



west virginia department of environmental protection

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

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

June 13, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-6900171, issued to CHESAPEAKE APPALACHIA, L.L.C., is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

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: CARL ROTTER OHI 1H
Farm Name: ROTTER, CARL J. AND GRACE A
API Well Number: 47-6900171
Permit Type: Horizontal 6A Well
Date Issued: 06/13/2013

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.

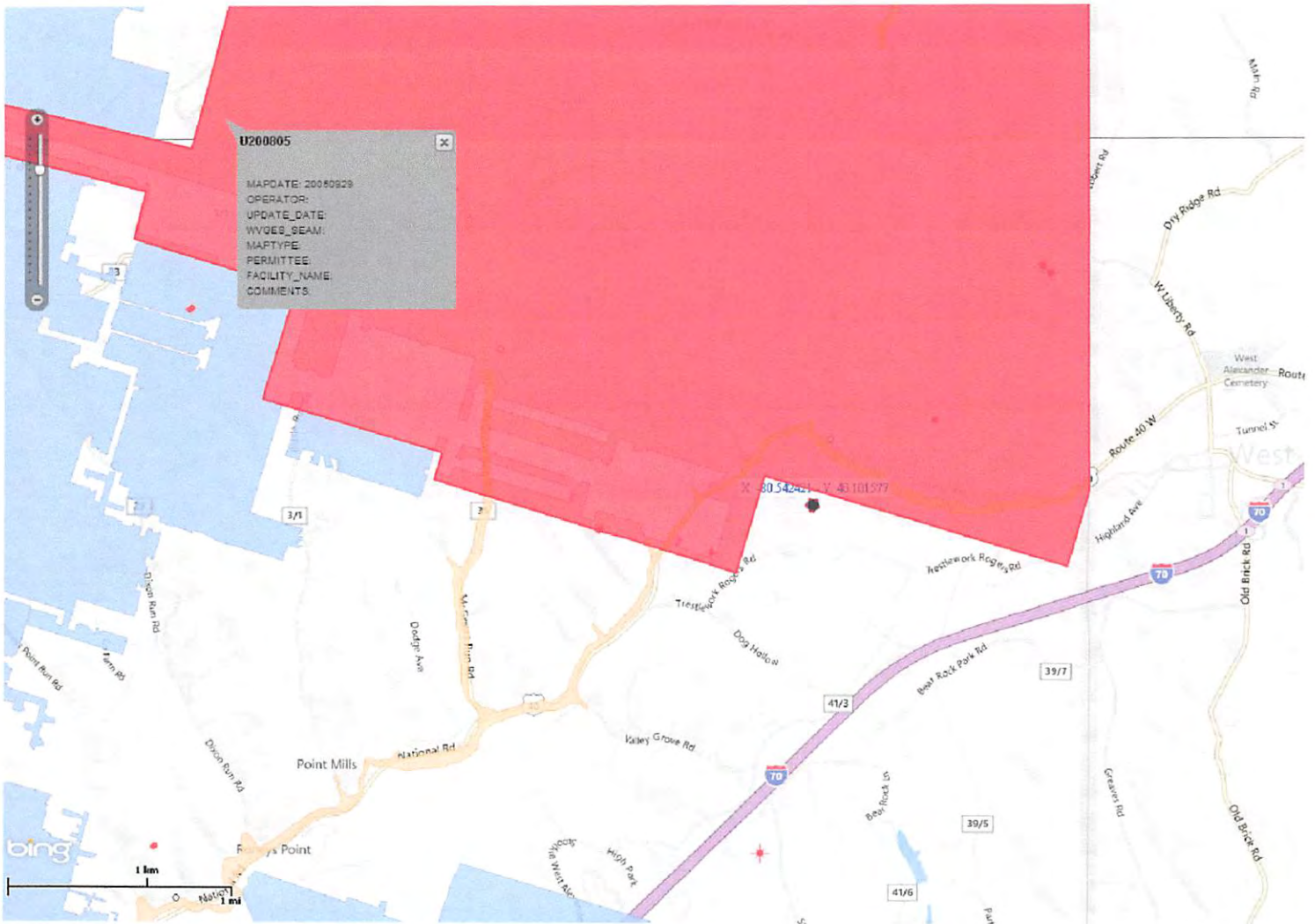
CONDITIONS

1. Valves on pad catch basin outlets shall remain closed during all drilling and completion activities on the pad so as to not allow any discharge from the pad during drilling and completion activities.
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% (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.
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.

06/14/2013

Map from a Flex Viewer applicatic

Powered by ArcGIS



Drilling very close to permitted mine:
U200805

UKC

06/14/2013



Rick Neidermeyer
Senior Landman - Coal Relations

March 20, 2013

Re: Carl Rotter OHI 1H Location

Dear Sir or Madam:

I am attaching an exhibit map as part of our permit review. I have indicated Chesapeake Appalachia LLC well location for the Carl Rotter OHI 1H in references to the active mine permits in the area. The location is approximately 380 feet outside of the permit boundaries of this mine. The owner/operator of this mine permit is Tunnel Ridge LLC. The permit number for this underground permit is U018183 and U200805. Please feel free to contact me if you have any further questions.

Sincerely,

A handwritten signature in blue ink, appearing to be "R. Neidermeyer".

Rick Neidermeyer

Received
Office of Oil & Gas

APR - 5 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: Chesapeake Appalachia, LLC 494477557 69-Ohio 3-Liberty 648-Valley Grove
Operator ID County District Quadrangle

2) Operator's Well Number: Carl Rotter OHI 1H Well Pad Name: Carl Rotter OHI Pad

3 Elevation, current ground: 1340' Elevation, proposed post-construction: 1334'

4) Well Type: (a) Gas Oil
Other
(b) If Gas: Shallow Deep
Horizontal

WJK
3/27/2013

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target formation-Marcellus, Target top TVD- 6550', Target base TVD- 6620', Anticipated thickness- 70', Associated Pressure -4038

7) Proposed Total Vertical Depth: 6,580

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 16,000'

10) Approximate Fresh Water Strata Depths: 442'

11) Method to Determine Fresh Water Depth: Data was gathered from e-logs, drillers logs and from wells within a 2500' radius

12) Approximate Saltwater Depths: 830'

13) Approximate Coal Seam Depths: 700'

14) Approximate Depth to Possible Void (coal mine, karst, other): None that we are aware of.

