



west virginia department of environmental protection

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

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

November 14, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706323, 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 completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

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

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: WV 513343
Farm Name: BUTLER, FRANKIN & KEY OIL C
API Well Number: 47-1706323
Permit Type: Horizontal 6A Well
Date Issued: 11/14/2013

Promoting a healthy environment.

PERMIT CONDITIONS

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

CONDITIONS

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

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: EQT Production Company

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Operator ID County District Quadrangle

2) Operator's Well Number: 513343 Well Pad Name WEU6

3 Elevation, current ground: 1,266.0 Elevation, proposed post-construction: 1,261.0

4) Well Type: (a) Gas Oil Underground Storage
Other _____

(b) If Gas: Shallow Deep
Horizontal

*DC W
8-16-2013*

5) Existing Pad? Yes or No: No *LKC*

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target formation is Marcellus at a depth of 6,815' with the anticipated thickness to be 19 feet and anticipated target pressure of 4,555 PSI ✓

7) Proposed Total Vertical Depth: 6,815'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 15,271'

10) Approximate Fresh Water Strata Depths: 352, 464, 507, 966, 1030

11) Method to Determine Fresh Water Depth: By offset wells

12) Approximate Saltwater Depths: n/a

13) Approximate Coal Seam Depths: 187

14) Approximate Depth to Possible Void (coal mine, karst, other): None reported ✓

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of Mine: None Reported

16) Describe proposed well work: Drill and complete a new horizontal well in the Marcellus formation. The vertical drill to go down to an approximate depth of 5506'. Then kick off the horizontal leg into the Marcellus using a slick water frac.

17) Describe fracturing/stimulating methods in detail: hydraulic fracturing is completed in accordance with state regulations using water recycled from previously fractured wells and obtained from freshwater sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid, gelling agent, gel breaker, friction reducer, biocide, and scale inhibitor). Stage lengths vary from 150 to 450 feet. Average approximately 400,000 gallons of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 400,000 pounds of sand per stage.

8) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 49.7

9) Area to be disturbed for well pad only, less access road (acres): 17.5

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47-017-06323

CASING AND TUBING PROGRAM

20)

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: for Drilling	INTERVALS: Left in Well	CEMENT: Fill- up (Cu.Ft.)
Conductor	20	New	Varies	81	40	40	38 CTS
Fresh Water	13 3/8	New	MC-50	54	1,130	1,130	977 CTS
Coal							
Intermediate	9 5/8	New	MC-50	40	2,782	2,782	1081 CTS
Production	5 1/2	New	P-110	20	15,271	15,271	See Note 1
Tubing	2 3/8		J-55	4.6			May not be run, if run will be set 100' less than TD
Liners							

UKC
11/15/13

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20	24	0.635	-	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.380	2,480	1	1.21
Coal						
Intermediate	9 5/8	12 3/8	0.395	3,590	1	1.21
Production	5 1/2	8 1/2	0.361	12,640	-	1.27/1.86
Tubing						
Liners						

Packers

Kind:	N/A		
Sizes:	N/A		
Depths Set:	N/A		

Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.

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WW Department of
Natural Resources

21) Describe centralizer placement for each casing string.

• Surface: Bow spring centralizers – One at the shoe and one spaced every 500'.

• Intermediate: Bow spring centralizers– One cent at the shoe and one spaced every 500'.

• Production: One spaced every 1000' from KOP to Int csg shoe

22) Describe all cement additives associated with each cement type.

Surface (Type 1 Cement): 0-3% Calcium Chloride

Used to speed the setting of cement slurries.

0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of the cement slurry to a thief zone.

Intermediate (Type 1 Cement): 0-3% Calcium Chloride. Salt is used in shallow, low temperature formations to speed the setting of cement slurries. 0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of whole drilling fluid or cement slurry (not filtrate) to a thief zone.

Production:

Lead (Type 1 Cement): 0.2-0.7% Lignosulfonate (Retarder). Lengthens thickening time.

0.3% CFR (dispersant). Makes cement easier to mix.

Tail (Type H Cement): 0.25-0.40% Lignosulfonate (Retarder). Lengthens thickening time.

0.2-0.3% CFR (dispersant). This is to make the cement easier to mix.

60 % Calcium Carbonate. Acid solubility.

0.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.

23) Proposed borehole conditioning procedures. **Surface:** Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating

one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5

minutes. To ensure that there is no fill, short trip two stands with no circulation. If there is fill, bring compressors back on

and circulate hole clean. A constant rate of higher than expected cuttings volume likely indicates washouts that will not clean up.

Intermediate: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at

surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. If foam drilling, to enhance

hole cleaning use a soap sweep or increase injection rate & foam concentration.

Production: Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume.

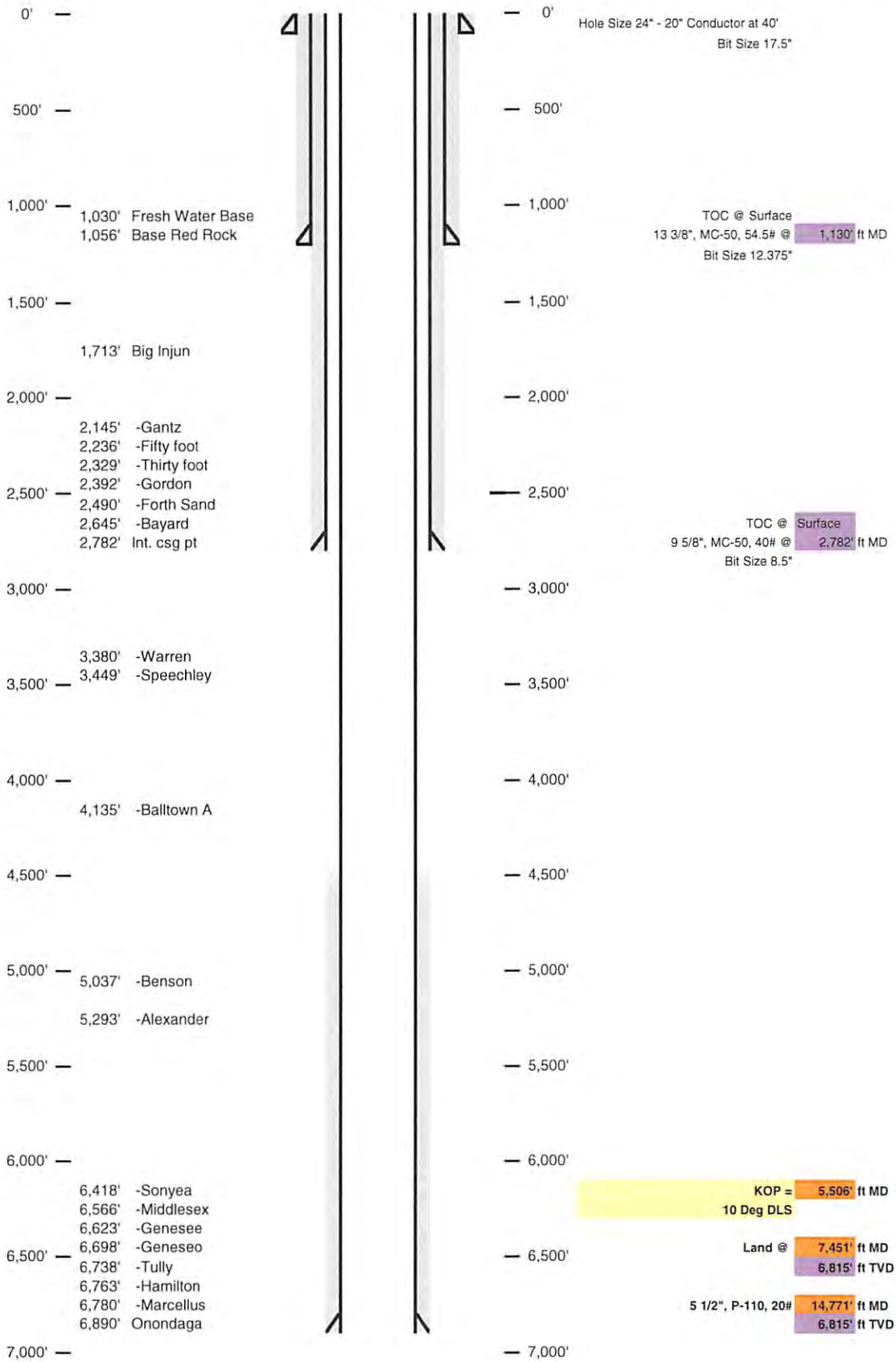
Perform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across the shakers every 15 minutes.

