



west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

September 05, 2014

WELL WORK PERMIT

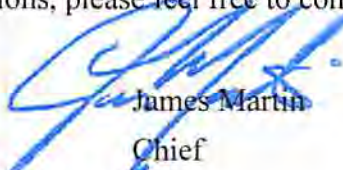
Horizontal 6A Well

This permit, API Well Number: 47-10303027, issued to HG ENERGY, LLC, 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 all 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 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.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-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) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: MA MILLER 406 N-5H
Farm Name: DULANEY, DALE K.

API Well Number: 47-10303027

Permit Type: Horizontal 6A Well

Date Issued: 09/05/2014

Promoting a healthy environment.

09/05/2014

PERMIT CONDITIONS

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

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. 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.

WW-6B
(9/13)

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

1) Well Operator: HG Energy, LLC 494497948 Wetzel Grant Big Run 7.5'
Operator ID County District Quadrangle

103 4 254

2) Operator's Well Number: MA Miller 406 N-5H Well Pad Name: MA Miller 406

3) Farm Name/Surface Owner: MA Miller Public Road Access: SLS 58

4) Elevation, current ground: 1385' Elevation, proposed post-construction: 1369'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No No

DMH
6-3-14

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus, Approximate TVD 7230 feet, approximate thickness 50 feet, associated pressure gradient @ 1.1 psi/foot

8) Proposed Total Vertical Depth: 7230 TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14387 TMD

11) Proposed Horizontal Leg Length: 5513'

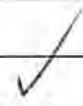
12) Approximate Fresh Water Strata Depths: 115

13) Method to Determine Fresh Water Depths: Based on drilling history in nearby wells

14) Approximate Saltwater Depths: 2175

15) Approximate Coal Seam Depths: 1265

16) Approximate Depth to Possible Void (coal mine, karst, other): NA



17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

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

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Office of Oil and Gas
WV Dept. of Environmental Protection

WW-6B
(9/13)

18)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor					60'	60'	NA (Drilled in)
Fresh Water					1319'	1319'	1400, CTS
Coal							
Intermediate					3500'	3500'	1550, CTS
Production					14387'	14387'	4225
Tubing					NA	8000'	NA
Liners							

*DMH
6-3-14*

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	20"	0.375"	1530#	NA	NA (Drilled in)
Fresh Water	13 3/8"	17 1/2"	0.38"	2740#	Class A	1.21
Coal	NA					
Intermediate	9 5/8"	12 1/4"	0.395"	3950#	Gas Block - Class A	Tail - 1.18 Lead - 1.29
Production	5 1/2"	8 1/2"	0.361"	12640#	50/50 - ASC	Tail - 1.5 Lead - 1.31
Tubing	2 3/8"	4.778"	0.19"	11200#	NA	NA
Liners						

PACKERS

Kind:				
Sizes:				
Depths Set:				

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WV Dept. of Environmental Protection

WW-6B
(9/13)

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

Drill, case, cement and complete a horizontal Marcellus well.

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

Plan to hydraulically fracture/stimulate the well with "slickwater" frac technique. Will utilize a plug and perforation technique through cased hole.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 10.62

22) Area to be disturbed for well pad only, less access road (acres): 4.39

23) Describe centralizer placement for each casing string:

Conductor: NA
Surface: Centralizer every 3 joints or 120'
Intermediate: Centralizer every 3 joints or 120'
Production Centralizer Program: Run 1 spiral centralizer every 120'

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

Conductor: NA - Drilled in (Casing while drilling, no annulus)
Surface: Premium NE-1 (Class A Cement) (see attachment for complete description)
Intermediate: Lead: Class A Cement / Tail: Class A Cement (see attachment for complete description)
Production: Lead: Class A (50/50) / Tail: Class A (ASC) (see attachment for complete description)

25) Proposed borehole conditioning procedures:

The wellbore will be properly circulated at TD of each section until as much of the residual drill cuttings have been removed from the wellbore as possible, residual drilling gas has been circulated out and until the mud and wellbore are both constant and stable. Mud properties will be adjusted if needed. Hole cleaning times may vary from well to well, hole section to hole section.

Reviewed
AUG 5 2014

*Note: Attach additional sheets as needed.

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6-3-14

103-03027

Cement Additives for WW-6B

Conductor: N/A – Drilled in / Sanded in (Casing While Drilling, no annulus)

Surface Casing:

Premium NE – 1 (Class A Cement) + 3% bwoc calcium Chloride + 0.75 gals/100 sack FP-12L (ANTI-FOAM) + 0.25 Lbs/sack Cello Flake (Lost Circulation Material)

Intermediate Casing:

Lead:

Type 1 Cement + 0.75 gals/100 sack FP (ANTI-FOAM) 12L + 0.25 lbs/sack Cello Flake (Lost Circulation)

Tail: Gas-Blok Blend

Premium NE-1 (Class A Cement) + 0.55% bwoc BA-10A (Bonding Agent) + 1% bwoc EC-1 (Bonding Agent) + 0.5% bwoc Sodium Metasilicate (Viscosifier) + 0.25 lbs/sack Cello Flake (Lost Circulation) + 0.75 gals/100 sack FP-12L (Anti-Foam)

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Wy Dept of Environmental Protection

DWH
6-3-14

Production:

Lead #1

(50:50) Poz (Fly Ash): Premium NE – 1 (Class A Cement) + 0.25% bwoc R-3 (Retarder) + 1% bwoc EC-1 (Bonding Agent) + 0.75 gals/100 0.25% bwoc R-3 (Retarder) + 1% bwoc EC-1 (Bonding Agent) + 0.75 gals/100 sack FP-12L (Anti-Foam) + 0.125 lbs/sack Cello Flake (Lost Circulation) + 0.5% bwoc MPA-170 (Multi Purpose Additive), ie Fluid Loss, Free Water and Stabilization

Lead #2

676 sacks (50:50) Poz (Fly Ash): Premium NE-1 (Class A Cement) + 0.125 lbs/sack Cello Flake (Lost Circulation) + 0.3% bwoc CD-32 (Dispersant) + 0.4% bwoc BA-59 (Bonding Agent) + 0.5% bwoc MPA-170 (Multi Purpose Additive), sack + 7.5 lbs/sack BA-90 (Bonding Agent) + 0.3% bwoc R-3 (Retarder) + 0.75 gals/100 sack FP-12L (Anti-Foam)

Lead #3

Premium NE-1 (Class A Cement) + 0.5% bwoc R-3 (Retarder) + 0.75 gals/100 sack FP-12L (Anti-foam) + 0.125 lbs/sack Cello Flake (Lost Circulation) + 0.25% bwoc CD-32 (Dispersant) + 0.6% bwoc Sodium Metasilicate (Viscosifier) + 1.2% bwoc BA-10A (Bonding Agent) + 10 lbs/sack ASCA-1 (Solubility Aid).

