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**west virginia** department of environmental protection

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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 12, 2012

**WELL WORK PERMIT**

**Horizontal Well**

This permit, API Well Number: 47-8509953, issued to EQT PRODUCTION COMPANY, 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 of completion of drilling, 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: 513045 - BROADWATER  
Farm Name: HEARTWOOD FOREST FUND IV  
**API Well Number: 47-8509953**  
**Permit Type: Horizontal Well**  
Date Issued: 06/12/2012

**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

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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. 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 twenty-five 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.
3. 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.
4. Pursuant to 35 CSR § 4-19.1.c, if the operator is unable to sample and analyze any water well or spring within 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.

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

1) Well Operator: EQT PRODUCTION COMPANY

|  |     |   |     |
|--|-----|---|-----|
|  | 085 | 1 | 539 |
|--|-----|---|-----|

Operator ID      County      District      Quadrangle

2) Operator's Well Name: 513045-Broadwater 3) Elevation: 795'

4) Well Type: (a) Oil \_\_\_\_\_ or Gas X  
(b) If Gas: Production X Underground Storage \_\_\_\_\_  
                  Deep \_\_\_\_\_ Shallow X

5) Proposed Target Formation(s): Marcellus Proposed Target Depth: 6,068'

6) Proposed Total Depth: **TVD:** 6,120' **MD:** 10,270'  
Formation at Proposed Depth: Onondaga

7) Approximate fresh water strata depths: 67,443,546 ✓

8) Approximate salt water depths: 1325, 1616, 2194

9) Approximate coal seam depths: 52, 233, 422 ✓

10) Approximate void depths (coal, Karst, other): N/A

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work in detail: Drill and complete a new horizontal well.  
The vertical drill to go down to the approx depth of 6,120', tagging the Onondaga not more than 20', then plug ✓  
back to approx.5,885' and kick off the horizontal leg into the Marcellus, using a slick water frac.

13) **CASING AND TUBING PROGRAM**

| TYPE         | SPECIFICATIONS |       |                | FOOTAGE  | INTERVALS         | CEMENT                   |
|--------------|----------------|-------|----------------|--|-------------------|--------------------------|
|              | Size           | Grade | Weight per ft. |  |                   |                          |
| Conductor    | 20"            | L.S.  | 65             | For Drilling 40                                      | Left in Well 40 ✓ | Fill-up (Cu.Ft) C.T.S. ✓ |
| Fresh Water  | 13 3/8"        | MC-50 | 54.5           | 763'   | 763' ✓            | C.T.S. ✓                 |
| Coal         |                |       |                |  |                   |                          |
| Intermediate | 9 5/8"         | MC-50 | 40             | 3,106'   | 3,106'            | C.T.S.                   |
| Production   | 5 1/2"         | P-110 | 20             | 10,270'  | 10,270'           | 100' Above Marcellus     |
| Tubing       | 2 3/8"         | J-55  | 4.6            | May not be run, if run will be set 100' less than TD |                   |                          |
| Liners       |                |       |                |  |                   |                          |

Packers: 12091  
6501  
Kind \_\_\_\_\_  
Size \_\_\_\_\_  
Depths Set \_\_\_\_\_

RECEIVED  
Office of Oil & Gas  
NOV 01 2011  
WV Department of  
Environmental Protection

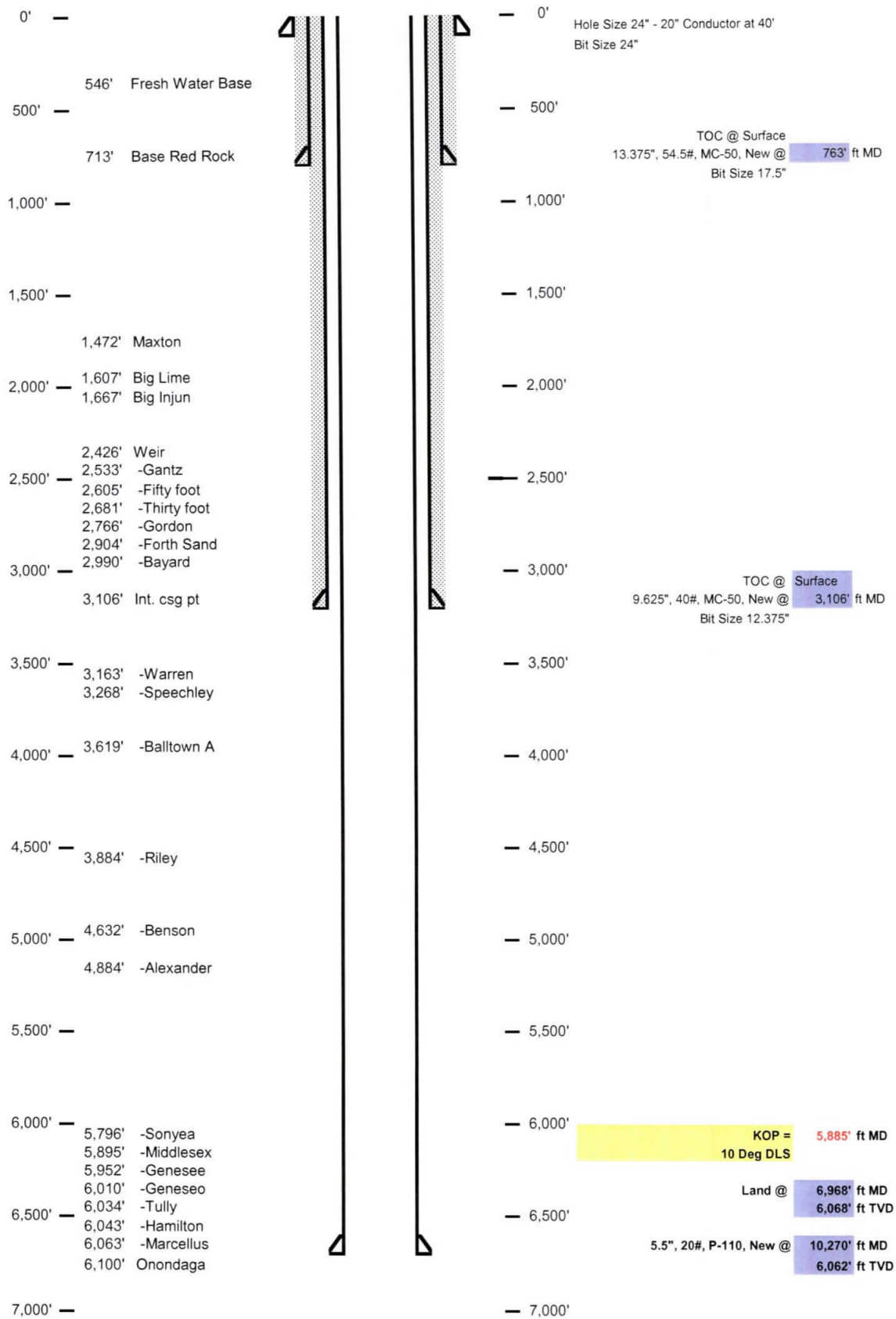
GCS for DHC  
6/12/12

85-09953H

Well Schematic  
EQT Production

Well Name 513045 (PEN16H5)  
County Ritchie County  
State West Virginia

Elevation KB: 805  
Target Marcellus  
Prospect  
Azimuth 155  
Vertical Section 4485



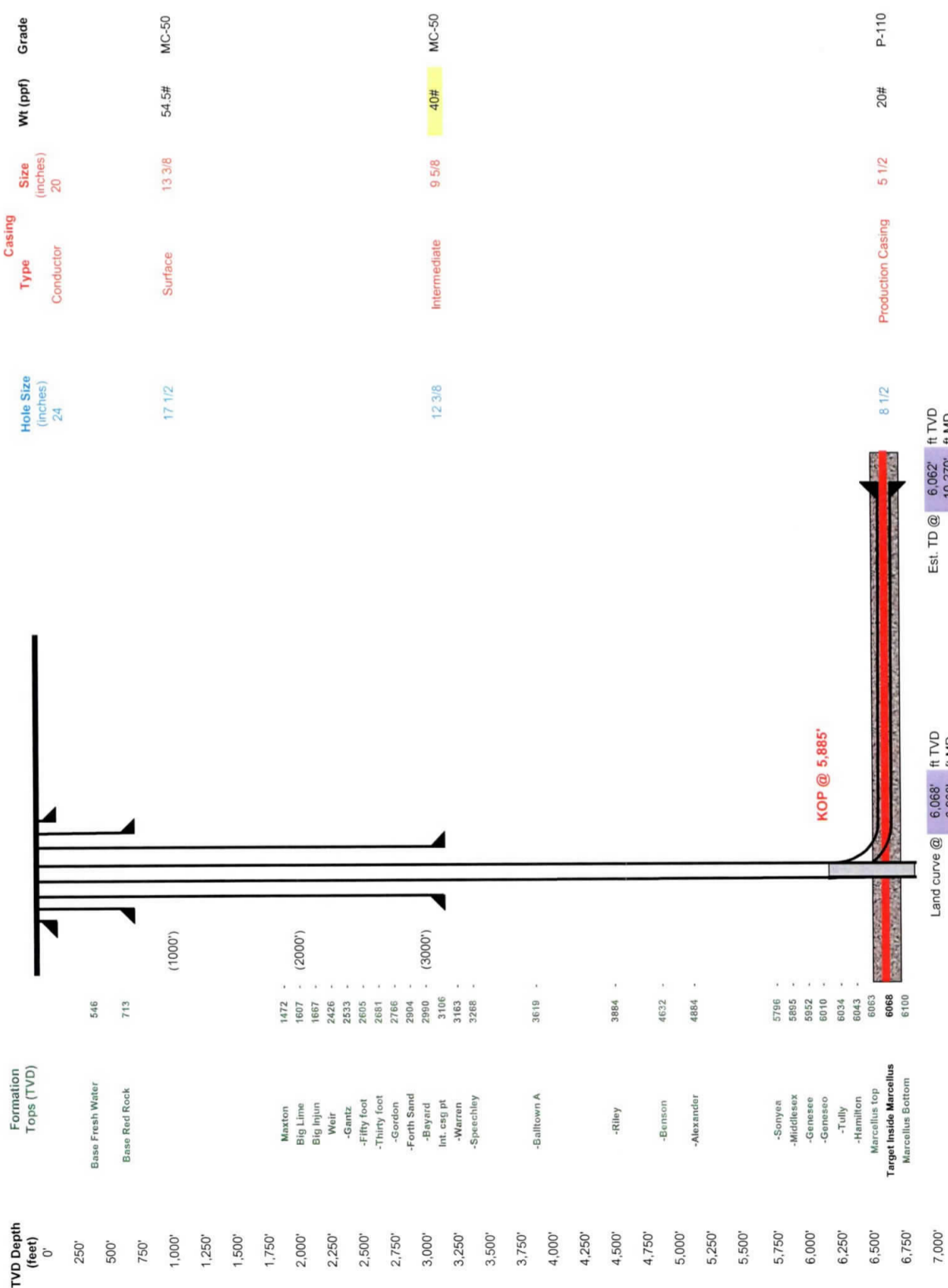
85-099534

Well Number: 513045 (PEN16H5)

| Casing and Cementing            |              |                 | Deepest Fresh Water: 546'      |                                |   |
|---------------------------------|--------------|-----------------|--------------------------------|--------------------------------|---|
| Type                            | Conductor    | Mine Protection | Surface                        | Intermediate                   | Production                              |
| Hole Size, In.                  | 24           | -               | 17 1/2                         | 12 3/8                         | 8 1/2                                   |
| Casing Size, OD In.             | 20           | -               | 13 3/8                         | 9 5/8                          | 5 1/2                                   |
| Depth, MD                       | 40'          | -               | 646'                           | 3,106'                         | 10,270'                                 |
| Depth, TVD                      | 40'          | -               | 646'                           | 3,106'                         | 6,062'                                  |
| Centralizers Used               | Yes          | -               | Yes                            | Yes                            | Yes                                     |
| Weight / Grade                  | 81#/MC-50    | -               | 54#/MC-50                      | 40#/MC-50                      | 20#/P-110                               |
| New or Used                     | New          | -               | New                            | New                            | New                                     |
| Pressure Testing                | -            | -               | 20% Greater than exp. Pressure | 20% Greater than exp. Pressure | 20% greater than exp. fracture pressure |
| After Fracture Pressure Testing | -            | -               | -                              | -                              | 20% greater than exp. shut pressure     |
| ID, in                          | 19.25        | -               | 12.625                         | 8.835                          | 4.778                                   |
| Burst (psi)                     | -            | -               | 2,485                          | 3,600                          | 12,640                                  |
| Collapse (psi)                  | -            | -               | 1,110                          | 2,480                          | 11,100                                  |
| Tension (mlbs)                  | -            | -               | 454                            | 456                            | 548                                     |
| Cement Class                    | -            | -               | -                              | -                              | H                                       |
| Cement Type                     | Construction | -               | 1                              | 1                              | -                                       |
| Meets API Standards             | -            | -               | Yes                            | Yes                            | Yes                                     |
| WOC Time                        | -            | -               | Min. 8 hrs                     | Min. 8 hrs                     | Min. 8 hrs                              |
| Top of Cement (Planned)         | Surface      | -               | Surface                        | Surface                        | 2,606'                                  |
| Fill (ft.)                      | 40'          | -               | 646'                           | 3,106'                         | 7,664'                                  |
| Percent Excess                  | -            | -               | 20                             | 20                             | 10                                      |
| Est. Volume (BBLs)              | -            | -               | 102                            | 218                            | 346                                     |

**Well 513045 (PEN16H5)**  
**EQT Production**  
**Pennsboro Quad**  
**Ritchie County**  
**West Virginia**

Azimuth Section  
 155  
 4485



85-09953H

KOP @ 5,885'

Land curve @  
 6,068' ft TVD  
 6,968' ft MD

Es. TD @  
 6,062' ft TVD  
 10,270' ft MD

3,302' ft Lateral

TD Pilot Hole @ 6120  
 20' below top of Onondaga  
 Run Logs, Plug back to KOP at 5885  
 Kick off for horizontal well in Marcellus

85-9953

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL & GAS  
CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM  
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name: EQT PRODUCTION COMPANY OP ID: \_\_\_\_\_

Watershed: North Fork Hughes River Quadrangle: Pennsboro 7.5'

Elevation: 795' County: Ritchie District: Clay

Description of anticipated Pit Waste: Drill water and various formation cuttings

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

Will synthetic liner be used in the pit? Yes Is so, what ml.? 40 ml

Proposed Disposal Method for Treated Pit Wastes:

- Land Application
- Underground Injection - UIC Permit Number 0014, 8462, 4037
- Reuse (at API Number)
- Offsite Disposal Permit #'s 3390, 1009, 29132
- Other: Explain \_\_\_\_\_

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. air and water based mud  
If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used? MILBAR, Viscosifer, Alkalinity Control, Lime, Chloride Salts, Filtration Control, Deflocculant, Lubricant, Detergent, Defoaming, Walnut shell, X-Cide, SOLTEX, Terra Rate

Will closed loop system be used? No

Drill Cuttings disposal method? Leave in pit, landfill, remove offsite, etc. Landfill

If left in pit and plan to solidify what medium will be used? Cement, Lime, sawdust N/A

Landfill or offsite name/permit number? See attached list

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 Division of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any terms 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.

