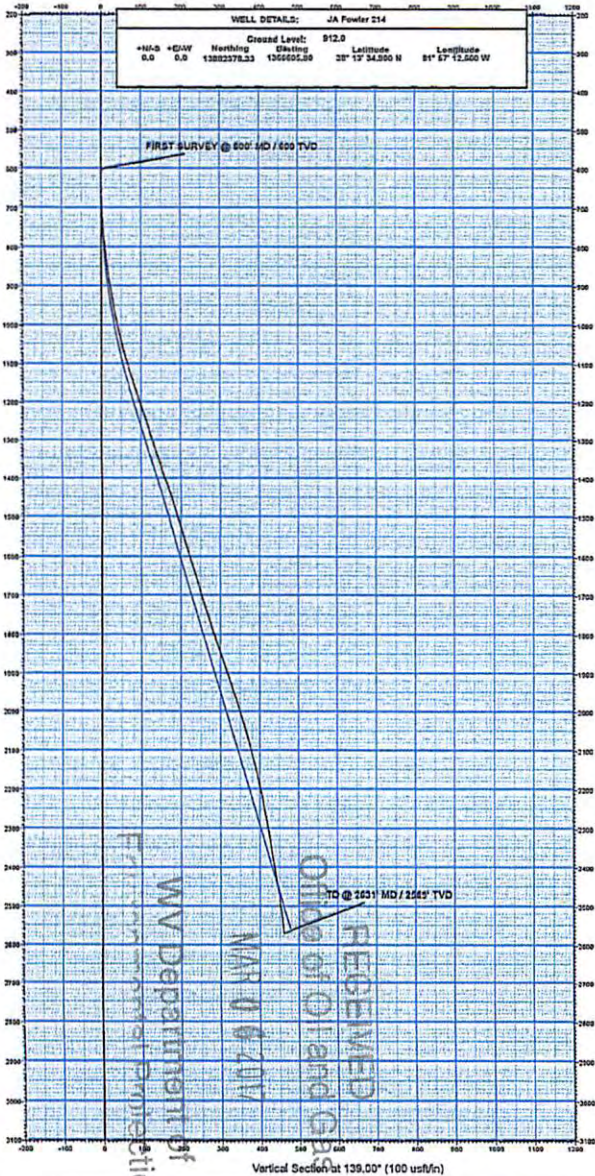
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PDHL - JA Fowler #214 - plan hits target center	2424.8	-226.5	283.8	13082551.78	156220.64	39° 17' 31.600 N	81° 57' 0.000 W

HG Energy



ANNOTATIONS

MD	Inc	Azi	TVD	+N-S	+E-W	VSect	Departure	Annotation
639.0	0.00	0.00	650.0	0.0	0.0	0.0	0.0	Bull's 3" / 100"
1163.0	16.29	139.00	1185.7	-27.9	50.3	76.7	76.7	808 @ 16.29° Inc / 139° Azm
2462.2	16.29	139.00	2464.5	-326.5	283.8	432.7	432.7	Held @ 16.29° Inc / 139° Azm
2622.2	16.29	139.00	2557.6	-360.4	313.3	477.5	477.5	TD @ 2622' MD / 2558' TVD



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