09/05/2014

WELL: M.A. Miller 406 N - 5H

Horizontal Marcellus Casing Schematic

DRAWING NOT TO SCALE

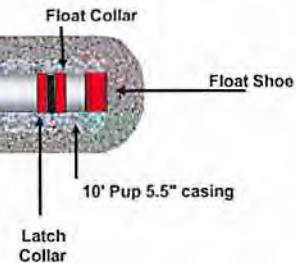


DMZ
6-3-14

Production Centralizer Program

Run 1 spiral centralizer every 120' from the 1st 5.5" long joint to the top of the curve.
Run 1 spiral centralizer every 200' from the top of the curve to surface.

Production Casing: Approx. 14,387' of 5-1/2" 20# P-110 Production



WV Dept. of Environmental Protection
Office of Oil and Gas

AUG 5 2014

103-03027

WW-9
(9/13)

API Number 47 - 103 - 03027
Operator's Well No. MA Miller 406 N-5H

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) North Fork Fishing Creek Quadrangle Big Run 7.5'

Elevation 1369' County Wetzel District Grant

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

Will a pit be used? Yes No

If so, please describe anticipated pit waste: _____

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

Proposed Disposal Method For Treated Pit Wastes:

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

*DMH
6-3-14*

Will closed loop system be used? If so, describe: Cuttings and fluids will be collected in a closed loop system, re-used or hauled to an approved disposal site or landfill.

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

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

Additives to be used in drilling medium? Water, soap, KCl, barite

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

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

-Landfill or offsite name/permit number? Wetzel County Landfill (Permit # 1110222-WV52)

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 AUG 5 2014

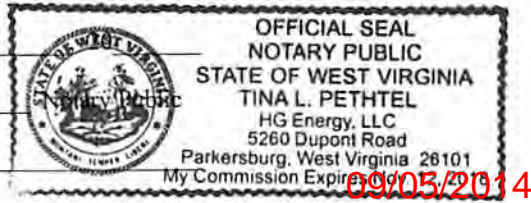
Company Official (Typed Name) Diane White

Company Official Title Accountant

Office of Oil and Gas
WV Dept. of Environmental Protection

Subscribed and sworn before me this 21 day of July 2014

My commission expires Nov 12, 2018



103-03027

Form WW-9

Operator's Well No. MA Miller 406 N-5H

HG Energy, LLC

Proposed Revegetation Treatment: Acres Disturbed 10.62 Prevegetation pH _____

Lime 2 Tons/acre or to correct to pH 6.5

Fertilizer type 10/20/20

Fertilizer amount 500 lbs/acre

Mulch 2 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type lbs/acre
Tall Fescue 40

Ladino Clover 5

Seed Type lbs/acre
Tall Fescue 40

Ladino Clover 5

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: [Signature]

Comments: _____

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AUG 5 2014

Title: Oil + Gas Inspector

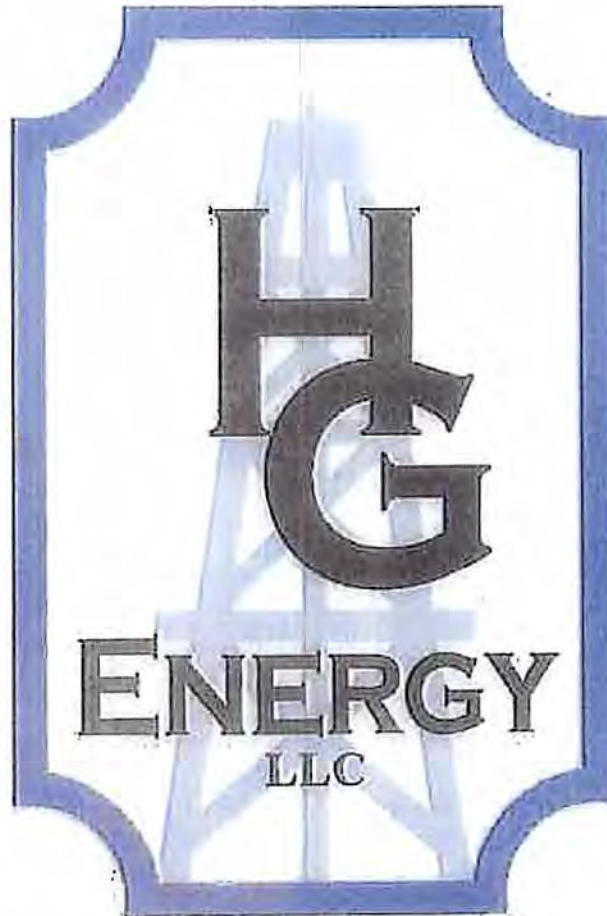
Date: 6-3-14

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Field Reviewed? Yes No

09/05/2014

406 Site Safety Plan



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Office of Oil and Gas
WV Dept. of Environmental Protection

The Following includes a Well Drilling Procedures and Site Safety Plan submitted by:

Name: Matthew J. McGuire Date: _____

Title: HSE Manager, HG Energy, LLC.