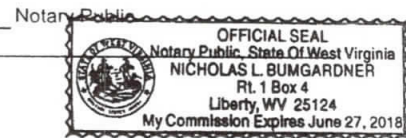
Company Official Signature *Victoria J. Roark*

Company Official (Typed or Printed) Victoria J. Roark

Company Official Title Permitting Supervisor

Subscribed and sworn before me this 6 day of FEBRUARY, 2012

My Commission Expires 6/27/2018



85-9953

OPERATOR'S WELL NO.:  
513045-Broadwater

### LEGEND

Property Boundary

Road

Planned Fence

Existing Fence

Open Ditch

North

Pit with Cut Walls

Diversion

Spring

Drain Pipe with size in inches

Stream

Artificial Filter Strip

Building

Water well

Wet Spot

Water Way

Cross Drain

Rock

Drill site

Pit with Compacted Walls

Area of Land Application of Pit Waste

Proposed Revegetation Treatment: Acres Disturbed: 37.01± Prevegetation pH 6.6

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20) or equivalent 1/3 ton lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre or hydroseed.

### SEED MIXTURES

| Area I        |          | Area II       |          |
|---------------|----------|---------------|----------|
| Seed Type     | lbs/acre | Seed Type     | lbs/acre |
| KY-31         | 40       | Orchard Grass | 15       |
| Alsike Clover | 5        | Alsike Clover | 5        |
| Annual Rye    | 15       |               |          |
|               |          |               |          |

### ATTACH:

Drawing(s) of road, location, pit and proposed area for land application.  
Photocopies section of involved 7.5' topographic sheet.

Plan approved by: David Cowan by GCS

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

Title: Inspector Date: \_\_\_\_\_

Field Reviewed? Yes  No



85-09953H

**EQT Production Water plan**  
**Offsite disposals for Marcellus wells**

**CWS TRUCKING INC.**

P.O. Box 391  
Williamstown, WV 26187  
740-516-3586  
Noble County/Noble Township  
Permit # 3390

**BROAD STREET ENERGY LLC**

37 West Broad Street  
Suite 1100  
Columbus, Ohio 43215  
740-516-5381  
Washington County/Belpre Twp.  
Permit # 8462

**LAD LIQUID ASSETS DISPOSAL INC.**

226 Rankin Road  
Washington, PA 15301  
724-350-2760  
724-222-6080  
724-229-7034 fax  
Ohio County/Wheeling  
Permit # USEPA WV 0014

**TRIAD ENERGY**

P.O. Box 430  
Reno, OH 45773  
740-516-6021 Well  
740-374-2940 Reno Office Jennifer  
Nobel County/Jackson Township  
Permit # 4037

**TRI COUNTY WASTE WATER MANAGEMENT, INC.**

1487 Toms Run Road  
Holbrook, PA 15341  
724-627-7178 Plant  
724-499-5647 Office  
Greene County/Waynesburg  
Permit # TC-1009

**KING EXCAVATING CO.**

Advanced Waste Services  
101 River Park Drive  
New Castle, Pa. 16101  
Facility Permit# PAR000029132

**Waste Management - Meadowfill Landfill**

Rt. 2, Box 68 Dawson Drive  
Bridgeport, WV 26330  
304-326-6027  
Permit #SWF-1032-98  
Approval #100785WV

**Waste Management - Northwestern Landfill**

512 E. Dry Road  
Parkersburg, WV 26104  
304-428-0602  
Permit #SWF-1025 WV-0109400  
Approval #100833WV

10751201

85-995B



Where energy meets innovation.

### Well Site Safety Plan

Marcellus Well  
513045 PEN16H5  
Ritchie County, WV

DATE:  
October 28, 2011

*Follow  
2-16-11  
David K. Aronoff*

*Victoria J. Park* Date 10-31-11  
EQT Production  
*Permitting Supv.*  
Title

\_\_\_\_\_ Date \_\_\_\_\_  
WVOOG  
\_\_\_\_\_  
Title

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## 1.0 Scope

This Attached Plan will be reviewed with all employees on the work site prior to beginning their work. Any required changes will be inserted into this Plan and made a part of the Plan after being approved by WVOOG.

### Documentation

A safety training attendance sheet must be completed for all training. Originals must be submitted to the Environmental and Safety Department and copies of the attendance sheets shall be on-site to serve as documentation of training.

### Plan Assimilation and Dissemination

- The Supervisor of Environmental and Safety - Drilling, or their designee, shall be responsible for providing a copy of this plan to the local emergency planning committee (LEPC) or county emergency services (CES) office within at least 7 days from land disturbance or well work.
  - The LEPC or CES representative will sign a receipt (See Appendices) documenting this.
- A copy of this Plan will be available in the following locations:
  - In the on-site mailbox
  - Office of the Environmental & Safety Coordinator
  - Electronically in *EQT Well File Library* (as part of the permit document).
- Copies of this plan, and all future revisions, will also be provided to:
  - On-Site Drilling or Completions Specialist and all Wellsite Consultants (Contractors).
  - West Virginia DEP Office of Oil and Gas
  - LEPC or CES
- Contact information for these organizations is provided in Section 3.0.

### Personal Protective Equipment (PPE)

- At a minimum, all personnel on-site shall wear the following PPE:
  - Hardhat
  - Safety glasses with side shields
  - Hard toe boots
- Additional PPE may be required based on unique job hazards such as:
  - Flame Resistance Clothing (FRC)
  - High visibility vest
  - Hearing Protection
- Additional PPE may be assigned dependent on the site conditions and shall be the discretion of the on-site specialist and the Environmental and Safety Department.
- All additional PPE requirements will be communicated to all personnel.

## 2.0 Well Design and Operations Summary

### Detail of Well Work, Drilling Operations

1. Review pertinent well data.
2. MIRU drilling rig.
3. Install riser and air bowl.
4. Drill surface or mine string hole to required depth on air / foam / water based mud.
  - Mine string must not be more than 100' deeper than mine void.
  - Surface casing must be set at least 30' below the deepest fresh water.
5. Run casing to programmed depth. Centralize per requirements.
6. Cement to surface per regulation.
7. WOC 8 hrs.
8. MIRU ELU and run bond log.
9. Pressure test casing to 20% over Maximum Anticipated Surface Pressure (MASP).
10. If separate mine string was required, prepare riser for the drilling of fresh water protective hole section as follows:
  - a. TIH with drilling assembly.
  - b. Drill out mine string and to section TD.
  - c. Run water protective string (surface casing) to prescribed depth per regulation.
  - d. Cement casing to surface per regulation.
  - e. Pressure test casing to 20% over MASP.
  - f. WOC 8 hrs.
11. MIRU ELU and run bond log.
12. Install and test wellhead per manufacturer's specification.
13. Install BOP stack.
14. Test BOP's
  - Annular Preventer to 70% MAWP
  - Ram Preventers to 80% MAWP
15. MU drilling assembly
16. Drill out surface casing and to planned section TD.
17. Run intermediate casing to programmed depth.
18. Cement intermediate casing to surface per regulation.
19. Pressure Test casing 20% over MASP.
20. WOC 8 hrs.
21. MIRU ELU and run bond log.
22. MU drilling assembly
23. Drill out casing. Perform formation integrity test to adequate pressure gradient.
24. Drill production hole to KOP. Trip for directional drilling assembly.
25. MU directional assembly, TIH and drill curve and lateral section of production hole with drilling assembly changes as necessary to achieve the planned wellbore trajectory.

26. Run production casing to programmed depth.
27. Cement production casing per regulation. Planned TOC will be 500' above the intermediate casing shoe.
28. WOC 8 hrs.
29. Nipple down BOP's and install tubing head. Test tubing head voids per manufacturers recommendation.
30. Install dry hole flange. RDMO drilling rigs.

### **First Stage Completion Work**

31. Move in and rig up to run bond log from attainable total depth to above cement top.
32. Install 10k frac valve.
33. Test production casing to 20% over anticipated fracture stimulation pressure.
34. Move in and Rig up coiled tubing unit/ rig and tubing (depending on length and tortuosity of wellbore) Install annular, pipe and blind rams with Blow out preventer on B-section.
35. Make cleanout run to plug back total depth and gauge hole for subsequent plug pump down.
36. Trip out of hole with pipe and install tubing conveyed perforating guns.
37. Run in whole under pressure control to td and perforate pipe.
38. Trip out of hole, Rig down unit, install Back Pressure Valve into B-section, remove frac valve and install second barrier dry hole tree. Secure well site until frac.

### **Fracture Stimulation**

39. Install 2- 10k frac valves and goat heads with frac iron. Rig up frac crew and proceed to frac first stage.
40. Rig up wire line and pump down plug and guns to perforate subsequent stages. Pump down operations are run under lubricator and pressure control.
41. Pump plug, perforate and frac subsequent stages.
42. Run and set final test plug above top perforations.
43. Rig down frac crews and secure location. Lubricate Back Pressure Valve into B section. Remove 1ea. 10k frac valve and install dry hole tree.

### **Frac Isolation Plug Drill Out Procedure**

44. Install annular bop, pipe and blind rams. Rig up Snubbing unit. Install flow cross and flow back equipment and test to 5000psig. Remove back pressure valve.
45. Test production casing to 20% over anticipated shut in pressure.
46. Run in hole with pipe and bottom hole assembly and drill plugs to td. Returns are taken to the gas separator and gas buster and/or tanks/pits. Gas is sent down sales line or flared. Pressures are maintained at levels below the operating pressure of snubbing unit components.
47. Rig down snubbing unit and rig.
48. Flow back well with gas to sales or flare until well is stabilized.
49. Install Back pressure valve and remove frac valves. Install production tree and lubricate out Back pressure valve. Turn over to production.

### **Production Operations**

50. Install containment, production equipment, metering equipment, and tankage per program.
51. Test safety systems.
52. Turn well to sales.

### 3.0 Site Directions and Emergency Contacts

#### Site Directions

**Surface Location:**                    **Northing:** 276995.5                    **Easting:** 1592382.9

I-77 North +/-76mi. to US-50. Take Right & follow US-50 +/-42.5mi. to CR-10(CabinRun) Turn right onto CR-10 and go +/-1.42mi. to proposed existing access on left. Turn left & follow access up the hill +/-0.51mi. to a large P/L ROW. Cross the ROW and follow the existing access +/-1.53mi. to proposed well site of the PEN-16H1-H5.

#### WV Oil and Gas Inspector – Emergency Contact Numbers

David Cowan                    WVO&G                    304.389.3509                    or                    800.642.3074

#### EQT Personnel – Contact Numbers

| <u>Name</u>    | <u>Group</u>               | <u>24 Hour Contact Number</u>           |
|----------------|----------------------------|---|
| Scott Held     | E&S Emergency Planning     | 724.705.4114                            |
| Jason Rinehart | Sr. E&S Coordinator        | 412.553.5960                            |
| David Fetty    | E & S Supervisor           | 412.584.9966                            |
| Phil Keaton    | Construction               | 304.542.8914                            |
| Alan Mulcahy   | Construction               | 304.348.5313                            |
| Bradley Maddox | Drilling                   | 412.395.7053                            |
| James Rose     | Drilling                   | 412.395.2319                            |
| James Pancake  | Geology                    | 304.561.5182                            |
| <u>TBD</u>     | <u>Drilling-Specialist</u> | <u>xxx.xxx.xxxx- assigned with rig.</u> |
| Jason Ranson   | Land                       | 304.543.9442                            |
| Bryant Bowman  | Land                       | 304.550.8821                            |
| John Marshall  | Completions                | 412.295.5877                            |
| Jim Helmick    | Completions                | 412.395.5518                            |



**Local Emergency Responders – Contact Numbers**

| <b>HOSPITALS</b>                        |                                      |                                 |
|---|--------------------------------------|---------------------------------|
| Camden-Clark Memorial Hospital          | Garfield Ave., Parkersburg, WV       | (800) 424-2111                  |
| St Joseph Hospital                      | 406 3rd St. Saint Mary's, WV 26170   | (304) 684-9994                  |
| United Hospital Center                  | 327 Medical Park Dr., Bridgeport, WV | (681) 342-1000                  |
| Wetzel County Hospital                  | HC 74 Box 50 Alma, WV. 26320         | (800) 423-1271                  |
| <b>Emergency Services</b>               |                                      |                                 |
| State Police                            | Emergency Phone Number (911)         | (304) 643-2101                  |
| Harrisville Chief of Police             | Emergency Phone Number (911)         | (304) 643-2669                  |
| Ritchie County Ambulance Authority Inc. | Emergency Phone Number (911)         | (304) 643-2369                  |
| Ritchie County Sheriff Department       | Emergency Phone Number (911)         | (304) 643-4747                  |
| Harrisville Fire Department             | Emergency Phone Number (911)         | (304) 643-2330                  |
| Pennsboro VFD                           | Emergency Phone Number (911)         | (304) 659-3969                  |
| Ellenboro Fire Department               | Emergency Phone Number (911)         | (304) 869-3244                  |
| Doddridge Co. Emergency Squad Inc.      | Emergency Phone Number (911)         | (304) 873-2211                  |
| Cairo VFD                               | Emergency Phone Number (911)         | (304) 628-3312                  |
| West Union VFD                          | Emergency Phone Number (911)         | (304) 873-1391 / (304) 873-2222 |
| Doddridge Co. Sheriff                   | Emergency Phone Number (911)         | (304) 873-1944                  |
| Town of West Union Police Department    | Emergency Phone Number (911)         | (304) 873-1107                  |
| Smithburg VFD                           | Emergency Phone Number (911)         | (304) 873-1493                  |
| Greenwood VFD                           | Emergency Phone Number (911)         | (304) 873-2440                  |

**Local Emergency Planning Committee and/or County Emergency Services Office:**

County Emergency Services Director: Bill Bayless 304.869.3231  
 Ritchie/Doddridge County Dispatch/ EMA 304.659.3770 Or 304.659.3334

## **4.0 Site Evacuation Plan**

### **Assembly areas**

- Each Site is responsible for identifying a designated assembly area for personnel to safely evacuate to in the event of an emergency.
- Evacuation in place may be most suitable for inclement weather but that decision shall be made by the On-Site Specialist or Emergency Coordinator (Examples: Near the access road, Site Location Sign, On-Site Specialist trailer).
- Assembly points should be determined so as to be upwind in consideration of the prevailing wind at the site.
- At a minimum, a secondary assembly area shall be determined for all site specific EAPS. Secondary assembly points should be located to be 90 degrees to the prevailing wind.
- Each determined assembly area shall be communicated to all personnel on the site.