15) Does land contain coal seams tributary or adjacent to, active mine? No adjacent to DEP-permitted mine

16) Describe proposed well work:
Drill and stimulate any potential zones between and including the Benson to the Marcellus. **If we should encounter a void, place basket above and below void area - balance cement to bottom of void and grout from basket to surface. Run casing not less than 20' below void nor more than 50' below void.
(*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts)

17) Describe fracturing/stimulating methods in detail:
Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface.
The well is produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 14.0

19) Area to be disturbed for well pad only, less access road (acres): 9.0

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9.0 APR - 2013

20)

CASING AND TUBING PROGRAM

<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	J-55	94#	100'	✓ 100'	CTS
Fresh Water	13 3/8"	New	J-55	54.5#	542'	✓ 542'	510 SX/CTS
Coal	9 5/8"	New	J-55	40#	2250'	✓ 2250'	850 SX/CTS
Intermediate	7"	New	P-110	20#	If Needed	✓ If Needed	If Needed/As Needed
Production	5 1/2"	New	P-110	20#	16,000'	✓ 16,000'	Lead 1210 sx Tail 1570 sx/100' inside intermediate
Tubing	2 3/8"	New	N-80	4.7#	Approx. 7753'	✓ Approx. 7753'	
Liners							

MJK 3/27/2013

<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"	30"	0.25	2120	15.6 ppg	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	15.6 ppg	1.19/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	15.6 ppg	1.19/50% Excess
Intermediate	7"	8 3/4"	.0317	4360	15.6 ppg	1.20/15% Excess
Production	5 1/2"	8 3/4"	0.361	12360	15.6 ppg	1.20/15% Excess
Tubing	2 3/8"	4.778"	0.190			
Liners						

PACKERS

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Kind:	10K Arrowset AS1-X			
Sizes:	5 1/2"			
Depths Set:	Approx. 6,197'			

21) Describe centralizer placement for each casing string. _____

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

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

**Please see attached sheets for Chemical Listing of Cement & Additives for Chesapeake Energy wells.

23) Proposed borehole conditioning procedures. _____

All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and continuing until operator is satisfied with borehole conditions.

*Note: Attach additional sheets as needed.

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Chemical Name	CAS Number	% Concentration Used
Fuller's earth (attapulgit)	8031-18-3	0.2% BWOC
Polypropylene glycol	25322-69-4	
polyethylene terephthalate	25038-59-9	0.125 lb/sk
calcium chloride	10043-52-4	2% BWOC
polyethylene terephthalate	25038-59-9	1 lb/bbl
bentonite	1302-78-9	20 lb/bbl
Fuller's earth (attapulgit)	8031-18-3	0.2% BWOC
Polypropylene glycol	25322-69-4	
polyethylene terephthalate	25038-59-9	0.125 lb/sk
sodium chloride	7647-14-5	10% BWOW
chrySTALLine silica	14808-60-7	0.15% BWOC
bentonite	1302-78-9	20 lb/bbl
polyethylene terephthalate	25038-59-9	1 lb/bbl
product classified as non-hazardous.		0.05 gal/sk
product classified as non-hazardous		0.01 gal/sk
polypropylene glycol	25322-69-4	0.02 gal/sk
Carbohydrate	proprietary	1 lb/bbl
Silica Organic Polymer	proprietary	0.1 gal/bbl
barium sulfate	7727-43-7	310 lb/bbl
fatty acid amine	proprietary	
ethoxylated alcohol	proprietary	
glycerol	56-81-5	
2,2'-Iminodiethanol	111-42-2	1 gal/bbl
aliphatic amide polymer	proprietary	0.35% BWOC
non-crystalline silica	7631-86-9	6% BWOC
boric acid	10043-35-3	0.8% BWOC
Fuller's earth (attapulgit)	8031-18-3	
Polypropylene glycol	25322-69-4	0.2% BWOC
chrySTALLine silica	14808-60-7	
metal oxide	proprietary	0.2% BWOC
sulphonated synthetic polymer	proprietary	
formaldehyde (impurity)	50-00-0	0.3% BWOC
Fuller's earth (attapulgit)	8031-18-3	
Polypropylene glycol	25322-69-4	0.2% BWOC
aliphatic amide polymer	proprietary	0.35% BWOC
Sodium Polynaphthalene Sulfonate	9008-63-3	
Sodium Sulfate	7757-82-6	0.25% BWOC

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2013

06/14/2013



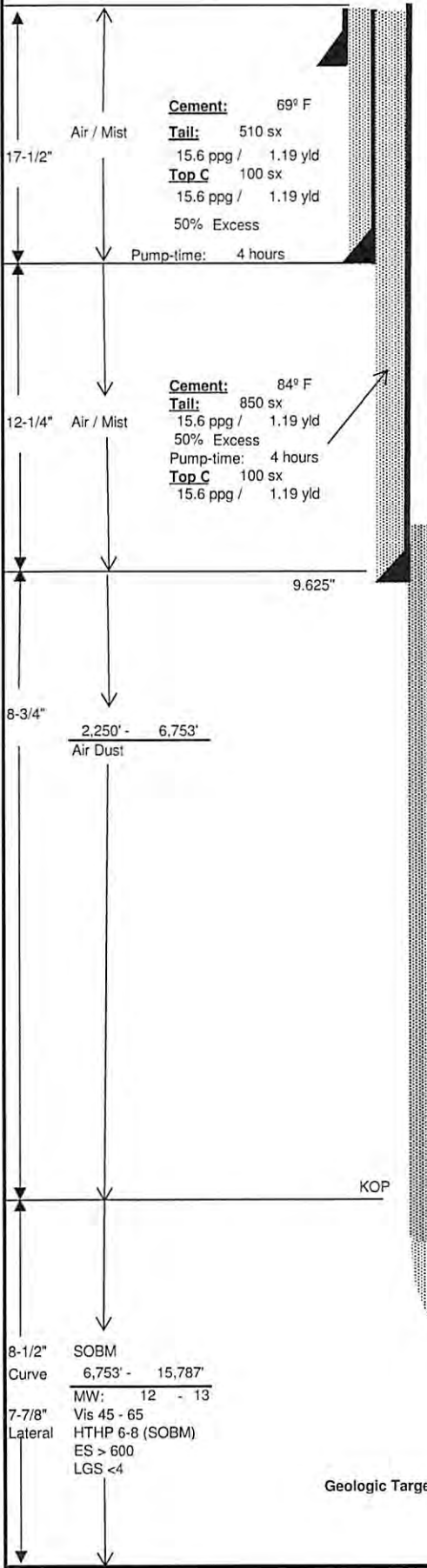
Well Name: **Carl Rotter OHI 1H**

Drilling Rig: **N/A**

Drilling Engineer: TBD
 Superintendent: N/A
 Asset Manager: N/A
 Geologist: N/A
 Land: N/A

Formation: Marcellus
 County, State: Ohio, WV
 Surface Latitude: 40.101504 Surface Longitude: -80.542628
 BH Latitude: 40.123629 BH Longitude: -80.559509
 KB Elevation: 1360' Ground Elevation: 1340'

Directional Drilling: N/A
 Drilling Mud: N/A
 Cement Surface: N/A
 Cement Longstrings: N/A
 Wellhead: N/A
 AFE #: N/A



Wellhead Equipment	
Tree Description	Blanking Cap
Tubing Head **	Blanking Cap
'B' Section	11" x 5M x 7-1/16" 10M
'A' Section	9-5/8" SOW x 11" 5M

** Space out such that Blanking Cap is no more than 30" above grade.

Casing Detail						
	Size	Wt	Grd	Conn.	From:	To:
Surface	13.375	54.5 #	J-55	STC	0'	542'
Interm	9.625	40 #	J-55	LTC	0'	2,250'
Prod	5.5	20 #	P-110	GBCD	0'	15,787'

Report any water or gas flows. Catch liquid sample if possible.

Casing Design						
	Size	ID	Coil	Burst	Tens	MU torq
Surface	13.375	12.615	1130	2740	514	5140
Interm	9.625	8.835	2570	3950	520	5200
Prod	5.5	4.778	12200	12360	641	8530

Surface Nudge for Anti-Collision purposes.

