



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

August 06, 2013

WELL WORK PERMIT

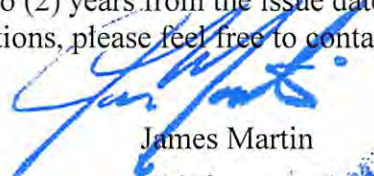
Horizontal 6A Well

This permit, API Well Number: 47-1706291, 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: 514142
Farm Name: SPIKER, SUE ANN
API Well Number: 47-1706291
Permit Type: Horizontal 6A Well
Date Issued: 08/06/2013

Promoting a healthy environment.

08/09/2013

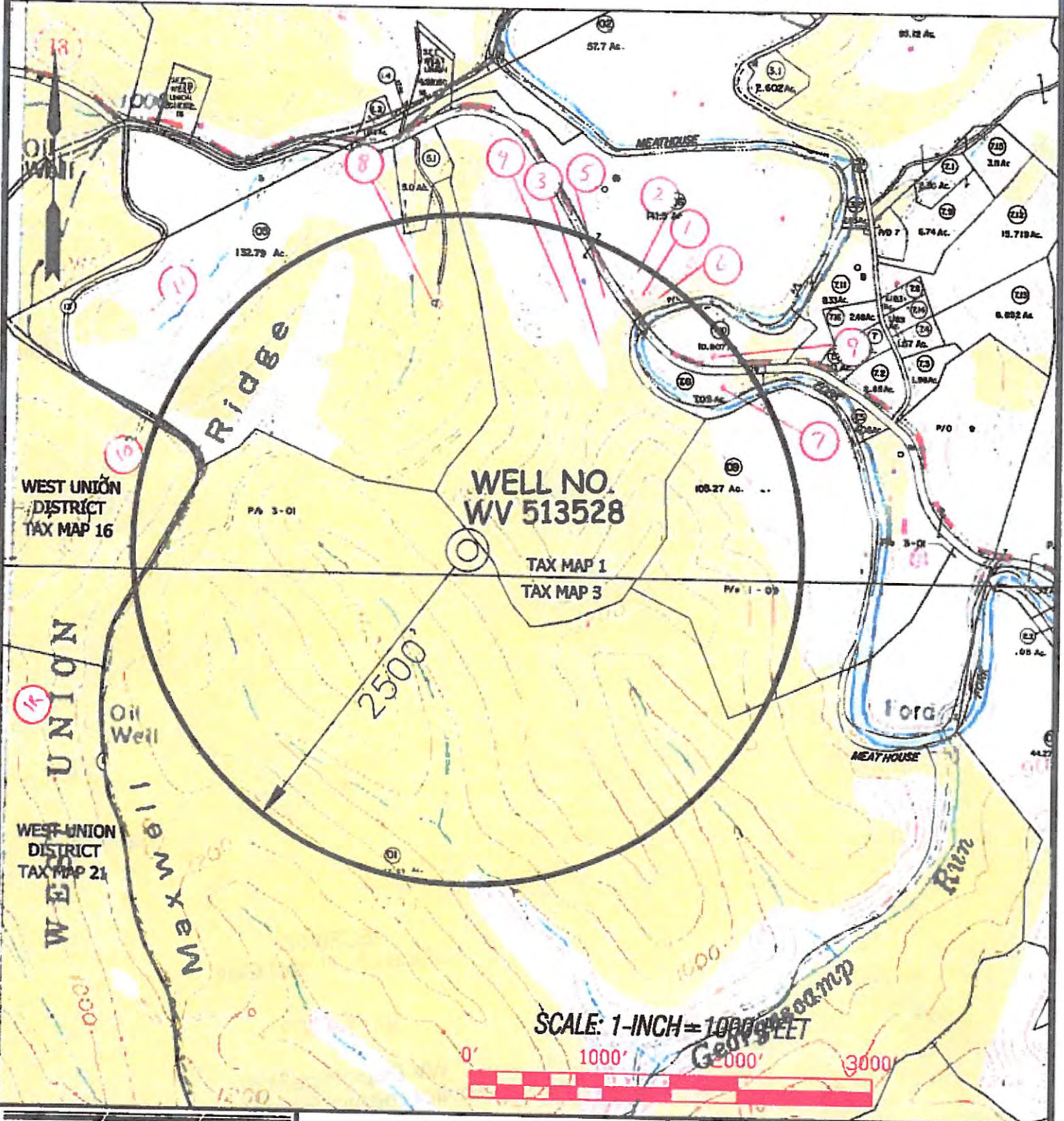
PERMIT CONDITIONS

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. 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.
2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

J.R.SHREVE LEASE WELL NO. WV 513528



SCALE: 1-INCH = 1000 FEET



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

DRAWN BY: K.D.W. FILE NO: 7428 DATE: 05/29/12 CADD FILE: 74280513328.dwg

TOPO SECTION OF:
 SMITHBURG, WV 7.5' QUAD.