*Note: Attach additional sheets as needed.

Well Schematic
EQT Production

Well Name: 513343(WEU6H2)
County: Doddridge
State: West Virginia

Elevation KB: 1272
Target: Marcellus
Prospect: 165
Azimuth: 8266
Vertical Section



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Well 513343(WEU6H2)

EQT Production

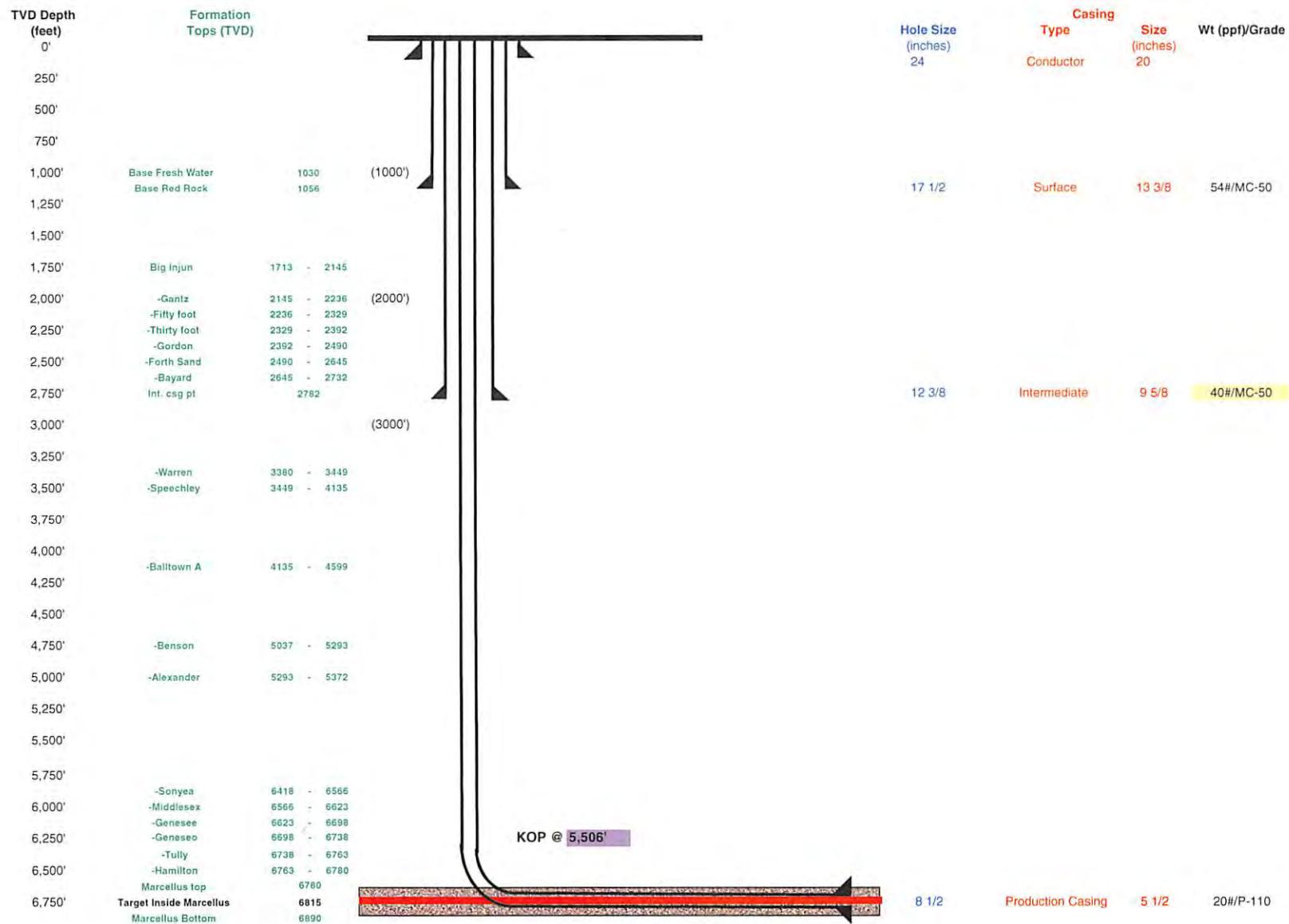
West Union

Doddridge West Virginia

Azimuth 165

Vertical Section 8268

17-06323



Proposed Well Work:
Drill and complete a new horizontal well in the Marcellus formation.
The vertical drill to go down to an approximate depth of 5506'.
Then kick of the horizontal leg into the Marcellus using a slick water frac.

Land curve @ 6,815' ft TVD
7,451' ft MD
Est. TD @ 6,815' ft TVD
14,771' ft MD
7,320' ft Lateral

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WW-9
(5/13)

API No. 47 - 017 - 0
Operator's Well No. 513343

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

Fluids/Cuttings Disposal & Reclamation Plan

Operator Name WEU6 OP Code _____

Watershed (HUC10) Bluestone Creek & Middle Island Creek Quadrangle West Union 7.5'

Elevation 1261.0 County Doddridge District West Union

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

Will a pit be used for drill cuttings: Yes: _____ No: X

If so please describe anticipated pit waste: _____

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

Proposed Disposal Method For Treated Pit Wastes:

- _____ Land Application
- _____ Underground Injection (UIC Permit Number 0014, 8462, 4037)
- _____ Reuse (at API Number _____)
- _____ Off Site Disposal (Supply form WW-9 for disposal location)
- _____ Other (Explain _____)

*D CW
8/16-2013*

Will closed loop system be used? YES

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air and water based mud

If oil based, what type? Synthetic, petroleum, etc _____

Additives to be used in drilling medium? MILBAR, Viscosifier, Alkalinity Control, Lime, Chloride Salts, Rate Filtration Control,

