



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

June 13, 2016

WELL WORK PLUGGING PERMIT

Plugging

This permit, API Well Number: 47-7500051, issued to CHESAPEAKE APPALACHIA, L.L.C., 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.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. The above named operator will also file, as required in WV Code 22-6-23, an affidavit on form WR-38 by two experienced persons in the operator's employment and the Oil and Gas inspector that the work authorized under this permit was performed and a description given. Failure to abide by all statutory and regulatory provisions governing all duties and operations here under may result in suspensions or revocation of this permit and in addition may result in civil and/or criminal penalties being imposed upon the operator.

This permit will expire in two (2) years from date of issue. If there are any questions, please free to contact me at (304) 926-0499 ext. 1654.

James Martin

Chief

Operator's Well No: MNF 15

Farm Name: U.S.A.

API Well Number: 47-7500051

Permit Type: Plugging

Date Issued: 06/13/2016

Promoting a healthy environment.

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. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
2. 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.
3. Well work activities shall not constitute a hazard to the safety of persons.
4. This well is under a consent order and must be plugged under the terms of that agreement.

Inspector's Signed Copy

7500051A

FORM WW-4 (B)
Observe
File Copy
(Rev. 2/01)

1) Date: 5/5/2016
2) Operator's Well No. 824478
3) API Well No. 47-075-00051

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil _____ Gas X Liquid injection _____ Waste disposal _____
 (Is Gas, Production X or Underground storage _____) Deep _____ Shallow X

5) Location: Elevation 3,915' Watershed Walderman Run of Poca Run
 District Green Bank County Pocahontas Quadrangle Thornwood, WV 7.5'

6) Well Operator Chesapeake Appalachia, L.L.C. 7) Designated Agent Jessica Greathouse
 Address P.O. Box 18496 Address P.O. Box 6070
Oklahoma City, OK 73154-0496 Charleston, WV 25362

8) Oil and Gas Inspector to be notified Name Danny Mullins
 Address 220 Jackacres Road
Buckhannon, WV 26201

9) Plugging Contractor Name Chesapeake Appalachia, L.L.C.
 Address P.O. Box 18496
Oklahoma City, OK 73154-0496

10) Work Order: The work order for the manner of plugging this well is as follows:

See Attached Sheet

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work Order approved by Inspector Danny Mullins Date 5-16-16

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WV Department of
Environmental Protection

API Number: 47-075-00051Operator's Well Number: 824478**P&A PROCEDURE**

- 1) Prepare road and location, MIRU Service Rig
- 2) Check pressures, blow well down to tank
- 3) If needed, kill well with enough fluid to kill highest pressure plus 25% safety factor
- 4) If needed, install BOP, tag PBTD with tubing (expect approximately 6040'), TOH with tubing
- 5) Remove cage/seating nipple and inspect tubing. If tubing is in suitable condition, use as work string – if not, replace.
- 6) Run W.S. to PBTD (approximately 6040') deeper if possible, spot gel
- 7) Spot 300' cement plug approximately 6040'-5740', pull W.S., WOC
- 8) RIH with tools or tubing to check top of plug. If TOC is below 5765', then add to top of plug
- 9) Pull or run W.S. to 5425', spot gel
- 10) Spot 150' cement plug 5425'-5275', pull W.S. to 4700'
- 11) Spot 125' cement plug 4700'-4575', pull W.S.
- 12) Cut 4.5" casing at free-point (approximately 2960') and pull
- 13) Run W.S. to 2960', spot gel
- 14) Spot 150' cement plug 2960'-2810', pull W.S. to 1450'
- 15) Spot 100' cement plug 1450'-1350', pull W.S. to 1125'
- 16) Spot 150' cement plug 1125'-985', pull W.S., WOC
- 17) RIH with tools or tubing to check top of plug. If TOC is below 1030', then add to top of plug.
- 18) Run or pull W.S. to 265'
- 19) Spot 265' cement plug 265'-surface
- 20) Pull W.S. and top off with cement
- 21) Erect monument and reclaim as prescribed by law

DM

3915' Elevation
 3965 to 3865
 100' cement plug

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 MAY 23 2016
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 Environmental Protection

WR-35

Date: January 5, 2001
API # 47-075-00051

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas
Well Operator's Report of Well Work

ADP

Farm name: US Dept of Interior Operator Well No.: MNF #15

LOCATION: Elevation: 3915.6' Quadrange: Thornwood
District: Greenbank County: Pocahontas
Latitude: 11324' feet South of 38° DEG. 37' MIN. 30" SEC.
Longitude: 7617' feet West of 79° DEG. 37' MIN. 30" SEC.