COUNTY	DISTRICT	TAX MAP-PARCEL NO.
DODDRIDGE	NEW MILTON	3-1

OPERATOR:
 EQT PRODUCTION COMPANY
 1710 PENNSYLVANIA AVENUE
 CHARLESTON, WV 25302

08/09/2013

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

	017	6	611
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Operator ID County District Quadrangle

2) Operator's Well Number: 514142 Well Pad Name SMI28

3 Elevation, current ground: 1,254' Elevation, proposed post-construction: 1,254'

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

(b) If Gas: Shallow Deep
 Horizontal

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target formation is Geneseo at a depth of 6684' with the anticipated thickness to be 40 feet and anticipated target pressure of 4482 PSI

7) Proposed Total Vertical Depth: 7132'

8) Formation at Total Vertical Depth: Onondaga

9) Proposed Total Measured Depth: 12,782'

10) Approximate Fresh Water Strata Depths: 22, 79, 100, 123, 260, 285, 366, 390, 427, 478, 500, & 570

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

12) Approximate Saltwater Depths: None Reported

13) Approximate Coal Seam Depths: 45, 281, 557, 628, 1207, & 1376

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. The vertical drill to go down to approximately depth of 7132' Tagging the Onondaga not more than 100' then plug back to approximately 5,618' and kick off the horizontal leg into the Geneseo 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.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): No Additional

19) Area to be disturbed for well pad only, less access road (acres): No Additional

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Office of Oil & Gas **08/09/2013**

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CASING AND TUBING PROGRAM

20)

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: for Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu.Ft.)</u>
Conductor	20	New	MC-50	81	72	72	69/C.T.S.
Fresh Water	13 3/8	New	MC-50	54	670	670	593/C.T.S.
Isol	-	New	-	-	-	-	-
Intermediate	9 5/8	New	MC-50	40	5,327	5,327	2104/C.T.S.
Production	5 1/2	New	P-110	20	12,782'	12,782'	See Note 1
Tubing	2 3/8		J-55	4.6			May not be run, if run will be set 100' less than TD
Runners							

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20	24	0.635	-	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,480	1	1.21
Isol	-	-	-	-	-	-
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						
Runners						

Packers

Depth:	N/A			
Weights:	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.

*DCW
5-30-2013*

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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 % Calcuim 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.

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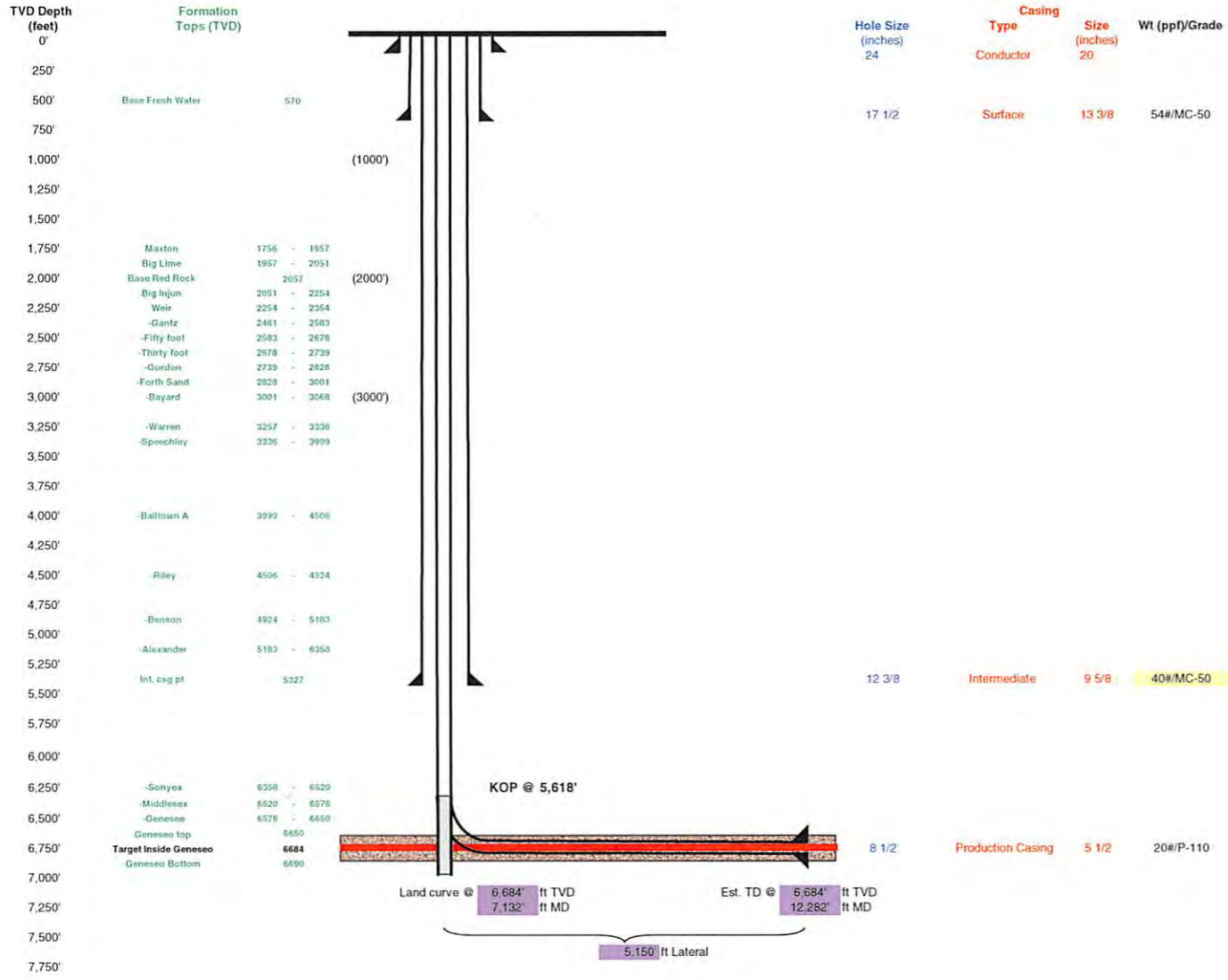
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17-6291

