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west virginia department of environmental protection

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

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

Tuesday, July 10, 2018  
WELL WORK PERMIT  
Vertical / Re-Work

HG ENERGY, LLC  
5260 DUPONT ROAD

PARKERSBURG, WV 26101

Re: Permit approval for C. MCGRAW 114  
47-087-04759-00-00

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

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

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

James A. Martin  
Chief

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

Operator's Well Number: C. MCGRAW 114  
Farm Name: ATKINSON, DELORES (TRUS)  
U.S. WELL NUMBER: 47-087-04759-00-00  
Vertical Re-Work  
Date Issued: 7/10/2018

## 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

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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 on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

FORM WW-3 (B)  
1/12



1) Date: 06/07/2018  
2) Operator's Well No. Charles McGraw 114  
3) API Well No.: 47 - 087 - 04759  
State County Permit  
4) UIC Permit No. 2R08704AP

STATE OF WEST VIRGINIA  
NOTICE OF LIQUID INJECTION OR WASTE DISPOSAL WELL WORK PERMIT APPLICATION  
FOR THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

5) WELL TYPE: Liquid Injection  / Gas Injection (not storage)  / Waste Disposal   
6) LOCATION: Elevation: 1111' Watershed: Rush Run  
District: Smithfield County Roane Quadrangle Looneyville 7.5'  
7) WELL OPERATOR: H G Energy LLC 8) DESIGNATED AGENT Diane White  
Address 5260 Dupont Rd Address 5260 Dupont Rd  
Parkersburg, WV 26101 Parkersburg, WV 26101  
9) OIL & GAS INSPECTOR TO BE NOTIFIED 10) DRILLING CONTRACTOR  
Name Joe Taylor Name NA  
Address 1478 Claylick Road Address  
Ripley, WV 25271

11) PROPOSED WELL WORK Drill  / Drill deeper  / Redrill  / Stimulate   
Plug off old formation  / Perforate new formation  / Convert   
Other physical change in well (specify) Reperforate Big Injun ( 2284-2292 MD) 6 SPF& acidize w/ 2000 gal HCL

12) GEOLOGIC TARGET FORMATION Big Injun Depth 2120 (TVD) Feet (top) to 2196 (TVD) Feet (bottom)  
13) Estimated Depth of Completed Well, (or actual depth of existing well): 2480 (MD) 2298 (TVD) Feet  
14) Approximate water strata depths: Fresh none Feet Salt 1740 Feet  
15) Approximate coal seam depths: NA  
16) Is coal being mined in the area? Yes No  
17) Virgin reservoir pressure in target formation 1250 psig Source Estimated  
18) Estimated reservoir fracture pressure 2650 psig (BHFP)  
19) MAXIMUM PROPOSED INJECTION OPERATIONS: Volume per hour 25 Bottom hole pressure 2400  
20) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES Fresh Water/Produced water,  
bactericides, and other chemicals as needed to maintain water quality and improve oil recovery  
Office of Oil and Gas

21) FILTERS (IF ANY) Cartridge filters  
22) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL JUN 15 2018

23) CASING AND TUBING PROGRAM WV Department of Environmental Protection

CASING OR TUBING TYPE	SPECIFICATIONS					FOOTAGE INTERVALS		CEMENT FILL -UP OR SACKS (CU. FT.)	PACKERS
	Size	Grade	Weight per ft.	New	Used	For Drilling	Left In Well		
Conductor	11 5/8"	LS	NA		X	30'	30'		Kinds
Fresh Water	7"	LS	17	X		507'	507'	CTS	
Coal									Sizes
Intermediate									2 3/8" x 4"
Production	4 1/2"	J-55	10.5	X		2450.4	2450.4	350 cu ft	Depths set
Tubing	2 3/8"	J-55	4.7	X		2175	2175		2175
Liners									Perforations
									Top Bottom
									2284 2292

24) APPLICANT'S OPERATING RIGHTS were acquired from C H McGraw  
by deed / lease x / other contract / dated 03/18/1910 of record in the  
Roane County Clerk's office in Lease Book 17 Page 570