WV DEP Approval by: [Signature] Date: 3-12-14

Title: Oil & Gas Inspector, West Virginia DEP

RECEIVED
Office of Oil and Gas
West Virginia DEP
MAR 21 2014

HG Energy: Site Safety Plan

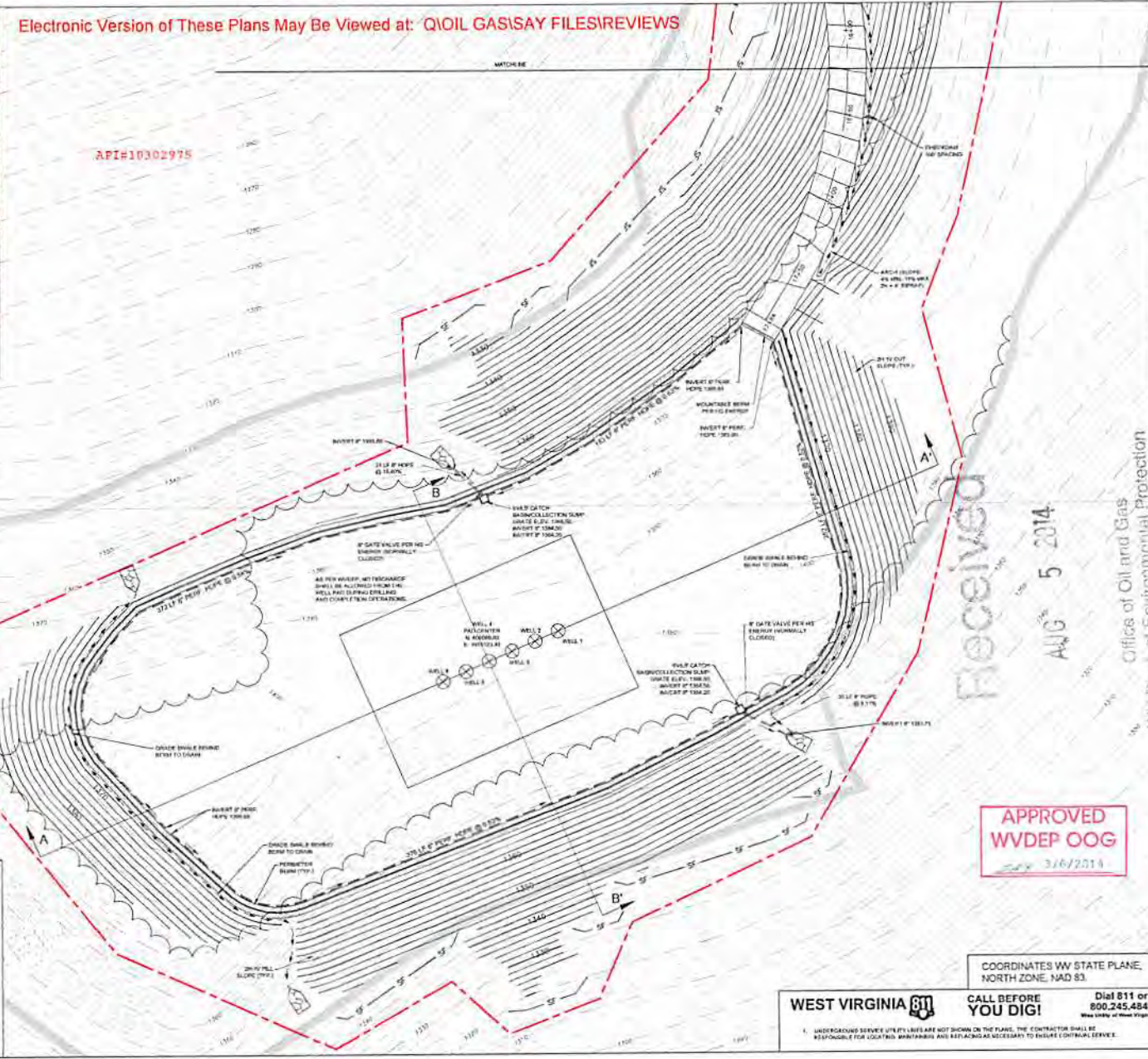
WV Department of
Environmental Protection
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09/05/2014

103-03027

Electronic Version of These Plans May Be Viewed at: QIOIL GASISAY FILES/REVIEWS

API#10302975



SHEET SET LIST	
SHT. NO.	DESCRIPTION
1-3	SITE DEVELOPMENT PLAN
4	WELL PAD CROSS SECTIONS
5	ACCESS ROAD PROFILES
6	ACCESS ROAD SECTIONS
7	CONSTRUCTION NOTES
8-11	CONSTRUCTION DETAILS
12-15	SURVEY POINT PLANS
16	SITE RECLAMATION PLAN

LEGEND	
	EROSION CONTROL
	COLLECTION CHANNEL
	SUPER SALT FENCE
	APPROXIMATE LIMITS OF DISTURBANCE
	APPROXIMATE PROPERTY LINE
	LIMIT OF SURVEYED SITE TOPOGRAPHY