Well 514142 (SMI28H10)
 EQT Production
 Smithburg
 Doddridge West Virginia

Azimuth 155
 Vertical Section 5607



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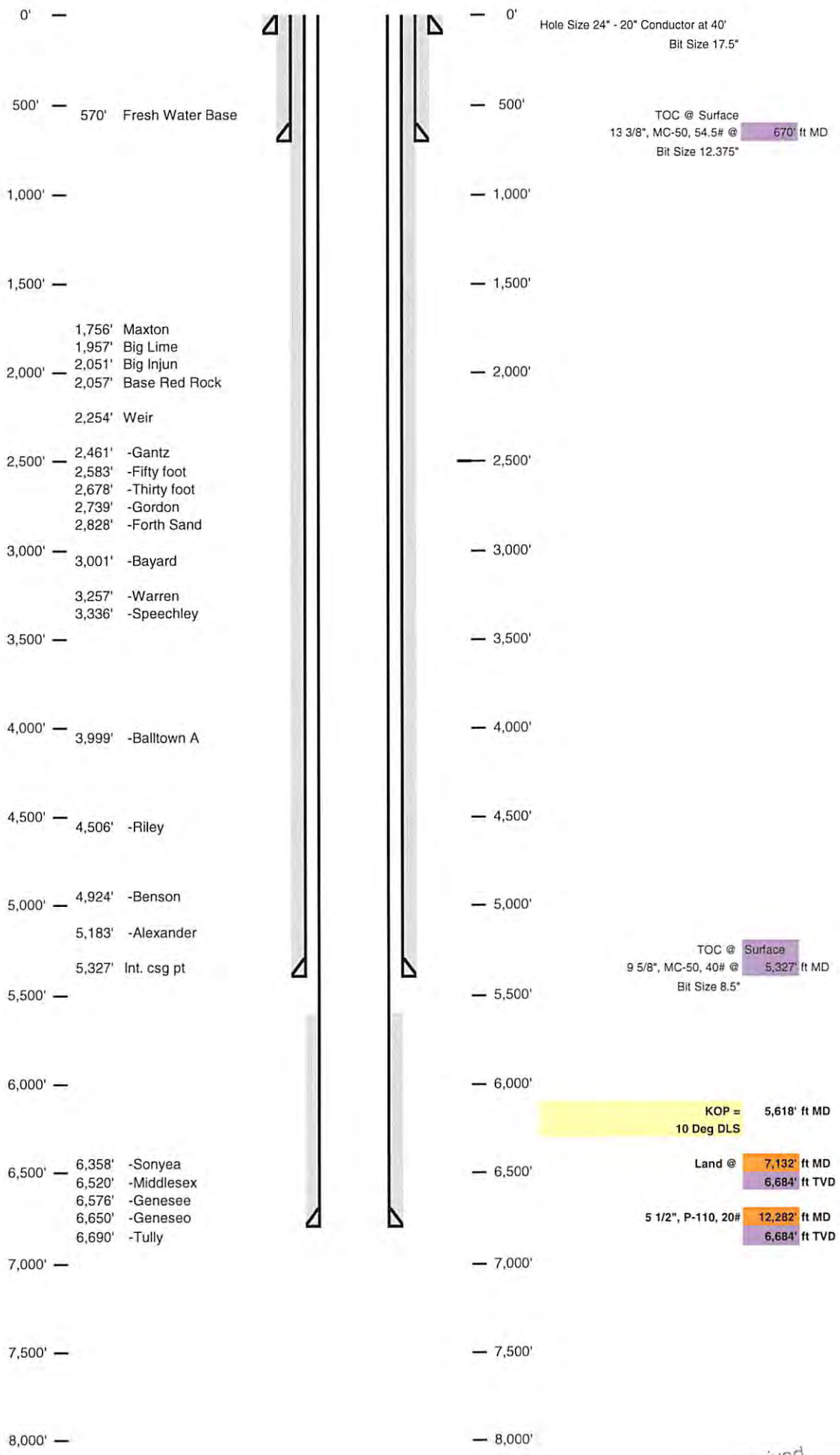
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17-6291

Well Schematic
EQT Production

Well Name 514142 (SMI28H10)
County Doddridge
State West Virginia

Elevation KB: 1264
Target Geneseo
Prospect
Azimuth 155
Vertical Section 5607



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MAY 24 2013

08/09/2013

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

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name SMI28 OP Code _____

Watershed (HUC10) Tributary of Georgescamp Run Quadrangle Smithburg 7.5'

Elevation 1,254' County Doddridge District New Milton

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

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

If so please describe anticipated pit waste: _____

Will a synthetic liner be used in the pit? Yes _____ No _____ If so, what ml.? 60

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 _____)

*DCW
5-30-2013*

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, Viscosifer, 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.