### **Affected and Unaffected areas**

- The Emergency Coordinator, or their representative, will establish the emergency area as the affected area and order the evacuation of all non-essential personnel to the primary assembly area.
- The purpose is to minimize the risk of exposure to all personnel.
- On-site rescuers and equipment should be staged in areas unaffected by the emergency.
- Off-site services and equipment summoned to the scene should be staged in areas unaffected by the emergency.
- Only essential personnel, as determined by the Emergency Coordinator, shall be granted entry into the affected area(s) after an emergency has occurred.

### **Evacuation**

- In the event of an emergency all non-essential personnel shall immediately evacuate their work areas and report to the Assembly Area.
- Evacuation must be quick as life safety may be of the essence.
- Personnel should evacuate to the assembly area via the quickest route. If that route is blocked or hazardous, another route should be taken.
- Personnel should make sure that their co-workers heard the call for evacuation and assure that no one is left behind.
- Only essential personnel required for process critical jobs can stay behind, all others shall evacuate. This decision shall be at the sole discretion of the Emergency Coordinator and in no means should life safety be jeopardized.
- Should the primary assembly area be unsuitable for evacuation, the alternate location shall be communicated to all personnel. The Emergency Coordinator or their designee is responsible for determining the safest assembly area.
- Accountability shall be verified as soon as possible by the Emergency Coordinator or their designee. Those who are unaccounted for shall be immediately reported to the Emergency Coordinator
- If evacuation is required for the surrounding areas, notifications to all personnel listed on the Dwelling List Map and Contact Information (Section 15.0) shall be made by the On-Site Emergency Coordinator or their designee.

- Evacuation locations and assembly areas will be made with the coordination of local emergency first responders.

#### **Scene Access**

- Access to the scene should be controlled at all times by the Emergency Coordinator or their representative.
- Access needs to be controlled to reduce life safety concerns as well as preserve evidence for investigation and root cause analysis.
- Access should never be restricted in a way as to impede those who are evacuating in an emergency.
- The scene needs to be secured to prevent unauthorized entry by posting signs, tape, personnel, or other means at any and all access points.
- Unauthorized access into the affected area(s) is prohibited and calls for immediate removal from the site.

## **5.0 General Site Safety Plan**

### **Accountability**

- The Access Control Form shall be used for all personnel and will be maintained during the drilling and completions phases of the operation.
- The Access Control Form shall be completed by all personnel entering and exiting the well site
- The Access Control Form will be kept in the EQT On-site Offices.
- A copy of the Access Control Form is listed in the Section 15.0.

### **Material Safety Data Sheets (MSDS):**

MSDS for all materials and chemicals on-site will be maintained and readily available at the well site. Copies of these MSDS will be kept in the EQT On-site Offices, or be available on-line and be the responsibility of the EQT On-site Specialist

### **Safety Meetings**

Safety Meetings will be held weekly on-site, at a minimum, and specifically prior to the beginning of drilling, completion, and work-over operations. Meeting attendance should be logged using a Safety Training Attendance Sheet listed in Section 15.0.

### **Pre-Drill Meeting**

A Pre-Drill Meeting will be held on location with the following personnel in attendance:

- EQT Construction Specialist
- EQT Land Agent
- WV OOG Inspector and /or Supervisor
- EQT Environmental & Safety Supervisor – Drilling
- EQT On-Site Drilling Specialist and/or Supervisor
- EQT Drilling Contractor Personnel, i.e. Tool Pusher, Driller(s), Safety Manager
- EQT H2S Contractor
- EQT Completions Personnel

## 6.0 Detailed Casing and Cementing Program

Well Number: 513045 (PEN16H5)

| Casing and Cementing            |              |                 |                                |                                |   | Deepest Fresh Water: 546' |
|---------------------------------|--------------|-----------------|--------------------------------|--------------------------------|---|---------------------------|
| Type                            | Conductor    | Mine Protection | Surface                        | Intermediate                   | Production                              |                           |
| Hole Size, In.                  | 24           | -               | 17 1/2                         | 12 3/8                         | 8 1/2                                   |                           |
| Casing Size, OD In.             | 20           | -               | 13 3/8                         | 9 5/8                          | 5 1/2                                   |                           |
| Depth, MD                       | 40'          | -               | 646'                           | 3,106'                         | 10,270'                                 |                           |
| Depth, TVD                      | 40'          | -               | 646'                           | 3,106'                         | 6,062'                                  |                           |
| Centralizers Used               | Yes          | -               | Yes                            | Yes                            | Yes                                     |                           |
| Weight / Grade                  | 81#/MC-50    | -               | 54#/MC-50                      | 40#/MC-50                      | 20#/P-110                               |                           |
| New or Used                     | New          | -               | New                            | New                            | New                                     |                           |
| Pressure Testing                | -            | -               | 20% Greater than exp. Pressure | 20% Greater than exp. Pressure | 20% greater than exp. fracture pressure |                           |
| After Fracture Pressure Testing | -            | -               | -                              | -                              | 20% greater than exp. shut pressure     |                           |
| ID, in                          | 19.25        | -               | 12.625                         | 8.835                          | 4.778                                   |                           |
| Burst (psi)                     | -            | -               | 2,485                          | 3,600                          | 12,640                                  |                           |
| Collapse (psi)                  | -            | -               | 1,110                          | 2,480                          | 11,100                                  |                           |
| Tension (mlbs)                  | -            | -               | 454                            | 456                            | 548                                     |                           |
| Cement Class                    | -            | -               | -                              | -                              | H                                       |                           |
| Cement Type                     | Construction | -               | 1                              | 1                              | -                                       |                           |
| Meets API Standards             | -            | -               | Yes                            | Yes                            | Yes                                     |                           |
| WOC Time                        | -            | -               | Min. 8 hrs                     | Min. 8 hrs                     | Min. 8 hrs                              |                           |
| Top of Cement (Planned)         | Surface      | -               | Surface                        | Surface                        | 2,606'                                  |                           |
| Fill (ft.)                      | 40'          | -               | 646'                           | 3,106'                         | 7,664'                                  |                           |
| Percent Excess                  | -            | -               | 20                             | 20                             | 10                                      |                           |
| Est. Volume (BBLs)              | -            | -               | 102                            | 218                            | 346                                     |                           |

- 1) All cement volumes are typical, actual conditions may dictate changes in geometry.
- 2) All casing and cement meet API standards, but are not API monogrammed.
- 3) Mine strings will be run as required by geologic conditions.
- 4) Full BOP pressure tests on installation, function test daily, blind ram test on trips.

## 7.0 BOP Equipment and Casing Heads

| <b>BOP Equipment</b> |                  |                     |             |                       |                            |                          |
|----------------------|------------------|---------------------|-------------|-----------------------|----------------------------|--------------------------|
| <u>Size (in)</u>     | <u>Operation</u> | <u>Hole Section</u> | <u>Type</u> | <u>Pressure Class</u> | <u>Test Pressure (psi)</u> | <u>Testing Frequency</u> |
| 13-5/8"              | Drilling         | Intermediate        | Annular     | 3M                    | 2100                       | Initial                  |
| 13-5/8"              | Drilling         | Pilot               | Annular     | 3M                    | 2100                       | Initial, Weekly, Trip    |
| 13-5/8"              | Drilling         | Production          | Annular     | 5M                    | 3500                       | Initial, Weekly, Trip    |
| 13-5/8"              | Drilling         | Production          | Blind       | 5M                    | 4000                       | Initial, Weekly, Trip    |
| 13-5/8"              | Drilling         | Production          | Pipe        | 5M                    | 4000                       | Initial, Weekly, Trip    |
| 7-1/16"              | Completions      | Production          | Cameron U's | 5M                    | 5000                       | Initial                  |

### Wellhead Detail

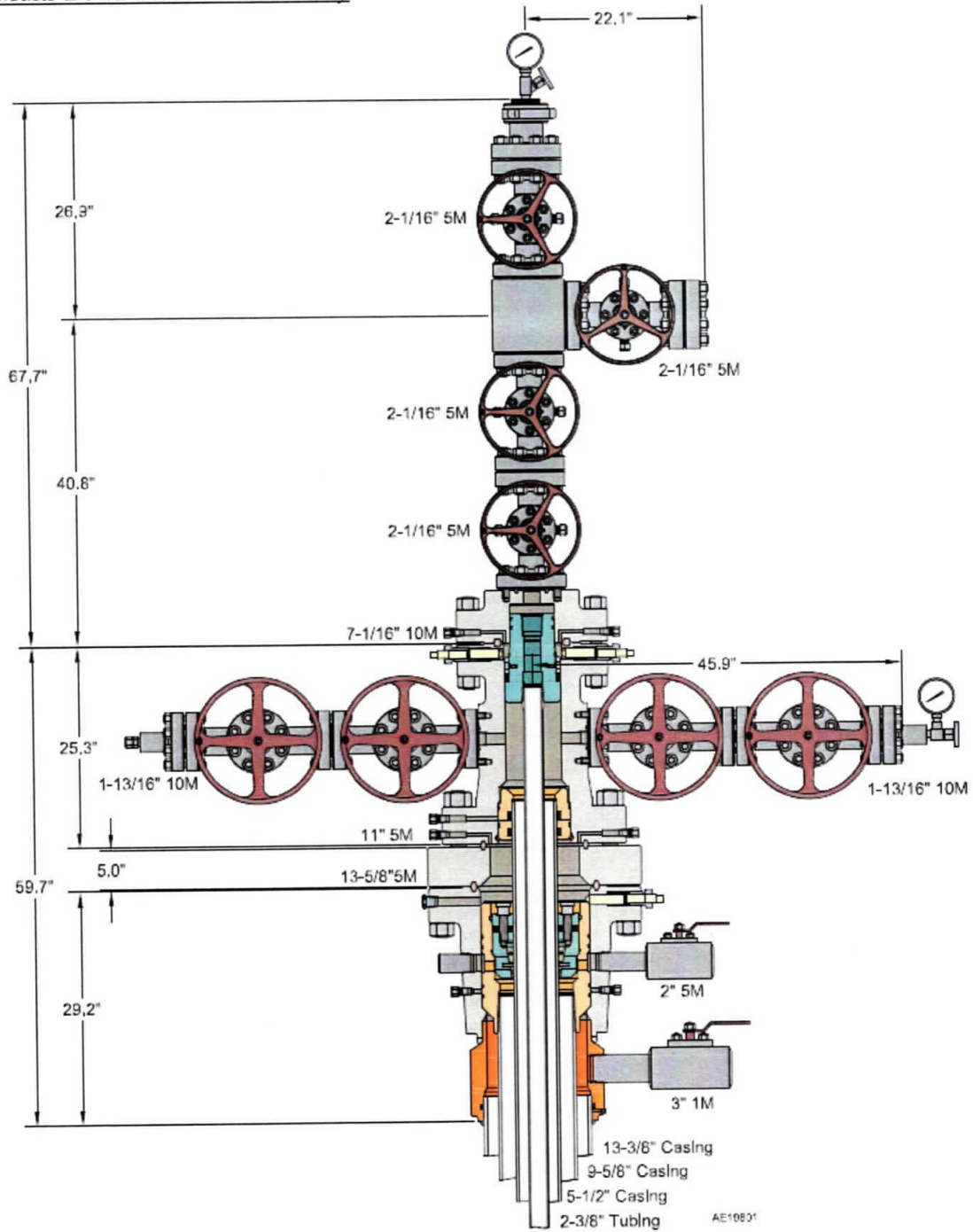
| Size (in)                | Type                 | M.A.W.P. (psi) |
|--------------------------|----------------------|----------------|
| 13-3/8" SOW x 13-5/8" 5M | Multi-ball Well Head | 5,000          |
| 13-5/8" 5M x 7-1/16 10M  | Tubing Head          | 10,000         |
| 2-1/16" 5M               | Christmas Tree       | 5,000          |

### Well Control Trained Personnel

- Drilling
  - EQT On-Site Specialist – 2 on rotating hitches.
  - Contract Group's – Tool Pusher & Drillers
- Completions & Production
  - EQT On-Site Specialist

# 8.0 Well Head Assembly Design

## Typical Multi-Bowl Wellhead Assembly



## 9.0 Flaring Operations

### Drilling

#### Flare Line Installation

The BOP equipment will all be located on the surface. The choke line coming off the stack will lead into a 5,000 psi choke manifold with 2 adjustable chokes. The 7" blooie line will divert any gas 50-75' away from rig substructure. Blooie line will be properly anchored with stakes or buried and will be set up so that gas can be vented. There will be a clearing of 25' for the gas to be vented. Duration of flare is expected to be ~ 7 days, depending on actual test results.

#### Ignition Methods and

1. Primary – Vent
2. Backup – Marine flare pistol

#### Notification

Notification of a Flare will be given to the local Fire Department and/or 911 center, if possible. Refer to Section 3.0 for contact information.

### Completions

#### Flare Line Installation

The Flare Stacks will be positioned in a safe area at least 25' away from pit liners, trees and any other hazardous sites. The Flowback configuration consist of in order: 71/16" 10m frac valve; Flow Cross with 41/16" wing valve ; 3" 5 valve choke manifold; 3" line with junk catcher; 1440 psi horizontal test separator and 2" 1502 pipe to 4" x 40' vertical Flare Stack. Flowline will be properly anchored and tethered. Duration of flare is expected to be ~ 7 days, depending on actual test results.

#### Ignition Methods

1. Primary –Pilot Light
2. Backup – Marine flare pistol

#### Notification

Notification of a Flare will be given to the local Fire Department and/or 911 center, if possible. Refer to Section 3.0 for contact information.



## 10.0 Mud Information

| <b>Mud Usage</b>         |                  |
|--------------------------|------------------|
| Mix Mud Amount           | 2000 - 3500 bbls |
| Mud Weights              | 8.5 - 14.8 ppg   |
| Amount Weighted Material | 47 - 375 tons    |
| Volume Mixing Water      | 275 - 2750 bbls  |
| Mud Type                 | Water Based      |

## **11.0 Well Kill Procedures**

### **Killing Operations**

In a well control situation, all influxes are to be handled using the Wait-and-Weight Method or the Driller's Method. With the Wait-and-Weight Method, the influx is circulated out while kill weight mud is simultaneously circulated down the drill pipe and up the annulus. The heavy mud is circulated to the bit at a slow kill rate, and the drill pipe pressure is maintained according to a prepared table that gives drill pipe pressure for the corresponding strokes of kill mud pumped.

The Driller's Method is accomplished in two circulations using constant drill pipe pressure and maintaining constant pump speed. The drillpipe pressure is kept constant by adjusting the choke. Once the annulus is clear of the influx, the mud weight is adjusted to kill-weight. The kill-weight mud is then circulated to the bit using constant pump speed and drillpipe pressure step-down plan. When kill-weight mud has reached the bit, the FCP is maintained until the heavy mud has reached the surface.

## **12.0 Hydrogen Sulfide (H<sub>2</sub>S) Plan**

### **Purpose**

The purpose of this plan is to insure the safety of the all on-site personnel as well as those residents in close proximity. Hazards associated with the possibility of H<sub>2</sub>S encounters and the warning signs of H<sub>2</sub>S exposure will be covered.