Directional Drilling Details								
Section	TMD	Inc.	Azimuth	TVD	BUR	DLS	+N/-S	+E/-W
Surface	0.00'	0.00	0.00	0.00'	0.00	0.00	0.0'	0.0'
Surface	1,000'	0.00	0.00	1,000'	0.00	0.00	0.0'	0.0'
Surface	2,000'	0.00	0.00	2,000'	0.00	0.00	0.0'	0.0'
Surface	3,000'	0.00	0.00	3,000'	0.00	0.00	0.0'	0.0'
Surface	4,000'	0.00	0.00	4,000'	0.00	0.00	0.0'	0.0'
Hold	6,103'	0.00	0.00	6,103'	0.00	0.00	0.0'	0.0'
KOP2	6,853'	90.00	315.10	6,580'	12.00	12.00	338.2'	-337.0'
Landing Pt	7,753'	90.00	315.10	6,580'	0.00	0.00	975.7'	-972.3'
Nudge	8,698'	90.00	334.00	6,580'	0.00	2.00	1,742.0'	-1,517.9'
TD	15,787'	90.00	334.00	6,580'	0.00	0.00	8,114.3'	-4,625.9'
VS Plane	334.00						VS Length	9,320.95'

Lateral Length ==> 8,034.80'

Plat Date 3/14/13

Logging Program		
Run	Log Type	Interval
1	TBD	TBD
2	TBD	TBD

Mudlogger operational at Surface

Formation Depths (TVD)

BASE BIG INJUN	2,095'
GENESECO	6,380'
TULLY	6,400'
HAMILTON	6,435'
MARCELLUS	6,550'
ONONDAGA	6,620'

Cement: 121° F
Lead: 1,210 sx
 15.6 ppg / 1.20 yld
Tall: 1,570 sx
 15.6 ppg / 1.20 yld
 15% Excess
 Pump-time: 6 hours

Geologic Target: 6,580' TVD @ 0° VS w/ 0.00 degrees/100 ft Up-dip

PBHL 5.5'
 TMD: 15,787'
 TVD: 6,580'
 Inclination: 10.00°
06/14/2013

**Gyro the 1st well on the pad at KOP.
 Ensure all Surveys are referenced to Grid North!!**

Drawn by: **TBD**
 Date: **3/18/2013**

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

*MJC
3/27/2013*

Operator Name Chesapeake Appalachia, LLC OP Code 494477557

Watershed Upper Ohio South Quadrangle 648-Valley Grove

Elevation 1340' County 69-Ohio District 3-Liberty

Description of anticipated Pit Waste: Closed loop system in place at this time - cuttings will be taken to a permitted landfill.

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

Will a synthetic liner be used in the pit? . If so, what mil.?

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number 2D0072539/ 2D0413175/ 2D0610306/ 2D0610317)
- Reuse (at API Number at next anticipated well, API# will be included with the WR-34/DDMR &/or permit addendum)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Flow back fluids will be put in steel tanks and reused or taken to a permitted disposal facility.)

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

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

Additives to be used? see attached sheets

Will closed loop system be used? yes

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,

-Landfill or offsite name/permit number? Meadowfill SWF-1032, SS Grading SWF-4902, Northwestern SWF-1025

Short Creek 1034/WV0109517 / CID28726 , Arden Landfill 100172, Carbon Limestone 28726/CID 28726, American 02-12954, Country Wide 38390/CID 38390, Pine Grove 13688

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.

*Received
Office of Oil & Gas
APR - 5 2013*

Company Official Signature *[Signature]*

Company Official (Typed Name) Danielle Southall

Company Official Title Regulatory Analyst II

Subscribed and sworn before me this 20th day of March, 2013

Brittany R Woody Notary Public

My commission expires 11/27/22



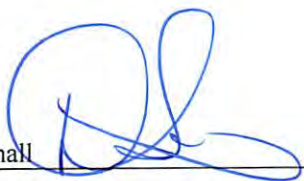
06/14/2013

**Marcellus Well Drilling Procedures
And Site Safety Plan**

Chesapeake Appalachia, LLC

47 - 69 -
Well name Carl Rotter OHI 1H
Valley Grove, Quad
Liberty, District
Ohio County, West Virginia

*MSK
3/27/2013*

Submitted by:  Date: 3/19/2013
Danielle Southall
Title Regulatory Analyst II Chesapeake Appalachia, LLC

Approved by: _____ Date: _____
Title: _____

Approved by: _____ Date: _____
Title: _____

Chesapeake Appalachia, L.L.C. – Confidential

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Site Safety Plan

1. A formal pre-spud meeting will be held prior to this well being drilled. Discussions between the drilling rig toolpusher and CHK representatives will be held weekly regarding general safety and environmental issues.
2. The highest ranking drilling contractor representative present shall keep an accurate count of all drilling personnel on the drilling location at all times. All non-drilling (i.e., non-CHK and non-drilling contractor) personnel will be required to sign the attached ACCESS CONTROL REPORT. All non-essential persons will be kept off the drilling location at all times, and such access will be enforced by the highest ranking drilling contractor representative present.
3. In case of an emergency on the drilling site, all persons on location will exit via the access road and meet at the evacuation meeting area designated on the attached EVACUATION PLAN. The highest ranking drilling contractor representative will be responsible for comparing the persons that were present on location to those persons gathered at the designated evacuation meeting area. Any evacuation deemed necessary of residents in the surrounding area will be accomplished by telephone or door-to-door contact from a CHK representative.
4. For the prevailing wind direction please see Evacuation Route/Prevailing Winds sheet attached hereto.
5. General safety and environmental awareness meetings will be held with the rig toolpusher weekly or more often if needed.

The following is a list of emergency response agencies for well Carl Rotter OHI 1H:

Agency Type	Name	Phone Number	Cell
County Police	Ohio County	911 or 304-234-3811	
State Police	Ohio County	911 or 304-238-1100	
Ambulance Service	Ohio County	911 or 304-277-4357	
Hospital		304-234-0123	
Fire Department	Ohio County	911 or 304-234-3651	
Darrel Overgaard	Drilling Engineer Manager	405-935-4118	405-248-7920
Casey McDonough	Drilling Engineer	405-935-4778	405-606-1482
Chase Duggins	Drilling Engineer	405-935-4247	405-312-6284
Stacey Tubbs	Drilling Superintendent	575-391-1462	575-631-8271
John Melville	Drilling Superintendent	814-573-6692	304-380-7127
Rick Harless	Drilling Superintendent		304-807-3600
Rickey Beene	Drilling Superintendent	405-990-0394	970-250-4441
Clayton Lane	Drilling Superintendent		304-997-9466
Malcom Ashley	Drilling Superintendent		304-997-9258
Gary Gould	District Manager	405-935-4060	405-249-4514
Scott Nease	Production Superintendent	304-517-1416 x 86001	304-641-0085
Kevin Patterson	EHS Field Specialist	304-517-1416 x 86015	304-641-0551
Zach Arnold	Operations Manager	304-517-1416 x 86028	304-203-8059
Nathan Smarr	Field Superintendent	304-517-1416 x 86023	304-997-0600
Tim Murray	Field Manager	405-935-2505	405-818-2467
Joe Kennedy	Drilling Safety Manager, Op.	405-935-8256	405-990-8126
Kris Osecky	Field Safety Representative	724-324-2205 x 83836	724-886-8161
Gayne Knitowski	WV Oil and Gas Inspector		304-546-8171
Dave Belcher	Inspector Supervisor	304-926-0499 x 1647	304-389-7590
James Martin	Chief	304-926-0499 x 1654	
WV DEP	Emergency Pollution and Spills	1-800-642-3074	
Chesapeake	24 Hour Hotline	1-800-566-9306	