Company: Cabot Oil & Gas Corporation
900 Lee Street East, Suite 500
Charleston, WV 25301

Agent: John Abshire
Inspector: Craig Duckworth
Permit Issued: 6/15/00
Well Work Commenced: 10/22/00
Well Work Completed: 12/18/00
Verbal Plugging
Permission granted on:
Rotary Cable
Total Depth (feet) 6176' MD / 5986' TVD
Fresh Water Depths (ft) 81', 234'

Casing & Tubing Size	Used in Drilling	Left in Well	Cement Fill up Cu. Ft.
20"	35'	35'	16 sks
13-3/8"	1060'	1060'	795 sks
8-5/8"	2874'		
4-1/2"		6155'	380 sks
4-1/2" CASING SET ON McALLISTER ACP INFLATABLE PACKER SET @ 5785'			
2-3/8"		5908'	

Salt Water Depths (ft) 2597'
Is coal being mined in area (Y / N)?

Coal Depths (ft)
OPEN FLOW DATA
Producing formation

Producing formation	<u>Oriskany</u>	Pay zone depth (ft)	<u>5987' - 6030'</u>
Gas: Initial open flow	<u>2000</u> MCF/d	Oil: Initial open flow	<u>N/A</u> Bbl/d
Final open flow	<u>1404</u> MCF/d	Final open flow	<u>N/A</u> Bbl/d
Time of open flow between initial and final tests	<u>9.5</u> Hours		
Static rock pressure	<u>822</u> psig (surface pressure after	<u>48</u> Hours	

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Permitting
JAN 18 2001
WV Division of
Environmental Protection

Second producing formation		Pay zone depth (ft)	
Gas: Initial open flow	<u></u> MCF/d	Oil: Initial open flow	<u></u> Bbl/d
Final open flow	<u></u> MCF/d	Final open flow	<u></u> Bbl/d
Time of open flow between initial and final tests	<u></u> Hours		
Static rock pressure	<u></u> psig (surface pressure after	<u></u> Hours	

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

For: CABOT OIL & GAS CORPORATION

By: *Roy Prudnick* Operations Manager
Date: 1-17-01

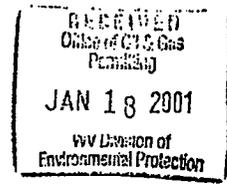
Poca 0051

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7500051 P
 Well 824478
 Page 2 of 2

Loggers constructed perf guns on site. 2.5" x 4 wire shogun strip guns. RIH to perf 6008'-6010', 6015'-6018' and 6026'-6030'. Gun shorted and failed to fire. Attempted to POOH, but gun apparently caught on baffle and fell off line. RIH with CCI only and checked hole to 6050', POOH RIH with second gun, 2.5" x 4 wire shogun (24.5 grams, 0.35 EHD, 33.3" pen) and perforated 5987'-6001' with 5 SPF 71 holes total. POOH. Bottom wires blown off. RIH to check hole. Set down on wires in proposed lower perfs. Spud on wires and drove down hole, POOH. Rebuild #1 gun and RIH. Perf 6008'-6010', 8 holes, 6015'-6018', 10 holes and 6026'-6030', 13 holes with approx. 3 SPF because of lost charges in bottom of hole (48 total @ bottom).
 Break down perfs with KCl water. Perfs broke @ 1996 psi, pumped 40 bbl @ 6.5 BPM, treated @ 1950 psi avg., ISIP: 1800 psi @ 11:00 PM, 5 min ISIP, 870 psi, press dropped to 0 psi and on vacuum in 9.25 min.
 Pumped 50,550# 20/40 sand, concentration 1-3 ppa, ATP 3892#, MTP 4166#, ATR 25 bbl/min., ISIP 3600#, 5 min. 2902#, 10 min. 2280#, 15 min 1955#. Total fluid 923 bbl. RU Allegheny and perf Oriskany (1st) from 5900'-5920', 4 SPF, 81 holes. Dropped frac ball and chased with perf gun. Cross-link gel frac Oriskany (1st). Break down Oriskany with 1500 gal acid (placed during displacement of 1st stage) and 14 bbl treated water. No clear indication of breakdown. ISIP 3100#. Calc bottom hole treating pressure 5600#. Cross link Oriskany (1st) using 28,660# sand, 1-3 ppa. ATP 3850#, MTP 4100#, ATR 24.7 bbl/min., ISIP 2577#, 5 min 2435#, 10 min 2348#, 15 min 2275#. Total fluid 666 bbl.