### **Scope**

The policy is to consider every encounter with H<sub>2</sub>S as potentially lethal until proven otherwise. Upon encountering H<sub>2</sub>S, EQT employees or contractors(s) will determine the concentration of H<sub>2</sub>S.

### **General Information**

- If necessary, the well will be shut in and the work will be stopped until adequate safety personnel and equipment have arrived on site.
- No work will take place until the appropriate personnel and equipment are in place.
- Work will resume only after it has been determined those adequate measures have been taken.
- The primary considerations at this time will be:
  - H<sub>2</sub>S concentration
  - Gas Volume
  - Weather Conditions
  - Dwellings in the area.

### **Personal Protective Equipment**

- The EQT H<sub>2</sub>S contractor will have an emergency trailer with SCBA's, additional gas detection equipment and other instrumentation and PPE required for appropriate response.
- All personnel on location; all personnel monitoring adjacent to the location; or all personnel associated with the operation, will be equipped with personal H<sub>2</sub>S monitors.
- There will be a H<sub>2</sub>S monitor located at the flow line exit, during the drilling of this well, as well as on the Rig Floor.
- This PPE shall be in addition to the PPE requirements listed in Section 1.0

### **Training**

- Only personnel whom have been properly trained; or are qualified in the hazards of H<sub>2</sub>S, will be allowed on location during operations that have encountered, or projected to encounter H<sub>2</sub>S.
- There will be a safety briefing prior to start of each shift or tower and all personnel will sign in on a Safety Training Attendance Sheet listed in Section 15.0

### **Briefing (Assembly) Areas**

- Refer to Section 4.0 for specifics on Primary and Secondary Assembly Areas.
- Specific considerations for H<sub>2</sub>S should include:
  - Windssocks or streamers for indication of wind direction.
  - Being upwind of harmful levels of H<sub>2</sub>S
  - Avoiding low lying areas
  - Being upwind
- Signage will be utilized along the location road, or any other entrances to the location, if H<sub>2</sub>S is encountered.

### **H<sub>2</sub>S Response Team**

- See Section 3.0

### **Contractors**

- EQT designated H<sub>2</sub>S contractor (**TBD**)

### **Personnel**

- List of personnel onsite will be determined based on the Access Control Form located in the EQT On-Site Offices and referenced in Section 5.0

### **Emergency numbers**

- Emergency Notifications shall be made as listed in Section 13.0 using the lists detailed in Section 3.0 and the Dwelling List Map and Contact Information listed in Section 15.0

### **Site Access**

- Refer to site directions list in Section 3.0

### **Notifications**

- The EQT H<sub>2</sub>S Contractor will be notified at the following intervals:
  - Pre-Spud Meeting
  - Spud Date
  - Bottom of 9 5/8"
  - 1000' Above Onondaga

## **13.0 Notification Procedure**

### **Significant Event Notifications**

- A detailed record of significant drilling events will be recorded in the EQT Production Well Log Book (Blue Book).
- In addition to the record above, the local inspector of the WV DEP Office of Oil and Gas and Supervisor of Environmental and Safety - Drilling (listed in Section 3.0) will be notified by the EQT On-Site Specialist for the following events:
  - Encounter of Hydrogen Sulfide
  - Blow-outs
  - Significant kicks
- Contact information can be found in Section 3.0

### **Emergency Notifications**

- In the event emergency response personnel and residents surrounding the work site are affected by specific events during the operation they must be notified as soon as possible by the On-site Specialist or their designee.

### **Flaring Notifications**

- The local fire department(s) and/or county dispatch centers must be notified immediately prior to the ignition of a flare.

## 14.0 Protection Zone Plans

### Emergency Protection Zone Plan

- In the event of an emergency on the well site, the Emergency Coordinator, or his designee, shall determine protective zones to limit the risk of exposure to workers, local responders, and residents surrounding the work area.
- Life safety, impacts to the environment, and property conservation are priorities.
- The Emergency Coordinator shall determine these zones based on the following information on the scene:
  - Magnitude of the incident
  - Wind Direction
  - MSDS of applicable materials
  - Current and forecasted weather conditions
  - Topography and land conditions
  - Other influences specific to the incident
- Once established, these zones will be maintained until a determination is made by the Emergency Coordinator to alter or discontinue them.

### Flowback Condensate Protection Zone Plan

- A pre-job meeting or contact will be performed with all parties prior to startup.
- Equipment and operational guidelines are:
  - Permit entry only 30' radius around gas buster tanks.
  - Signs posted around well site.
  - Gas detectors and condensate sticks will be on location and used.
  - Approved vendors only for condensate transfer to pre-approved sites.
  - Emergency response plan reviewed for either WV or PA operations.
  - EQT On-Site Completion Specialist (OCS) will be notified immediately of any liquids on the ground.
  - Only approved companies and vacuum trucks to be used to pick up fluids.
  - LEL meter usage verified and to be checked.
  - All ignition sources around well site will be reviewed.

## **15.0 Appendices**

- I. Access Control Form
- II. Safety Training Attendance Form
- III. Site Plan View and Topographical Maps
- IV. Dwelling List Map and Contact Information
- V. Site Geological Prognosis
- VI. Well Site Safety Plan Receipt Acknowledgement





II.

Employer Name

Location

Instructor(s)

Date

Subject

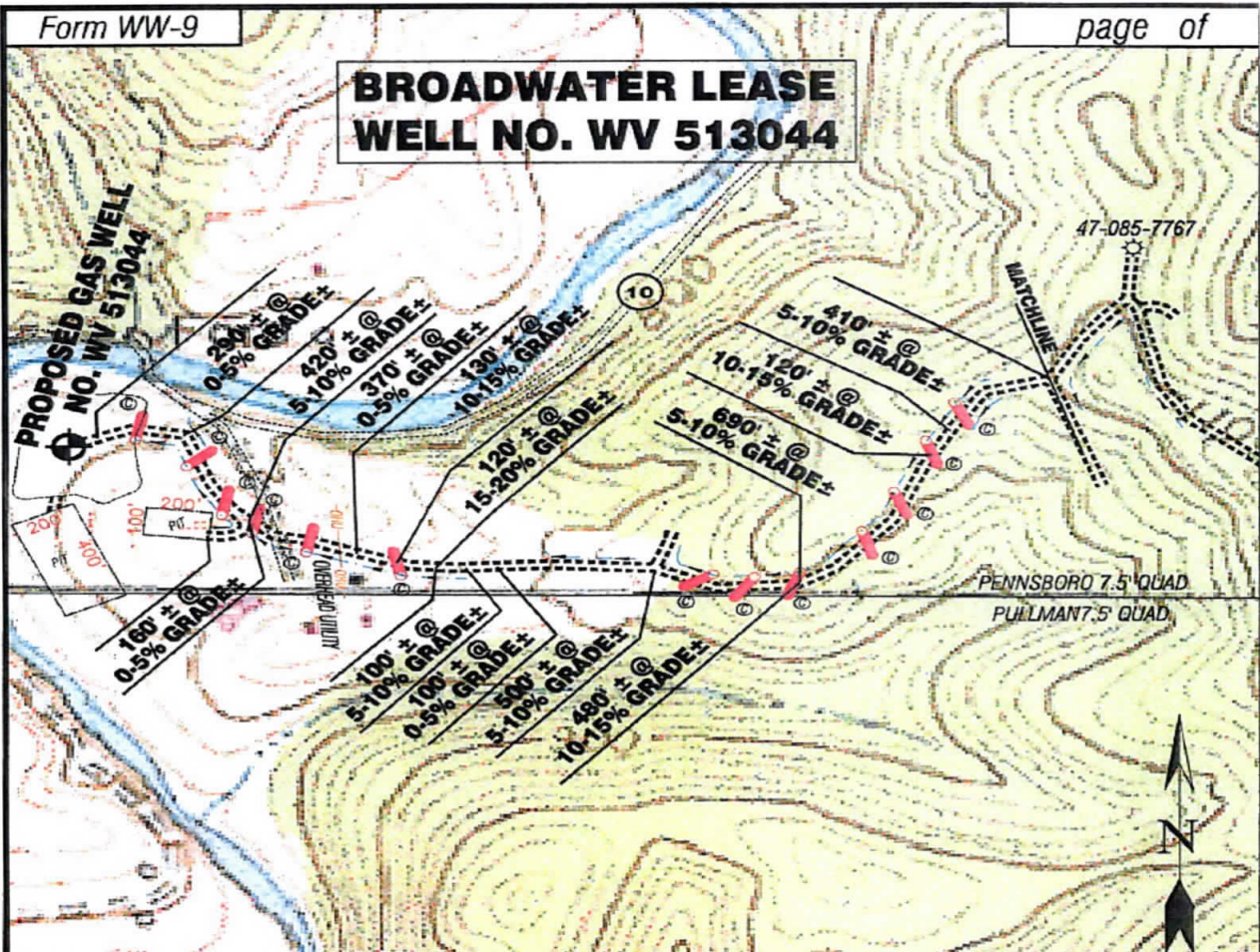
The employees listed have satisfactorily participated and been tested per Regulation/Company Training requirements.

| DEPT. | EMPLOYEE NAME | EMPLOYEE ID | EMPLOYEE SIGNATURE |
|-------|---------------|-------------|--------------------|
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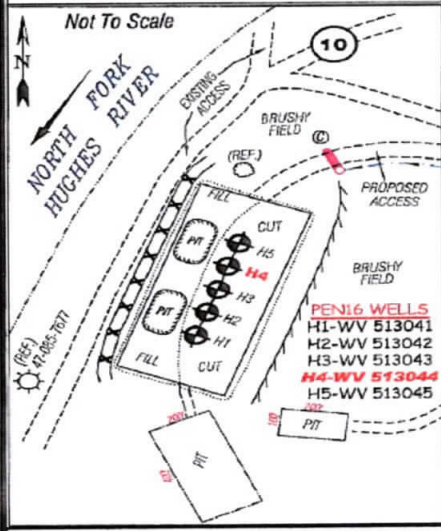
III.



# BROADWATER LEASE WELL NO. WV 513044



Detail Sketch for Proposed Well WV 513044



ALL ROADS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED AND SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.E.P. OIL AND GAS BMP MANUAL ENTRANCES AT COUNTY STATE ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATION. SEPARATE PERMITS MAY BE REQUIRED BY THE D.O.T.

SEDIMENT BASINS (TRAPS) AND APPROPRIATE EROSION CONTROL BARRIERS ARE TO BE CONSTRUCTED AT ALL CULVERT AND CROSS DRAIN INLETS AND OUTLETS AS REQUIRED IN THE WV D.E.P. OIL AND GAS BMP MANUAL. FIELD CONDITIONS (ROCK OUTCROPS AND BEDROCK) MAY PROHIBIT INLET TRAPS BEING INSTALLED. WHEN THESE CONDITIONS EXIST ADDITIONAL EROSION CONTROL MEASURES SHALL BE EVALUATED AND UTILIZED AS NEEDED.

EARTHWORK CONTRACTORS ARE RESPONSIBLE FOR NOTIFICATION TO THE OPERATOR AND INSPECTOR PRIOR TO ANY DEVIATION FROM THIS PLAN.

TEMPORARY SEED & MULCH ALL SLOPES AFTER CONSTRUCTION OF LOCATION.

CUT & STACK ALL MARKETABLE TIMBER.

STACKED BRUSH MAY BE USED FOR SEDIMENT CONTROL.

APPLICATIONS FOR SEPARATE PLC PERMITS ON THE ACCESS ROAD STREAM CROSSINGS HAVE BEEN PREPARED (IF APPLICABLE).

PONDS ARE NOT TO SCALE.

- EXISTING CULVERT
  - PROPOSED CULVERT 12" MIN. UNLESS OTHERWISE NOTED
  - PROPOSED STREAM CROSSING (IF APPLICABLE)
- \*SEE TABLE FOR CULVERT DETAIL.

SCALE: 1"=500'



**SLS**

SMITH LAND SURVEYING, INC.  
 P.O. BOX 150 GLENVILLE, WV, 26351  
 PH: (304) 462-5634 FAX: (304) 462-5656 E-MAIL: [sls@slssurveyors.com](mailto:sls@slssurveyors.com)

DRAWN BY: D.L.P. FILE NO.: 7566 DATE: 09/22/11 CADD FILE: 7566(C)WV513044.dwg

TOPO SECTION OF USGS PENNSBORO & PULLMAN 7.5' QUADRANGLES

# IV.



| MAP # | TM/PARCEL | NAME  | ADDRESS                                   | PHONE          |
|-------|-----------|---|---|----------------|
| 1     | 3-31-2    | Dewayne and Judith Britton                  | 567 Lynn Camp Rd Pennsboro WV 26415       | 304-659-2959   |
| 2     | 3-31-3    | Sherri, Robert and Samuel Hammet            | 955 Bull Creek Rd Waverly WV 26184        | UNLISTED       |
| 3     | 3-31-1    | Barbara, Donald, Marilyn and Lewis Cottrill | 12736 Pullman Rd Pennsboro WV 26415       | 304-659-2604   |
| 4     | 3-26-55   | Virginia Cottrill                           | RR 3 BOX 35 Pennsboro WV 26415            | 304-659-2604   |
| 5     | 3-26-56.2 | Virginia Cottrill                           | RR 3 BOX 35 Pennsboro WV 26415            | 304-659-2604   |
| 6     | 3-31-4    | Virginia Cottrill                           | RR 3 BOX 35 Pennsboro WV 26415            | 304-659-2604   |
| 7     | 3-31-22   | Jo Ann, Judith, and Thomas Robinson         | Rt 1 Box 1015 Pennsboro WV 26415          | 304-873-2397   |
| 8     | 3-31-22   | Jo Ann, Judith, and Thomas Robinson         | Rt 1 Box 1015 Pennsboro WV 26415          | 304-873-2398   |
| 9     | 3-31-5    | Jess and Randy Collins                      | 5368 Muscovy Rd Middleburg FL 32068       | (904) 282-0917 |
| 10    | 3-31-14   | Forestland Heartwood                        | 3001 Emerson Ave Parkersburg WV 26104     | 304-424-3834   |
| 11    | 3-31-10   | Barbara and Donald Deem                     | RR 1 Box 108-1 Pennsboro WV 26415         | UNLISTED       |
| 12    | 3-31-3.1  | Tommie Demsey and Larry Davis               | 709 Duncan Fork Delbarton WV25670         | 304-475-2357   |
| 13    | 3-31-9    | Janet and Steven Stanley                    | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076   |
| 14    | 3-31-9.2  | David Hardman                               | 16508 SW Two Wood Way Indiantown FL 34956 | UNLISTED       |
| 15    | 3-31-8.1  | Sherri, Robert and Samuel Hammet            | 12736 Pullman Rd Pennsboro WV 26415       | UNLISTED       |
| 16    | 3-30-18   | Jaclyn Knight and Ersel Coss                | 11521 Sarbaugh SW Masillon OH 44647       | UNLISTED       |
| 17    | 3-30-18   | Jaclyn Knight and Ersel Coss                | 11521 Sarbaugh SW Masillon OH 44647       | UNLISTED       |
| 18    | 3-30-18.5 | Megan Oliver                                | 232 W Main St Harrisville WV 26362        | 304-643-4031   |
| 19    | 3-30-18.1 | Ardeth and Don Ambrose                      | Rt 1 Box 113 Pennsboro WV 26415           | 304-659-2216   |
| 20    | 3-30-18.2 | Judith Oliver                               | RR 1 Box 112 Pennsboro WV 26415           | UNLISTED       |
| 21    | 3-31-2.3  | kelly Mossor                                | 491 Lynn Camp Rd Pennsboro WV 26415       | 304-659-3567   |
| 22    | 3-31-7    | Dewayne and Judith Britton                  | 567 Lynn Camp Rd Pennsboro WV 26415       | 304-659-2959   |
| 23    | 3-31-2.1  | Kimberly and Steven Britton                 | 1 First American Way Westlake TX 76262    | UNLISTED       |
| 24    | 3-31.2.2  | Joyce and Thomas Trammel                    | 729 Lynn Camp Rd Pennsboro WV 26415       | UNLISTED       |
| 25    | 3-31-8.3  | Steven Stull                                | 109 Lynn Camp Rd Pennsboro WV 26415       | UNLISTED       |
| 26    | 3-31-8.4  | Steven Stull                                | 109 Lynn Camp Rd Pennsboro WV 26415       | UNLISTED       |
| 27    | 3-31-8    | Mary and Earl Sanford                       | 686 Lynn Camp Rd Pennsboro WV 26415       | 304-659-2623   |
| 28    | 3-31-8.6  | Mary and Earl Sanford                       | 686 Lynn Camp Rd Pennsboro WV 26415       | 304-659-2623   |
| 29    | 3-31-8.2  | Pauline Bail                                | Rt 1 Box 108 B Pennsboro WV 26415         | 304-659-2007   |
| 30    | 3-31-8.5  | David Rupert                                | RT 1 Box 111 A Pennsboro WV 26415         | 304-659-3220   |
| 31    | 3-31-12   | Janet and Steven Stanley                    | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076   |
| 32    | 3-31-12.1 | Janet and Steven Stanley                    | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076   |
| 33    | 3-31-13   | Taylor cemetery                             | Rt 1 Box 1 Harrisville WV 26362           | UNLISTED       |