Contractor's	Company	Phone	
Well Control Co.'s	Boots & Coots	1-800-256-9688	
	Halliburton	1-800-409-6479	
Earthwork/Equipment	Triple J Contractors	304-472-3962	
Remediation/Cleanup	Weaverton Environmental	724-746-4850	
Remediation/Cleanup	Ryan Environmental	304-842-5578	
Remediation/Cleanup	Central Environmental Services	304-863-8867	
Heavy Equipment	Kanawha Stone	304-755-8271	
Heavy Equipment/Rouster	Arvilla Pipeline	304-665-2652	
Heavy Equipment	Hoy Contracting	724-627-0272	
Cleanup Supplies	McJunkin Supply	304-472-3565	

Driving Directions: Take I-79N to I-70W. Go approx.. 16.7 miles and take the exit toward Old Brick Road. Turn right on Old Brick Road and continue onto Maple Ave. Turn left onto Church Street and then turn left onto Highland Ave. Continue onto Trestlework Rogers Road entering into WV. Follow for approx.. 1.6 to arrive at the Carl Rotter Pad.

Casing Requirements

- The following is a list of all known freshwater, saltwater, oil and gas producing, hydrogen sulfide producing, thief, and high pressure and volume zones:

Name of Zone	Anticipated Depth	Type of Zone
Fresh water	442'	Fresh Water
Coal	700'	Coal
Salt Water	830'	Salt Water
Big Injun Base	2095'	Gas
Geneseo	6380'	Gas
Tully	6400'	Gas
Hamilton	6435'	Gas
Marcellus	6550'	Gas

** All casing used in the well bore will be new.

- The casing and cementing program is as follows:

Casing Type	Size	Grade	Weight	Footage	Cement Top
Conductor	20"	J-55	94#	100'	CTS
Fresh Water	13 3/8"	J-55	54.5#	542'	510 SX/CTS
Coal	9 5/8"	J-55	40#	2250'	850 SX/CTS
Intermediate	7"	P-110	20#	If Needed	If Needed/As Needed
Production	5 1/2"	P-110	20#	16,000'	On lead 0210 or fail, 1570 Sx/or at least 100' up inside intermediate string
Tubing	2 3/8"	N-80	4.7	Approx. 7753'	2013
Packer 10K Arrowset ASI-X	5 1/2"				
Contingency Liner	7 5/8"	P-110	29.7		

** All Cements used will meet the API Standards.

3. -Well Work Detail: Drill and stimulate the Marcellus formation. If we should encounter a void, place a basket above and below the void area – balance cement to bottom of void and grout from basket to surface. Run casing not less than 20' below void nor more than 50' below void. If freshwater is encountered deeper than anticipated it must be protected, set casing at least 50' below but not more than 100' below freshwater and cts.
4. -All casing cemented will not be disturbed for at least 8 hours after cementing operations.
5. -Surface, Coal, and Intermediate strings will be pressure tested at a pressure 20% greater than what is expected to be exerted on each string throughout the remainder of the well operations.
6. -No oil or gas production or pressure should exist on the surface or coal protection strings.
7. -A Formation Integrity Test (FIT) will be performed immediately following the drill out of intermediate casing.
8. -Centralizers will be used in the well. However, the placement of the centralizers will be contingent on the final well log and directional data.
9. -Production casing will be pressure tested at a pressure 20% greater than what is expected to be exerted upon it during fracturing operations. Upon completion of fracturing operations the production casing will be pressure tested at a pressure 20% greater than expected shut in pressure.
10. -Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. The well is produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks.

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BOP Requirements

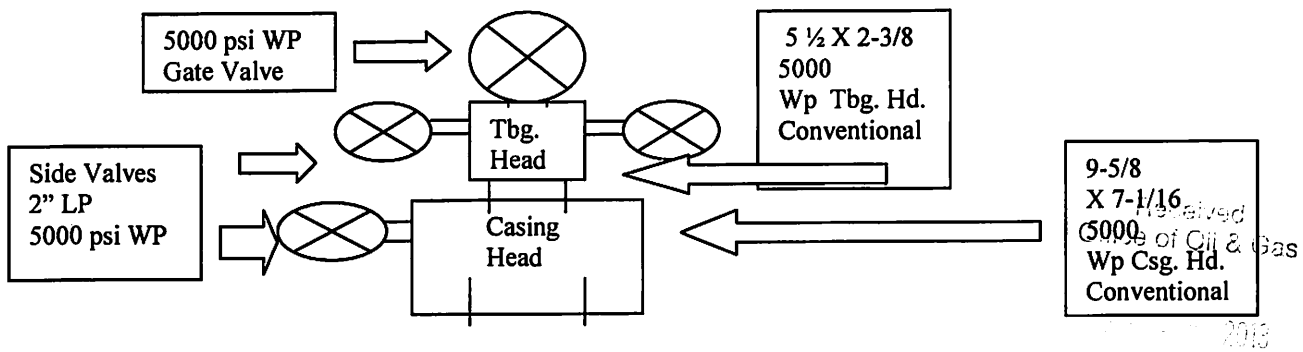
1. The following is a list of the blow-out prevention equipment that will be utilized at various times during the drilling of the well:

13-3/8" Casing String	9-5/8" Casing String
13- 5/8" Annular	11" 5000 psi BOP Stack

2. Testing of the BOP stack intermediate drilling phase will be conducted upon initial set up and the annular tested to 70% of capacity. For the Bottom and horizontal wellbore drilling phase, the BOP equipment will be tested upon initial installation – Annulars to 70% of capacity and rams to 80% of capacity.
3. The BOP equipment will be installed when nipping-up on the casing strings as shown above.
4. The following persons that will be involved in the drilling operations are BOP certified:

Rig Toolpusher
 Rig Morning Tour Driller
 Rig Daylight Tour Driller
 Rig Evening Tour Driller
 CHK Drilling Representatives

5. A drilling record book will be maintained during the drilling operation, which will denote all formations encountered, any water or hydrocarbon occurrences, any occurrences of hydrogen sulfide, any lost circulation zones and any abnormally pressured zones. The WVOOG inspector will be notified by phone upon any significant drilling events.
6. The following diagram illustrates the wellhead assembly that will be placed on the well upon completion of the well.



Well Flaring Operations

1. No flaring is anticipated on this well and therefore no flare lines will be utilized. Based on offset well information no significant gas flows should be encountered during drilling. If a significant show is encountered the gas would be flared through the 7" flanged flowline. This flowline will be anchored to the ground using chains and deadman stakes, and will be approximately 75 feet long.
2. In the unlikely event that gas needs to be flared. The well would be shut-in, and a smudge pot would be set up as a primary ignition with a marine flare pistol used as a backup igniter.
3. All flammable material within a minimum distance of 50' from the end of the flow line will be cleared, in case a flare would be needed.
4. The fire department will be notified immediately prior to flaring.
5. The duration of flaring typically will not last more than 7 days.