*[Handwritten Signature]*  
6-13-18

07/13/2018

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

API 47-087-04759 County ROANE District SMITHFIELD  
Quad LOONEYVILLE 7.5' Pad Name MCGRAW, CHARLES Field/Pool Name CLOVER  
Farm name ATKINSON, DELORES Well Number 114  
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 4,285,136 M Easting 475,573 M  
Landing Point of Curve Northing \_\_\_\_\_ Easting \_\_\_\_\_  
Bottom Hole Northing 4,284,937 M Easting 475,484 M

Elevation (ft) 1,111' 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

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Date permit issued 2/13/15 Date drilling commenced 5/28/15 Date drilling ceased 6/4/15  
Date completion activities began 6/24/15 Date completion activities ceased 6/30/15  
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 None Open mine(s) (Y/N) depths None  
Salt water depth(s) ft 1740' Void(s) encountered (Y/N) depths None  
Coal depth(s) ft None Cavern(s) encountered (Y/N) depths None  
Is coal being mined in area (Y/N) N

Reviewed by:

07/13/2018

WR-35  
Rev. 8/23/13

API 47-087 - 04759 Farm name ATKINSON, DELORES Well number 114

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/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"	507'	New	LS	64'	N
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 1/4"	4 1/2"	2450.4'	New	J-55		Y
Tubing							
Packer type and depth set							

Comment Details Grouted w/ Est. 25 sks to surface on 7" surface cement job. Circulated Est. 25 sks to surface on 4 1/2" cement job.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Reg Neat	130	15.6	1.18	153	Surface	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	50:50 Pozmix	100/125	13.2/14.2	1.64/1.27	164/186	Surface	8
Tubing							

Drillers TD (ft) 2480' Loggers TD (ft) 2467'

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

Plug back procedure N/A

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Kick off depth (ft) 650'

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 \_\_\_\_\_

20 Centralizers every 88 from bottom on 4 1/2", Centralizer placed mid string on 7"

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_



WR-35  
Rev. 8/23/13

API 47- 087 - 04759 Farm name ATKINSON, DELORES Well number 114

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Big Injun</u>	<u>2120'- 2146'</u> TVD	<u>2272'- 2304'</u> 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 \_\_\_\_\_ Oil \_\_\_\_\_ NGL \_\_\_\_\_ Water \_\_\_\_\_ GAS MEASURED BY  
\_\_\_\_\_ mcfpd \_\_\_\_\_ bpd \_\_\_\_\_ bpd \_\_\_\_\_ bpd  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
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Sand/Shale	0	1592	0	1644	
Sand	1592	1603	1644	1656	
Shale	1603	1640	1656	1698	
Sand	1640	1778	1698	1860	
Shale	1778	1788	1860	1872	
Sand	1788	1946	1872	2060	
Little Lime	1946	1964	2060	2080	
Pencil Cave	1964	1974	2080	2094	
Big Lime	1974	2100	2094	2248	
Keener	2100	2120	2248	2272	
Big Injun	2120	2146	2272	2304	Drilled directional S 22.6° W a distance of 642.5'
Shale	2146	2298	2304	2480	
TD	2298		2480		

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 Hall Rd City Buckhannon State WV Zip 26201

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 *Roger Heldman* Title Operations Manager Date 7/28/15

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

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JUN 15 2018  
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WW-9  
(2/15)

API Number 47 - 087 - 04759  
Operator's Well No. Charles McGraw 114

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) Rush Run Quadrangle Looneyville 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: No fluids anticipated while stimulating well

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

Proposed Disposal Method For Treated Pit Wastes:

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

Will closed loop system be used? If so, describe: No

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

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

Additives to be used in drilling medium? Water, Soap, KCl

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) NA

-Landfill or offsite name/permit number? To be determined upon approval of permit

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JUN 15 2018

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

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

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

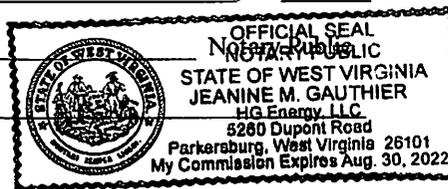
Company Official Signature Diane White

Company Official (Typed Name) Diane White

Company Official Title Agent

Subscribed and sworn before me this 29th day of May, 20 18

Jeanine M. Gauthier  
My commission expires Aug 30, 2022



07/13/2018

HG Energy, LLC

Proposed Revegetation Treatment: Acres Disturbed .5 Prevegetation pH \_\_\_\_\_

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch Straw 2 Tons/acre

Seed Mixtures

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

Sediment Control Plan will be in effect at all times.