|    |           |  |   |              |
|----|-----------|--|---|--------------|
| 34 | 3-31-12   | Janet and Steven Stanley               | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076 |
| 35 | 3-31-17.2 | Katrina and Edward Andrews             | 1 First American Way Westlake TX 76262    | UNLISTED     |
| 36 | 3-31-17   | Mary Weekley and Dale Taylor           | PO Box 165 Harrisville WV 26362           | UNLISTED     |
| 37 | 3-31-16   | Katrina and Edward Andrews             | 1 First American Way Westlake TX 76262    | UNLISTED     |
| 38 | 3-31-18   | William Robbins                        | 2132 Lynn Camp RD Pennsboro 26415         | 304-659-3159 |
| 39 | 3-36-7    | Suzanne and Maifred Jaotha             | 1873 Buzzard Run Rd Pennsboro WV 26415    | UNLISTED     |
| 40 | 3-36-3.4  | Robert Fouss                           | 4200 Grand Central Avenue Vienna WV 26105 | 304-295-9058 |
| 41 | 3-31-9.1  | Dorothy and Joseph Guth                | 65 Stoney Hollow RD Pennsboro WV 26415    | 304-659-3174 |
| 42 | 3-31-9.4  | Rachel and Phillip Mueller             | Rt 1 Box 108 Pennsboro WV 26415           | UNLISTED     |
| 43 | 3-31-9    | Janet and Steven Stanley               | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076 |
| 44 | 3-31-20.1 | Marvin McGraw And Larry Ryder          | 652 Elk Ests Elkview WV 25071             | 304-965-3645 |
| 45 | 3-31-20   | Steven Walbright                       | 2222 DR Cr Rd Clendenin WV 25045          | UNLISTED     |
| 46 | 3-31-21   | Dale Moore                             | 1851 Lynn Camp RD Pennsboro WV 26415      | 304-659-2734 |
| 47 | 3-36-1    | Dale Moore                             | 1851 Lynn Camp RD Pennsboro WV 26415      | 304-659-2734 |
| 48 | 3-36-3.4  | Robert Fouss                           | 4200 Grand Central Avenue Vienna WV 26105 | 304-295-9058 |
| 49 | 3-36-3.1  | Robert Fouss                           | 4200 Grand Central Avenue Vienna WV 26105 | 304-295-9058 |
| 50 | 3-36-3.2  | Randall Lamm                           | 2597 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3075 |
| 51 | 3-36-3.5  | Kathryn and Randall Lamm               | 2597 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3075 |
| 52 | 3-36-3    | Randall Lamm                           | 2597 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3075 |
| 53 | 3-31-11   | Forestland Heartwood                   | 3001 Emerson Ave Parkersburg WV 26104     | 304-424-3834 |
| 54 | 3-36-2    | Robert Fouss                           | 4200 Grand Central Avenue Vienna WV 26105 | 304-295-9058 |
| 55 | 3-31-14.1 | Forestland Heartwood                   | 3001 Emerson Ave Parkersburg WV 26104     | 304-424-3834 |
| 56 | 3-31-9    | Steven and Janet Stanley               | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076 |
| 57 | 3-31-11   | Forestland Heartwood                   | 3001 Emerson Ave Parkersburg WV 26104     | 304-424-3834 |
| 58 | 3-36-3.3  | Randall Lamm                           | 2597 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3075 |
| 59 | 3-36-8.1  | Virginia and Joseph Means              | 2518 Lynn Camp Rd Pennsboro, WV 26415     | UNLISTED     |
| 60 | 3-31-17   | Mary Weekley and Dale Taylor           | PO Box 165 Harrisville WV 26362           | UNLISTED     |
| 61 | 3-35-5    | Mary Weekley                           | PO Box 165 Harrisville WV 26362           | UNLISTED     |
| 62 | 3-31-5    | Jess and Randy Collins                 | 5368 Muscovy Rd Middleburg FL 32068       | 904-282-0917 |
| 63 | 3-31-5    | Jess and Randy Collins                 | 5368 Muscovy Rd Middleburg FL 32068       | 904-282-0917 |
| 64 | 3-36-4    | Joslyn Jason Gordy and Teresa Chandler | 105 Inglewood PL Elyria OH 44035          | UNLISTED     |
| 65 | 3-31-9    | Janet and Steven Stanley               | 1410 Lynn Camp Rd Pennsboro WV 26415      | 304-659-3076 |

# V.

## WEST VIRGINIA GEOLOGICAL PROGNOSIS

Horizontal Well  
**513045 (PEN16H5)**  
 Ritchie County

### Drilling Objectives:

|                            |                           |                                    |               |             |
|----------------------------|---------------------------|------------------------------------|---------------|-------------|
| <b>Quad:</b>               | Marcellus                 |                                    |               |             |
| <b>Elevation:</b>          | Pennsboro Quad            |                                    |               |             |
|                            | <b>805 KB</b>             |                                    | <b>795 GL</b> |             |
| <b>Surface Location:</b>   | <b>Northing: 277040.2</b> | <b>Easting: 1592387.7</b>          |               |             |
| <b>Landing Point:</b>      | <b>Northing: 276826.7</b> | <b>Easting: 1593565</b>            |               | <b>6068</b> |
| <b>Bottom Hole:</b>        | <b>Northing: 273834.3</b> | <b>Easting: 1594960.4</b>          |               | <b>6062</b> |
| <b>Recommended Azimuth</b> | <b>155</b> Degrees        | <b>Recommended Lateral Length:</b> |               | <b>3302</b> |

### Proposed Logging Suite:

@ **Intermediate Casing Point:** The open hole logs need to consist of Gamma Ray, Neutron, Density, Induction and Dipole Sonic. **CONTACT RANDY BLOOD PRIOR TO LOGGING (412.303.8861)**  
 Cased hole cement bond log required after intermediate casing. **Baker Atlas' Segmented Bond Log preferred.**  
 @ **kickoff point - Run OH logs for evaluation of uphole zones.**  
**An e-log should be run for the first well on every horizontal well pad.**  
 GR/LDT/DIL/CNL/Temp/Audio (Allegheny's Air Suite) - pull GR to surface.  
 Mudloggers to be on location at kickoff point to run samples and measure gas thru both the curve and lateral sections.

### Recommended Gas Tests:

1800, 2050, 2600, Intrm Csg. Pt., 3400, 4900, 5250, KOP, (Gas test at any mine void)  
 Gas test during any trip or significant downtime while drilling the lateral section.

Possible red rock at: \*60.142.226.228.253.362.566.686.713

### ESTIMATED FORMATION TOPS

| Formation                      | Top (TVD)   | Base (TVD)                  | Lithology | Comments  |
|--------------------------------|-------------|-----------------------------|-----------|---|
| Fresh Water Zone               | 1           | 546                         |           | FW @ 67,443,546   |
| Coal                           | 52          | 60 Coal                     |           |   |
| Coal                           | 233         | 238 Coal                    |           | SW @ 1325,1616,2194   |
| Coal                           | 422         | 425 Coal                    |           |   |
| Maxton                         | 1472        | 1518 Sandstone              |           | Red Rock Possible @ 60.142.226.228.253.362.566.686.713      |
| Big Lime                       | 1607        | 1667 Limestone              |           |   |
| Big Injun                      | 1667        | 1848 Sandstone              |           |   |
| Weir                           | 2426        | 2533 Sandstone              |           |   |
| Top Devonian                   | 2930        |                             |           |   |
| -Gantz                         | 2533        | 2605 Silty Sand             |           |   |
| -Fifty foot                    | 2605        | 2646 Silty Sand             |           |   |
| -Thirty foot                   | 2681        | 2715 Silty Sand             |           |   |
| -Gordon                        | 2766        | 2885 Silty Sand             |           |   |
| -Forth Sand                    | 2904        | 2985 Silty Sand             |           |   |
| -Bayard                        | 2990        | 3056 Silty Sand             |           |   |
| Int. csg pt                    | 3106        |                             |           | 50 ft below Bayard  |
| -Warren                        | 3163        | 3250 Silty Sand             |           |   |
| -Speechley                     | 3268        | 3327 Silty Sand             |           |   |
| -Balltown A                    | 3619        | 3693 Silty Sand             |           |   |
| -Riley                         | 3884        | 4003 Silty Sand             |           |   |
| -Benson                        | 4632        | 4690 Silty Sand             |           |   |
| -Alexander                     | 4884        | 4974 Silty Sand             |           |   |
| -Undiff. gray shales and silts | 4974        | 5796 Gray Shales and Silts  |           |   |
| -Sonyea                        | 5796        | 5895 Gray shale             |           |   |
| -Middlesex                     | 5895        | 5952 Shale                  |           |   |
| -Genesee                       | 5952        | 6010 Gray shale interbedded |           |   |
| -Genesee                       | 6010        | 6034 Black Shale            |           |   |
| -Tully                         | 6034        | 6043 Limestone              |           |   |
| -Hamilton                      | 6043        | 6063 Gray shale with some   |           |   |
| -Marcellus                     | 6063        | 6100 Black Shale            |           |   |
| -Purcell                       | 6078        | 6081 Limestone              |           |   |
| <b>-Lateral Zone</b>           | <b>6068</b> | <b>6062</b>                 |           | <b>Start Lateral at 6068 ft, drill up to max of 6062 ft</b> |
| -Cherry Valley                 | 6086        | 6089 Limestone              |           |   |
| Onondaga                       | 6100        | Limestone                   |           |   |
| <b>Pilot Hole TD</b>           | <b>6120</b> |                             |           |   |

Base RR  
713

**Comments:** Note that this is a TVD prog for a horizontal well (azimuth of 155 degrees; target formation = Marcellus). **All measurements taken from estimated KB elevation.** Water and coal information estimated from surrounding well data. Salt water reported at 1325, 1616, 2194. Intermediate casing point is recommended 50' beneath the Bayard to shut off any water production from the upper Devonian sands. Intermediate casing should be cemented into the surface string, per WV regulations. The estimated TD is the TVD landing point for the horizontal section of well, with the plan to then drill up-angle to a final TVD of 6062' at the toe of the lateral. The geologic structure is expected to rise 6' along the the horizontal portion of the wellpath.

### LATERAL DRILLING TOLERANCES

**Mapview - Left of borehole:** Deviate no more than possible to the left to avoid planned spur well PEN16H2  
**Mapview - Right of borehole:** Deviate no more than possible to the right to avoid deviating from planned azimuth  
**Mapview - TD:** **DO NOT EXTEND** beyond recommended wellbore to avoid lease boundary  
**X-sectional View - Heel:** 14 ft below MRC top  
**X-sectional View - Toe:** 24 ft above MRC base

### RECOMMENDED CASING POINTS

|                         |        |        |            |      |
|-------------------------|--------|--------|------------|------|
| <b>Fresh Water/Coal</b> | CSG OD | 13 3/8 | CSG DEPTH: | 646  |
| <b>Intermediate 1:</b>  | CSG OD | 9 5/8  | CSG DEPTH: | 3106 |
| <b>Production:</b>      | CSG OD | 5 1/2  | CSG DEPTH: | @ TD |

P. Morath  
 Prog created: 10/25/2011 DAF Plat Date: 10/13/2011

VI.



Where energy meets innovation.<sup>SM</sup>

**WELL SITE SAFETY PLAN RECEIPT ACKNOWLEDGMENT**

This form letter is to be signed by the LEPC or CES representative to indicate they have received the Site Safety Plan for the following well site location and understand its use.

Site Location:

I have received my copy of the *Well Site Safety Plan* for the above described location. I understand that this is a reference tool for emergency response and it is my responsibility to read and understand the Plan.

|  |            |
|--|------------|
| _____                                  | Date _____ |
| LCEP or CES Representative (printed)   |            |
| _____                                  |            |
| Representative Affiliation and Title   |            |
| _____                                  |            |
| Representative Signature               |            |
|  |            |
| _____                                  | Date _____ |
| EQT Representative (printed)           |            |
| _____                                  |            |
| EQT Environmental and Safety title     |            |
| _____                                  |            |
| EQT Environmental and Safety Signature |            |



1) Date: October 20, 2011  
2) Operator's Well Number  
513045-Broadwater  
3) API Well No.: 47 085 - 0995314  
State County Permit

**STATE OF WEST VIRGINIA - BUREAU OF ENVIRONMENT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL & GAS  
NOTICE AND APPLICATION FOR A WELL WORK PERMIT**

4) **Surface Owner(s) to be served:**

(a) Name Heartwood Forest Fund IV  
Address 3001 Emerson Avenue  
Parkersburg, WV 26104

(b) Name 0  
Address 0  
0

(c) Name 0  
Address 0  
0

(d) Name \_\_\_\_\_  
Address \_\_\_\_\_

5) (a) **Coal Operator:**  
Name None found  
Address \_\_\_\_\_

(b) **Coal Owner(s) with Declaration:**  
Name Thomas J. Broadwater  
Address 603 N. 6th St.  
Cambridge, OH 43725  
0  
Name see attached  
Address \_\_\_\_\_

(c) **Coal Lessee(s) with Declaration:**  
None found

6) **Inspector:** David Cowan  
Address Rt. 1 Box 202  
Harrisville, WV 26362  
Telephone 304-389-3509

**TO THE PERSONS NAMED ABOVE TAKE NOTE 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)

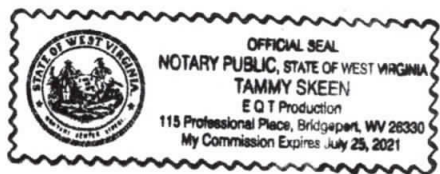
I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through \_\_\_\_\_ on the above named parties by:

- 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.