Deflocculant, Lubricant, Detergent, Defoaming, Walnut Shell, X-Cide, SOLTEX Terra

Drill cuttings disposal method? Leave in pit, landfill, removed 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 Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

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

Company Official Signature *Victoria J. Roark*

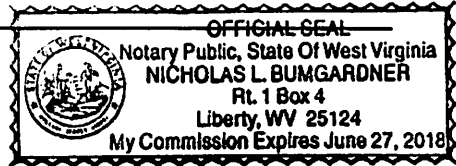
Company Official (Typed Name) Victoria J. Roark

Company Official Title Permitting Supervisor

Subscribed and sworn before me this 22 day of JULY, 20 13

[Signature] Notary Public

My commission expires 6/27/2018



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WW-9

Operator's Well No. 513343

Proposed Revegetation Treatment: Acres Disturbed 49.7 Prevegetation pH 6

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 13 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

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.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Douglas Newton

Comments: Preseed & Mulch install ETS To WV Dep regulations

Title: Oil & Gas inspector Date: 8-16-2013

Field Reviewed? (/) Yes () No

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EQT Production Water plan Offsite disposals for Marcellus wells
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CWS TRUCKING INC.

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

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

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

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

BROAD STREET ENERGY LLC

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

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

KING EXCAVATING CO.

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

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 Environmental Protection

7/24



Water Management Plan: Primary Water Sources



WMP-01441

API/ID Number: 047-017-06323

Operator:

EQT Production Company

513343 (WEU6H2)

Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.

APPROVED SEP 20 2013

Source Summary

WMP-01441

API Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Stream/River

● Source **Ohio River @ Westbrook Trucking Site** Pleasants Owner: **Stephen R. and Janet Sue Westbrook**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.384455	-81.25645

Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): 1,260 **Min. Gauge Reading (cfs): 6,468.00** **Min. Passby (cfs)**

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: <http://www.erh.noaa.gov/ohrfc//flows.shtml>

● Source **Ohio River @ Select Energy** Pleasants Owner: **Select Energy**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.346473	-81.338727

Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999998 Ohio River Station: Racine Dam

Max. Pump rate (gpm): 1,500 **Min. Gauge Reading (cfs): 7,216.00** **Min. Passby (cfs)**

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: <http://www.erh.noaa.gov/ohrfc//flows.shtml>

● Source **Middle Island Creek @ Travis Truck Pad** Doddridge Owner: **Michael J. Travis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.308545	-80.781102

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 4,200 **Min. Gauge Reading (cfs): 72.16** **Min. Passby (cfs) 28.33**

DEP Comments:

● Source **Middle Island Creek @ Rock Run** **Doddridge** Owner: **William Whitehill**
 Start Date: 9/15/2013 End Date: 9/15/2014 Total Volume (gal): 12,000,000 Max. daily purchase (gal): Intake Latitude: 39.298763 Intake Longitude: -80.760682
 Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV
Max. Pump rate (gpm): 1,680 Min. Gauge Reading (cfs): 62.89 Min. Passby (cfs) 26.43
 DEP Comments:

● Source **Middle Island Creek @ Barnes Withdrawal Site** **Doddridge** Owner: **Ellen L. Barnes**
 Start Date: 9/15/2013 End Date: 9/15/2014 Total Volume (gal): 12,000,000 Max. daily purchase (gal): Intake Latitude: 39.29958 Intake Longitude: -80.75694
 Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV
Max. Pump rate (gpm): 1,260 Min. Gauge Reading (cfs): 59.06 Min. Passby (cfs) 26.39
 DEP Comments:

● Source **Meathouse Fork @ Spiker Withdrawal Site** **Doddridge** Owner: **John & Sue Spiker**
 Start Date: 9/15/2013 End Date: 9/15/2014 Total Volume (gal): 12,000,000 Max. daily purchase (gal): Intake Latitude: 39.2591 Intake Longitude: -80.72489
 Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV
Max. Pump rate (gpm): 1,260 Min. Gauge Reading (cfs): 74.77 Min. Passby (cfs) 9.26
 DEP Comments:

● Source **South Fork of Hughes River @ Upper Wizard Run** Doddridge Owner: **I.L. Morris**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.189998	-80.79511

Regulated Stream? Ref. Gauge ID: **3155220** SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WA

Max. Pump rate (gpm): 1,260 **Min. Gauge Reading (cfs): 33.12** **Min. Passby (cfs) 0.64**

DEP Comments:

● Source **South Fork of Hughes River @ Harmony Road** Doddridge Owner: **I.L. Morris**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.1962	-80.81442

Regulated Stream? Ref. Gauge ID: **3155220** SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WA

Max. Pump rate (gpm): 1,260 **Min. Gauge Reading (cfs): 33.12** **Min. Passby (cfs) 0.98**

DEP Comments:

● Source **Straight Fork @ Maxson Withdrawal Site** Ritchie Owner: **Douglas L. Maxson**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.144317	-80.848587

Regulated Stream? Ref. Gauge ID: **3155220** SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WA

Max. Pump rate (gpm): 1,680 **Min. Gauge Reading (cfs): 28.43** **Min. Passby (cfs) 2.36**

DEP Comments:

Source **Middle Fork @ Janscheck Withdrawal Site** Doddridge Owner: **Mary Jo Janscheck**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	12,000,000		39.151388	-80.812222

Regulated Stream? Ref. Gauge ID: **3155220** SOUTH FORK HUGHES RIVER BELOW MACFARLAN, W

Max. Pump rate (gpm): **840** Min. Gauge Reading (cfs): **24.16** Min. Passby (cfs) **4.46**

DEP Comments:

Source Detail

WMP-01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24186 Source Name: Ohio River @ Westbrook Trucking Site
Stephen R. and Janet Sue Westbrook

Source Latitude: 39.384455
Source Longitude: -81.25645

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 County: Pleasants

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,260

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

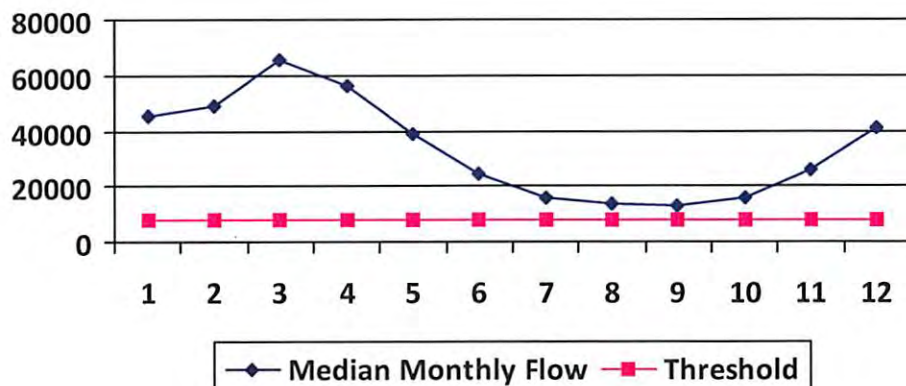
Reference Gaug 9999999 Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.) 25,000.00

Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): -
 Upstream Demand (cfs): 0.00
 Downstream Demand (cfs): 0.00
 Pump rate (cfs): 2.81
 Headwater Safety (cfs): 0.00
 Ungauged Stream Safety (cfs): 1,617.00

Min. Gauge Reading (cfs): -
 Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24187 Source Name Ohio River @ Select Energy
Select Energy

Source Latitude: 39.346473
Source Longitude: -81.338727

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 County: Pleasants

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,500

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm) 0

Gauged Stream?