- GENERAL NOTES:
1. REFER TO THE SHEET WITH THE CONSTRUCTION NOTES AND DETAILS.
 2. SITE TO BE CONSTRUCTED IN ACCORDANCE WITH WEST VIRGINIA PERMIT REGULATIONS REQUIRED TO CONSTRUCT SITE INCLUDING BUT NOT LIMITED TO FEDERAL, STATE AND LOCAL REGULATIONS.
 3. A GEOTECHNICAL OR SOIL STABILITY ANALYSIS HAS BEEN PERFORMED FOR THIS SITE. CONTRACTOR IS RESPONSIBLE TO CONSTRUCT CONSTRUCTION PRACTICES BASED ON FIELD CONDITIONS TO PREVENT SLURRIES FOR FULL PROTECTION ON STEEP SLOPES.
 4. ESTABLISH EROSION AND SEDIMENTATION CONTROL BARRIERS PRIOR TO CONSTRUCTION.
 5. REMOVE AND STOCKPILE AVAILABLE TOPSOIL FROM WITHIN THE LIMIT OF DISTURBANCE.
 6. ALL EROSION CONTROL STRUCTURES SHALL BE CONSTRUCTED TO A MINIMUM OF 18 INCH UNLESS NOTED OTHERWISE.
 7. ALL MATERIALS SHALL BE PLACED IN LAYERS OVER THE LENGTH OF THE FULL THICKNESS OF THE SOIL SHALL BE AS THIN AS THE DISTURBED UNDERLYING MATERIAL WILL PERMIT. TYPICALLY 8-12 INCHES THICK. THE SIZE OF ROCK LIFTS SHALL NOT EXCEED 8 INCHES. THE ROCK SHALL NOT BE GREATER IN ANY DIMENSION THAN 25 ROCKS. CONSTRUCTION SHALL BE OBTAINED WITH COMPACTATION TO VISIBLE NON-MOVEMENT OF THE UNDERLYING MATERIAL. CONSTRUCTION SHALL NOT BECEASE UNTIL THE MATERIAL IS FULLY SETTLED. EACH LIFT SHALL BE COMPACTED TO A STANDARD PROCTOR DENSITY OF AT LEAST 90% BEFORE BEGINNING THE NEXT LIFT. QC TESTING SHALL BE PERFORMED AT A RATE OF 3 TESTS/ACTIVITY.
 8. THE CATCH BASIN/SEDIMENT TRAP SHALL BE A PIPE G BUILT STRUCTURE AS SHOWN IN THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DESIGN OF HIGHWAYS - STREAMS - DETAIL - STANDARD SHEET 200-2 OF EQUIVALENT.
 9. THE BEST MANAGEMENT PRACTICE SHALL BE SMOOTH WELLS & SOIL STABILIZATION MATS. THE MATS SHALL HAVE A MINIMUM OF 18 INCH OF SOIL COVER. SOIL PROTECTION SHALL BE USED TO PREVENT EROSION FROM THE DISTURBANCE.
 10. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED IN PLACE UNTIL VEGETATION IS ESTABLISHED AND THE VEGETATION GROUND COVER HAS ACHIEVED A MINIMUM OF 70% COVER. ANY AREAS NOT MEETING A 70% VEGETATION COVER SHALL BE REVEGETATED AND MAINTAINED WITHIN 24 HOURS OF DETECTION.
 11. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED IN PLACE UNTIL VEGETATION IS ESTABLISHED AND THE VEGETATION GROUND COVER HAS ACHIEVED A MINIMUM OF 70% COVER. ANY AREAS NOT MEETING A 70% VEGETATION COVER SHALL BE REVEGETATED AND MAINTAINED WITHIN 24 HOURS OF DETECTION.
 12. SECONDARY CONTAINMENT WILL BE PROVIDED DURING DRILLING OPERATIONS. A LEAK AND SPILL CONTROL WITH BURN WILL BE INSTALLED PRIOR TO DRILLING AND MAINTAINED THROUGHOUT THE PROJECT. IT SHALL BE MAINTAINED THROUGHOUT THE PROJECT AND BE RELOCATED AS NECESSARY IN ACCORDANCE WITH ANY REGULATIONS.

REVISION DATE DESCRIPTION

1	02/24/2014	GENERAL COMMENTS PER WVDP
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APPROVED WVDEP OOG 3/6/2014

SITE CONSTRUCTION PLAN WITH EROSION AND SEDIMENTATION CONTROLS
WELL UNIT 406/407
WELLYALE DISTRICT
WETZEL COUNTY, WEST VIRGINIA

PREPARED FOR
HC ENERGY
VIENNA, WEST VIRGINIA

APPROVED BY: 08/15/2013
CHECKED: WVP 08/26/2013
DRAWN: WVP 08/26/2013
PROJECT NO.: 406-304227

ISSUING NUMBER
PAD04827-01
SHEET 1

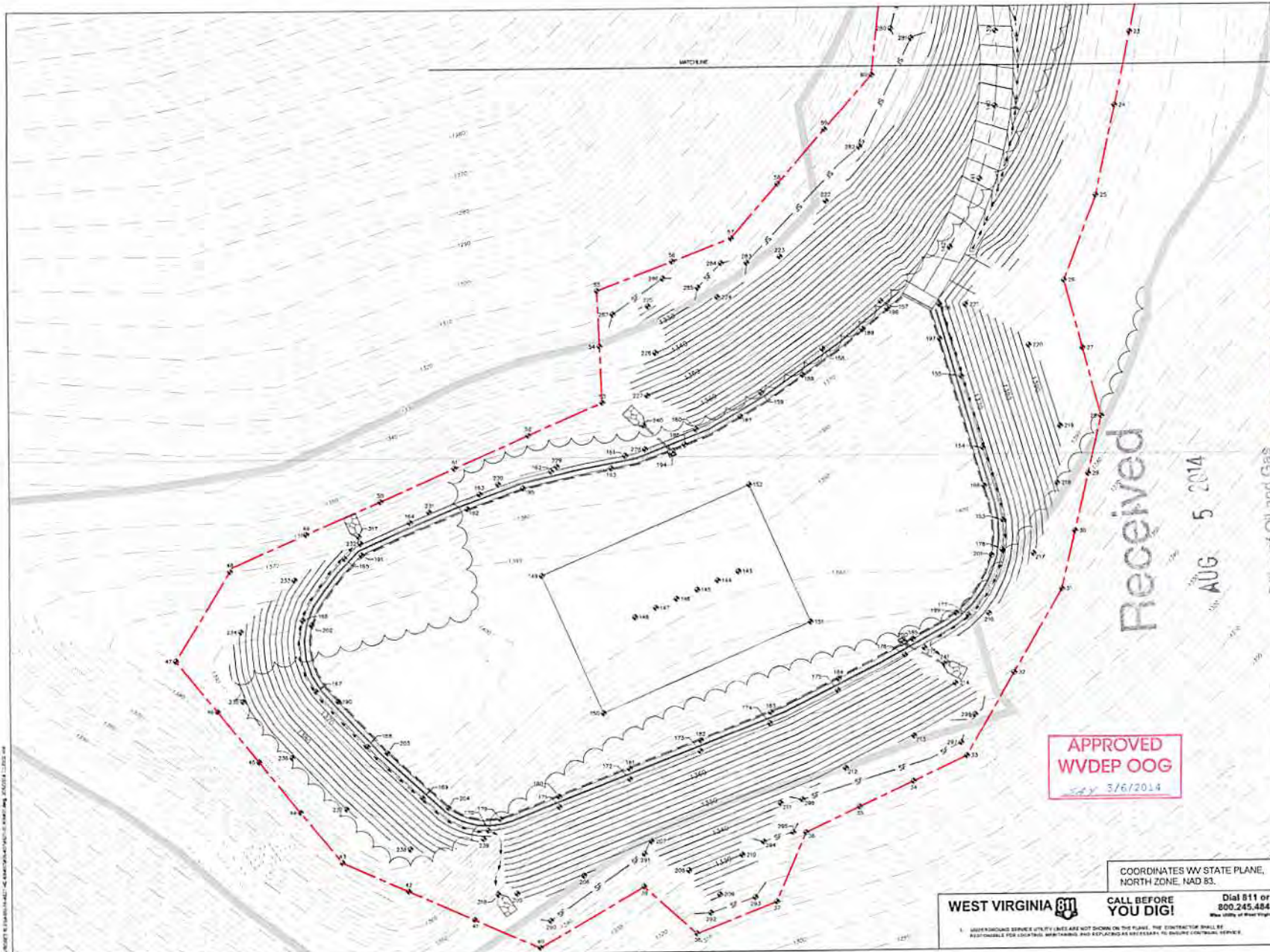
100 RYAN COURT, WETZEL, WV 26062
410-723-1222