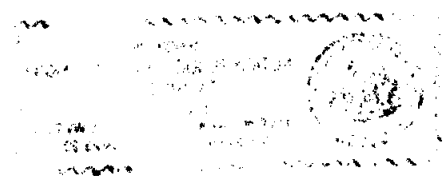


Well Operator: EQT Production Company  
By: [Signature]  
Its: Permitting Supervisor  
Address: 115 Professional Place  
P.O. Box 280  
Bridgeport, WV 26330  
Telephone: (304) 848-0082

Subscribed and sworn before me this 31 day of October, 2011  
Tammy Skeen Notary Public

My Commission Expires: 7-25-21

**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 regular 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](mailto:depprivacyofficer@wv.gov).



85-09953H

WW2-A

**Additional Coal Owners:**

Barbara A. Basil ✓  
2620 Berwyn Rd.  
Columbus, OH 43220

Martha Wilson ✓  
837 Fairview Ave.  
Parkersburg, wv 26101

Calvin H. Grosscup, Jr. ✓  
1309 Cove PL.  
Ocean Springs, MS 39564

Michael C. Broadwater ✓  
4400 Reed Rd.  
Columbus, OH 43220

Mary J. Smith ✓  
5229 Glenbrook Dr.  
Vienna, WV 26105

Mabel Broadwater ✓  
5504 12th Ave.  
Vienna, WV 26105

CONFIDENTIAL  
JUN 01 2011  
FBI - COLUMBUS

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 and gas as follows:

| Grantor, lessor, etc.         | Grantee, lessee, etc. | Royalty | Book/Page |
|-------------------------------|-----------------------|---------|-----------|
| Creed Collins & Susan Collins | W. A. Flanagan        | 1/8th   | 24/315 ✓  |

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 under any public roads that the well lateral crosses. ✓

**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

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated. ✓

WELL OPERATOR: EQT PRODUCTION COMPANY  
By: *[Signature]*  
Its: Permitting Supervisor

RECEIVED  
Office of Oil & Gas  
NOV 01 2011  
West Virginia Department of Environmental Protection

65-0995314

Operator's Well No.:

513045-Broadwater

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL & GAS

**NOTICE TO SURFACE OWNERS**

The well operator named below is preparing to file for a permit from the State to drill a new well. Before a well work permit can be filed with the Chief of the Office of Oil and Gas, the well operator is required to have given notice of the right to request water well or spring analytical testing. This notice shall be given to the owners or occupants of land which have a water well or spring being utilized for human consumption, domestic animals, or other general use and which is located within 1000 feet of the proposed well site.

With this form, the operator is giving you notice of your right to request analytical testing. The operator is required to sample and analyze the water wells or springs of all owners or occupants who request it. Therefore, if you wish to have your water well or spring tested, contact the operator named below.

All sampling shall be completed prior to drilling. Within thirty (30) days of the receipt of such sample analyses the operator shall submit the results to the Chief of the Office of Oil and Gas and to the owners or occupants who may have requested them.

If no water well or spring is located within 1000 feet, the Chief may require the operator to sample and analyze water from a water well or spring within 2000 feet of the proposed well site.

Be advised, you have the right to sample and analyze any water supply at your own expense.

The laboratory used by the operator to analyze the samples will be approved by the Chief. A list of approved commercial laboratories is maintained by the WVDEP and may be viewed at: <http://www.dep.wv.gov/WWE/Programs/lab/Pages/default.aspx>

Listed below is the laboratory chosen by operator to perform analysis and contractor chosen to collect sample.

Certified Laboratory Name  
Contractor Name

Sturm Environmental Services  
Smith Surveying INC.

Well Operator  
Address  
Telephone

EQT Production Co.  
1710 Pennsylvania Ave  
Charleston, WV 25302  
(304) 348-3845



FOR OPERATOR'S USE ONLY: Below, or on an attached page, list those persons which were given this notice. Place an asterisk beside the one(s) that contacted you and requested sampling and analyses. If there were no requests made, indicate by underlining which one you have selected to sample and analyze. If there are no water wells or springs within 1000 feet of the proposed site please indicate such.

6± water supplies within 2,500' of the proposed well site.





85-09953H

OPERATOR: EQT Production Company

LEASE NAME AND NUMBER: WV # 513045 (PEN 16 H 5)

COMMENTS

The initial mapping review of the area surrounding the proposed well site revealed the below listed surface owner(s) that were potentially utilizing groundwater (potable) for Human Consumption or other purposes within 2500' of the proposed well site. The following landowners will be notified of the opportunity to request a water sample.

\*Please note that the following information is subject to change upon field inspection.

INDIVIDUAL CONTACTED OR NOTIFIED

Owner/Occupant: Steven J. & Janet M. Stanley

Address: 1410 Lynn Camp Rd., Pennsboro, WV. 26415 Letter/Notice Date: \_\_\_\_\_

Comments: Par # 9 & # 12.1

Owner/Occupant: Joseph M. Jr. & Dorothy Anne Guth

Address: 65 Stoney Hollow Rd., Pennsboro, WV. 26415 Letter/Notice Date: \_\_\_\_\_

Comments: Par # 9.1

Owner/Occupant: David A. Hardman

Address: 16508 SW Two Wood Way, Indiantown, FL. 34956 Letter/Notice Date: \_\_\_\_\_

Comments: Par # 9.2

Owner/Occupant: Phillip Cary & Rachel A. Mueller

Address: RR 1 Box 108, Pennsboro, WV. 26415 Letter/Notice Date: \_\_\_\_\_

Comments: Par # 9.4

Owner/Occupant: Donald E. & Barbara A. Deem

Address: RR 1 Box 108-1, Pennsboro, WV. 26415 Letter/Notice Date: \_\_\_\_\_

Comments: Par # 10

85-09953H

Owner/Occupant: Heartwood Forestland Fund IV Limited Partnership

Address: 3001 Emerson Avenue, Parkersburg, WV, 26104 Letter/Notice Date: \_\_\_\_\_

Comments: Par # 14

Owner/Occupant: \_\_\_\_\_

Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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

Owner/Occupant: \_\_\_\_\_

Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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

Owner/Occupant: \_\_\_\_\_

Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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

Owner/Occupant: \_\_\_\_\_

Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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

Owner/Occupant: \_\_\_\_\_

Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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

Owner/Occupant: \_\_\_\_\_

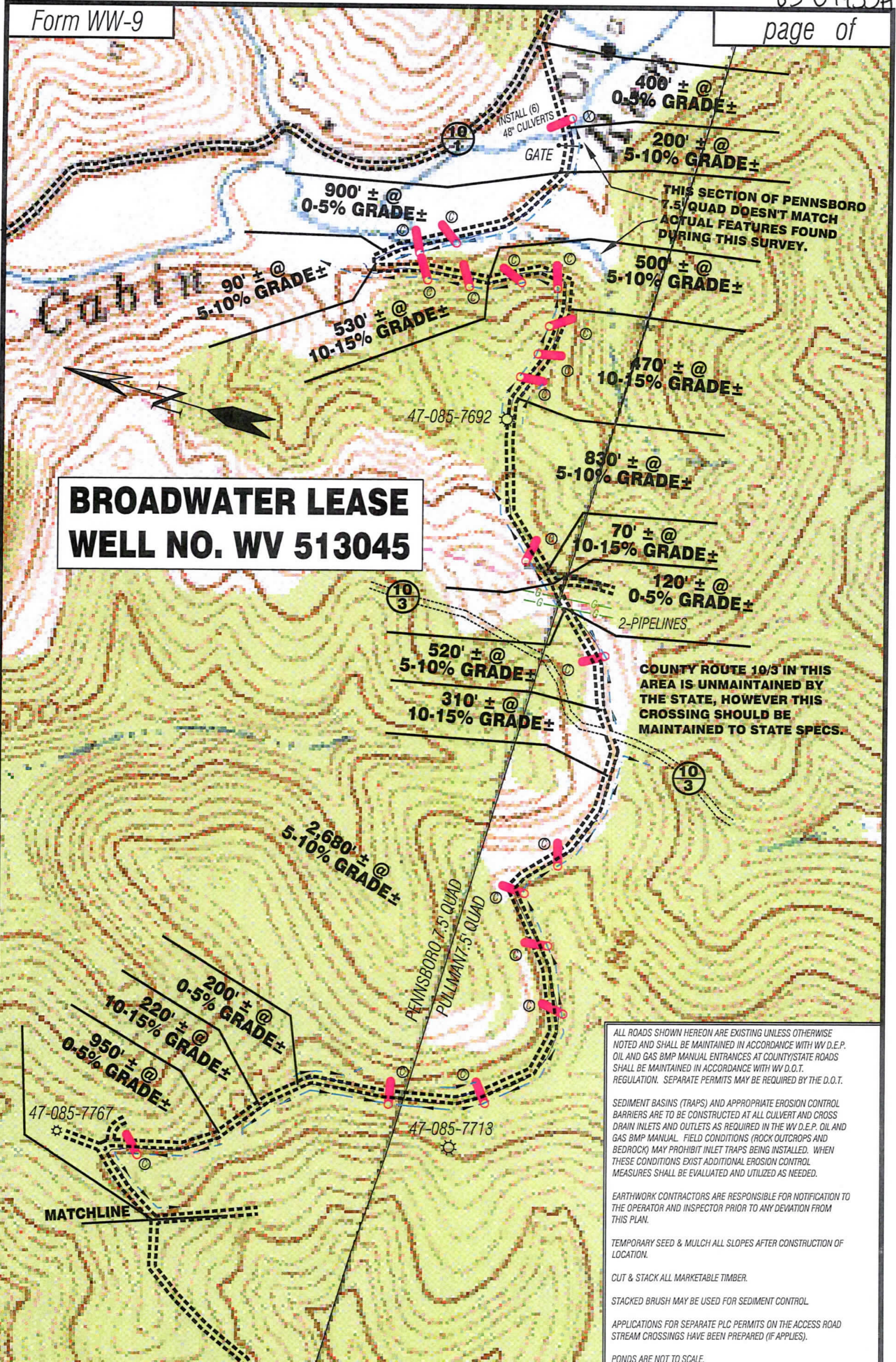
Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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

Owner/Occupant: \_\_\_\_\_

Address: \_\_\_\_\_ Letter/Notice Date: \_\_\_\_\_

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



ALL ROADS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED AND SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.E.P. OIL AND GAS BMP MANUAL ENTRANCES AT COUNTY/STATE ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATION. SEPARATE PERMITS MAY BE REQUIRED BY THE D.O.T.

SEDIMENT BASINS (TRAPS) AND APPROPRIATE EROSION CONTROL BARRIERS ARE TO BE CONSTRUCTED AT ALL CULVERT AND CROSS DRAIN INLETS AND OUTLETS AS REQUIRED IN THE WV D.E.P. OIL AND GAS BMP MANUAL. FIELD CONDITIONS (ROCK OUTCROPS AND BEDROCK) MAY PROHIBIT INLET TRAPS BEING INSTALLED. WHEN THESE CONDITIONS EXIST ADDITIONAL EROSION CONTROL MEASURES SHALL BE EVALUATED AND UTILIZED AS NEEDED.

EARTHWORK CONTRACTORS ARE RESPONSIBLE FOR NOTIFICATION TO THE OPERATOR AND INSPECTOR PRIOR TO ANY DEVIATION FROM THIS PLAN.




TEMPORARY SEED & MULCH ALL SLOPES AFTER CONSTRUCTION OF LOCATION.

CUT & STACK ALL MARKETABLE TIMBER.

STACKED BRUSH MAY BE USED FOR SEDIMENT CONTROL.

APPLICATIONS FOR SEPARATE PLC PERMITS ON THE ACCESS ROAD STREAM CROSSINGS HAVE BEEN PREPARED (IF APPLIES).

PONDS ARE NOT TO SCALE.

-  = EXISTING CULVERT
-  = PROPOSED CULVERT 12" MIN. UNLESS OTHERWISE NOTED
-  = PROPOSED STREAM CROSSING (IF APPLIES)
- \*SEE TABLE FOR CULVERT DETAIL

**SCALE: 1"=500'**



TOPO SECTION OF USGS PENNSBORO & PULLMAN 7.5' QUADRANGLES

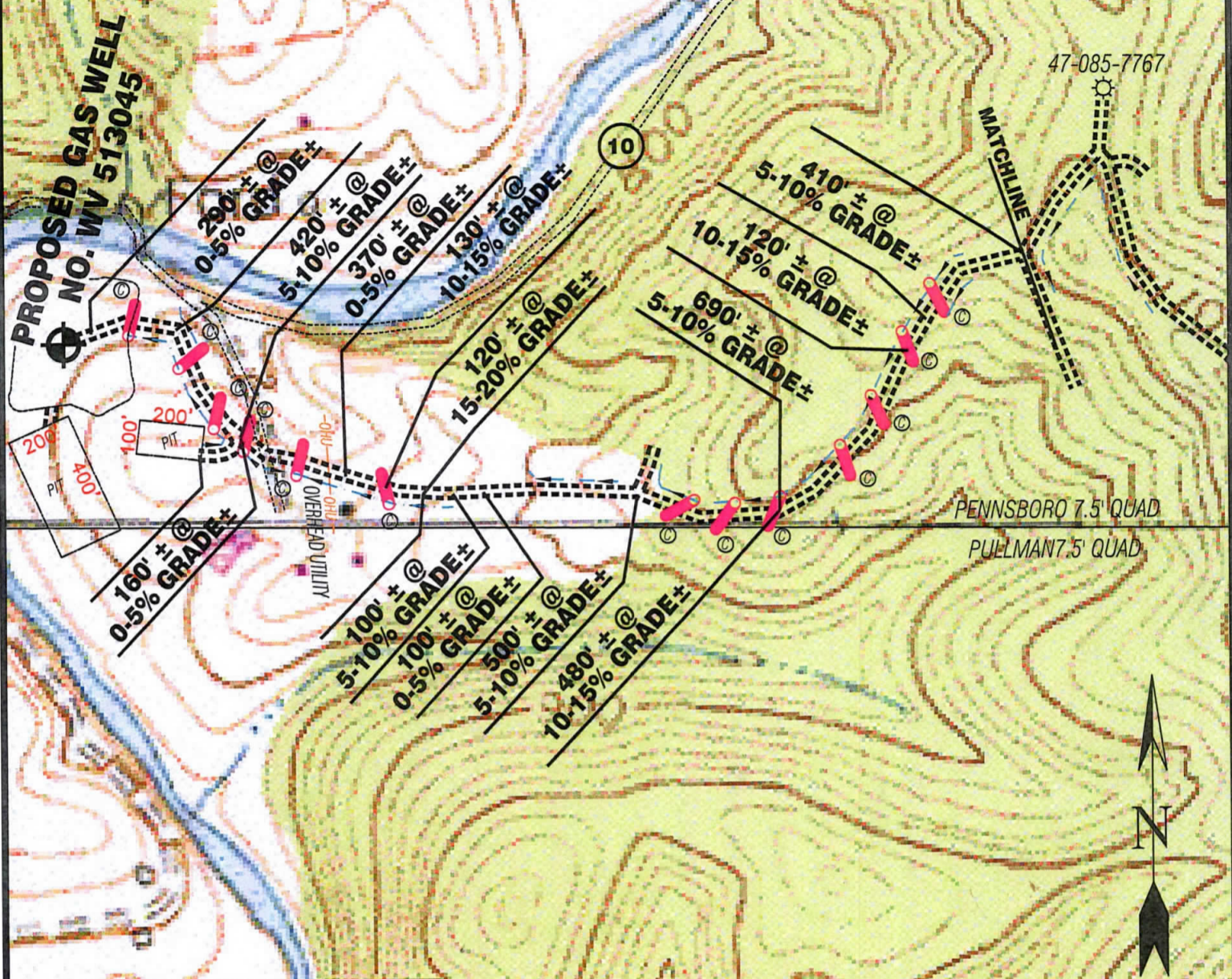


SMITH LAND SURVEYING, INC.  
P.O. BOX 150 GLENVILLE, WV, 26351  
PH: (304) 462-5634 FAX: (304) 462-5656 E-MAIL: sls@slssurveys.com