FORMATION	TOP	BOTTOM	REMARKS
SHALE/SILT	0	3090	FW @ 81', 234' SW @ 2597'
SILTSTONE	3090	3095	
SHALE/SILT	3095	3724	
SILTSTONE	3724	3730	
SHALE/SILT	3730	4187	
SILTSTONE	4187	4195	
SHALE/SILT	4195	4380	
SILTSTONE	4380	4390	
SHALE/SILT	4390	5212	
TULLEY	5212	5242	
UPPER MARCELLUS	5409	5498	
PURCELL	5498	5516	
LOWER MARCELLUR	5516	5573	
ONONDAGA	5573	5657	
HUNTERSVILLE CHERT	5657	5676	
NEEDMORE SHALE	5676	5778	
ORISKANY (BENCH 1)	5778	5863	
ORISKANY (BENCH 2)	5863	5950	
ORISKANY (BENCH 3)	5950	5984	
HELDERBERG	5984	6176	Measured Dpeth



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 Office of Oil and Gas
 MAY 23 2016
 WV Department of
 Environmental Protection

WW4-A
Revised
1/01

1) Date: 5/5/2016
2) Operator's Well No. 824478
3) API Well No. 47-075-00051

STATE OF WEST VIRGINIA - BUREAU OF ENVIRONMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL

1) Surface Owner(s) to be served:
(a) Name U.S. Department of Agriculture
Address U.S. Forest Service/
Mon. National Forest
200 Sycamore Street
Elkins, WV 26241-3962

(b) Name _____
Address _____

(c) Name _____
Address _____

5) Coal Operator
(a) Name None

Coal Owner(s) with Declaration
(b) Name U.S. Department of Interior
Address Bureau of Land Mgmt - Eastern States
626 E. Wisconsin Ave., Suite 200
Milwaukee, WI 53202-4617

Name _____
Address _____

Name _____
Address _____

2) Inspector Danny Mullins
Address 220 Jackacres Road
Buckhannon, WV 26201

Telephone 304-932-6844

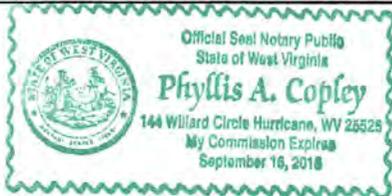
Coal Lessee with Declaration
(c) Name None
Address _____

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

- (1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
- (2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed the Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of the Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.



Well Operator: Chesapeake Appalachia, L.L.C.
By: [Signature]
Its: Manager - Operations, Appalachia South
Address: P.O. Box 18496
Oklahoma City, OK 73154-0496
Telephone: 405-935-4073

Received
Office of Oil & Gas
MAY 09 2016

Subscribed and sworn before me this 5th day of May the year of 2016
Phyllis A. Copley Notary Public

My Commission Expires September 16, 2018
Form WW-9

7500051P

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Office of Oil and Gas

JUN 13 2016

Form WW-9
4/16)

WV Department of
Environmental Protection

API Number 47-075-00051
Operator's Well No. 824478

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLUIDS/CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Chesapeake Appalachia, L.L.C. OP Code 494477557
Watershed (HUC 10) Walderman Run of Poca Run Quadrangle Thornwood, WV 7.5'