Well Killing Operations Method and Type

1. Barite and saturated brine will be available if necessary to weight up beyond the proposed compositions. Should a significant gas flow occur, historical data from the field shows that the brine is of sufficient weight to kill the well.
2. No mixing units will be required since only brine would be utilized in the unlikely event of a significant gas show.

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Chesapeake H2S Safety Packages

Hydrogen Sulfide Operations H2S (Low Level Concentration and Low Risk)

1. Training
 - a. Basic awareness training (either video or booklet review) will occur on-site and may require two trips in order to train all rig crew members
 - b. Each crew member will be given certification test to verify his competence to respond in an H2S situation.
 - c. Physically show members how to properly don a mask and perform a qualitative fit test (banana oil) if utilizing a tight fitting mask as an escape unit.
 - d. Identify and discuss the location of escape units, SCBA's and location of H2S monitors and sensors.

2. Drills
 - a. Evacuation of the rig (Discuss). Identify muster points and location of SCBA's.
 - b. Man Down Drill (Discuss procedures for rescuing an employee who has gone down).

3. Safety Equipment
 - a. (10) 5 – minute escape packs will be installed on the rig floor for a quick escape.
 - b. (1) 10 – minute escape pack will be installed on the board.
 - c. (4) 30 – minutes SCBA's will be on-site. Two SCBA's will be placed at the entrance to the location (Muster Point #1) and the other two placed at Muster Point #2 on the other side of the location. This will allow either equipment to be in area that is upwind.
 - d. (1) 4 – multichannel H2S Monitor with sensors placed on the floor, shakers, bell nipple and other to be placed where needed.
 - e. (2) hand held multi-gas monitor or a box of H2S tubes and a box of SO2 tubes to perform test in the event a monitor has been sounded.
 - f. (2) Safety Area Signs
 - g. (1) Condition Sign
 - h. (2) Wind socks that are to be placed in areas that can be seen at all times on the rig and at an height with good wind flow.

4. Record Keeping
 - a. A copy of employee certifications should be submitted to the Chesapeake Rig Consultant for files.
 - b. Weekly checks or calibration records must be provided to the Chesapeake Rig Consultant.

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Step-Up Package (High Risk and High Concentration)

- I. Training (Same training as the Basic Packing with the following Additions):
 - a. Medical Eval Forms to be filled out
 - b. Perform Fit Test
 - c. Discuss how to properly hook up supplied air equipment to masks.

- II. Drills
 - a. Evacuation of the rig (Discuss). Identify muster points and location of SCBA's.
 - b. Man Down Drill (Discuss procedures for rescuing an employee who has gone down).

- III. Safety Equipment (Same as the Basic with the following Additions):
 - a. Install a supplied air cascading system with (2) manifolds that will supply air to the the floor and the rigs backyard.
 - i. (5) Quick connects on the floor and 20ft – 50ft of hose.
 - ii. (1) Quick connect at the shakers with 20ft – 50 ft of hose.
 - iii. (1) Quick connect mid-way down the pits with 20ft – 50 ft of hose.
 - iv. (1) Quick connect at the end of the pit with 20ft – 50ft of hose.
 - v. (1) Quick connect installed to provide air to the choke manifold with 20ft – 50ft of hose.
 - b. Install an explosion proof siren and lights

- IV. Record Keeping
 - a. A copy of employee certifications should be submitted to the Chesapeake Rig Consultant for files.
 - b. Weekly checks or calibration records must be provided to the Chesapeake Rig Consultant.
 - c. If a H2S Safety Representative is required on location for 24-hours periods, then a daily report must be provided to Chesapeake's Rig Consultant.

****Chesapeake will authorize payment for initial training of all rig crew members. If a new rig crew member is hired, then the contractor is responsible for payment to train the new employee.**

In the unlikely event that hydrogen sulfide would be present, all affected residents and agencies would be notified by telephone or in person by a Chesapeake Appalachia, LLC representative, and access would be controlled by a sign, color coded flags and a sign-in sheet. Oil and Gas Inspector, Gayne Knitowski will be called at (304) 546-8171.

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BLOWOUT PREVENTER SCHEMATIC

CHESAPEAKE OPERATING INC

WELL :
 FIELD :
 RIG :
 COUNTY :
 OPERATION : 17 1/2" Surface Hole

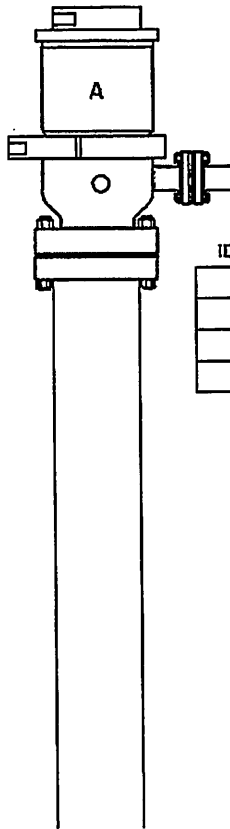
STATE :
 REVISION : : / /

Component Descriptions

	Size	Pressure	Description
A	13 3/4"	500 psi	Rotating Head
B			
C			
D			
E			
F			
G			
H			
DSA			
C Sec			
B Sec			
A Sec			

Description	Reference

Trip Tank Required: Yes No



Flowline to closed loop pits with bypass vent line to flare

Kill Line

ID	Pressure	Description

Choke Line

ID	Pressure	Description

Testing Requirements

Item	Pressure	Frequency
Rotating Head	280 / 500 psi	Once prior to DO shoe

Approved by _____ Date _____

CEA	
CP	
CD	

BLOWOUT PREVENTER SCHEMATIC

CHESAPEAKE OPERATING INC

WELL :
 FIELD :
 RIG :
 COUNTY :
 OPERATION : 12 1/2" Intermediate Hole

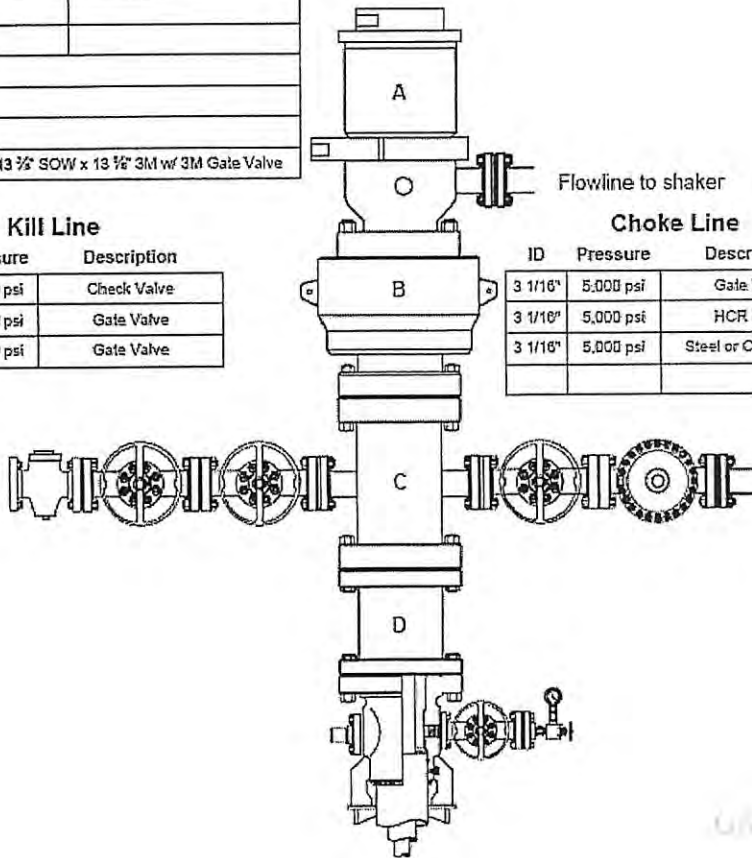
STATE :
 REVISION : : / /

Component Descriptions

Size	Pressure	Description	
A	13 3/4"	500 psi	Rotating Head
B	13 3/4"	3,000 psi	Annular
C	13 3/4"	3,000 psi	Mud Cross
D	13 3/4"	3,000 psi	Drilling Spool
E			
F			
G			
H			
DSA			
C Sec			
B Sec			
A Sec	13 3/4" SOW x 13 3/4" 3M w/ 3M Gate Valve		