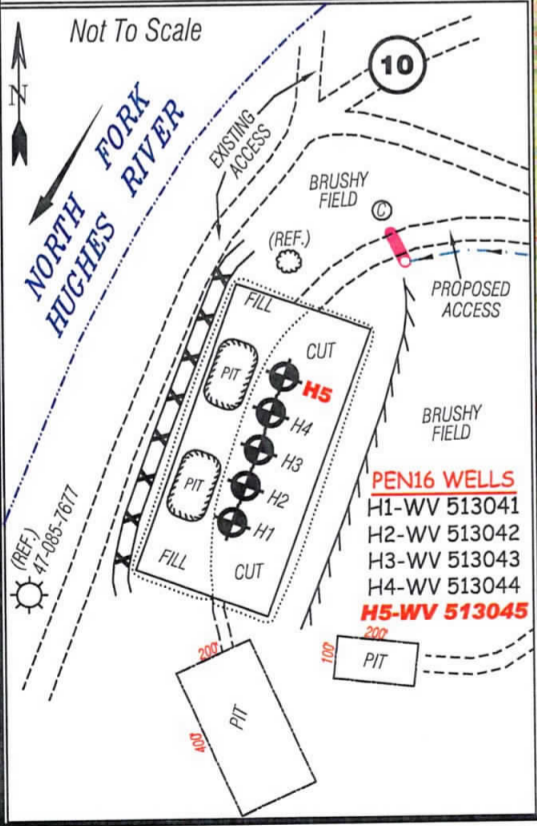
|                    |                  |                  |                                    |
|--------------------|------------------|------------------|------------------------------------|
| DRAWN BY<br>D.L.P. | FILE NO.<br>7566 | DATE<br>09/22/11 | CADD FILE:<br>7566RECWW51304SR.dwg |
|--------------------|------------------|------------------|------------------------------------|



# BROADWATER LEASE WELL NO. WV 513045



Detail Sketch for Proposed Well WV 513045



ALL ROADS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED AND SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.E.P. OIL AND GAS BMP MANUAL ENTRANCES AT COUNTY/STATE ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATION. SEPARATE PERMITS MAY BE REQUIRED BY THE D.O.T.

SEDIMENT BASINS (TRAPS) AND APPROPRIATE EROSION CONTROL BARRIERS ARE TO BE CONSTRUCTED AT ALL CULVERT AND CROSS DRAIN INLETS AND OUTLETS AS REQUIRED IN THE WV D.E.P. OIL AND GAS BMP MANUAL. FIELD CONDITIONS (ROCK OUTCROPS AND BEDROCK) MAY PROHIBIT INLET TRAPS BEING INSTALLED. WHEN THESE CONDITIONS EXIST ADDITIONAL EROSION CONTROL MEASURES SHALL BE EVALUATED AND UTILIZED AS NEEDED.

EARTHWORK CONTRACTORS ARE RESPONSIBLE FOR NOTIFICATION TO THE OPERATOR AND INSPECTOR PRIOR TO ANY DEVIATION FROM THIS PLAN.

TEMPORARY SEED & MULCH ALL SLOPES AFTER CONSTRUCTION OF LOCATION.

CUT & STACK ALL MARKETABLE TIMBER.

STACKED BRUSH MAY BE USED FOR SEDIMENT CONTROL.

APPLICATIONS FOR SEPARATE PLC PERMITS ON THE ACCESS ROAD STREAM CROSSINGS HAVE BEEN PREPARED (IF APPLIES).

PONDS ARE NOT TO SCALE.

SCALE: 1"=500'



- = EXISTING CULVERT
- = PROPOSED CULVERT 12" MIN. UNLESS OTHERWISE NOTED
- = PROPOSED STREAM CROSSING (IF APPLIES) \*SEE TABLE FOR CULVERT DETAIL



SMITH LAND SURVEYING, INC.  
P.O. BOX 150 GLENVILLE, WV. 26351  
PH: (304)462-5634 FAX: (304)462-5656 E-MAIL: sls@slssurveys.com

|                    |                  |                  |                                    |
|--------------------|------------------|------------------|------------------------------------|
| DRAWN BY<br>D.L.P. | FILE NO.<br>7566 | DATE<br>09/22/11 | CADD FILE:<br>7566RECWW51304SR.dwg |
|--------------------|------------------|------------------|------------------------------------|

TOPO SECTION OF USGS PENNSBORO & PULLMAN 7.5' QUADRANGLES

State of West Virginia  
Department of Environmental Protection  
Office of Oil and Gas

**Well Work Permit Application Addendum**

(To be completed when fluid volumes used or disposed may be greater than 5000 barrels)

- 1) Well Operator: **EQT Production Co**
- 2) Operator ID #: **306686**
- 3) Operator's Well Number: **513045 PEN16H5**
- 4) County: **Ritchie**
- 5) Approximate Amount of Water to be Us Used (bbls) **150,000**
- 6) Fracture/Drilling Water Source (estimate % of each source to be used)
- |           |               |          |              |                 |           |           |
|-----------|---------------|----------|--------------|-----------------|-----------|-----------|
| <b>90</b> | Surface Water | <b>0</b> | Ground Water | Purchased Water | ReUsed Wa | <b>10</b> |
|-----------|---------------|----------|--------------|-----------------|-----------|-----------|
- 7) Location of Surface Water Source (if applicable) **N/A**
- a) County: **Ritchie**  
Water Source Name: **North Fork of Hughes River**  
Latitude (d/m/s) **39 15' 08"** Longitude (d/m/s) **-80° 56' 24"**
- b) Anticipated month(s) of water withdrawals **\_ Jan - Dec**
- 8) Location of Groundwater Source (if applicable) **N/A**
- a) County:  
Water Source Name:  
Latitude (d/m/s) Longitude (d/m/s)
- b) Anticipated month(s) of water withdrawals \_\_\_\_\_
- 9) Location of Purchased Water Source (if applicable)
- Public/Private Water System Name
- 10) Location of Reused Water (if applicable)
- County: **Ritchie**  
Well/Facility ID: **PEN 15**
- 11) Will Centralized Pits/Ponds Be Utilized **x** yes **no**
- Location (if applicable) (NAD83)  
Latitude (d/m/s) **39.25042000** Longitude (d/m/s) **-80.93923000**  
Dimensions in Feet (if applicable)  
Length **412'** Width **212'** Depth **19'**
- 12) Water Disposal Method (estimate % each facility is to receive)
- |            |                      |               |       |                   |
|------------|----------------------|---------------|-------|-------------------|
| _____      | Land Application     | UIC           | _____ | UIC permit number |
| _____      | POTW - facility name |               |       |                   |
| _____      | NPDES - permit #     |               |       |                   |
| <b>100</b> | Other                | Reuse/Recycle |       |                   |

**Location of additional Surface Water Source:**

County: **Ritchie**  
Water Source name: **North Fork of Hughes River**  
Lat **39° 13' 38.07"**  
Long **-81° 02' 06.09"**

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Sent To  
**Martha Wilson**  
837 Fairview Ave.  
Parkersburg, WV 26101

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**Mary J. Smith**  
5229 Glenbrook Dr.  
Vienna, WV 26105

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City, State, ZIP+4

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| Total Postage & Fees                           | \$ 11.10 | 11/01/2011 |

Sent To  
**Michael C. Broadwater**  
4400 Reed Rd.  
Columbus, OH 43220

Street, Apt. No., or PO Box No.  
City, State, ZIP

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| Return Receipt Fee (Endorsement Required)      | \$ 2.30  |            |
| Restricted Delivery Fee (Endorsement Required) | \$ 0.00  |            |
| Total Postage & Fees                           | \$ 11.10 | 11/01/2011 |

Sent To  
**Mabel Broadwater**  
5504 12<sup>th</sup> Ave.  
Vienna, WV 26105

Street, Apt. No., or PO Box No.  
City, State, ZIP+4

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|--|----------|------------|
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| Certified Fee                                  | \$ 2.85  |            |
| Return Receipt Fee (Endorsement Required)      | \$ 2.30  |            |
| Restricted Delivery Fee (Endorsement Required) | \$ 0.00  |            |
| Total Postage & Fees                           | \$ 11.10 | 11/01/2011 |

Sent To  
**Heartwood Forest Fund IV**  
c/o Greg Wihelm  
3001 Emerson Ave.  
Parkersburg, WV 26104

Street, Apt. No., or PO Box No.  
City, State, ZIP

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| Return Receipt Fee (Endorsement Required)      | \$ 2.30  |            |
| Restricted Delivery Fee (Endorsement Required) | \$ 0.00  |            |
| Total Postage & Fees                           | \$ 11.10 | 11/01/2011 |

Sent To  
**Barbara A. Basil**  
2620 Berwyn Rd.  
Columbus, OH 43220

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|--|----------|------------|
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| Certified Fee                                  | \$ 2.85  |            |
| Return Receipt Fee (Endorsement Required)      | \$ 2.30  |            |
| Restricted Delivery Fee (Endorsement Required) | \$ 0.00  |            |
| Total Postage & Fees                           | \$ 14.50 | 11/01/2011 |

Sent To  
**Calvin H. Grosscup, Jr.**  
1309 Cove Pl.  
Ocean Springs, MS 39564

Street, Apt. No., or PO Box No.  
City, State, ZIP+4

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7009 2250 0004 3161 7447

7009 2250 0004 3161 7355

7009 2250 0004 3161 7430

7009 2250 0004 3161 7447

7009 2250 0004 3161 7348

7009 2250 0004 3161 7393

7009 2250 0004 3161 7416

Thomas J. Broadwater  
603 N. 6<sup>th</sup> St.  
Cambridge, OH 43725  
513042 513044 513045

|  |          |            |
|--|----------|------------|
| Postage  | \$ 5.95  | 0098       |
| Certified Fee                                  | \$ 2.85  |            |
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| Restricted Delivery Fee (Endorsement Required) | \$ 0.00  |            |
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Office of Oil, Gas  
NOV 01 2011

Pennsboro

Operator: EQT PRODUCTION COMPAN API: 8509953

WELL No: 513045 - BROADWATER

Reviewed by: Ja Date: 12-30-11

15 Day End of Comment: 1/17

59 Days ✓  
37.1 acres

**CHECKLIST FOR FILING A PERMIT**

- WW-2B *need surface casing* **Horizontal Well**
- Inspector signature on WW-2B *apparently*
- WW-2A (Notarized)
- Certified Mail Receipts, Waivers, or Affidavits of Personal Service
- Surface Owner Waiver
- Coal Owner / Lessee / Operator Waiver
- WW-2A-1 (Signed) Showing Book/Page Number and Royalty Percentage
- WW-2B-1 (Names, addresses, and spot on topographical map listed as water testing)
- WW-9 (Page 1 & 2) (Notarized) *cutting disposal*
- More than 5,000 bbls
- Inspector Signature on WW-9
- Reclamation plan
- Topographic Map of location of well
- Mylar Plat (Signed and Sealed) (Surface owner on plat matches WW-2A)
- Bond
- Company is Registered with the SOS
- Worker's Compensation / Unemployment Insurance account is OK
- \$650.00 check (\$550.00 if no pit)
- Mine Data
- Addendum
- Flow Distance to Nearest Intake
- Horizontal Rule Series 8 Effective August 30, 2011-Well Sites Greater Than 3 Acres
- Erosion and Sediment Control Plan
- Site Construction Plan
- Well Site Safety Plan
- Water Management Plan (Plan to withdraw 210,000 gallons or more during any one month period)
- Within a Municipality
- Class I Legal Advertisement in Newspaper for first permit on well pad