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

Description of anticipated Pit Waste: Plugging Returns/Cement

Will a synthetic liner be used in the pit? 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: No pit will be used. Fluid will be collected in steel tanks and hauled for proper disposal)

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

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

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

Additives to be used in drilling medium? _____

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

-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 August 1, 2015, 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 *David Gocke*

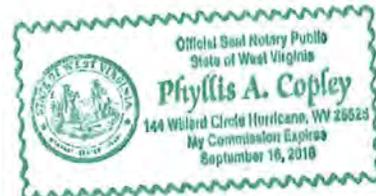
Company Official (Typed Name) David Gocke

Company Official Title Manager - Operations, Appalachia South

Subscribed and sworn before me this 13th day of June, 2016.

Phyllis A. Copley Notary Public.

My Commission Expires September 16, 2018

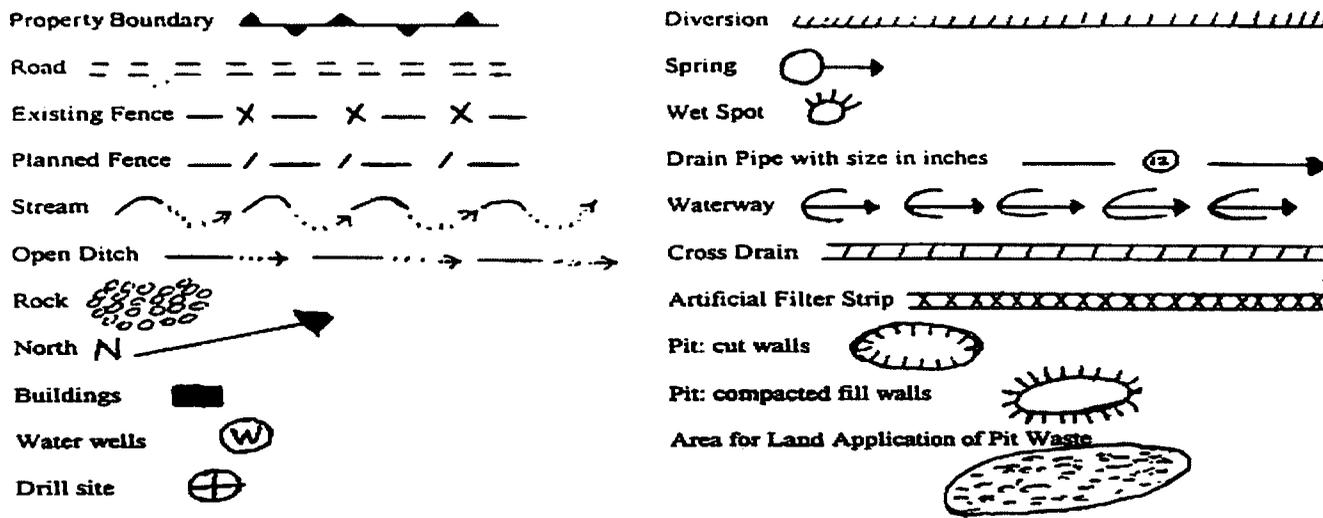


Attachment #1

API #: 47-075-00051

Operator's Well No. 824478

LEGEND



- Timothy - 7 lbs./acre
- Kentucky Bluegrass - 7 lbs./acre
- Winter Wheat (June 15-Nov. 15) or Spring Wheat (Feb. 15-June 15) - 12 lbs./acre
- Annual Rye (June 15-Nov. 15) or Oats (Feb. 15-June 15) - 14 lbs/acre
- Alfalfa (pre inoculated) - 10 lbs./acre
- Durana Clover (pre inoculated) - 3 lbs./acre
- Mammoth Red Clover (pre inoculated) - 5 lbs./acre
- Chicory - 2 lbs./acre

Total Seeding will be 60 lbs./acre

- Mulch - Weed free straw at 1500 lbs./acre
- Fertilizer - 10-20-10 at 500 lbs./acre
- Lime - Agricultural lime or lime pellets at 3 tons/acre