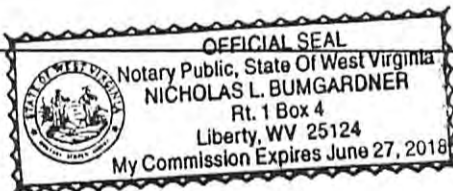
I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is 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 23 day of MAY, 20 13

Nicholas L. Bumgardner Notary Public

My commission expires 6/27/2018



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08/09/2013

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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

08/09/2013

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 Office of Oil & Gas

WW-9

4701706291

API No. 47 - 017 - 06291
Operator's Well No. 514142

Proposed Revegetation Treatment: Acres Disturbed No Additional Prevegetation pH

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 1/3 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 Newlon

Comments: Maintain ETS to WV DEP regulations

Title: Oil & Gas inspector Date: 5-30-2013

Field Reviewed? () Yes (✓) No

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5/24



Water Management Plan: Primary Water Sources



WMP-01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

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 JUN 24 2013

Source Summary

WMP-01287

API Number:

047-017-06291

Operator:

EQT Production Company

514142 (SMI28H10)

Stream/River

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

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
8/1/2013	8/1/2013	8,500,000		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** Owner: **Select Energy**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
8/1/2013	8/1/2013	8,500,000		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 **Tygart River @ Kuhnes Withdrawal Site A** Owner: **Charlie & Peggy Kuhnes**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
8/1/2013	8/1/2013	8,500,000		39.35692	-80.05474

Regulated Stream? Tygart Valley Dam Ref. Gauge ID: 3057000 TYGART VALLEY RIVER AT COLFAX, WV

Max. Pump rate (gpm): **1,260** Min. Gauge Reading (cfs): **404.79** Min. Passby (cfs) **392.62**

DEP Comments:

08/09/2013

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

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
8/1/2013	8/1/2013	8,500,000		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** Owner: **William Whitehill**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
8/1/2013	8/1/2013	8,500,000		39.298763	-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 **Meathouse Fork @ Spiker Withdrawal Site** Owner: **John & Sue Spiker**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
8/1/2013	8/1/2013	8,500,000		39.2591	-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:

08/09/2013

Source Detail

WMP- 01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

Source ID: 19763 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: 8/1/2013

Anticipated withdrawal end date: 8/1/2013

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 8,500,000

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?

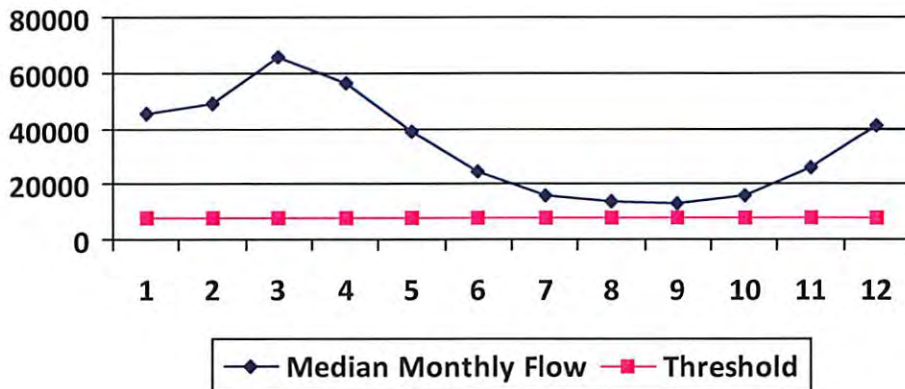
Reference Gaug 9999999 Ohio River Station: Willow Island Lock & Dam

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.

08/09/2013

Source Detail

WMP-01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

Source ID: 19764 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: 8/1/2013

Anticipated withdrawal end date: 8/1/2013

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 8,500,000

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?

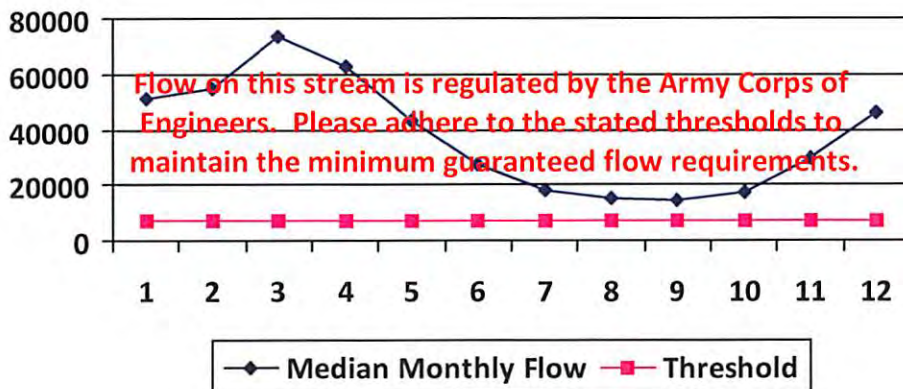
Reference Gaug 9999998 Ohio River Station: Racine Dam

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.