Attach:

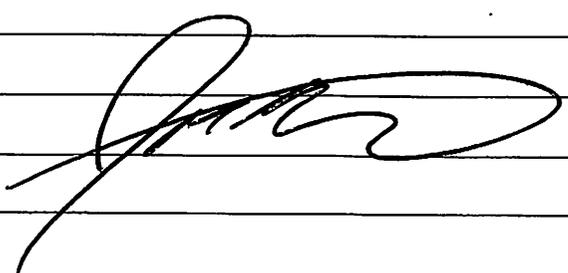
Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: \_\_\_\_\_

Comments: \_\_\_\_\_

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Title: 006 Inspect Date: 6-13-18

Field Reviewed?  Yes  No

# Reclamation Plan For: Charles McGraw No. 114

47-087-04759

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

-1,400' of Existing Access  
Road to WV SR 36

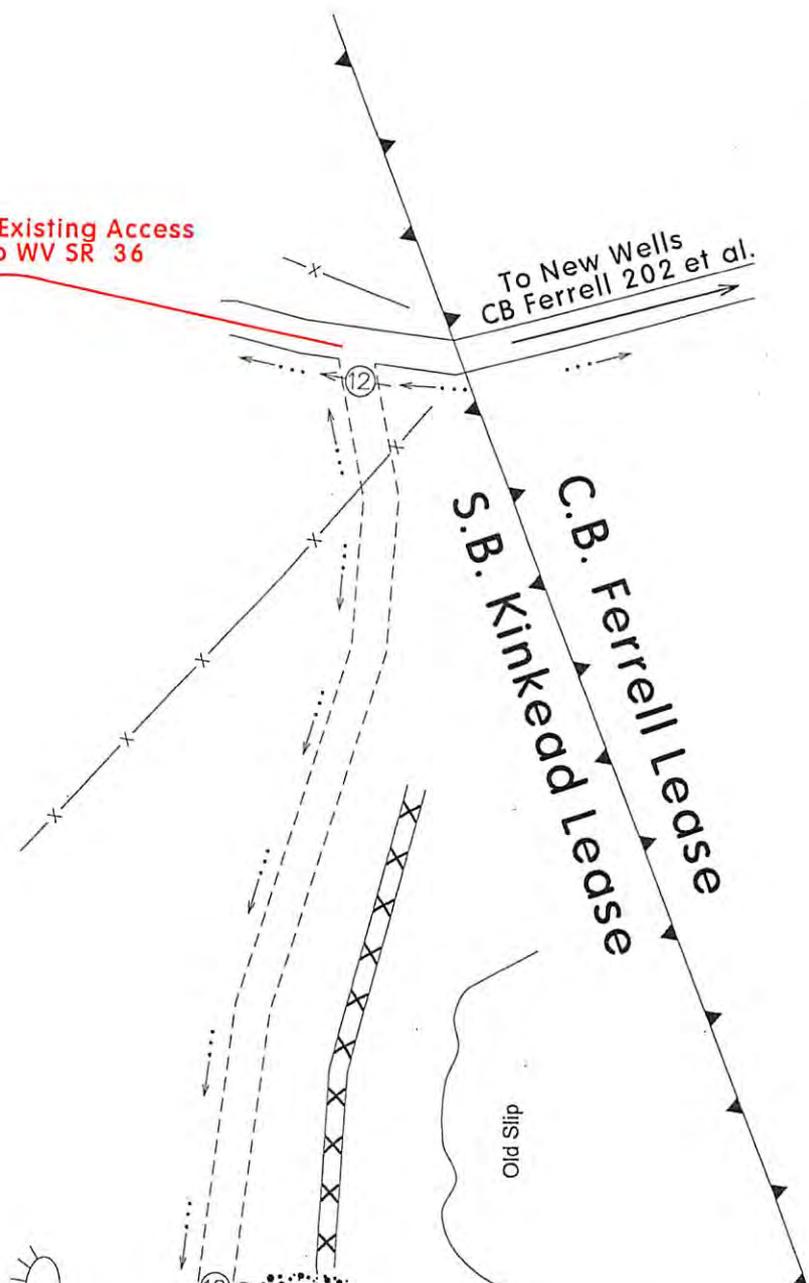
To New Wells  
CB Ferrell 202 et al.