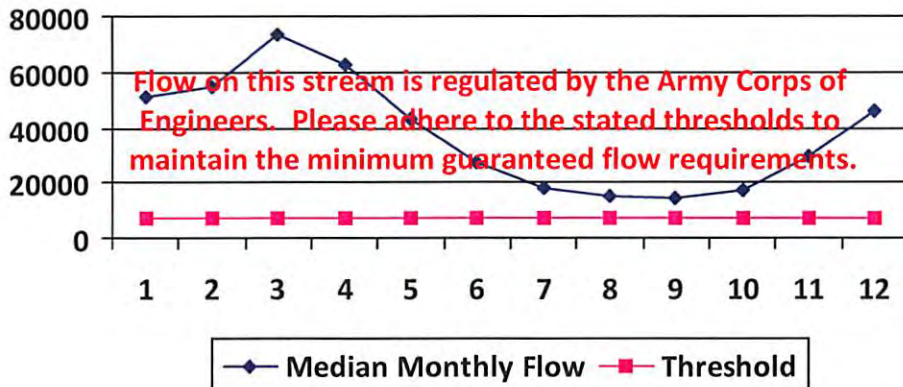
Reference Gaug 9999998 Ohio River Station: Racine Dam

Drainage Area (sq. mi.) 25,000.00

Gauge Threshold (cfs): 7216

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	50,956.00	-	-
2	54,858.00	-	-
3	73,256.00	-	-
4	62,552.00	-	-
5	43,151.00	-	-
6	27,095.00	-	-
7	17,840.00	-	-
8	14,941.00	-	-
9	14,272.00	-	-
10	17,283.00	-	-
11	29,325.00	-	-
12	46,050.00	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	3.34
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00

Min. Gauge Reading (cfs): -

Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24188 Source Name: Middle Island Creek @ Travis Truck Pad
Michael J. Travis

Source Latitude: 39.308545
Source Longitude: -80.781102

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 122.83 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 4,200

Regulated Stream?

Proximate PSD? West Union Municipal Water

Max. Simultaneous Trucks: 10

Gauged Stream?

Max. Truck pump rate (gpm): 420

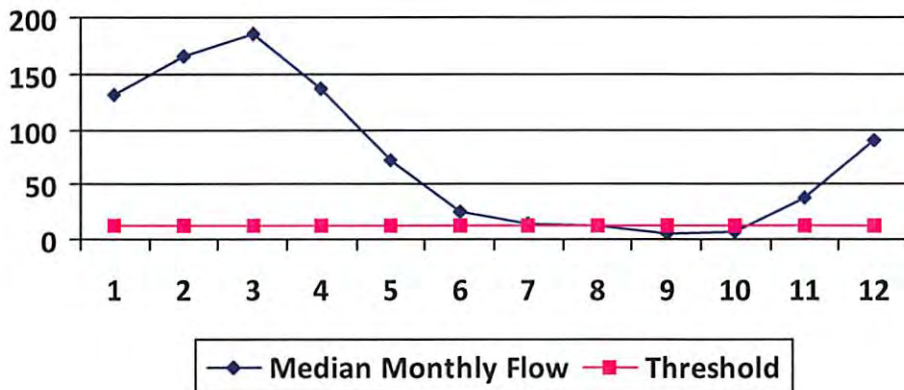
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	131.72	30.99	101.10
2	165.69	30.99	135.07
3	185.40	30.99	154.78
4	137.68	30.99	107.05
5	72.63	30.99	42.00
6	25.36	30.99	-5.26
7	14.35	30.99	-16.27
8	11.82	30.99	-18.81
9	6.05	30.99	-24.57
10	7.60	30.99	-23.02
11	37.14	30.99	6.51
12	90.73	30.99	60.11

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	12.07
Upstream Demand (cfs):	6.55
Downstream Demand (cfs):	13.24
Pump rate (cfs):	9.36
Headwater Safety (cfs):	3.02
Ungauged Stream Safety (cfs):	0.00
<hr/>	
Min. Gauge Reading (cfs):	72.16
Passby at Location (cfs):	28.33

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24189 Source Name Middle Island Creek @ Rock Run
William Whitehill

Source Latitude: 39.298763
Source Longitude: -80.760682

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 107.35 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,680

Regulated Stream?

Proximate PSD? West Union Municipal Water

Max. Simultaneous Trucks: 4

Gauged Stream?

Max. Truck pump rate (gpm) 420

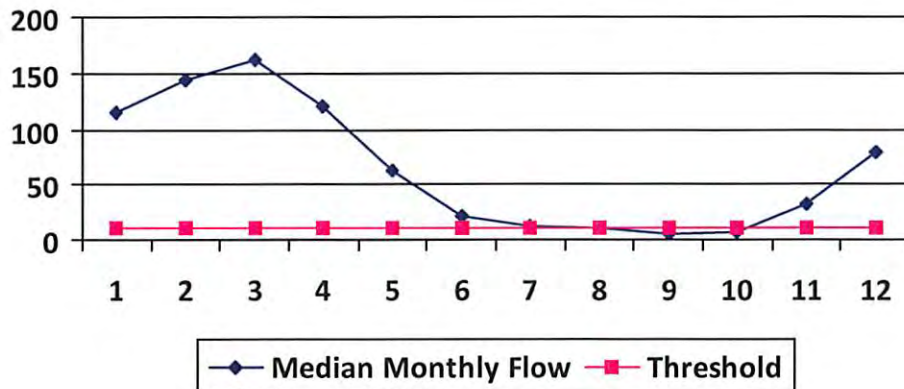
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	115.12	19.74	95.58
2	144.81	19.74	125.27
3	162.04	19.74	142.50
4	120.33	19.74	100.79
5	63.47	19.74	43.93
6	22.17	19.74	2.63
7	12.54	19.74	-7.00
8	10.33	19.74	-9.21
9	5.29	19.74	-14.25
10	6.65	19.74	-12.89
11	32.46	19.74	12.91
12	79.30	19.74	59.76

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	10.55
Upstream Demand (cfs):	2.81
Downstream Demand (cfs):	13.24
Pump rate (cfs):	3.74
Headwater Safety (cfs):	2.64
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	62.80
Passby at Location (cfs):	26.42

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24190 Source Name: Middle Island Creek @ Barnes Withdrawal Site
Ellen L. Barnes

Source Latitude: 39.29958
Source Longitude: -80.75694

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 107.08 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,260

Regulated Stream?

Max. Simultaneous Trucks: 0

Proximate PSD? West Union

Max. Truck pump rate (gpm): 0

Gauged Stream?