*OK*

*need approval*

*6/12/12*

*OK*

**Smith, Gene C**

---

To: Roark, Vicki  
Subject: pen16 pad 513042 85-9951 and 513045 85-9953

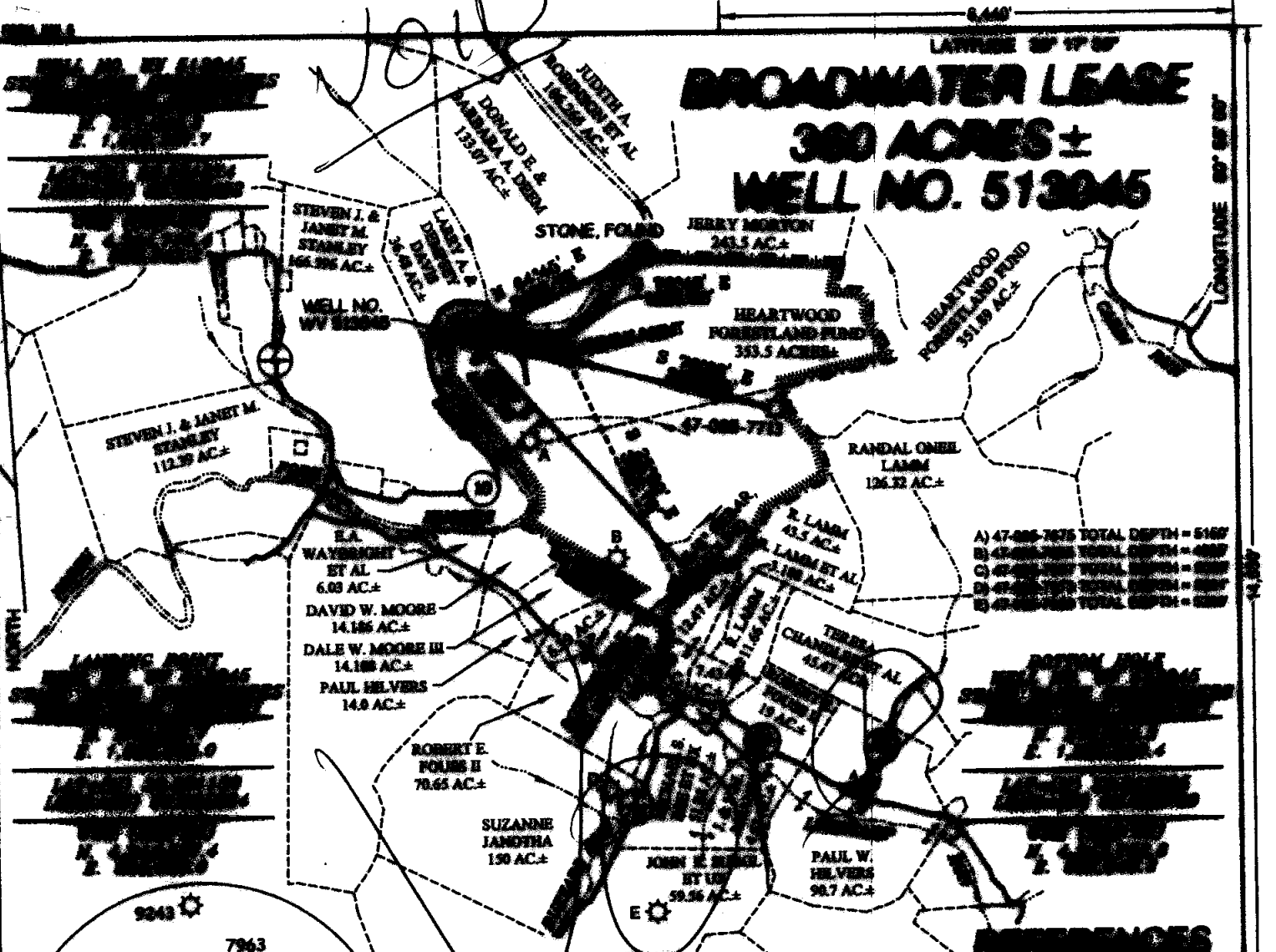
Vicki, the following needs completed to make the subject apps complete:

- OK* - Site safety needs field approval *6/12/12*
- OK* - Site Construction and Erosion and Sediment Control plans need field approval *6/11/12*
- OK* - Need a statement of why the surface casing will need to be set more than 300 feet *6/11/12*
- OK* - Cuttings disposal method should not be solidification-need hauled to landfill *6/12/12*

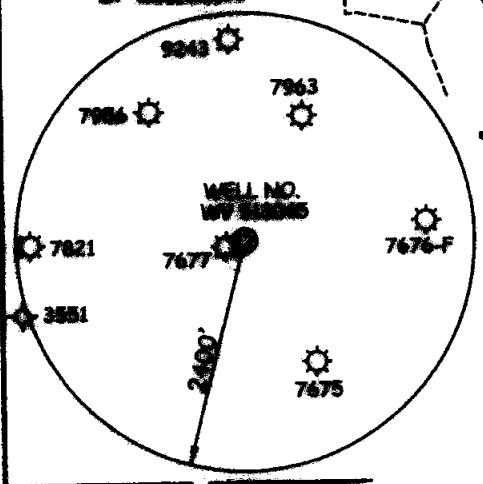
# BROADWATER LEASE

## 300 ACRES ±

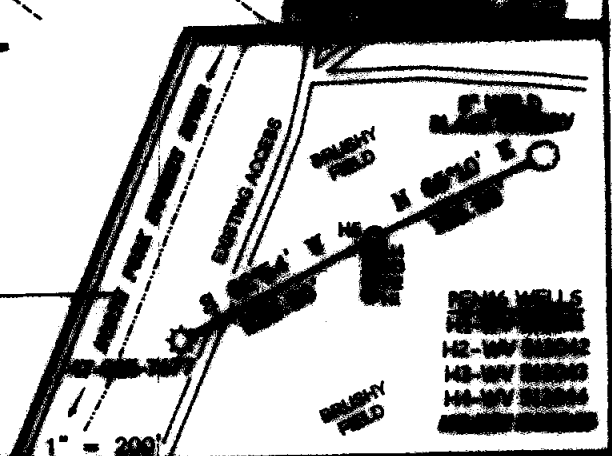
### WELL NO. 513045



LATITUDE 37° 17' 00"  
 LONGITUDE 81° 07' 00"

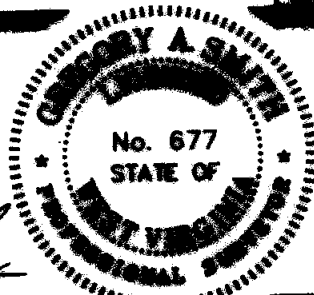


- NOTES ON SURVEY**
1. THIS SURVEY IS REFERRED TO AS THE SURVEY IN AND NEARBY THE WV STATE PLAT, COGNOME SYSTEM NORTH ZONE MAG '27.
  2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM BOOK 197 PAGE 181.
  3. SURFACE OWNER AND ADJACENT INTERESTS TAKEN FROM THE ADJACENT AND ADJACENT COUNTY RECORDS OF MICHIE COUNTY IN JULY, 2010.
  4. WELL LAT./LONG. (MAG'27) ESTABLISHED BY DGPS (SURVEY GRADE).



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF THE ORIGINAL RECORD AS FILED IN THE OFFICE OF THE REGISTER OF DEEDS AND RECORDS OF MICHIE COUNTY, WEST VIRGINIA, AND THAT THE SAME HAS BEEN REPRODUCED BY THE OFFICE OF ENVIRONMENTAL PROTECTION.

P.S. 677 *[Signature]*



(\*) SIGNATURE AND DATE OF WELL OR LEASED STATES THEREON AND DATE.

DATE October 13, 20 11

OPERATORS WELL NO. WV 513045

API WELL NO. 47-085-000534

STATE WV COUNTY Clay

SCALE 1" = 200'

FILE NO. Z88433888 (20-38)

PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE)

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

WELL TYPE: OIL  GAS  INJECTION  DISPOSAL  "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION 2800 WATERSHED NORTH FORK HIGHES RIVER

DISTRICT CLAY COUNTY MITCHE QUADRANGLE PENNSBORO 7.5

SURFACE OWNER HEARTWOOD FORELAND FUND ACREAGE 300.51

ROYALTY OWNER JACKSON BROADWATER MINES ET AL LEASE ACREAGE 300

PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS

ESTIMATED DEPTH \_\_\_\_\_

WELL OPERATOR BOE ENVIRONMENTAL SERVICES DESIGNATED AGENT WELLS BAY

ADDRESS 1710 PENNSYLVANIA AVENUE ADDRESS 1710 PENNSYLVANIA AVENUE

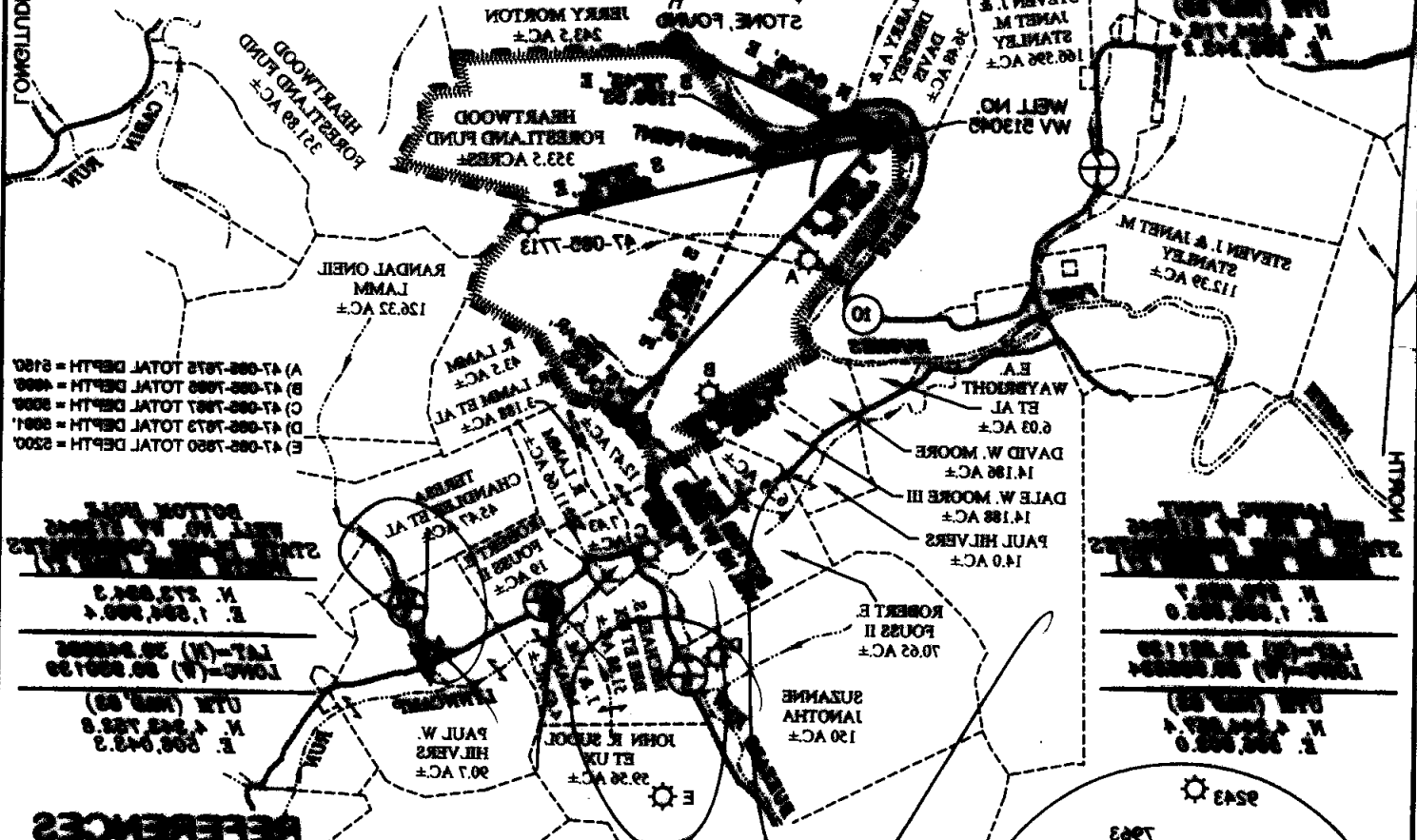
COLUMBIA, WV 25725 CHARLOTTE, WV 25302

COUNTY NAME  
 PRESENT

**WELL NO. 213045 ±  
380 ACRES ±  
BROADWATER LEASE**

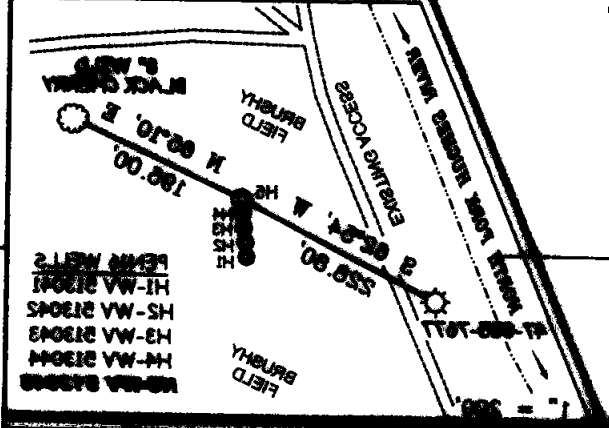
LATITUDE 30° 17' 30"

LONGITUDE 90° 08' 00"



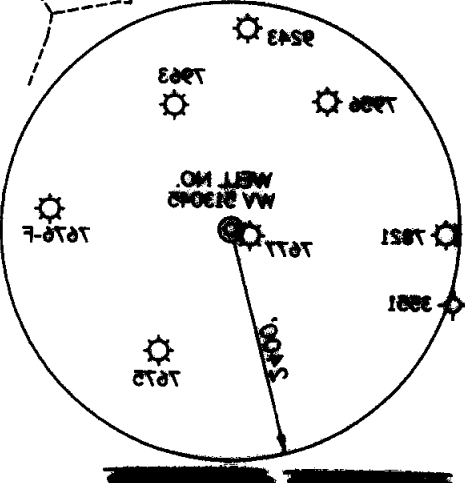
- (A) 41-088-7875 TOTAL DEPTH = 5182
- (B) 41-088-7880 TOTAL DEPTH = 4988
- (C) 41-088-7887 TOTAL DEPTH = 3828
- (D) 41-088-7873 TOTAL DEPTH = 3881
- (E) 41-088-7880 TOTAL DEPTH = 2500

**REFERENCES**



**NOTES ON SURVEY**

1. THIS SURVEY COMPLETES & REFINES THE SURVEY OF THE NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE AND '27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 127 PAGE 388 SURFACE OWNER AND ADDRESS INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF RITCHIE COUNTY IN JULY, 2010.
3. A WELL LAT/LONG (AND '27) ESTABLISHED BY DECS (SURVEY GRADE).



DATE OCTOBER 13 20 11

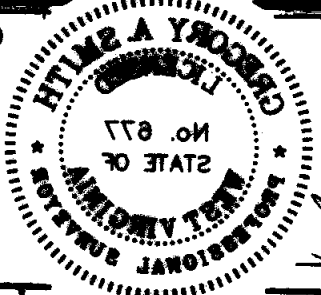
OPERATORS WELL NO. WV 213045

STATE WV COUNTY PUTNAM

WELL NO. 47

APL 082

PERMIT 000234



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RECORDS HEREON RECORDED AND PROVIDED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

GREGORY A. SMITH

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

FILE NO. 100213045 (25-28)

SCALE 1" = 2000'

DECS (SURVEY GRADE)

WELL TYPE:  GAS  INJECTION  LIQUID  WASTE DISPOSAL  "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: DISTRICT CLAY COUNTY RITCHIE WATERSHED NORTH FORK HUGHES RIVER

SURFACE OWNER HEARTWOOD FORESTLAND FUND

ROYALTY OWNER HEARTWOOD FORESTLAND FUND

LEASE NO. 108415 LEASE ACREAGE 380± ACREAGE 383.2± QUADRANGLE PENNSBORO T.S.

PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD

FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) MARCELLUS TARGET FORMATION MARCELLUS ESTIMATED DEPTH

WELL OPERATOR EST PRODUCTION COMPANY ADDRESS 1710 PENNSYLVANIA AVENUE CHARLESTON, WV 25305

DESIGNATED AGENT REX C. RAY ADDRESS 1710 PENNSYLVANIA AVENUE CHARLESTON, WV 25305