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: _____

Title: _____

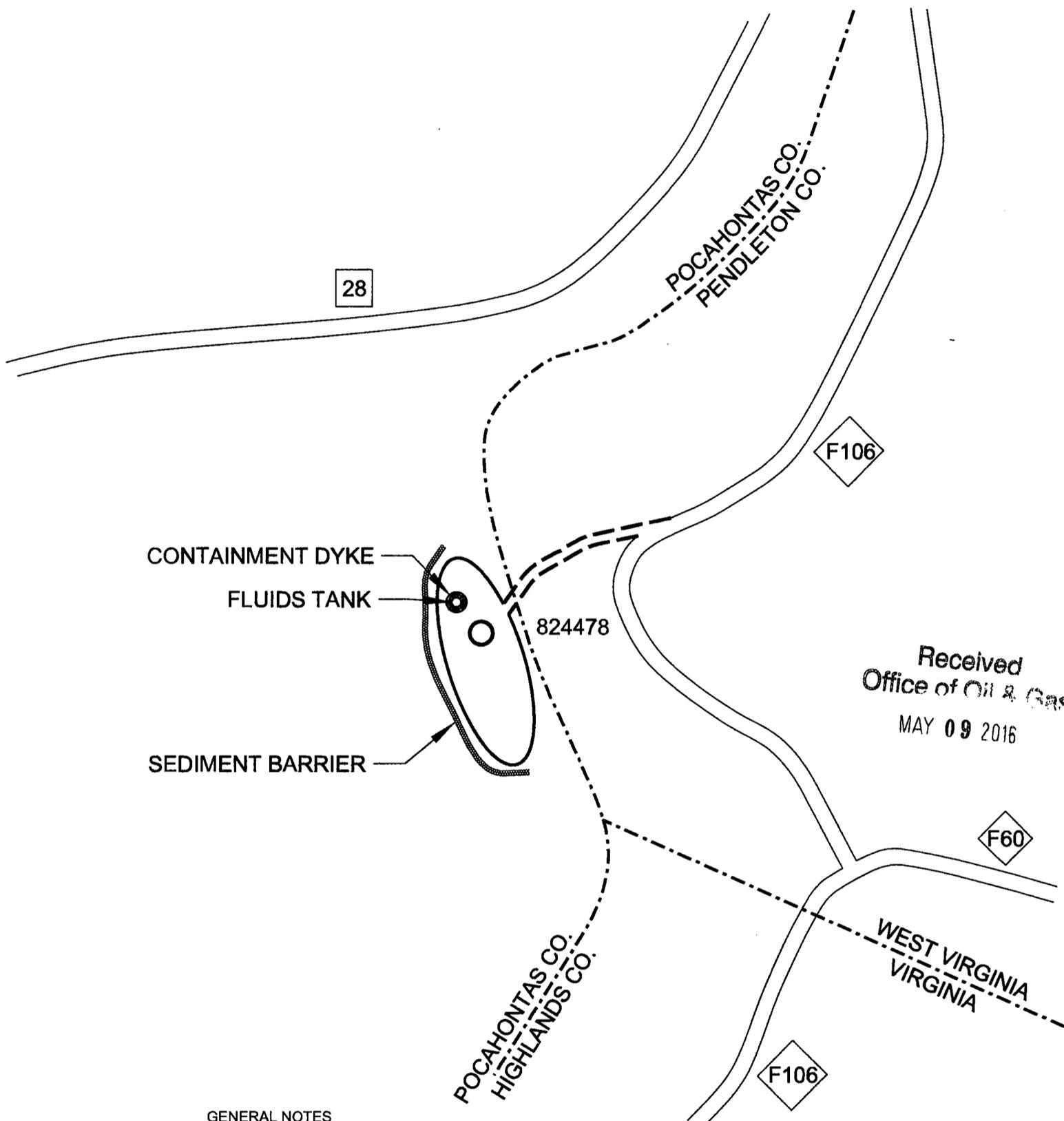
Date: _____

Field Reviewed? () Yes () No

CHESAPEAKE APPALACHIA, L.L.C.