08/09/2013

Source Detail

WMP-01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

Source ID: 19765 Source Name Tygart River @ Kuhnes Withdrawal Site A
Charlie & Peggy Kuhnes

Source Latitude: 39.35692
Source Longitude: -80.05474

HUC-8 Code: 5020001

Drainage Area (sq. mi.): 1302.2 County: Taylor

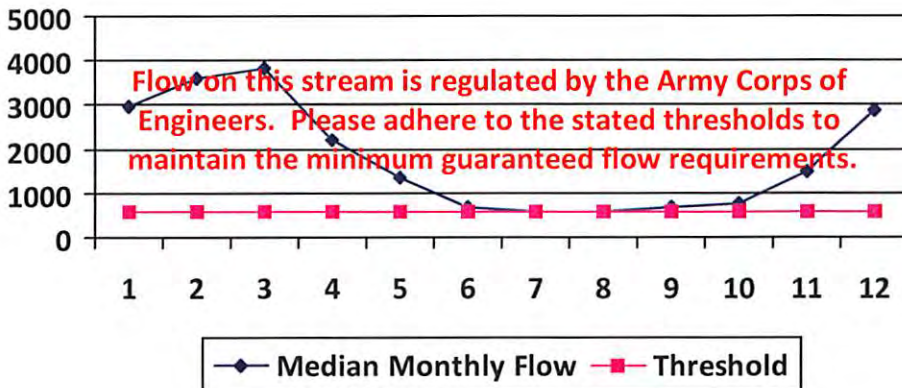
- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream? Tygart Valley Dam
- Proximate PSD?
- Gauged Stream?

Anticipated withdrawal start date: 8/1/2013
Anticipated withdrawal end date: 8/1/2013
Total Volume from Source (gal): 8,500,000
Max. Pump rate (gpm): 1,260
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug 3057000 TYGART VALLEY RIVER AT COLFAX, WV
Drainage Area (sq. mi.) 1,363.00 Gauge Threshold (cfs): 624

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	2,968.50	-	-
2	3,584.04	-	-
3	3,829.89	-	-
4	2,188.80	-	-
5	1,373.55	-	-
6	695.24	-	-
7	584.64	-	-
8	593.45	-	-
9	661.90	-	-
10	755.75	-	-
11	1,477.45	-	-
12	2,905.01	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): -
Upstream Demand (cfs): 20.95
Downstream Demand (cfs): 11.59
Pump rate (cfs): 2.81
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.

08/09/2013

Source Detail

WMP-01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

Source ID: 19766 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: 8/1/2013

Anticipated withdrawal end date: 8/1/2013

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 8,500,000

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

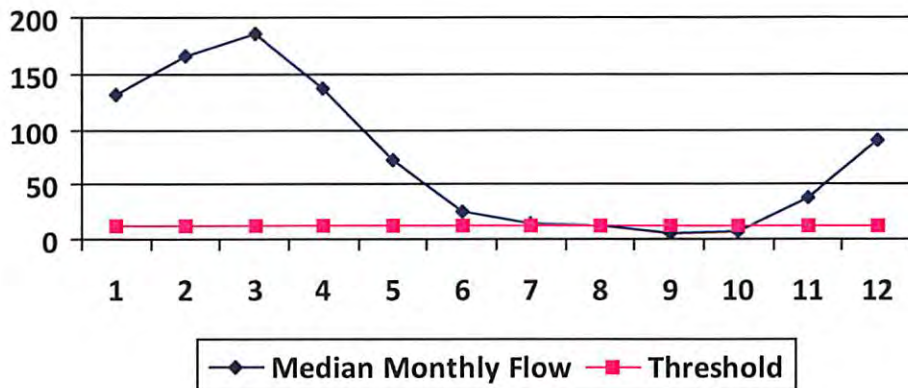
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

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
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.

08/09/2013

Source Detail

WMP-01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

Source ID: 19767 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: 8/1/2013

Anticipated withdrawal end date: 8/1/2013

Endangered Species? Mussel Stream?

Trout Stream? Tier 3?

Total Volume from Source (gal): 8,500,000

Regulated Stream?

Max. Pump rate (gpm): 1,680

Proximate PSD? West Union Municipal Water

Max. Simultaneous Trucks: 4

Gauged Stream?

Max. Truck pump rate (gpm): 420

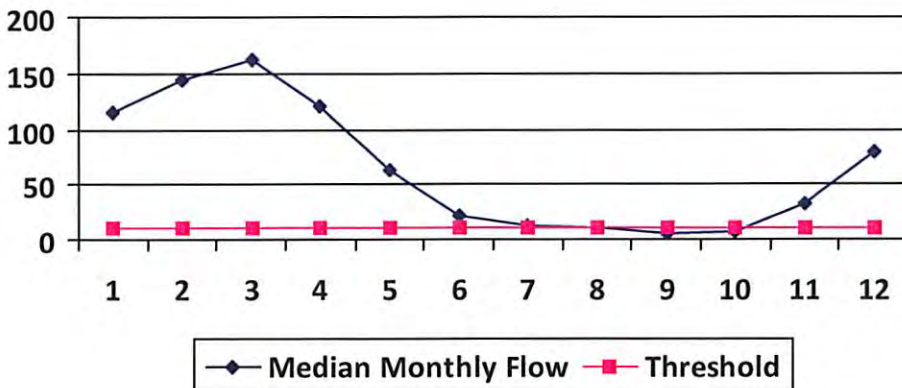
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	115.12	32.98	82.34
2	144.81	32.98	112.03
3	162.04	32.98	129.26
4	120.33	32.98	87.55
5	63.47	32.98	30.69
6	22.17	32.98	-10.61
7	12.54	32.98	-20.24
8	10.33	32.98	-22.45
9	5.29	32.98	-27.49
10	6.65	32.98	-26.13
11	32.46	32.98	-0.33
12	79.30	32.98	46.52

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): 10.55
 Upstream Demand (cfs): 16.05
 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): 76.04

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.

08/09/2013

Source Detail

WMP-01287

API/ID Number: 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

Source ID: 19768 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: 8/1/2013

Anticipated withdrawal end date: 8/1/2013

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 8,500,000

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?

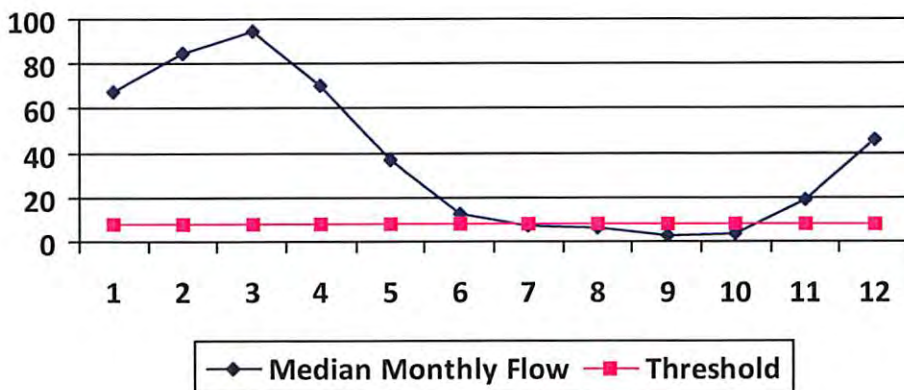
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

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.

08/09/2013



Water Management Plan: Secondary Water Sources



WMP-01287

API/ID Number 047-017-06291

Operator: EQT Production Company

514142 (SMI28H10)

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:	19771	Source Name	Maxson Property Test Well #1	Source start date:	8/1/2013
				Source end date:	8/1/2013
Source Lat:	39.14472	Source Long:	-80.84664	County	Doddridge
Max. Daily Purchase (gal)		Total Volume from Source (gal):			8,500,000

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:	19773	Source Name	Pennsboro Lake		Source start date:	8/1/2013	
					Source end date:	8/1/2013	
		Source Lat:	39.281689	Source Long:	-80.925526	County	Ritchie
		Max. Daily Purchase (gal)		Total Volume from Source (gal):			8,500,000
		DEP Comments:					

Multi-site impoundment

Source ID:	19775	Source Name	Davies Centralized Freshwater Impoundment		Source start date:	8/1/2013	
					Source end date:	8/1/2013	
		Source Lat:	39.269635	Source Long:	-80.77711	County	Doddridge
		Max. Daily Purchase (gal)		Total Volume from Source (gal):			8,500,000
		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

08/09/2013

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: 19776 Source Name: Various

Source start date: 8/1/2013

Source end date: 8/1/2013

Source Lat:

Source Long:

County

Max. Daily Purchase (gal)

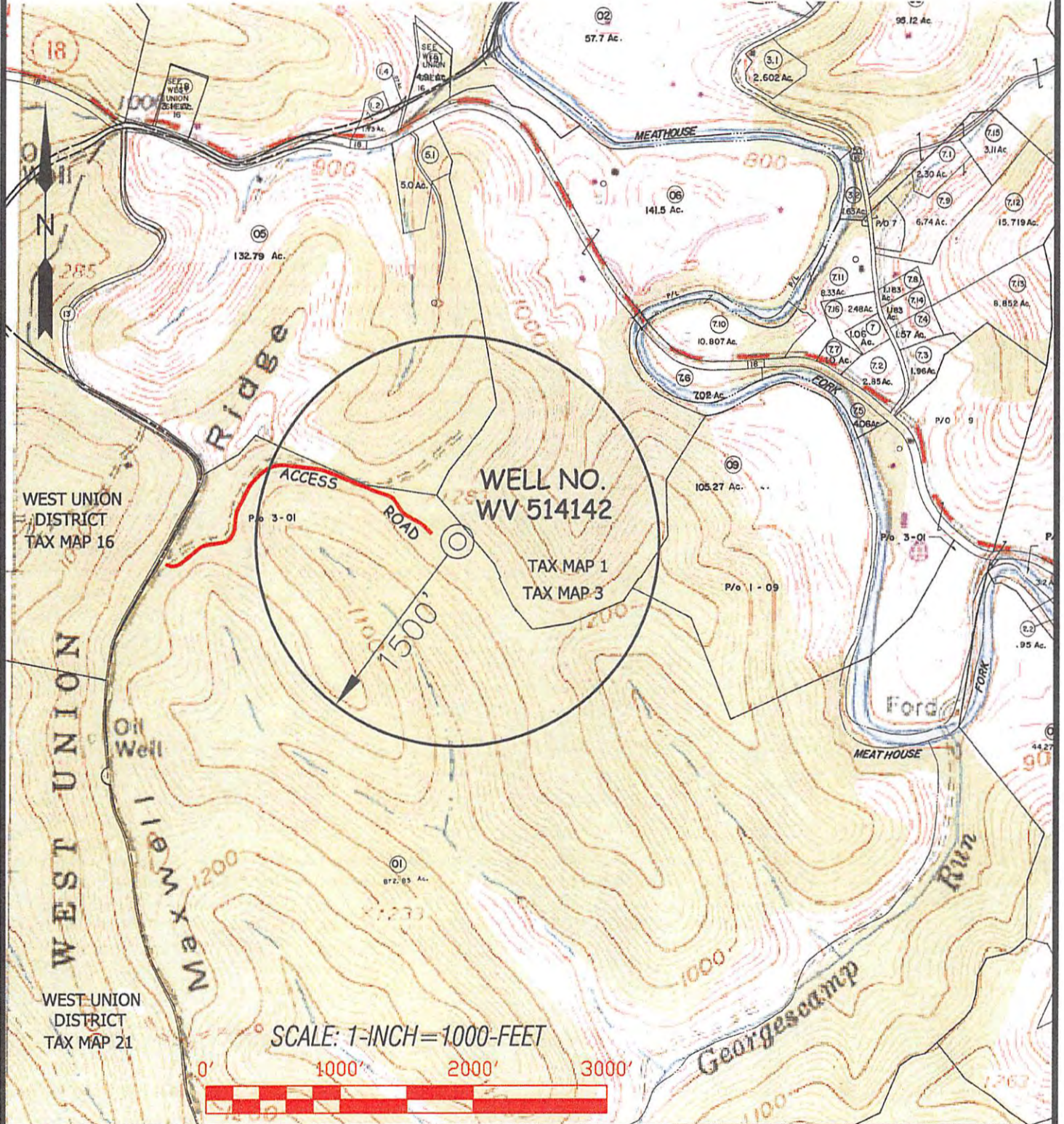
Total Volume from Source (gal): 8,500,000

DEP Comments:

WATER SAMPLES

page of

J.R.SHREVE LEASE WELL NO. WV 514142



Professional Energy Consultants
A DIVISION OF SOUTH LAND SURVEYING

SLS
SURVEYORS
PROJECT MGMT.
ENGINEERS
ENVIRONMENTAL

200 West Main St.
P.O. Box 100
Greenville, WV 26030
(304) 467-3638

5005 Dines Bottom Road
Martinsburg, WV 25807
(304) 521-9911

INTEGRITY. QUALITY.

DRAWN BY: K.D.W.
FILE NO.: 7428
DATE: 05/20/13
CADD FILE: 7428WSS14142.DWG

TOPO SECTION OF:
SMITHBURG, WV 7.5' QUAD.

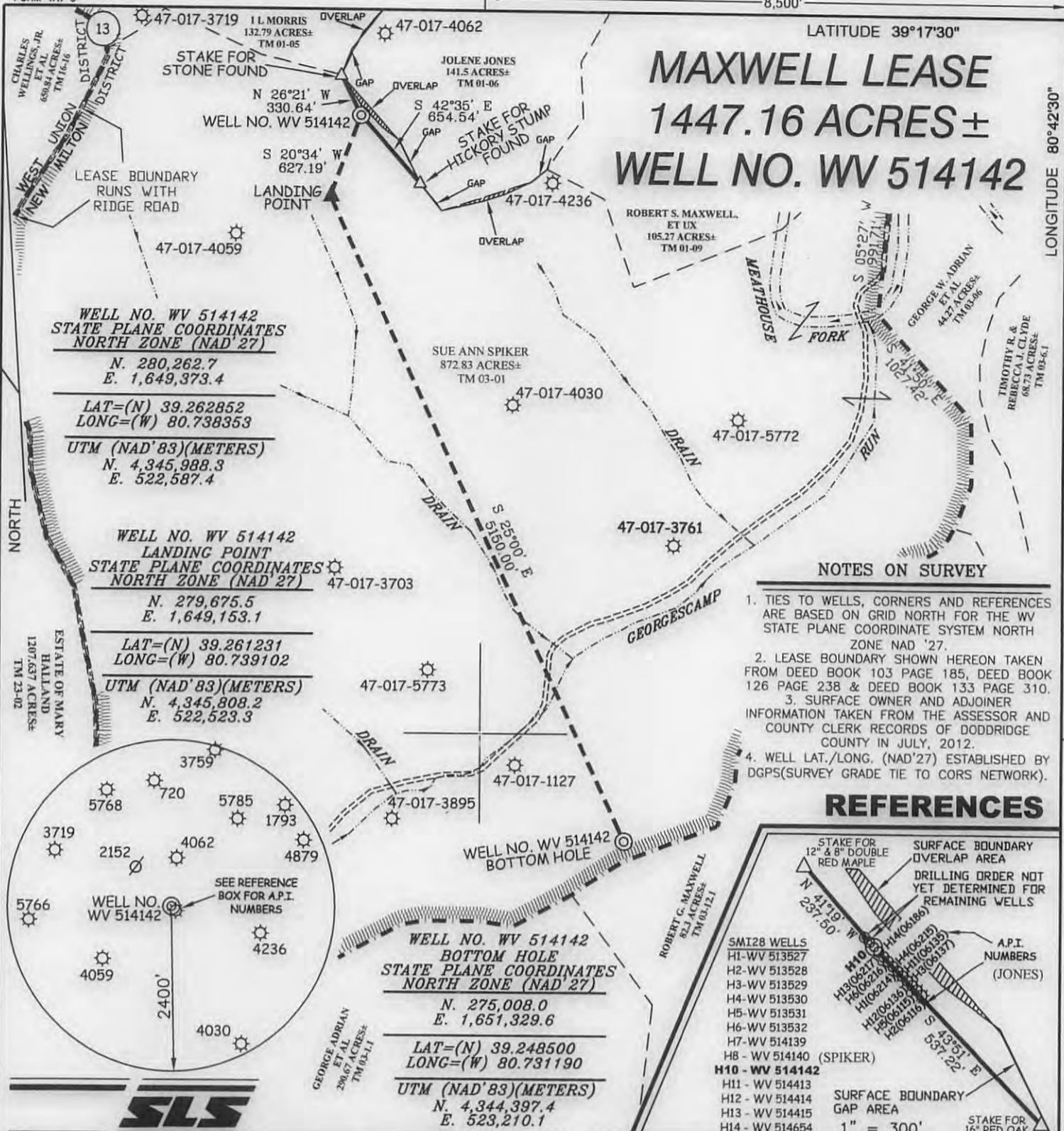
COUNTY	DISTRICT	TAX MAP-PARCEL NO.
DODDRIDGE	NEW MILTON	3-1

OPERATOR:
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
P.O. BOX 280
BRIDGEPORT, WV 26309
08/09/2013

Received
Office of Oil & Gas

MAY 24 2013

MAXWELL LEASE 1447.16 ACRES ± WELL NO. WV 514142



WELL NO. WV 514142
STATE PLANE COORDINATES
NORTH ZONE (NAD '27)

N. 280,262.7
E. 1,649,373.4

LAT=(N) 39.262852
LONG=(W) 80.738353

UTM (NAD'83)(METERS)
N. 4,345,988.3
E. 522,587.4

WELL NO. WV 514142
LANDING POINT
STATE PLANE COORDINATES
NORTH ZONE (NAD '27)

N. 279,675.5
E. 1,649,153.1

LAT=(N) 39.261231
LONG=(W) 80.739102

UTM (NAD'83)(METERS)
N. 4,345,808.2
E. 522,523.3



WELL NO. WV 514142
BOTTOM HOLE
STATE PLANE COORDINATES
NORTH ZONE (NAD '27)

N. 275,008.0
E. 1,651,329.6

LAT=(N) 39.248500
LONG=(W) 80.731190

UTM (NAD'83)(METERS)
N. 4,344,397.4
E. 523,210.1

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 103 PAGE 185, DEED BOOK 126 PAGE 238 & DEED BOOK 133 PAGE 310.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF DODDRIDGE COUNTY IN JULY, 2012.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE TIE TO CORS NETWORK).

REFERENCES



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 APRIL 23, 20 13
OPERATORS WELL NO. WV 514142
API WELL NO. 47-17-6291H6A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7428P514142
PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1,000'

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 1254' (PAD ELEVATION) WATERSHED TRIBUTARY OF GEORGESCAMP RUN
DISTRICT NEW MILTON COUNTY DODDRIDGE QUADRANGLE SMITHBURG 7.5'
SURFACE OWNER SUE ANN SPIKER ACREAGE 872.83±
ROYALTY OWNER LEWIS MAXWELL HEIRS LEASE ACREAGE 1447.16± LEASE NO. 080617
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 GENESEO 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

08/09/2013

COUNTY NAME PERMIT