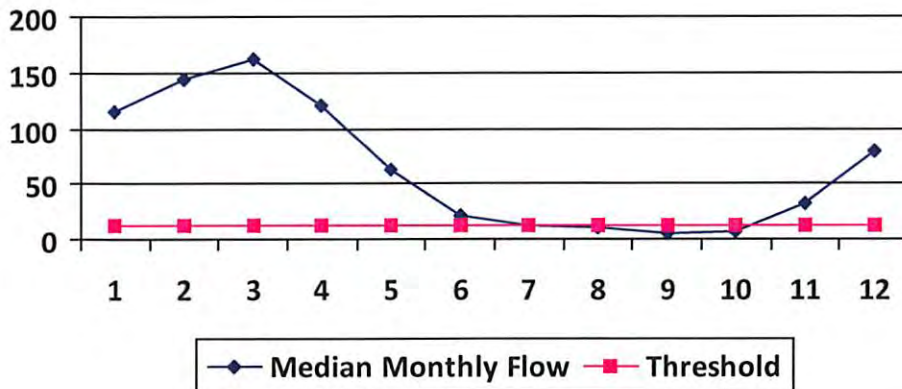
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	114.83	18.59	96.42
2	144.45	18.59	126.03
3	161.63	18.59	143.21
4	120.02	18.59	101.61
5	63.31	18.59	44.90
6	22.11	18.59	3.69
7	12.51	18.59	-5.91
8	10.30	18.59	-8.12
9	5.28	18.59	-13.14
10	6.63	18.59	-11.79
11	32.37	18.59	13.96
12	79.10	18.59	60.68

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	10.52
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	13.24
Pump rate (cfs):	2.81
Headwater Safety (cfs):	2.63
Ungauged Stream Safety (cfs):	2.63
Min. Gauge Reading (cfs):	70.31
Passby at Location (cfs):	29.02

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24191 Source Name: Meathouse Fork @ Spiker Withdrawal Site
John & Sue Spiker

Source Latitude: 39.2591
Source Longitude: -80.72489

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 62.75 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream?

Tier 3?

Max. Pump rate (gpm): 1,260

Regulated Stream?

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

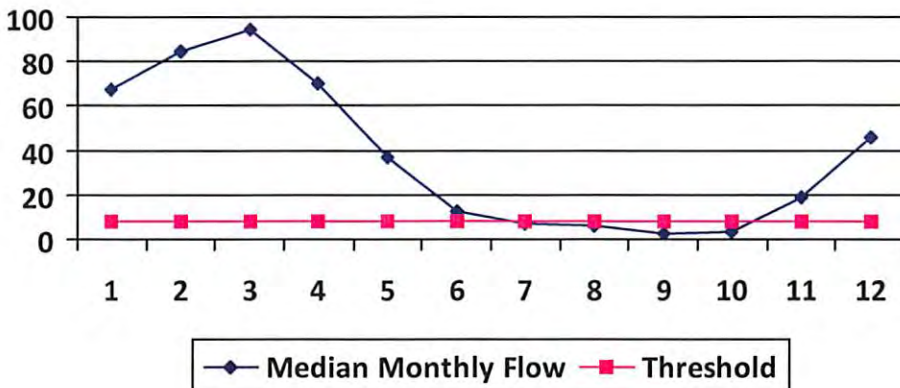
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	67.29	16.52	51.09
2	84.65	16.52	68.45
3	94.72	16.52	78.52
4	70.34	16.52	54.14
5	37.10	16.52	20.90
6	12.96	16.52	-3.24
7	7.33	16.52	-8.87
8	6.04	16.52	-10.16
9	3.09	16.52	-13.11
10	3.88	16.52	-12.32
11	18.97	16.52	2.77
12	46.35	16.52	30.15

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): 6.17

Upstream Demand (cfs): 4.46

Downstream Demand (cfs): 0.00

Pump rate (cfs): 2.81

Headwater Safety (cfs): 1.54

Ungauged Stream Safety (cfs): 1.54

Min. Gauge Reading (cfs): 74.77

Passby at Location (cfs): 9.25

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24192 Source Name: South Fork of Hughes River @ Upper Wizard Run
I.L. Morris

Source Latitude: 39.189998

Source Longitude: -80.79511

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 5.33 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,260

Regulated Stream?

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

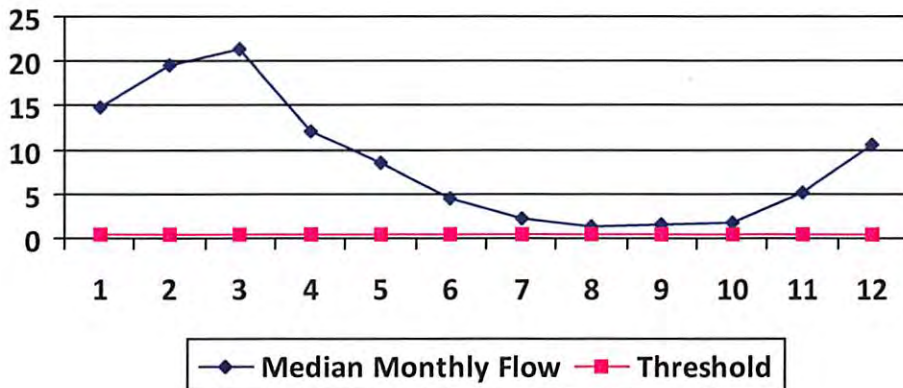
Reference Gaug: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.): 229.00

Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	14.97	6.26	8.79
2	19.52	6.26	13.33
3	21.37	6.26	15.19
4	12.08	6.26	5.90
5	8.48	6.26	2.29
6	4.56	6.26	-1.63
7	2.26	6.26	-3.93
8	1.31	6.26	-4.88
9	1.57	6.26	-4.62
10	1.70	6.26	-4.48
11	5.09	6.26	-1.09
12	10.51	6.26	4.32

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	0.51
Upstream Demand (cfs):	2.81
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	0.13
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	33.12
Passby at Location (cfs):	0.64

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24193 Source Name: South Fork of Hughes River @ Harmony Road
I.L. Morris

Source Latitude: 39.1962
Source Longitude: -80.81442

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 8.1 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,260

Regulated Stream?

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

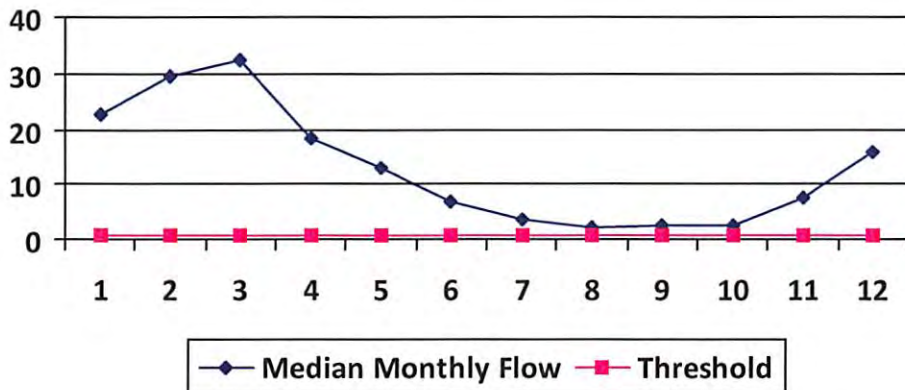
Gauged Stream?