RECLAMATION DIAGRAM
WELL LOCATION 824478

API 47-075-00051



GENERAL NOTES

This drawing is a schematic representation of the well site and access road. Proposed structures such as well site, drilling pit, roadways, culverts, sediment barriers, etc. are shown in approximate pre-planning configurations.

All culvert pipes will be a minimum of 15 inches in diameter. All culvert pipes installed will be accompanied by an entrance sump with dimensions no less than 3 feet (width) x 3 feet (length) x 4 feet (deep). Culverts will be installed at an angle to ensure proper flow. The outfall of culverts will be protected from erosion and sedimentation using large rocks or other sediment controls deemed necessary in the prevention of erosion and sedimentation. Storm water from the ditches to the culverts will be directed to stable natural vegetative areas. Where culverts are not practical, operator will have other sediment control in place to minimize erosion and sedimentation.

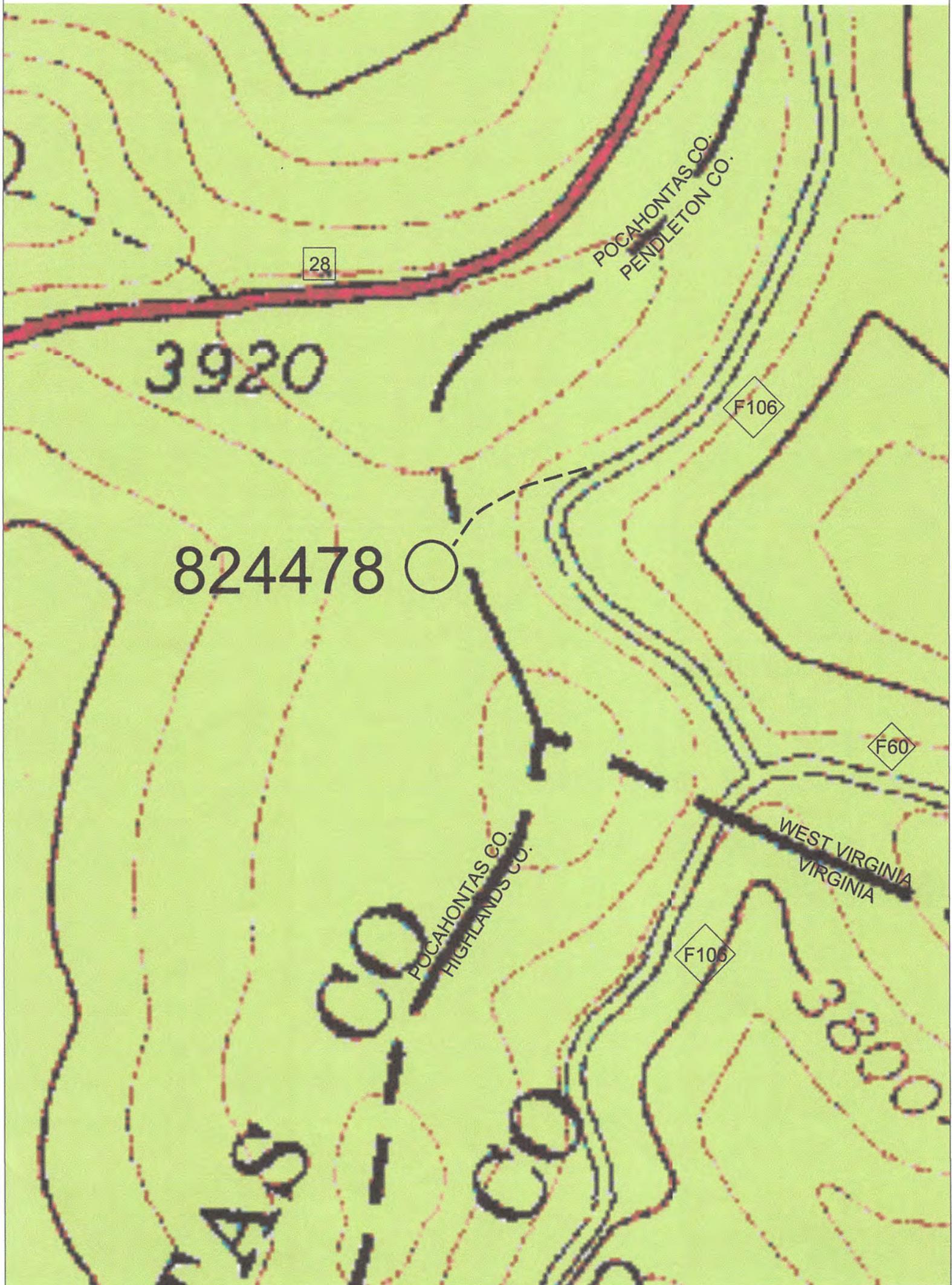
Cross drains, broad based dips, water bars, and diversion ditches, will be employed during the construction phase. These erosion and sediment control structures will be used to control erosion and sedimentation during the construction phase, where applicable, and in areas that will allow. These structures will be considered permanent and used as such.