- CONSTRUCTION SEQUENCE:
1. PRIOR TO COMMENCEMENT OF ANY EARTH DISTURBANCE ACTIVITY, INCLUDING CLEARING AND GRADING, THE CONTRACTOR SHALL CONTACT MISS SILENTIA OF WEST VIRGINIA (811) A MINIMUM OF 3 DAYS PRIOR TO COMMENCING WORK. THE RECIPIENT ALSO MUST CLEARLY DEMARK SENSITIVE AREAS, BURIED UTILITY LOCATIONS, AND OTHER AREAS OF CONCERN WITHIN THE PROJECT SITE, AND SHALL INSTALL APPROPRIATE BARRIERS. THESE BARRIERS MAY NOT BE PLACED IN AREAS DESIGNATED FOR EQUIPMENT OR OTHER USE AT THE SITE INCLUDING PARKING AND STOCKPILES.
 2. SITE ACCESS - THIS IS THE FIRST EARTH DISTURBANCE ACTIVITY TO TAKE PLACE AT THE SITE AND SHOULD PROVIDE IMPROVED ACCESS TO ALL AREAS DESIGNATED FOR EQUIPMENT OR OTHER USE AT THE SITE INCLUDING PARKING AND STOCKPILES.
 3. SEDIMENT BARRIERS - INSTALL PERIMETER BARRIERS AFTER THE DRILLING SITE IS APPROXIMATELY 50% UNDISTURBED. CLEARING AND GRADING LIMITED TO ONLY THAT WHICH IS REQUIRED FOR NEARBY PERIMETER BARRIERS.
 4. LAND CLEARING AND GRADING - IMPLEMENT CLEARING AND GRADING ONLY AFTER ALL CONTOURS ARE SHOWN AND BEEN CONSULTED AND STABILIZED.
 5. SOIL STABILIZATION - APPLY VEGETATION OR PERMANENT STABILIZATION MEASURES IMMEDIATELY TO ANY DISTURBED AREAS WHERE WORK HAS REACHED FINAL GRADE, HAS BEEN DELAYED OR OTHERWISE TEMPORARILY SUSPENDED.
 6. WORK COMPLETION OF PAD SOIL ELEMENT.

WEST VIRGINIA CALL BEFORE YOU DIG! Dial 811 or 800.245.4848

1. UNDERGROUND SERVICES UTILITIES ARE NOT SHOWN ON THE PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING MAINTAINING AND REPAIRING AS NECESSARY TO ENSURE CONTINUAL SERVICE.

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Office of Oil and Gas
West Virginia Department of Environmental Protection



- LEGEND**
- R/W EAP ARROW
 - COLLECTION CHANNEL
 - SILVER SILT FENCE
 - APPROXIMATE LIMITS OF DISTURBANCE
 - APPROXIMATE PROPERTY LINE
 - LIMIT OF SURVEYED SITE TOPOGRAPHY



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 AUG 5 2014

APPROVED
 WVDEP OOG
 3/6/2014

Office of Oil and Gas
 Office of Environmental Protection

- REFERENCE**
1. SITE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC ON FEBRUARY 23, 2013 AND FROM UNCS SURVEY (1977) FIELDS 151 AND 152
 2. LEADDEPT OWNED BY OTHERS FOR HG ENERGY, LLC

1. 02/24/2014 GENERAL COMMENTS PER WVDEP

GRAPHIC SCALE: 1" = 100'

SURVEY POINT PLAN
 WELL UNIT 406/407
 WETZEL COUNTY, WEST VIRGINIA
 PREPARED FOR
 HG ENERGY
 VIENNA, WEST VIRGINIA

COORDINATES WV STATE PLANE,
 NORTH ZONE, NAD 83.