S.B. Kinkhead Lease  
C.B. Ferrell Lease

*Ed Asbury*  
- Surface Owner

Note  
Access roads and Drill Site were constructed  
in 2015 for the drilling of the subject well.  
All structures are in place and will be maintained

Old Slip



Ed Asbury  
- Surface Owner

2579

4

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Environmental Protection

Charles McGraw Lease

Existing Vegetative  
Filter Strip

Existing  
Location on  
Ridgetop

206

4759  
114

115

Existing Vegetative  
Filter Strip

4

Richard Fisher, et al.  
- Surface Owners

8-1-19

Notes:

- REQUESTED PERMIT IS FOR RECOMPLETION OF AN EXISTING WELL.
- ACCESS ROADS ARE EXISTING AND WILL BE MAINTAINED TO WVDEP STANDARDS.
- NO EARTHWORK IS ANTICIPATED FOR REQUESTED WELL WORK
- NO PIT WILL BE REQUIRED FOR REQUESTED WELL WORK.
- ANY DISTURBED AREAS WILL BE RE-VEGETATED AS OUTLINED ON FORM WW-9.
- MAINTAIN SEDIMENT BARRIERS AND DRAINAGE STRUCTURES.
- DRAWING NOT TO SCALE.

SUBJECT WELL  
Charles McGraw No.114  
47-087-04759



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JUN 15 2018  
Section of  
WV Department of  
Environmental Protection  
**Looneyville 7.5' Quadrangle**  
07/13/2018  
SCALE 1"=1000'

**1 - Well ties and Latitude and Longitude were measured by DGPS (Sub-meter Mapping Grade). Bearings are referenced to UTM Grid North (Zone 17 North - NAD 1983).**

**2 - Surface owners and adjacent information obtained from the Roane County Assessor's tax records.**

**3 - No Title Opinion was provided to the Surveyor during this survey. This survey is subject to a complete Title Opinion.**

**4 - Existing well spots from HGE or Seneca Tech, Inc. data**

**SURVEY NOTES**

**UTM Coordinates (Zone 17N-NAD 1983)**

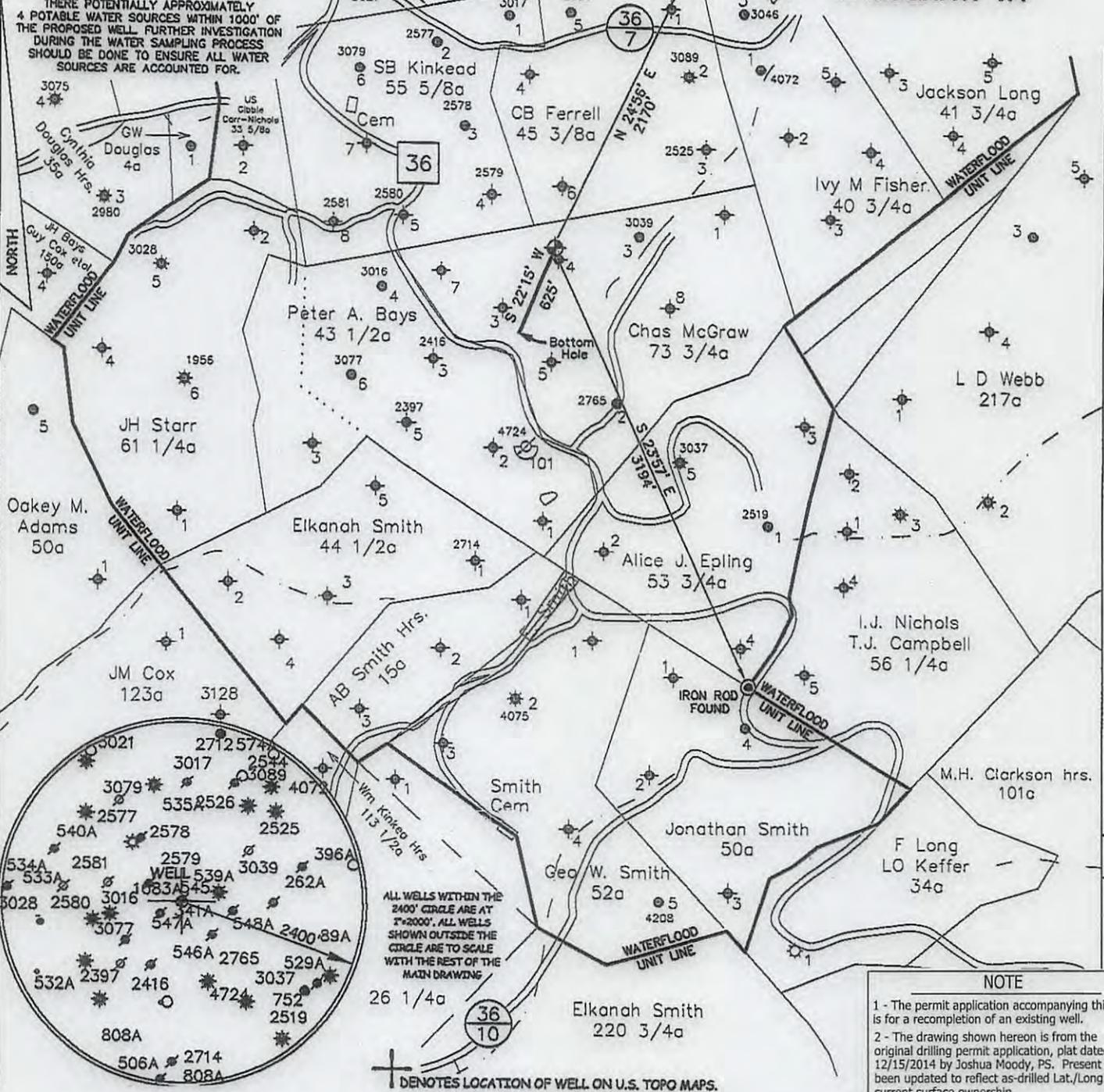
Surface N-4,285,136m.  
E-475,573m.