Reference Gaug: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.): 229.00 Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	22.75	6.59	16.28
2	29.66	6.59	23.19
3	32.48	6.59	26.01
4	18.36	6.59	11.89
5	12.88	6.59	6.41
6	6.92	6.59	0.45
7	3.43	6.59	-3.04
8	1.98	6.59	-4.49
9	2.38	6.59	-4.09
10	2.59	6.59	-3.88
11	7.74	6.59	1.27
12	15.97	6.59	9.50

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	0.78
Upstream Demand (cfs):	2.81
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	0.19
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	33.12
Passby at Location (cfs):	0.97

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24194 Source Name: Straight Fork @ Maxson Withdrawal Site
Douglas L. Maxson

Source Latitude: 39.144317
Source Longitude: -80.848587

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 16.99 County: Ritchie

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 1,680

Regulated Stream?

Max. Simultaneous Trucks: 4

Proximate PSD?

Max. Truck pump rate (gpm): 420

Gauged Stream?

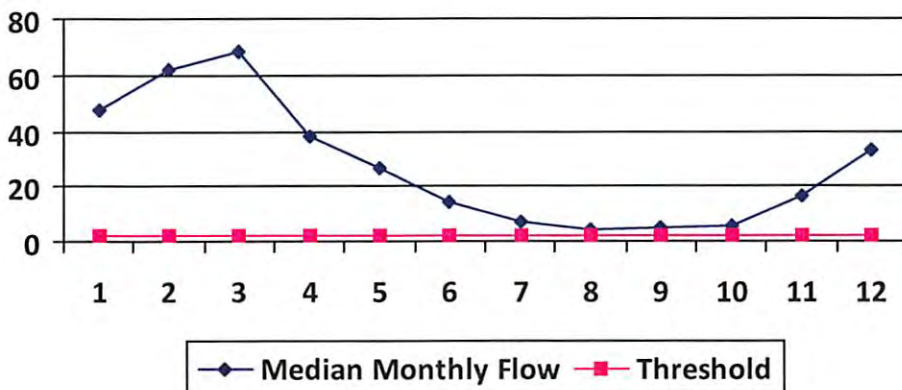
Reference Gaug: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.): 229.00

Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	47.72	8.06	39.75
2	62.22	8.06	54.25
3	68.13	8.06	60.17
4	38.52	8.06	30.55
5	27.03	8.06	19.06
6	14.52	8.06	6.55
7	7.20	8.06	-0.77
8	4.16	8.06	-3.81
9	5.00	8.06	-2.97
10	5.43	8.06	-2.54
11	16.23	8.06	8.26
12	33.50	8.06	25.53

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	1.63
Upstream Demand (cfs):	1.87
Downstream Demand (cfs):	0.00
Pump rate (cfs):	3.74
Headwater Safety (cfs):	0.41
Ungauged Stream Safety (cfs):	0.41
Min. Gauge Reading (cfs):	38.61
Passby at Location (cfs):	2.45

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Source ID: 24195 Source Name Middle Fork @ Janschek Withdrawal Site
Mary Jo Janschek

Source Latitude: 39.151388
Source Longitude: -80.812222

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 5.92 County: Doddridge

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 12,000,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 840

Regulated Stream?

Max. Simultaneous Trucks:

Proximate PSD?

Max. Truck pump rate (gpm)

Gauged Stream?

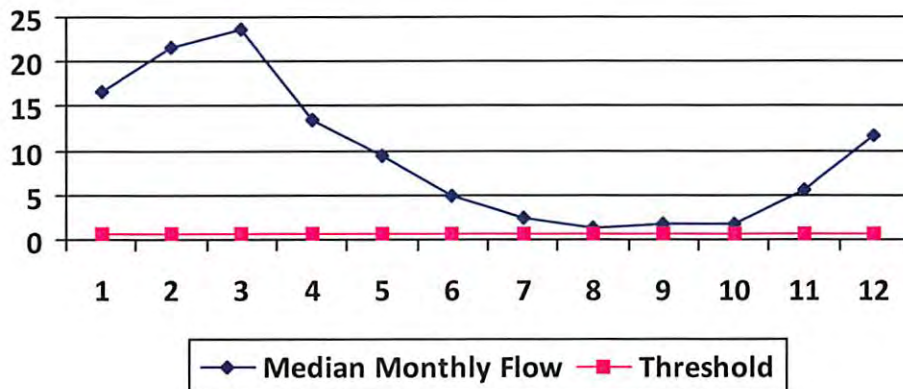
Reference Gaug 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.) 229.00

Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	16.63	2.72	14.03
2	21.68	2.72	19.08
3	23.74	2.72	21.14
4	13.42	2.72	10.83
5	9.42	2.72	6.82
6	5.06	2.72	2.46
7	2.51	2.72	-0.09
8	1.45	2.72	-1.15
9	1.74	2.72	-0.85
10	1.89	2.72	-0.70
11	5.66	2.72	3.06
12	11.67	2.72	9.08

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	0.57
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	3.74
Pump rate (cfs):	1.87
Headwater Safety (cfs):	0.14
Ungauged Stream Safety (cfs):	0.14
Min. Gauge Reading (cfs):	34.87
Passby at Location (cfs):	4.59

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.



Water Management Plan: Secondary Water Sources



WMP-01441

API/ID Number: 047-017-06323

Operator: EQT Production Company

513343 (WEU6H2)

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Ground Water

Source ID: 24198	Source Name	Groundwater Well TW#1	Source start date:	9/15/2013	
			Source end date:	9/15/2014	
Source Lat:	39.56059	Source Long:	-80.56027	County	Wetzel
Max. Daily Purchase (gal)		Total Volume from Source (gal):		12,000,000	

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Lake/Reservoir

Source ID:	24199	Source Name	Pennsboro Lake		Source start date:	9/15/2013	
					Source end date:	9/15/2014	
		Source Lat:	39.281689	Source Long:	-80.925526	County	Ritchie
		Max. Daily Purchase (gal)		Total Volume from Source (gal):			12,000,000

DEP Comments:

Multi-site impoundment

Source ID:	24200	Source Name	Davies Centralized Freshwater Impoundment		Source start date:	9/15/2013	
					Source end date:	9/15/2014	
		Source Lat:	39.269635	Source Long:	-80.77711	County	Doddridge
		Max. Daily Purchase (gal)		Total Volume from Source (gal):			12,000,000

DEP Comments:

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.