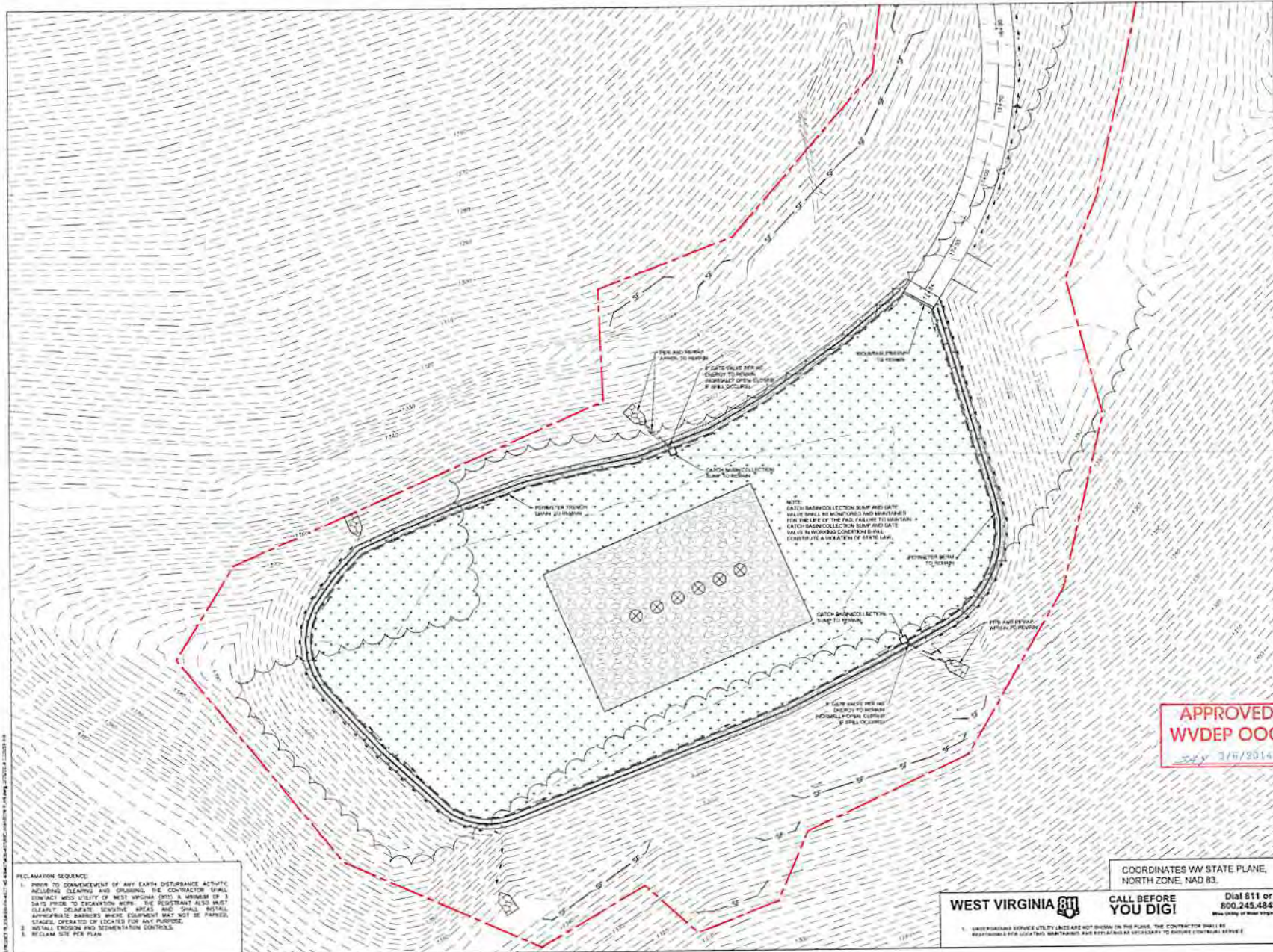
WEST VIRGINIA **CALL BEFORE YOU DIG!** Dial 811 or 800.245.4848
When Utility of West Virginia

APPROVED BY: 08/18/2013
 CHECKED: WEP 08/29/2013
 DRAWN: WEP 08/29/2013
 PROJECT NO.: 4000-304827

Penn E&R
 Environmental & Production, Inc.
 100 RYAN COURT, PITTSBURGH, PA 15205
 412-722-1222

DRAWING NUMBER
 PAD04827-01
 SHEET 17

15:00:00 10/10/2013 10:00:00 AM



- LEGEND**
- BREAK APRON
 - COLLECTION CHANNEL
 - REINFORCED SILT FENCE
 - APPROXIMATE LIMITS OF DISTURBANCE
 - APPROXIMATE PROPERTY LINE
 - RECLAIMED AREA
 - GRAVEL AREA TO REMAIN

- GENERAL NOTES**
1. RECLAMATION (SOIL PREPARATION, SEED AND MULCH) WILL OCCUR ONLY IN AREAS THAT ARE NOT UTILIZED DURING PRODUCTION OPERATIONS.
 2. FILL PLACEMENT DURING RECLAMATION, USE A MINIMUM LIFT THICKNESS OF 24-INCHES AND A MINIMUM COMPACTION TO 90% OF THE STANDARD PROCTOR DENSITY (ASTM D-1556).

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AUG 5 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

DESIGNED BY: [Signature] DATE: 08/12/2014
 CHECKED BY: [Signature] DATE: 08/12/2014
 APPROVED BY: [Signature] DATE: 08/12/2014

REVISION	DATE	DESCRIPTION
1	08/12/2014	GENERAL COMMENTS PER REVIEW

GRAPHIC SCALE: 1" = 100'

APPROVED WVDEP OOG
3/5/2014

STATE OF WEST VIRGINIA
17881

SITE RECLAMATION PLAN
 WELL UNIT 406/407
 WETZEL COUNTY DISTRICT
 WETZEL COUNTY, WEST VIRGINIA

PREPARED FOR
 HC ENERGY
 VIENNA, WEST VIRGINIA

APPROVED BY: 08/12/2014
 CHECKED BY: 08/12/2014
 DRAWING NUMBER: PA00-4827-01
 SHEET 16

Penn E&R
 Environmental Remediation, Inc.
 100 Ryan Court, Pittsburgh, PA 15205
 412-722-1222

- RECLAMATION SEQUENCE:**
1. PRIOR TO COMMENCEMENT OF ANY EARTH DISTURBANCE ACTIVITY INCLUDING CLEARING AND GRUBBING, THE CONTRACTOR SHALL CONTACT AND NOTIFY OF WEST VIRGINIA (WV) A MEMBER OF A STATE POLICE TO ESCORTATION WORK. THE RESIDENT ALSO MUST CLEARLY DELINEATE, SIGNIFY, MARK, AND INSTALL APPROPRIATE BARRIERS WHERE EQUIPMENT MAY NOT BE PARKED, STAGED, OPERATED OR LOCATED FOR ANY PURPOSE.
 2. INSTALL EROSION AND SEDIMENTATION CONTROLS.
 3. RECLAIM SITE PER PLAN.