Exception	Reference

Trip Tank Required: Yes No



Kill Line

ID	Pressure	Description
2 1/16"	5,000 psi	Check Valve
2 1/16"	5,000 psi	Gate Valve
2 1/16"	5,000 psi	Gate Valve

Choke Line

ID	Pressure	Description
3 1/16"	5,000 psi	Gate Valve
3 1/16"	5,000 psi	HCR Valve
3 1/16"	5,000 psi	Steel or Colflex Line

Testing Requirements

Item	Pressure	Frequency
Rotating Head	250 / 500 psi	Once prior to OO shoe
Annular	250 / 1,500 psi	Every 21 Days
Choke Manifold	250 / 1,500 psi	Every 21 Days

• Function test on trips

Approved by _____ Date _____

CEM	
VP	
ESC	

Office of Oil & Gas

APR - 2013

BLOWOUT PREVENTER SCHEMATIC

CHESAPEAKE OPERATING INC

WELL :
 FIELD :
 RIG :
 COUNTY :
 OPERATION : 8 3/4" or 7 7/8" Production Hole

STATE :
 REVISION : : / /

Component Descriptions

Size	Pressure	Description	
A	11"	500 psi	Rotating Head
B	11"	5,000 psi	Annular
C	11"	5,000 psi	Pipe Ram
D	11"	5,000 psi	Blind Ram
E	11"	5,000 psi	Mud Cross
F			
G			
H			
DSA			
C Sec			
B Sec 13 3/4" 3M x 11" 5M w/ 5M Gate Valves			
A Sec 13 3/4" SOW x 13 3/4" 3M w/ 3M Gate Valve			

Exception	Reference

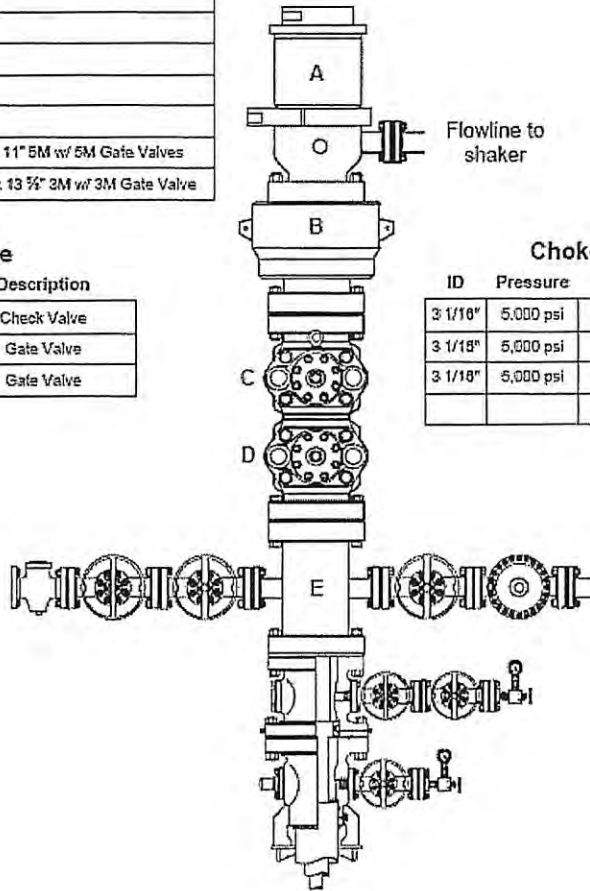
Trip Tank Required: Yes No

Kill Line

ID	Pressure	Description
2 1/16"	5,000 psi	Check Valve
2 1/16"	5,000 psi	Gate Valve
2 1/16"	5,000 psi	Gate Valve

Choke Line

ID	Pressure	Description
3 1/16"	5,000 psi	Gate Valve
3 1/16"	5,000 psi	HCR Valve
3 1/16"	5,000 psi	Steel or Co-flex Line



Testing Requirements

Item	Pressure	Frequency
Rotating Head	250 / 500 psi	Once prior to DO shoe
Annular	250 / 1,500 psi	Every 21 Days
Rams	250 / 5,000 psi	Every 21 Days
Choke Manifold	250 / 5,000 psi	Every 21 Days

• Function test on trips

Approved by	Date

Office of Oil & Gas

2013

06/14/2013



Water Management Plan: Primary Water Sources



WMP-01180

API/ID Number: 047-069-00171

Operator:

Chesapeake Energy

Carl Rotter OHI 1H - 837750

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

06/14/2013

Source Summary

WMP-01180

API Number: 047-069-00171

Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Stream/River

Source **Ohio River WP 1 (Beech Bottom Staging Area)** Owner: **Brownlee Land Ventures**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000		40.226889	-80.658972

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

Max. Pump rate (gpm): **6,000** 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 @ Essroc Withdrawal Site** Owner: **Essroc Ready Mix Corp.**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000		39.9947	-80.736483

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

Max. Pump rate (gpm): **6,000** 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 **Big Wheeling Creek WP 1** Owner: **Fulton Storage, LLC**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000		40.077019	-80.713866

Regulated Stream? Ref. Gauge ID: 3112000 **WHEELING CREEK AT ELM GROVE, WV**

Max. Pump rate (gpm): **2,500** Min. Gauge Reading (cfs): **43.57** Min. Passby (cfs) **40.03**

DEP Comments:

06/14/2013

Source **Little Wheeling Creek WP 1 (Rt. 40 Staging Area)**

Owner: **JDS Investments, LLC**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000		40.078324	-80.591145

Regulated Stream? Ref. Gauge ID: **3112000** **WHEELING CREEK AT ELM GROVE, WV**

Max. Pump rate (gpm): **2,000** Min. Gauge Reading (cfs): **64.80** Min. Passby (cfs) **2.83**

DEP Comments:

Source Summary

WMP- 01180

API Number:

047-069-00171

Operator:

Chesapeake Energy

Carl Rotter OHI 1H - 837750

Purchased Water

Source **The Village of Valley Grove** Owner: **The Village of Valley Grove**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000	720,000	-	-

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

Max. Pump rate (gpm): 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 County PSD** Owner: **Ohio county PSD**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000	720,000	-	-

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

Max. Pump rate (gpm): 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 **Wheeling Water Department** Owner: **Wheeling Water Department**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000	720,000	-	-

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

Max. Pump rate (gpm): 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>

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Source **Elite Gasfield Services**

Owner: **Elite Gasfield Services**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2013	7/1/2014	4,032,000	2,000,000	-	-

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

Max. Pump rate (gpm): **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>**

06/14/2013

Source Detail

WMP-01180

API/ID Number: 047-069-00171

Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Source ID: 16215 Source Name: The Village of Valley Grove
The Village of Valley Grove

Source Latitude: -
Source Longitude: -

HUC-8 Code: 5030106

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

Anticipated withdrawal start date: 7/1/2013

Anticipated withdrawal end date: 7/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 4,032,000

Trout Stream? Tier 3?