Reference: WMP-1083

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Recycled Frac Water

Source ID: 24201 Source Name: Various

Source start date: 9/15/2013

Source end date: 9/15/2014

Source Lat:

Source Long:

County

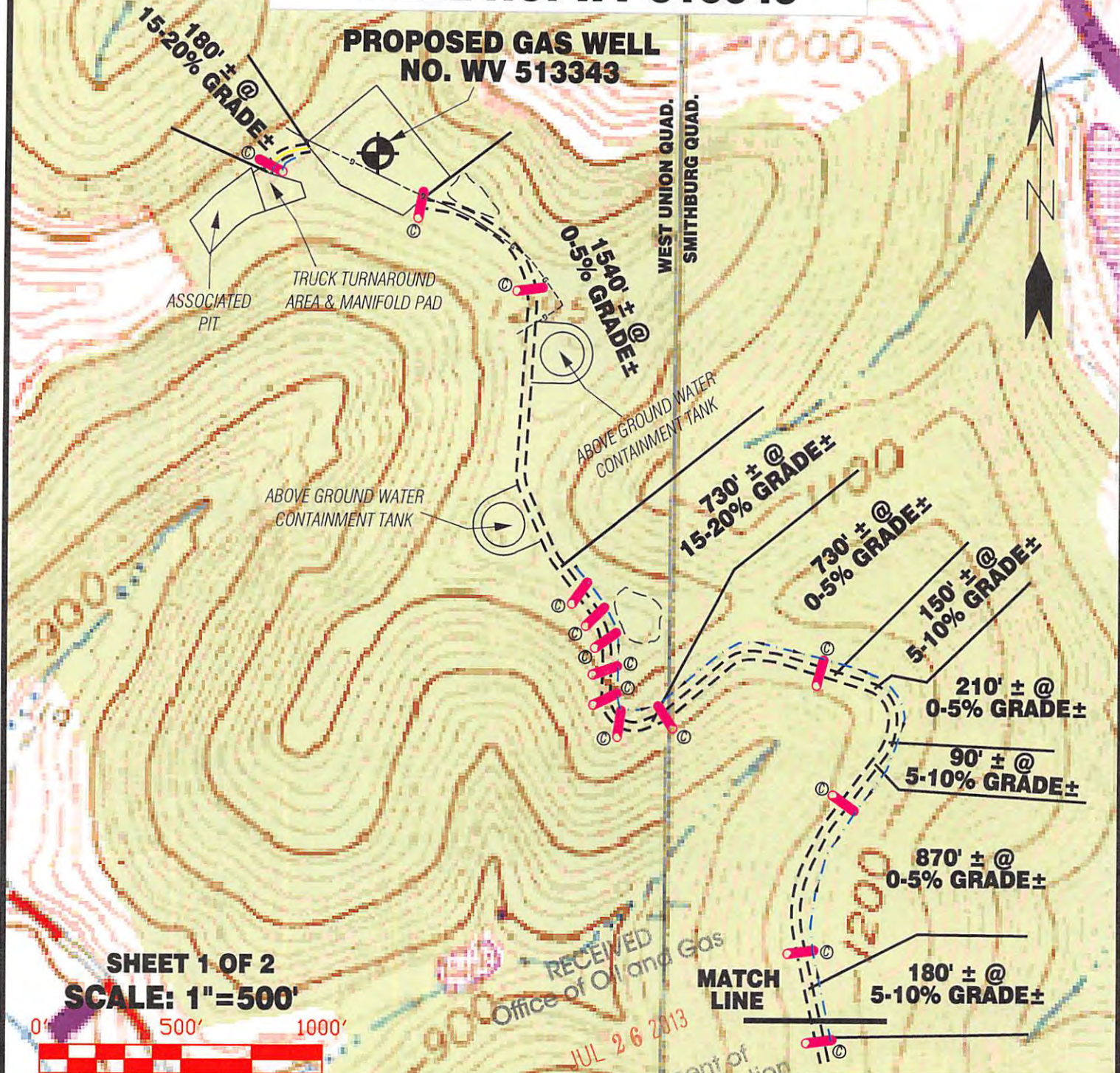
Max. Daily Purchase (gal)

Total Volume from Source (gal): 12,000,000

DEP Comments:

EQT PRODUCTION COMPANY LEWIS MAXWELL LEASE WELL NO. WV 513343

PROPOSED GAS WELL NO. WV 513343



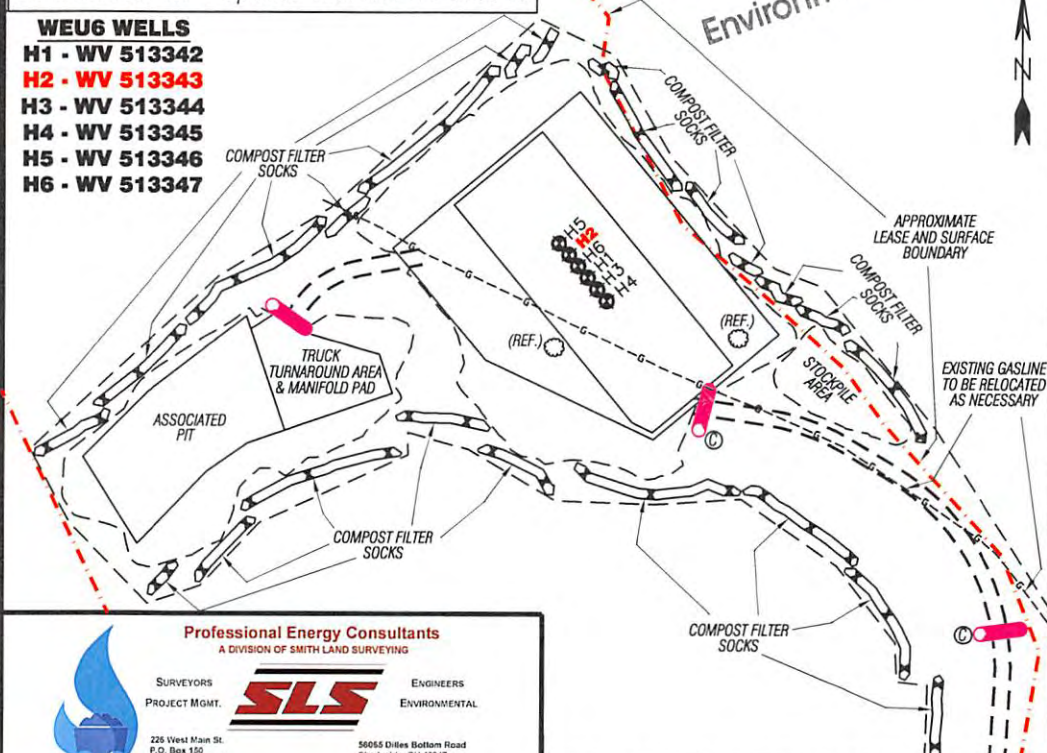
SHEET 1 OF 2

SCALE: 1"=500'



Detail Sketch for Proposed Well No. WV 513343

- WEUG WELLS**
H1 - WV 513342
H2 - WV 513343
H3 - WV 513344
H4 - WV 513345
H5 - WV 513346
H6 - WV 513347



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)

EXISTING CULVERT
 PROPOSED CULVERT 15' MIN. UNLESS OTHERWISE NOTED

PROPOSED STREAM CROSSING
 APPROXIMATE LIMITS OF DISTURBANCE

Professional Energy Consultants
 A DIVISION OF SMITH LAND SURVEYING



SURVEYORS
 PROJECT MGMT.