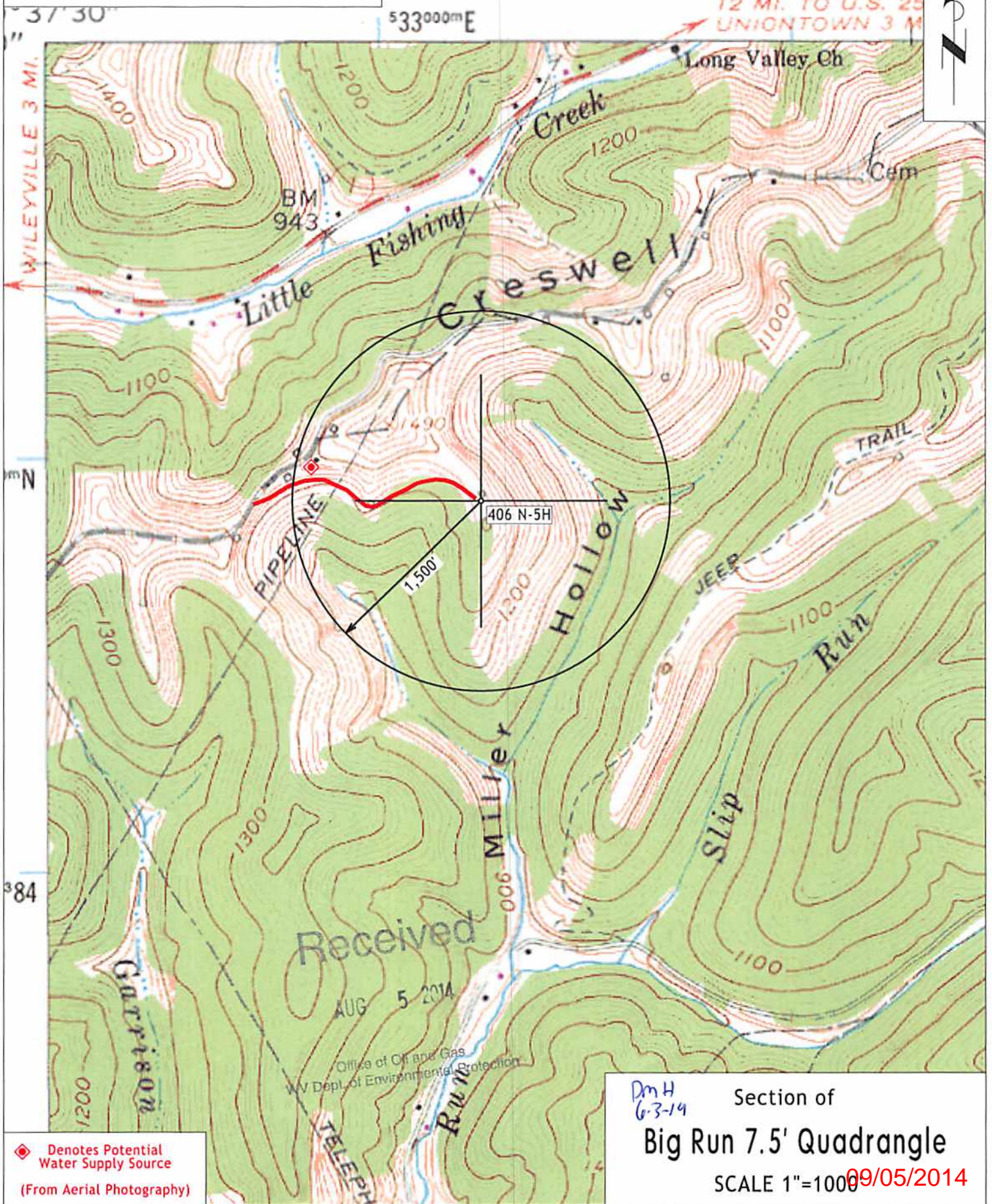
COORDINATES WV STATE PLANE,
 NORTH ZONE, NAD 83.

WEST VIRGINIA 811 CALL BEFORE YOU DIGI Dial 811 or 800.245.4848
 West Utility of West Virginia

1. UNDERGROUND SERVICE UTILITY LINES ARE NOT SHOWN ON THIS PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, MARKING, AND VERIFYING AS NECESSARY TO AVOID COLLISION SERVICE.

SUBJECT WELL
Mary A. Miller 406 N-5H

OF THE INTERIOR AL SURVEY



BOTTOM HOLE: LON: -80°37'10.8"

LON: -80°36'45.3"

8245

LON: 80°35'00"

LAT: 39°36'53.9"

BOTTOM HOLE: LAT: 39°37'52.3"

SURVEY NOTES

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 1927).

2 - Surface owners & adjoiner information obtained from Wetzel Co. Assessor's Office. Lease names & line mapping provided by HGE GIS system. Ends of unit lines mapped by MLS lic & HGE. (Zone 17 North - NAD 1927).