Bottom Hole N-4,284,960m.  
E-475,501m.

**LOCATION REFERENCES**

**MAGNETIC BEARING**  
S 76° W 124.7' 15" RED OAK  
S 06° E 81.2' PLUG WELL CM #4

**MAP OF H.G. ENERGY, LLC -WATERFLOOD UNIT- C. MCGRAW 114**



ALL WELLS WITHIN THE 2400' CIRCLE ARE AT 1"=2000'. ALL WELLS SHOWN OUTSIDE THE CIRCLE ARE TO SCALE WITH THE REST OF THE MAIN DRAWING

⊕ DENOTES LOCATION OF WELL ON U.S. TOPO MAPS.

**NOTE**

1 - The permit application accompanying this plat is for a recompletion of an existing well.

2 - The drawing shown hereon is from the original drilling permit application, plat dated 12/15/2014 by Joshua Moody, PS. Present plat has been updated to reflect as-drilled Lat./Long. and current surface ownership.

FILE NO. \_\_\_\_\_

SCALE 1" = 1000'

MINIMUM DEGREE OF ACCURACY \_\_\_\_\_

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 ENVIRONMENTAL PROTECTION.

(SIGNED) *[Signature]*  
TIMOTHY P. ROUSH PS 793



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



DATE April 23, 2018

FARM Charles McGraw No.114

API WELL NO. 47 - 087 - 04759 W

WELL TYPE: OIL \_\_\_ GAS \_\_\_ LIQUID INJECTION  WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION \_\_\_ STORAGE \_\_\_ DEEP \_\_\_ SHALLOW \_\_\_

LOCATION: ELEVATION 1,111' WATERSHED Rush Run

DISTRICT Smithfield COUNTY Roane

QUADRANGLE Looneyville 7.5'

SURFACE OWNER Richard W. Fisher, et al. ACREAGE 40 Ac.

OIL & GAS ROYALTY OWNER George W. Carr, et al. LEASE ACREAGE 75 Ac.

LEASE NO. \_\_\_\_\_

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

07/13/2018

PLUG AND ABANDON \_\_\_ CLEAN OUT AND REPLUG \_\_\_

TARGET FORMATION Big Injun ESTIMATED DEPTH 2,480' MD

WELL OPERATOR HG Energy LLC. DESIGNATED AGENT Diane White

ADDRESS 5260 DuPont Road ADDRESS 5260 DuPont Road

Parkersburg, WV 26101 Parkersburg, WV 26101