Max. Pump rate (gpm):

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks:

Proximate PSD? Wheeling Water Department

Max. Truck pump rate (gpm):

Gauged Stream?

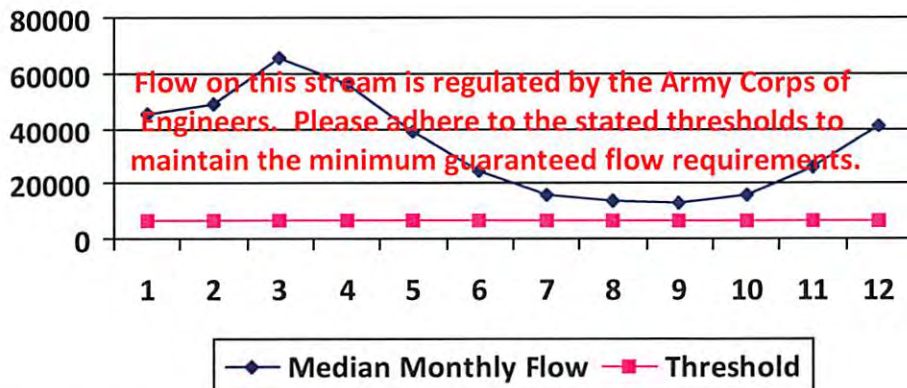
Reference Gaug: 9999999 Ohio River Station: Willow Island Lock & Dam

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):

Downstream Demand (cfs):

Pump rate (cfs):

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.

06/14/2013

Source Detail

WMP- 01180 API/ID Number: 047-069-00171 Operator: Chesapeake Energy
 Carl Rotter OHI 1H - 837750

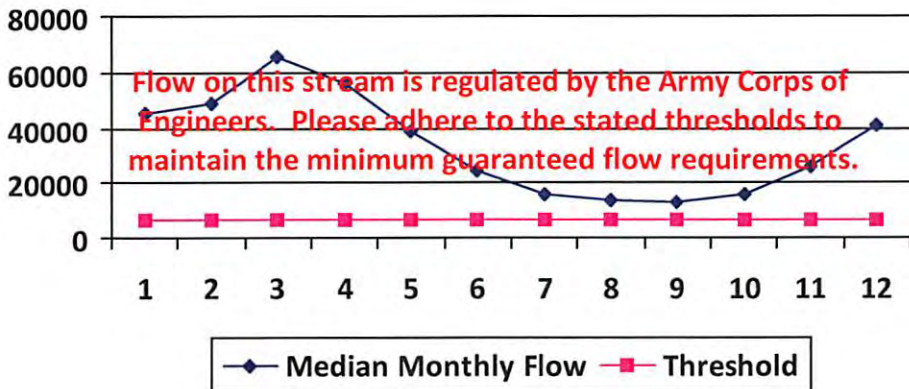
Source ID: 16216 Source Name: Ohio County PSD Source Latitude: -
 Ohio county PSD Source Longitude: -
 HUC-8 Code: 5030106
 Drainage Area (sq. mi.): 25000 County: Ohio Anticipated withdrawal start date: 7/1/2013
 Anticipated withdrawal end date: 7/1/2014
 Total Volume from Source (gal): 4,032,000
 Max. Pump rate (gpm):
 Max. Simultaneous Trucks:
 Max. Truck pump rate (gpm):

Endangered Species? Mussel Stream?
 Trout Stream? Tier 3?
 Regulated Stream? Ohio River Min. Flow
 Proximate PSD? Wheeling Water Department
 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):
 Downstream Demand (cfs):
 Pump rate (cfs):
 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.

06/14/2013

Source Detail

WMP- 01180 API/ID Number: 047-069-00171 Operator: Chesapeake Energy
 Carl Rotter OHI 1H - 837750

Source ID: 16217 Source Name: Wheeling Water Department Source Latitude: -
 Wheeling Water Department Source Longitude: -

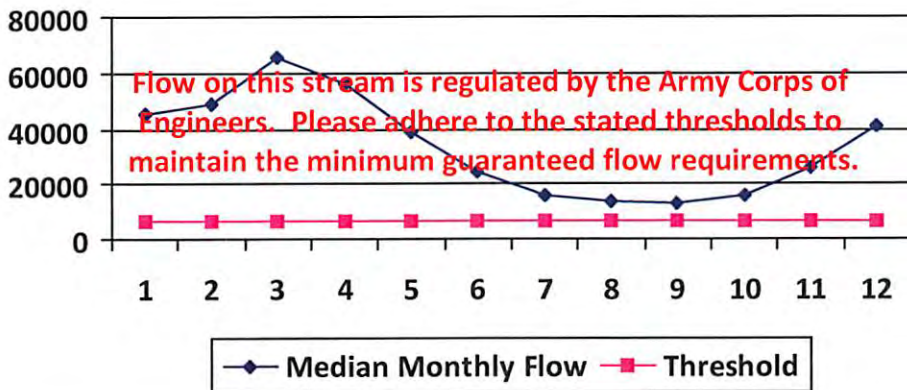
HUC-8 Code: 5030106 Anticipated withdrawal start date: 7/1/2013
 Drainage Area (sq. mi.): 25000 County: Ohio Anticipated withdrawal end date: 7/1/2014

- Endangered Species? Mussel Stream?
 - Trout Stream? Tier 3?
 - Regulated Stream? Ohio River Min. Flow
 - Proximate PSD? Wheeling Water Department
 - Gauged Stream?
- Total Volume from Source (gal): 4,032,000
 Max. Pump rate (gpm):
 Max. Simultaneous Trucks:
 Max. Truck pump rate (gpm):

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): -
 Downstream Demand (cfs): -
 Pump rate (cfs): -
 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.

06/14/2013

Source Detail

WMP- 01180

API/ID Number: 047-069-00171

Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Source ID: 16218 Source Name: Elite Gasfield Services Source Latitude: -
 Elite Gasfield Services Source Longitude: -

HUC-8 Code: 5030101

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

Anticipated withdrawal start date: 7/1/2013

Anticipated withdrawal end date: 7/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 4,032,000

Trout Stream?

Tier 3?

Max. Pump rate (gpm):

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks:

Proximate PSD? City of Follansbee

Max. Truck pump rate (gpm):

Gauged Stream?