ENGINEERS
 ENVIRONMENTAL

226 West Main St.
 P.O. Box 150
 Glenville, WV 26031
 (204) 482-5634

5065 Dilles Bottom Road
 Shady Side, OH 43947
 (740) 671-9911

HONESTY, INTEGRITY, QUALITY

DRAWN BY: K.D.W. FILE NO.: 7831 DATE: 07/16/13 CADD FILE: 7831REC/W513343R2.DWG

TOPO SECTION OF WEST UNION 7.5' USGS TOPO QUADRANGLE

EQT PRODUCTION CO. LEWIS MAXWELL LEASE 640 ACRES± WELL NO. WV 513343

LATITUDE 39° 17' 30"

NOTES ON SURVEY

1. TIES TO WELLS, CORNERS, AND REFERENCES ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 167 PAGE 631 & DEED BOOK 143 PAGE 277.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF DODDRIDGE COUNTY IN JULY, 2013.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS (SURVEY GRADE TIES TO CORS NETWORK).
5. PLAT DATED 10/22/12 REVISED 07/02/13 TO SHOW NEW BOTTOM HOLE COORDINATES, 08/02/13 TO SHOW 500' SPACING FROM LATERAL, REVISED 11/01/13 TO ADD ADDITIONAL NOTES AND APPROXIMATE LOCATION OF DODDRIDGE COUNTY MIDDLE SCHOOL BASED ON IMAGERY FROM WVGIS & REVISED 11/06/13 TO SHOW ADDITIONAL WELLS ON LEASE ETC.
6. NO WATER WELLS WERE FOUND WITHIN 250 FEET OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS (GREATER THAN 2500 SQUARE FEET) OR DWELLINGS WERE FOUND WITHIN 625 FEET OF CENTER OF PROPOSED WELL PAD.

WELL NO. WV 513343
STATE PLANE COORDINATES
NORTH ZONE (NAD '27)

N. 290,290.7
E. 1,645,140.6

LAT=(N) 39.290221
LONG=(W) 80.753795

UTM (NAD'83)(METERS)
N. 4,349,021.7
E. 521,246.9

LANDING POINT
WELL NO. WV 513343
STATE PLANE COORDINATES
NORTH ZONE (NAD '27)

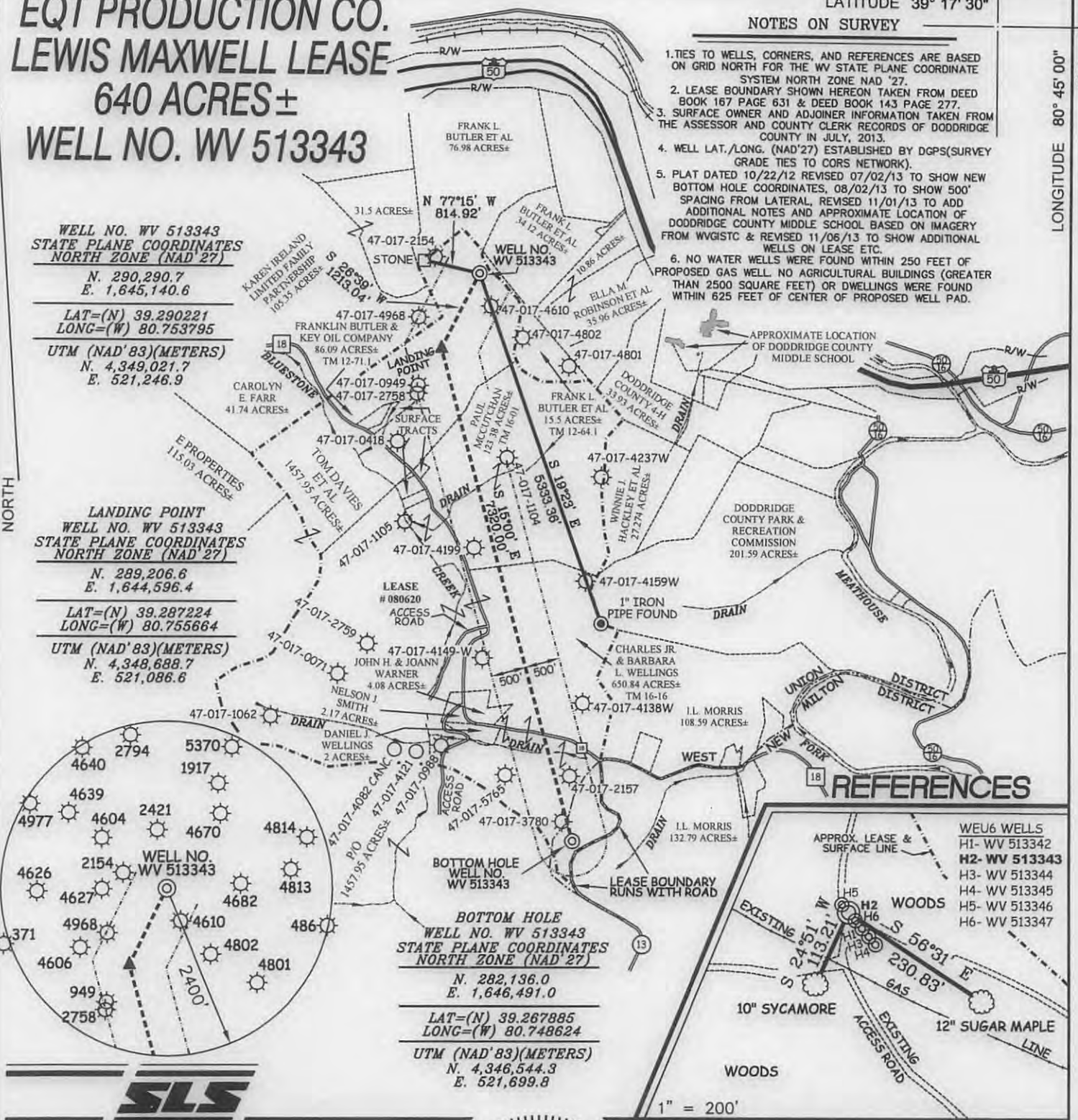
N. 289,206.6
E. 1,644,596.4

LAT=(N) 39.287224
LONG=(W) 80.755664

UTM (NAD'83)(METERS)
N. 4,348,688.7
E. 521,086.6

NORTH

LONGITUDE 80° 45' 00"



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.


P.S. 677 *Gregory A. Smith*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE NOVEMBER 6, 20 13
 OPERATORS WELL NO. WV 513343
 API WELL NO. 47-017-06323 **H6A**
 STATE 47 COUNTY 017 PERMIT 06323

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7831P513343R3 (390-47)
 PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIES TO CORS NETWORK) SCALE 1" = 2000'

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



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

LOCATION:
 ELEVATION 1,266 (GROUND) 1,261' (PROPOSED) WATERSHED BLUESTONE CREEK & MIDDLE ISLAND CREEK
 DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE WEST UNION 7.5'
 SURFACE OWNER FRANKLIN BUTLER & KEY OIL COMPANY ACREAGE 86.09±
 ROYALTY OWNER LEWIS MAXWELL HEIRS ACREAGE 640±
 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 EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY
 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT