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

October 01, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-9101286, 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 514158
Farm Name: GREENWOOD LAND INC.
API Well Number: 47-9101286
Permit Type: Horizontal 6A Well
Date Issued: 10/01/2013

10/04/2013

API Number: 91-01286

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 fill material shall be within plus or minus 2% 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.

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.

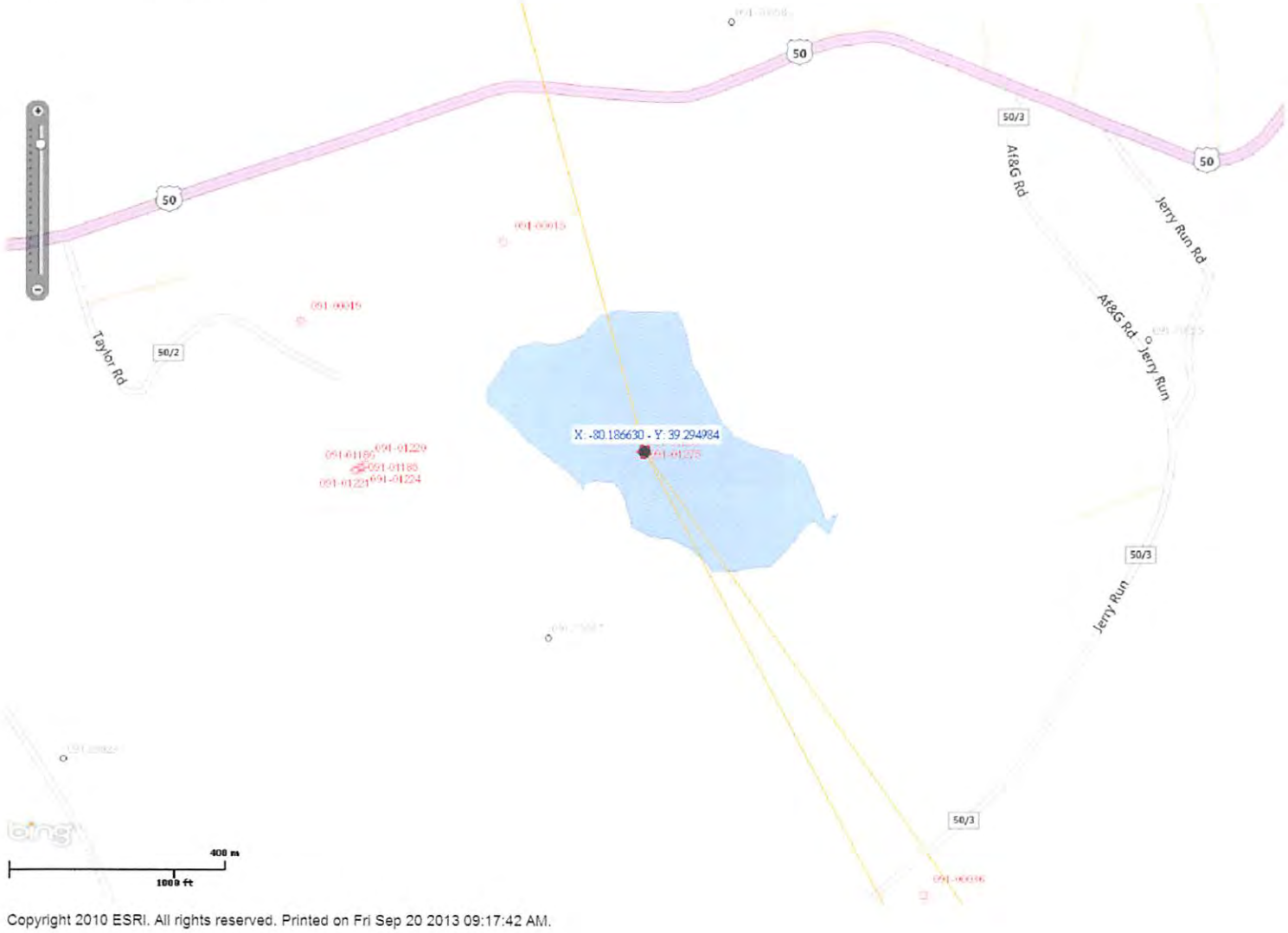
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

10/04/2013

91-01286

Map from a Flex Viewer application

Powered by ArcGIS



In an underground mine –
possible void at 177'

-LKC

10/04/2013

WW - 6B
(3/13)

4709101286

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

Operator ID	County	District	Quadrangle
	91	4	588

2) Operator's Well Number: 514158 Well Pad Name: RSM135

3 Elevation, current ground: 1,630.0 Elevation, proposed post-construction: 1,615.0

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

Other _____

(b) If Gas: Shallow • Deep _____

Horizontal •

5) Existing Pad? Yes or No: no

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):

Target formation is Marcellus at a depth of 7681' with the anticipated thickness to be 134 feet and anticipated target pressure of 5189 PSI

7) Proposed Total Vertical Depth: 7681'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 15,856

10) Approximate Fresh Water Strata Depths: 429, 743, 974

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

12) Approximate Saltwater Depths: n/a

13) Approximate Coal Seam Depths: 177, 748, 793, 926, 971, 1041

14) Approximate Depth to Possible Void (coal mine, karst, other): 177

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 6344'. Then kick off the horizontal leg into the marcellus using a slick water frac. If an open mine is encountered. EQT will set and cement a dedicated coal protection casing string. The hole will be drilled no more than 100' below the mine void. Cement basket(s) and centratizers will be run to facilitate cementing the coal protection casing string to surface.

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): 31.23 +/-

19) Area to be disturbed for well pad only, less access road (acres): 23.28

10/04/2013

WW - 6B

(3/13)

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	26	New	Varies	Varies	40	40	49
Fresh Water	13 3/8	New	MC-50	54#	1,074	1,074	930
Coal	20	New	MC-50	81#	235	235	297
Intermediate	9 5/8	New	MC-50	40#	2,649	2,649	1,030
Production	5 1/2	New	P-110	20#	15,856	15,856	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							

Bryan Harris 8-30-13

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	26	30	0.5	-	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,480	1	1.21
Coal	20	24	0.635	1,640	1	1.2
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.

91-01286

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.

10/04/2013

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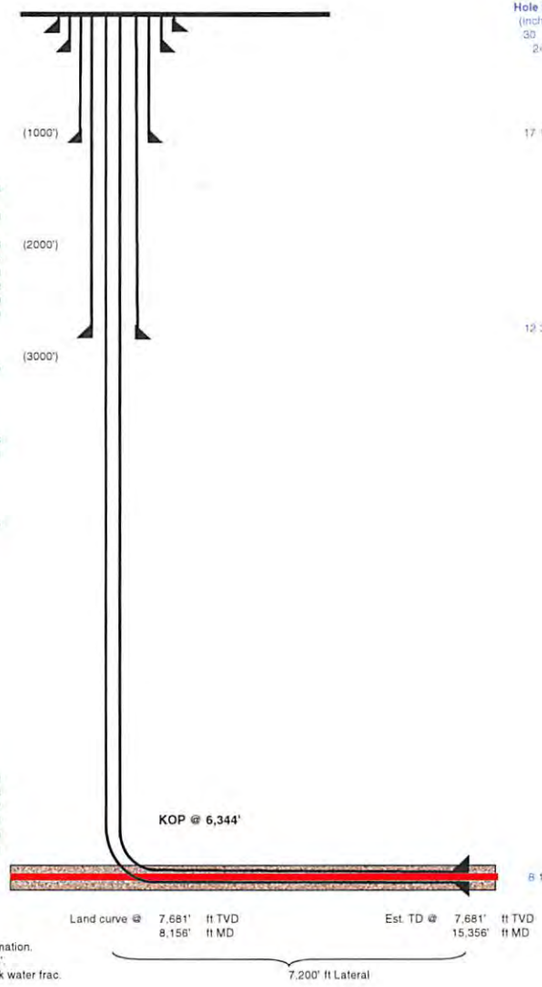
Well 514158 (RSM135H2)
EQT Production
Rosemont
Taylor **West Virgina**

Azimuth 155
Vertical Section 7448



TVD Depth (feet)	Formation Tops (TVD)			Hole Size (inches)	Casing Type	Size (inches)	Wt (ppf)/Grade
0'				30	Conductor	26	
250'				24	Mine Protection	20	81#/MC-50
500'							
750'							
1,000'	Base Fresh Water	974		17 1/2	Surface	13 3/8	54#/MC-50
1,250'							
1,500'	Big Injun	1603	1766				
1,750'	Weir	1766	2003				
2,000'	-Gantz	2003	2074				
2,250'	-Fifty foot	2175	2201				
2,500'	-Thirty foot	2201	2253				
	-Gordon	2253	2402				
	-Forth Sand	2402	2550				
	-Bayard	2550	2599				
2,750'	Int. csg pt	2649		12 3/8	Intermediate	9 5/8	40#/MC-50
	Base Red Rock	2717					
3,000'							
	-Speechley	3244	3747				
3,250'							
3,500'							
3,750'	-Balltown B	3747	3914				
	-Riley	3914	4581				
4,000'							
4,250'							
4,500'	-Benson	4581	5825				
4,750'							
5,000'							
5,250'							
5,500'							
5,750'							
6,000'							
6,250'							
6,500'							
6,750'	-Sonyea	5825	7142				
	-Middlesex	7142	7238				
7,000'	-Genesee	7238	7387				
	-Geneseo	7387	7421				
7,250'	-Tully	7421	7478				
	-Hamilton	7478	7611				
7,500'	Marcellus top	7611					
	Target inside Marcellus	**7681**		8 1/2	Production Casing	5 1/2	20#/P-110
7,750'	Marcellus Bottom	7745					

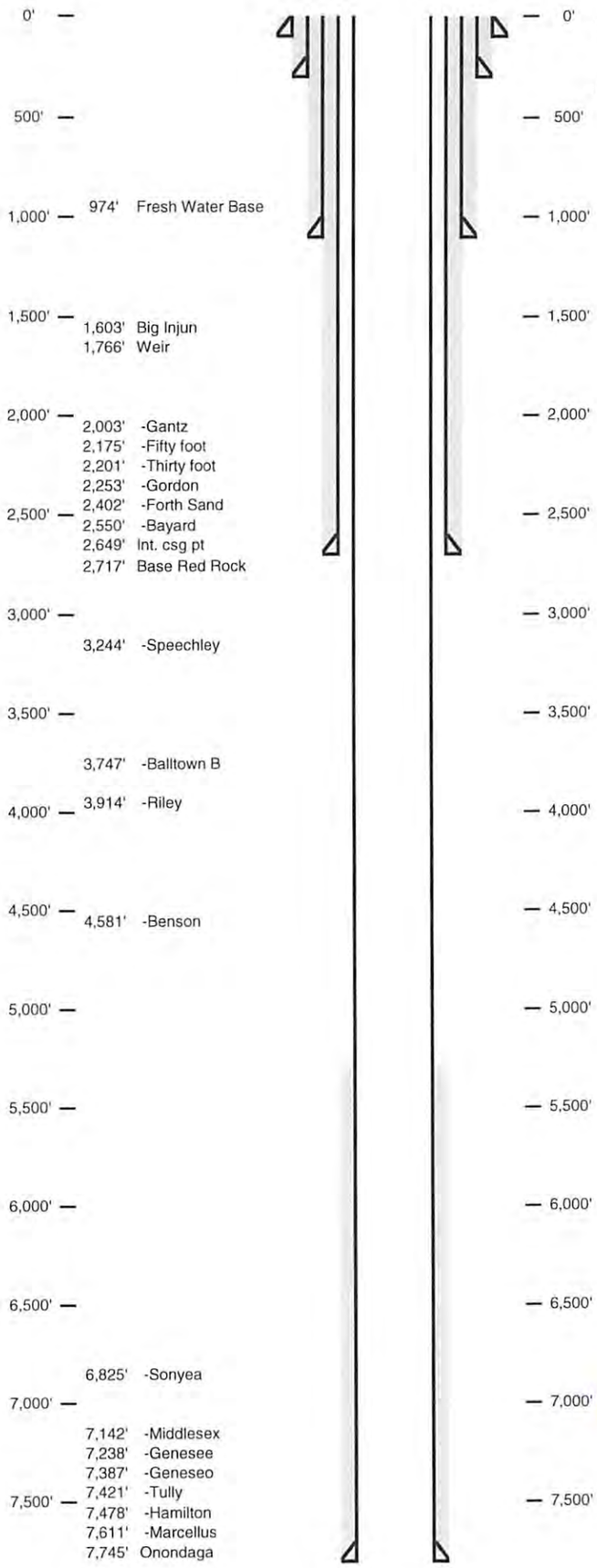
Proposed Well Work:
Drill and complete a new horizontal well in the Marcellus formation.
The vertical drill to go down to an approximate depth of 6344'.
Then kick of the horizontal leg into the Marcellus using a slick water frac.

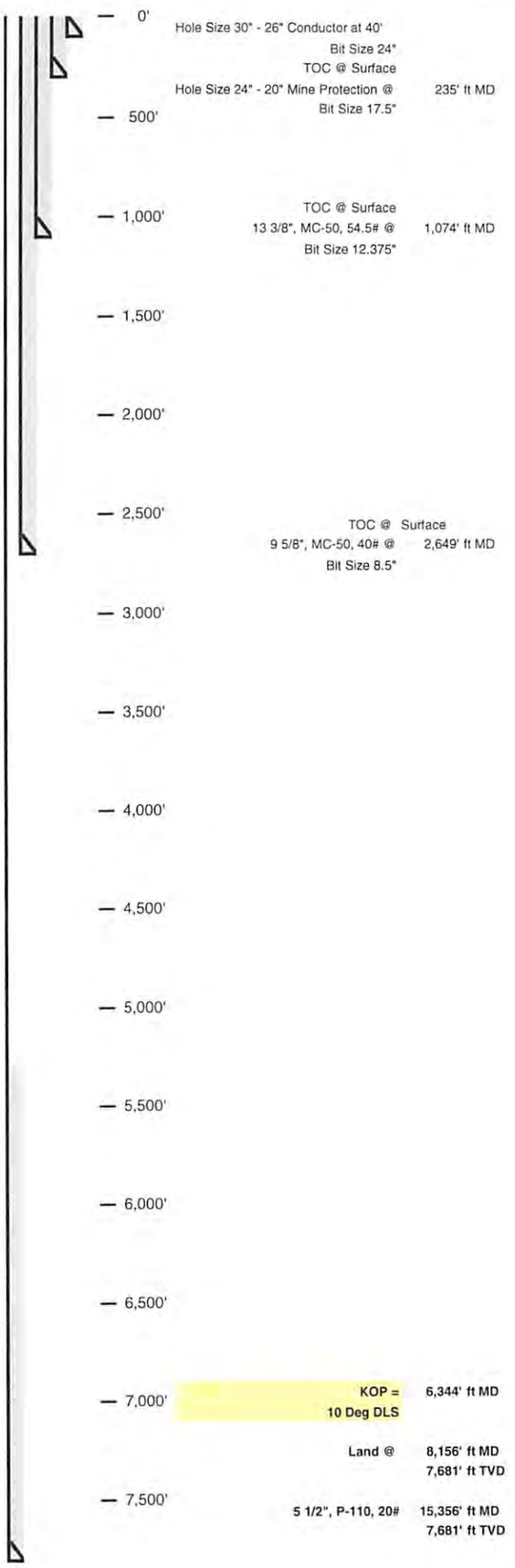
91-01286

Well Schematic
EQT Production

Well Name	514158 (RSM135H2)
County	Taylor
State	West Virgina

Elevation KB:	1625
Target	Marcellus
Prospect	
Azimuth	155
Vertical Section	7448





10/04/2013

WW-9
(5/13)

Page ____ of ____
API No. 47 - 91 - 01286
Operator's Well No. 514158

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

Fluids/Cuttings Disposal & Reclamation Plan

Operator Name EQT Production Company OP Code ____

Watershed (HUC10) Tributary of Peddler Run Quadrangle ROSEMONT 7.5' 588

Elevation 1615.0 County Taylor 91 District Flemington 04

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: n/a

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 ____)

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, Line, 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 ____
Company Official (Typed Name) Victoria J. Roark
Company Official Title Permitting Supervisor

Subscribed and sworn before me this 18 day of July, 20 13

____ Notary Public

My commission expires 6/27/2018

OFFICIAL SEAL
Notary Public, State Of West Virginia
NICHOLAS L. BUMGARDNER
Rt. 1 Box 4
Liberty, WV 25124
My Commission Expires June 27, 2018

10/04/2013

RECEIVED
Office of Oil and Gas

JUL 26 2013

WV Department of
Environmental Protection

4709101286

WW-9

Operator's Well No. 514158

Proposed Revegetation Treatment: Acres Disturbed 31.23 +/- Prevegetation pH 6.2

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: Bryan Harris

Comments:

Title: Oil and Gas Inspector Date: 8-30-13

Field Reviewed? (X) Yes ( ) No

RECEIVED
Office of Oil & Gas
SEP 12 2013
WV Department of
Environmental Protection

10/04/2013

91-01286

EQT Production Water plan
Offsite disposals for Marcellus wells

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

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

10/04/2013

Water Management Plan:
Primary Water Sources

WMP-01420 API/ID Number: 047-091-01286 Operator: EQT Production Company

514158 (RSM135H2)

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 mutiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interepreted 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 AUG 3 0 2013

10/04/2013

Source Summary

WMP- 01420	API Number:	047-091-01286	Operator:	EQT Production Company
		514158 (RSM135H2)		

Stream/River

- Source **Tygart River @ Kuhnes Withdrawal Site A** Taylor Owner: **Charlie & Peggy Kuhnes**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/1/2013	11/1/2014	11,500,000		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:

10/04/2013

Source Summary

WMP: 01420	API Number:	047-091-01286	Operator:	EQT Production Company
		514158 (RSM135H2)		

Purchased Water

- Source **Mountain View Water Association** Barbour Owner: **Mountain View Water Association**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/1/2013	11/1/2014	11,500,000	300,000	-	-

☐ Regulated Stream? Ref. Gauge ID: 3054500 TYGART VALLEY RIVER AT PHILIPPI, WV

Max. Pump rate (gpm): **0** **Min. Gauge Reading (cfs):** **352.81** **Min. Passby (cfs)**

DEP Comments:

- Source **Southwestern Water District** Barbour Owner: **Southwestern Water District**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
11/1/2013	11/1/2014	11,500,000	300,000	-	-

☐ Regulated Stream? Ref. Gauge ID: 3054500 TYGART VALLEY RIVER AT PHILIPPI, WV

Max. Pump rate (gpm): **0** **Min. Gauge Reading (cfs):** **352.81** **Min. Passby (cfs)**

DEP Comments:

Source Detail

WMP-01420 API/ID Number: 047-091-01286 Operator: EQT Production Company

514158 (RSM135H2)

Source ID: 23718 Source Name: Mountain View Water Association
Mountain View Water Association

Source Latitude: -
Source Longitude: -

HUC-8 Code: 5020001

Drainage Area (sq. mi.): 929.63 County: Barbour

Anticipated withdrawal start date: 11/1/2013
Anticipated withdrawal end date: 11/1/2014
Total Volume from Source (gal): 11,500,000
Max. Pump rate (gpm): 0
Max. Simultaneous Trucks:
Max. Truck pump rate (gpm)

- ☐ Endangered Species?
- ☐ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☐ Regulated Stream?
- ☑ Proximate PSD? Taylor County PSD
- ☑ Gauged Stream?

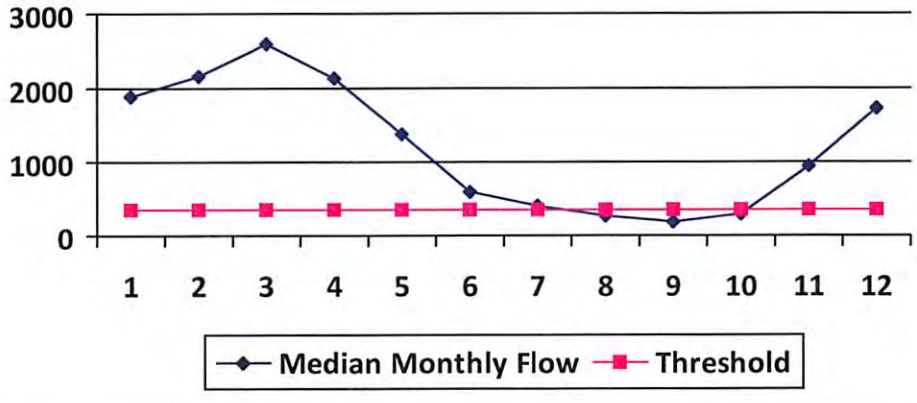
Reference Gaug 3054500 TYGART VALLEY RIVER AT PHILIPPI, WV

Drainage Area (sq. mi.) 914.00

Gauge Threshold (cfs): 341

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	1,897.38	358.64	1,541.16
2	2,151.34	358.64	1,795.12
3	2,595.90	358.64	2,239.68
4	2,128.11	358.64	1,771.89
5	1,372.82	358.64	1,016.60
6	584.97	358.64	228.75
7	401.23	358.64	45.01
8	280.03	358.64	-76.19
9	177.08	358.64	-179.14
10	286.20	358.64	-70.02
11	949.06	358.64	592.84
12	1,734.98	358.64	1,378.76

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	346.83
Upstream Demand (cfs):	11.81
Downstream Demand (cfs):	7.67
Pump rate (cfs):	0.00
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	**352.81**
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.

10/04/2013

Source Detail

WMP- 01420 | API/ID Number: 047-091-01286 | Operator: EQT Production Company

514158 (RSM135H2)

Source ID: 23719 | Source Name: Southwestern Water District

Southwestern Water District

Source Latitude: -

Source Longitude: -

HUC-8 Code: 5020001

Drainage Area (sq. mi.): 929.63 | County: Barbour

Anticipated withdrawal start date: 11/1/2013

Anticipated withdrawal end date: 11/1/2014

Total Volume from Source (gal): 11,500,000

Max. Pump rate (gpm): 0

Max. Simultaneous Trucks:

Max. Truck pump rate (gpm)

- ☐ Endangered Species?
- ☐ Mussel Stream?
- ☐ Trout Stream?
- ☐ Tier 3?
- ☐ Regulated Stream?
- ☑ Proximate PSD? Taylor County PSD
- ☑ Gauged Stream?

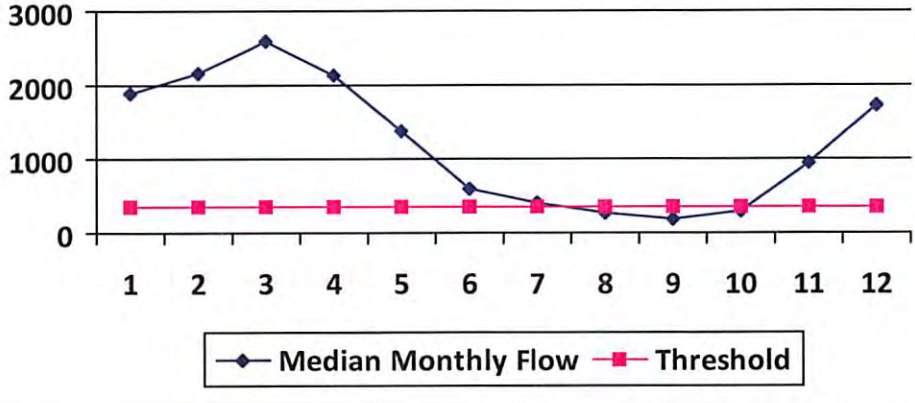
Reference Gaug: 3054500 TYGART VALLEY RIVER AT PHILIPPI, WV

Drainage Area (sq. mi.): 914.00

Gauge Threshold (cfs): 341

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	1,897.38	358.64	1,541.16
2	2,151.34	358.64	1,795.12
3	2,595.90	358.64	2,239.68
4	2,128.11	358.64	1,771.89
5	1,372.82	358.64	1,016.60
6	584.97	358.64	228.75
7	401.23	358.64	45.01
8	280.03	358.64	-76.19
9	177.08	358.64	-179.14
10	286.20	358.64	-70.02
11	949.06	358.64	592.84
12	1,734.98	358.64	1,378.76

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	346.83
Upstream Demand (cfs):	11.81
Downstream Demand (cfs):	7.67
Pump rate (cfs):	0.00
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	352.81
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.

10/04/2013

Source Detail

WMP-01420 | API/ID Number: 047-091-01286 | Operator: EQT Production Company

514158 (RSM135H2)

Source ID: 23717 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

Anticipated withdrawal start date: 11/1/2013
Anticipated withdrawal end date: 11/1/2014
Total Volume from Source (gal): 11,500,000

- ☐ Endangered Species?
- ☐ Trout Stream?
- ☑ Regulated Stream?
- ☐ Proximate PSD?
- ☑ Gauged Stream?
- ☑ Mussel Stream?
- ☐ Tier 3?

Tygart Valley Dam

Max. Pump rate (gpm): 1,260
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

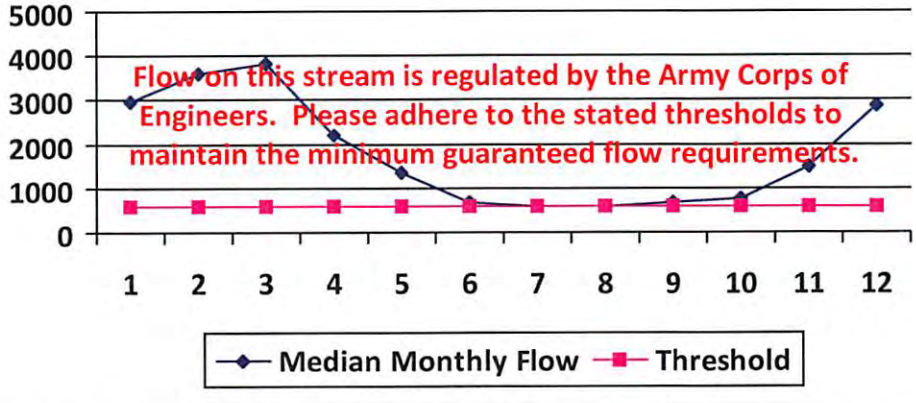
Reference Gaug 3057000 TYGART VALLEY RIVER AT COLFAX, WV

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.

10/04/2013

Water Management Plan:
Secondary Water Sources

WMP- 01420 API/ID Number 047-091-01286 Operator: EQT Production Company

514158 (RSM135H2)

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: 23720 Source Name Various

Source start date: 11/1/2013

Source end date: 11/1/2014

Source Lat: Source Long: County

Max. Daily Purchase (gal) Total Volume from Source (gal): 11,500,000

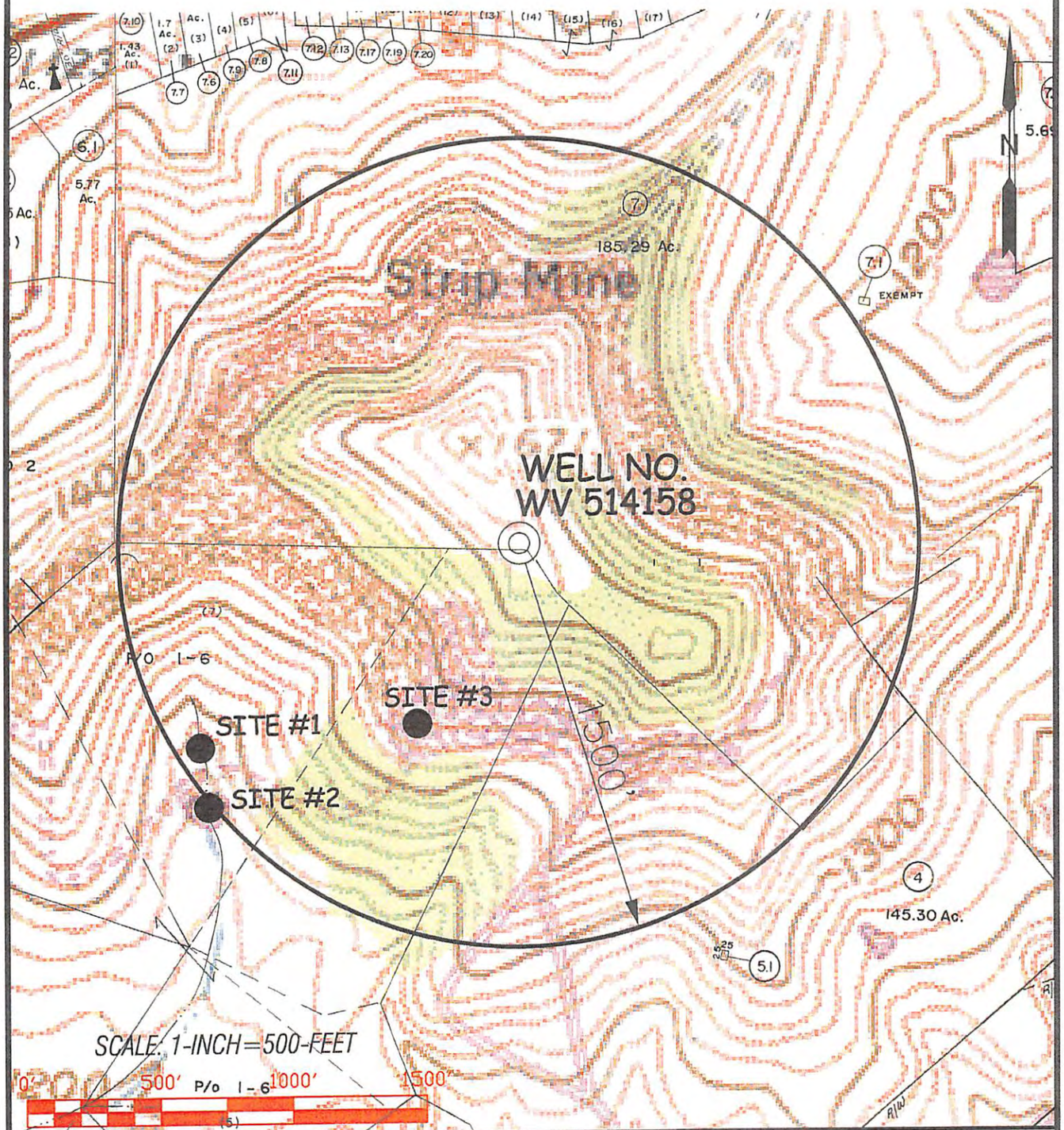
DEP Comments:

91-01286

WATER SAMPLES

page of

TUCKER LEASE
WELL NO. WV 514158



Professional Energy Consultants
A DIVISION OF SMITH LAND SURVEYING
SURVEYORS PROJECT SIGHT SLS ENGINEERS ENVIRONMENTAL
HONESTY, SUFFICIENCY, QUALITY

TOPO SECTION OF:
ROSEMONT, WV 7.5' QUAD.

DRAWN BY	FILE NO.	DATE	CADD FILE:
K.D.W.	7668	04/19/13	7668WS514158SITEMAP

DISTRICT	COUNTY	TAX MAP-PARCEL NO.
FLEMINGTON	TAYLOR	01-07

OPERATOR:
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
P.O. BOX 280
BRIDGEPORT, WV 26330

10/04/2013

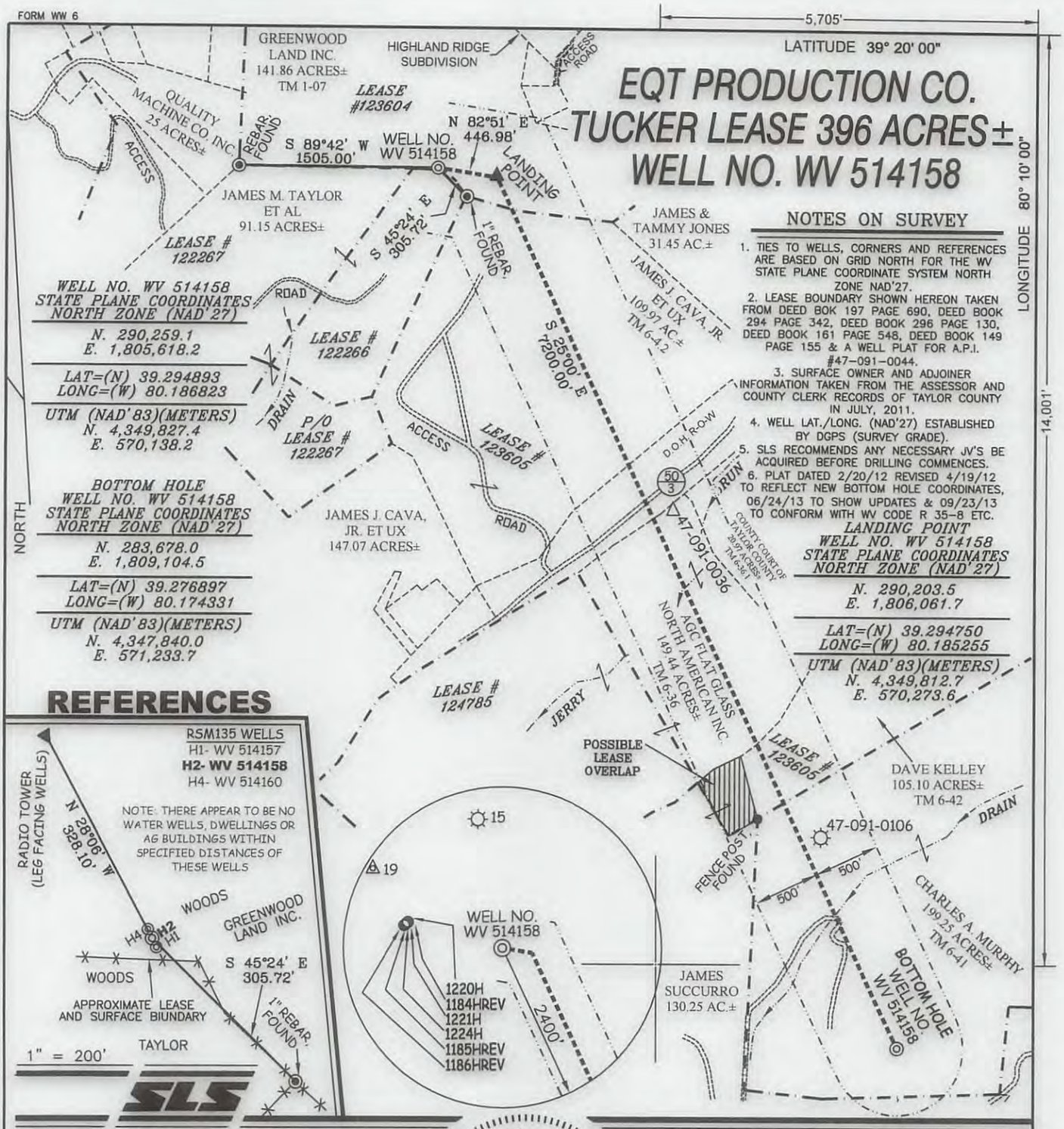
RECEIVED
Office of Oil and Gas

JUL 26 2013

WV Department of
Environmental Protection

FORM WW 6

EQT PRODUCTION CO.
TUCKER LEASE 396 ACRES±
WELL NO. WV 514158



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 BOK 197 PAGE 690, DEED BOOK 294 PAGE 342, DEED BOOK 296 PAGE 130, DEED BOOK 161 PAGE 548, DEED BOOK 149 PAGE 155 & A WELL PLAT FOR A.P.I. #47–091–0044.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF TAYLOR COUNTY IN JULY, 2011.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS (SURVEY GRADE).
5. SLS RECOMMENDS ANY NECESSARY JV'S BE ACQUIRED BEFORE DRILLING COMMENCES.
6. PLAT DATED 2/20/12 REVISED 4/19/12 TO REFLECT NEW BOTTOM HOLE COORDINATES, 06/24/13 TO SHOW UPDATES & 09/23/13 TO CONFORM WITH WV CODE R 35–8 ETC.

REFERENCES

SLS

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

GREGORY A. SMITH LICENSED No. 677 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

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

DATE SEPTEMBER 23 , 20 13

OPERATORS WELL NO. WV 514158

API WELL NO. 47 — 091 — 01286 H6A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500

PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIE TO CORS NETWORK)

FILE NO. 7668P514158R7 (390-02)

SCALE 1" = 1000'

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

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

LOCATION :
ELEVATION 1,630' (GROUND) / 1,615' (PROPOSED) WATERSHED TRIBUTARY OF PEDDLER RUN
DISTRICT FLEMINGTON COUNTY TAYLOR QUADRANGLE ROSEMONT 7.5'
SURFACE OWNER GREENWOOD LAND INC. ACREAGE 141.86 ±
ROYALTY OWNER GREENWOOD LAND INC. ET AL (396 AC.±) / PENNY A. KNOTTS ET AL (756 AC.±) / JOHN SCHNAUTZ HRS ET AL (204 AC.±)

PROPOSED WORK :
LEASE NO. 123604 / 123605 / J.V. (204 AC.±)
DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X 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 ___

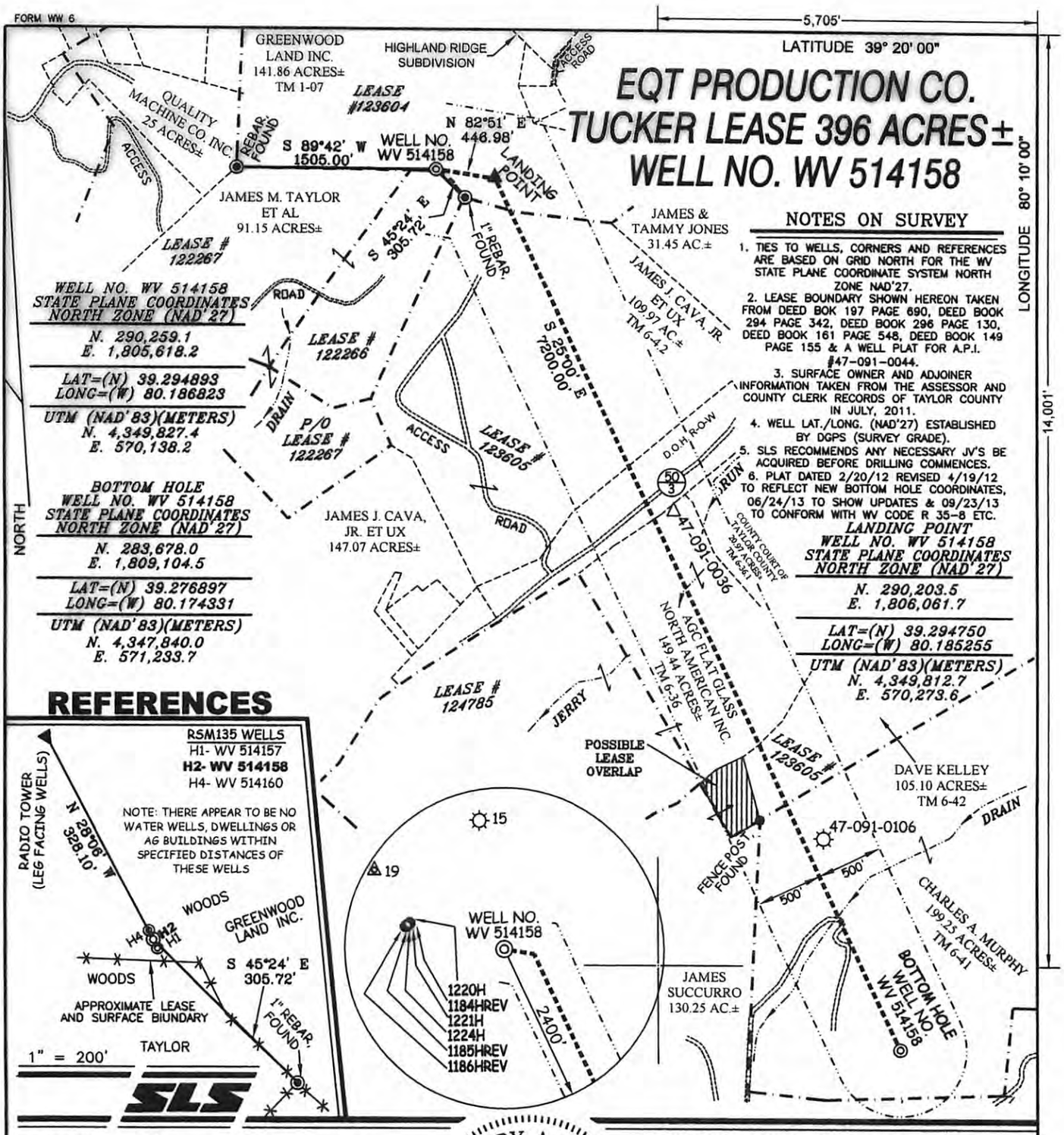
10/04/2013

COUNTY NAME PERMIT

WELL OPERATOR EQT PRODUCTION COMPANY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280
BRIDGEPORT, WV 26330

DESIGNATED AGENT REX C. RAY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280
BRIDGEPORT, WV 26330

FORM WW 6



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DATE SEPTEMBER 23 , 20 13

OPERATORS WELL NO. WV 514158

API WELL NO. 47 — 091 — 01286 H6
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500

PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIE TO CORS NETWORK)

FILE NO. 7668P514158R7 (390-02)

SCALE 1" = 1000'

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PHYSICAL CHANGE IN WELL (SPECIFY) ____

TARGET FORMATION MARCELLUS

ESTIMATED DEPTH ____

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