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

UTM Coordinates
(Zone 17N-NAD 1983)

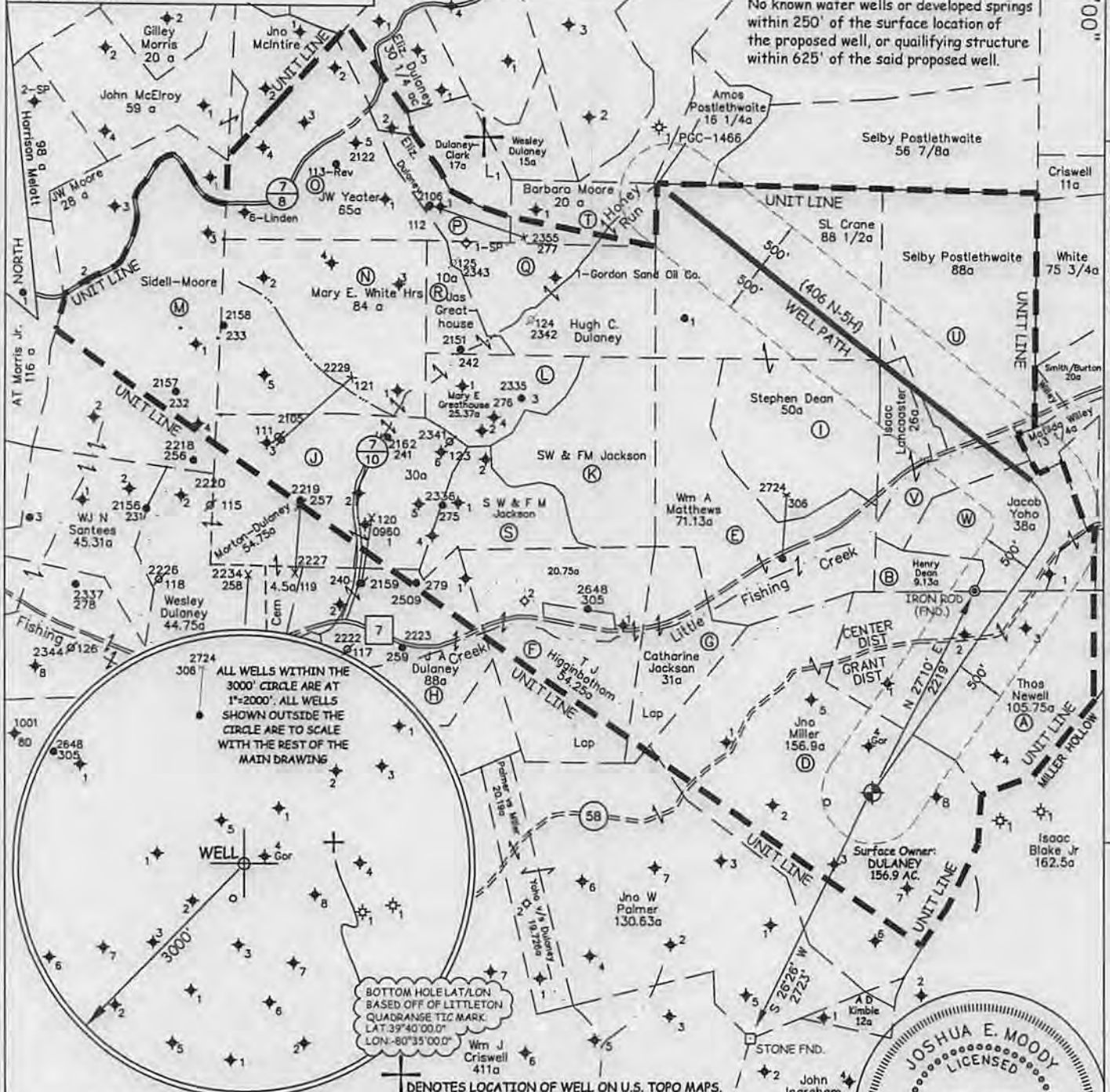
Surface N-4,385,106m.
E-533,270m.

Bottom Hole N-4,386,903m.
E-532,655m.

NAD83
LOCATION REFERENCES
N 41°24' W 559' 5/8" REBAR
S 21°03' E 175' SPIKE

LAT: 39°37'30"
**REVISED MAP OF
H.G. ENERGY, LLC
-MILLER 406 UNIT-**

No known water wells or developed springs within 250' of the surface location of the proposed well, or qualifying structure within 625' of the said proposed well.



JOB # 13-001
DRAWING # 13HG405B 406B
SCALE 1" = 1500'

MINIMUM DEGREE OF ACCURACY 1/200'
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

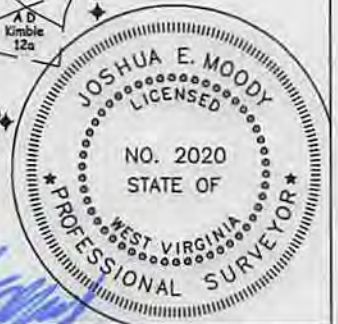
WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS

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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

MOODY LAND SURVEYING, LLC
ST. MARYS, WV 26170



JOSHUA E. MOODY, P.S. 2020

DATE 5/07/14
OPERATOR'S WELL # 406 N-5H

WELL TYPE: OIL GAS LIQUID INJECTION ___ WASTE DISPOSAL ___ HORIZONTAL
(IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
LOCATION: ELEVATION 1369' WATERSHED NORTH FOR, FISHING CREEK API WELL # HGEA
DISTRICT GRANT COUNTY WETZEL 47 - 103 - 03027
QUADRANGLE BIG RUN 7.5' STATE COUNTY PERMIT

SURFACE OWNER DALE K. DULANEY (surface hole) ACREAGE 156.9 AC. +/-
OIL & GAS ROYALTY OWNER ARTHUR MILLER et al LEASE ACREAGE 156.9 AC. +/-
PROPOSED WORK: DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___
OTHER PHYSICAL CHANGE IN WELL (SPECIFY) ___
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD= 7,230' MD= 14,387'
WELL OPERATOR H.G. ENERGY, LLC DESIGNATED AGENT MIKE KIRSCH
ADDRESS 5260 DuPONT ROAD ADDRESS 5260 DuPONT ROAD
PARKERSBURG, WV 26101 PARKERSBURG, WV 26101

09/05/2014