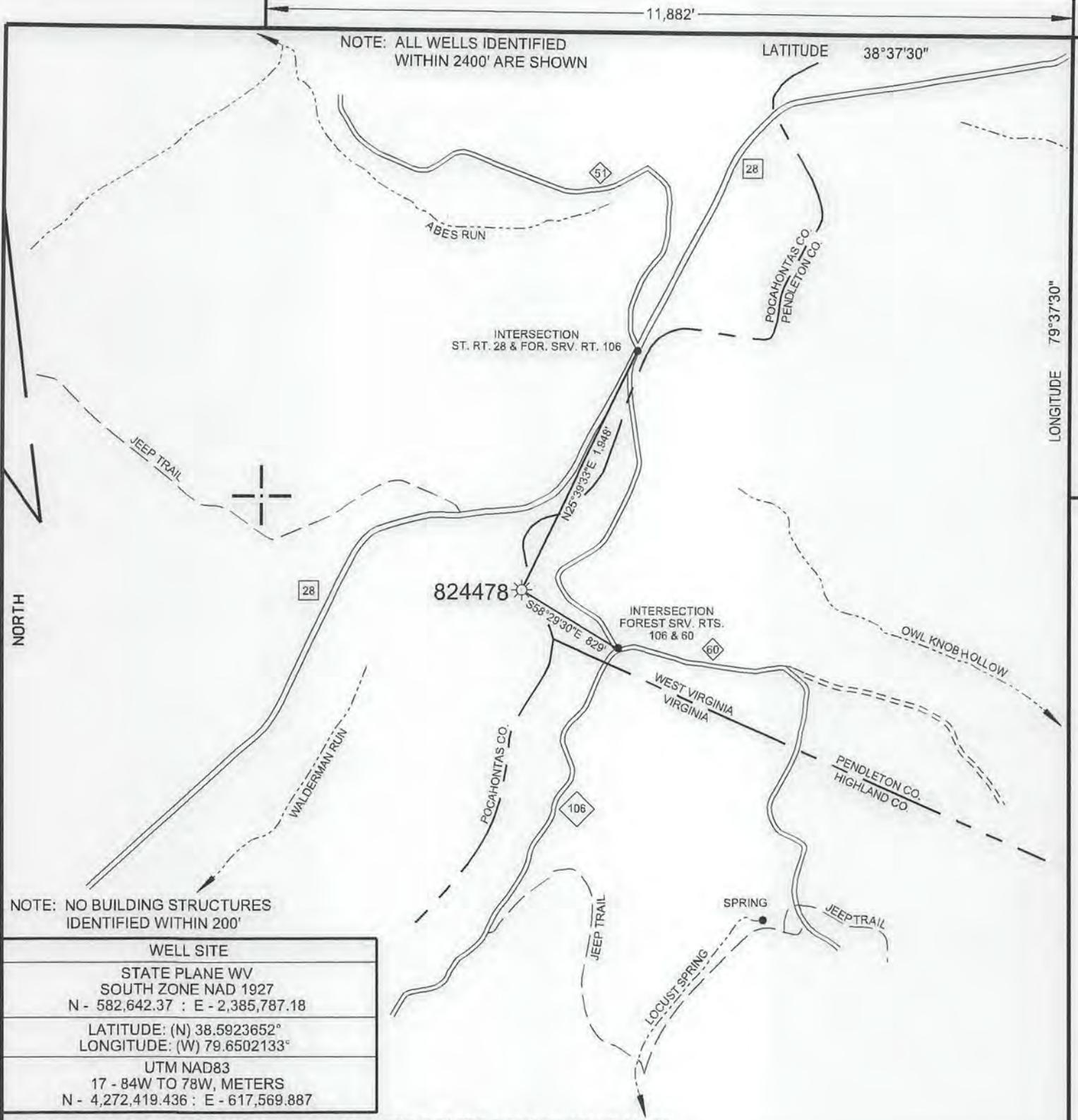
Permanent seeding: See Attachment #1.

CHESAPEAKE APPALACHIA, L.L.C.

TOPOGRAPHICAL MAP OF ACCESS AND
WELL LOCATION 824478

API 47-075-00051





WELL SITE
STATE PLANE WV SOUTH ZONE NAD 1927 N - 582,642.37 : E - 2,385,787.18
LATITUDE: (N) 38.5923652° LONGITUDE: (W) 79.6502133°
UTM NAD83 17 - 84W TO 78W, METERS N - 4,272,419.436 : E - 617,569.887

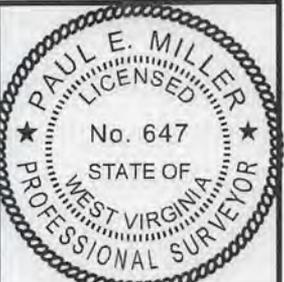
(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FILE NO.	CA 824478 P&A.DGN
DRAWING NO.	CA824478 P&A
SCALE	1" = 1000'
MINIMUM DEGREE OF ACCURACY	1 : 200
PROVEN SOURCE OF ELEVATION	MAPPING GRADE GPS

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) *Paul E. Miller*

R.P.E. _____ L.L.S. 647



STATE OF WEST VIRGINIA DIVISION OF ENVIRONMENTAL PROTECTION OIL AND GAS DIVISION		DATE <u>OCTOBER 5</u> , 20 <u>15</u>
WELL TYPE: OIL <input type="checkbox"/> GAS <input checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/>		OPERATOR'S WELL NO. <u>824478</u>
(IF "GAS,") PRODUCTION <input checked="" type="checkbox"/> STORAGE <input type="checkbox"/> DEEP <input type="checkbox"/> SHALLOW <input type="checkbox"/>		API WELL NO. <u>47 075 00051 P</u>
LOCATION: ELEVATION <u>3.915'</u> WATER SHED <u>WALDERMAN RUN OF POCA RUN</u>		STATE <u>47</u> COUNTY <u>075</u> PERMIT <u>00051 P</u>
DISTRICT <u>GREENBANK</u> COUNTY <u>POCAHONTAS</u>		
QUADRANGLE <u>THORNWOOD, WV 7.5'</u>		
SURFACE OWNER <u>UNITED STATES OF AMERICA</u> ACREAGE <u>--</u>		
OIL & GAS ROYALTY OWNER <u>US BUREAU OF LAND MANAGEMENT</u> LEASE ACREAGE <u>--</u>		
LEASE NO. <u>BLM-A-17120</u>		
PROPOSED WORK: DRILL <input type="checkbox"/> CONVERT <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/> OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____		COUNTY NAME
PLUG AND ABANDON <input checked="" type="checkbox"/> CLEAN OUT AND REPLUG <input type="checkbox"/>		PERMIT
TARGET FORMATION <u>ORISKANY</u> ESTIMATED DEPTH _____		
WELL OPERATOR <u>CHESAPEAKE APPALACHIA, L.L.C.</u> DESIGNATED AGENT <u>JESSICA GREATHOUSE</u>		
ADDRESS <u>P.O. BOX 18496, OKLAHOMA CITY, OK 73154-0496</u> ADDRESS <u>CHESAPEAKE APPALACHIA, L.L.C. PO BOX 6070, CHARLESTON, WV 25362</u>		

FORM WW-6