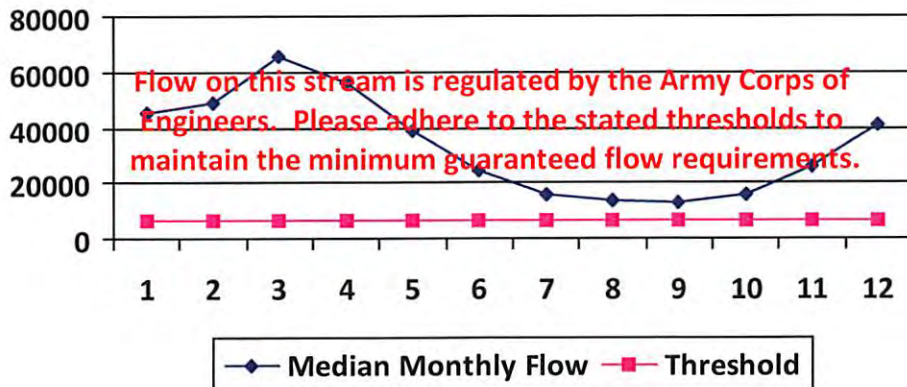
Reference Gaug: 9999999 Ohio River Station: Willow Island Lock & Dam

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):

Downstream Demand (cfs):

Pump rate (cfs):

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.

06/14/2013

Source Detail

WMP-01180 API/ID Number: 047-069-00171 Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Source ID: 16166 Source Name: Ohio River WP 1 (Beech Bottom Staging Area) Source Latitude: 40.226889
 Brownlee Land Ventures Source Longitude: -80.658972

HUC-8 Code: 5030106

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

Anticipated withdrawal start date: 7/1/2013

Anticipated withdrawal end date: 7/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 4,032,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 6,000

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks: 0

Proximate PSD? Beech Bottom Water Dept.

Max. Truck pump rate (gpm): 0

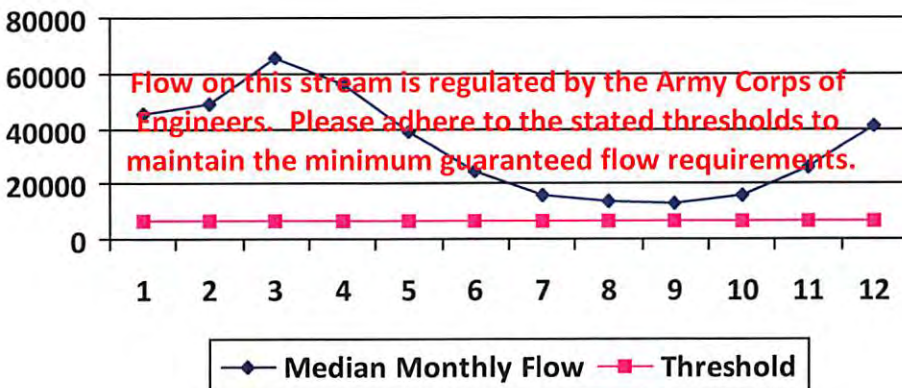
Gauged Stream?

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): -

Downstream Demand (cfs): -

Pump rate (cfs): 13.37

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.

06/14/2013

Source Detail

WMP-01180

API/ID Number: 047-069-00171

Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Source ID: 16187 Source Name: Ohio River @ Essroc Withdrawal Site
Essroc Ready Mix Corp.

Source Latitude: 39.9947
Source Longitude: -80.736483

HUC-8 Code: 5030106
Drainage Area (sq. mi.): 25000 County: Marshall

Anticipated withdrawal start date: 7/1/2013
Anticipated withdrawal end date: 7/1/2014
Total Volume from Source (gal): 4,032,000

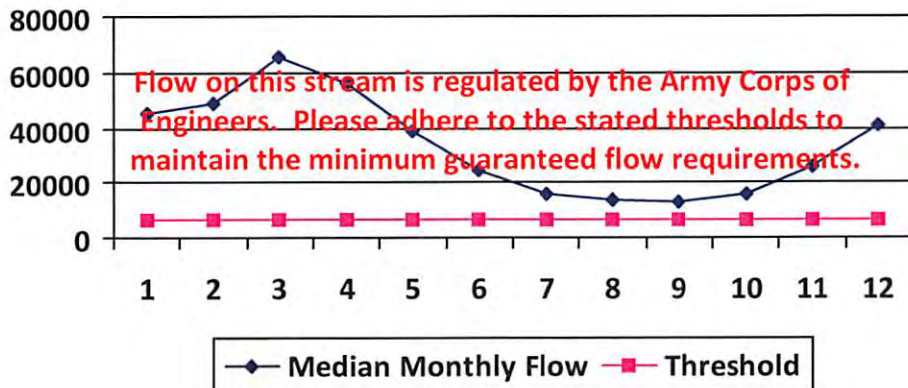
- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream? Ohio River Min. Flow
- Proximate PSD? McMechen Municipal Water
- Gauged Stream?

Max. Pump rate (gpm): 6,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

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): -
 Downstream Demand (cfs): -
 Pump rate (cfs): 13.37
 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.

06/14/2013

Source Detail

WMP- 01180

API/ID Number: 047-069-00171

Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Source ID: 16212 Source Name: Big Wheeling Creek WP 1
Fulton Storage, LLC

Source Latitude: 40.077019
Source Longitude: -80.713866

HUC-8 Code: 5030106

Drainage Area (sq. mi.): 296.04 County: Ohio

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

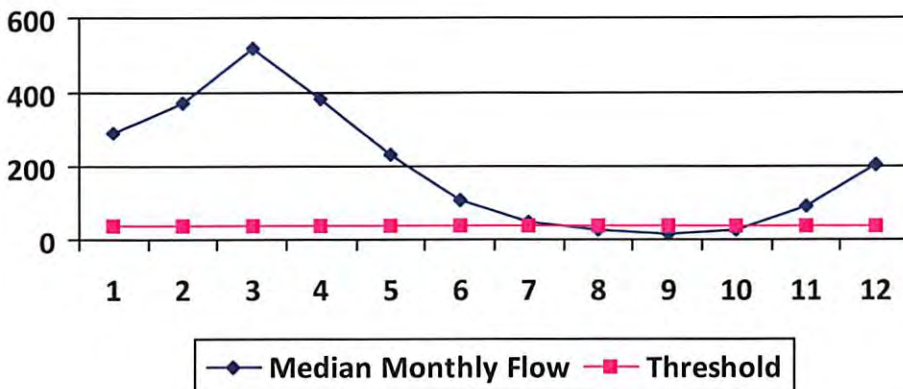
Anticipated withdrawal start date: 7/1/2013
Anticipated withdrawal end date: 7/1/2014
Total Volume from Source (gal): 4,032,000
Max. Pump rate (gpm): 2,500
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

Reference Gaug: 3112000 WHEELING CREEK AT ELM GROVE, WV

Drainage Area (sq. mi.): 281.00 Gauge Threshold (cfs): 38

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	293.29	45.60	247.82
2	374.26	45.60	328.78
3	519.05	45.60	473.58
4	385.31	45.60	339.84
5	234.87	45.60	189.40
6	106.90	45.60	61.43
7	47.24	45.60	1.77
8	27.63	45.60	-17.84
9	17.56	45.60	-27.91
10	29.09	45.60	-16.38
11	91.52	45.60	46.05
12	207.51	45.60	162.04

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): 40.03
Upstream Demand (cfs): 0.00
Downstream Demand (cfs): 0.00
Pump rate (cfs): 5.57
Headwater Safety (cfs): 0.00
Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): 43.57
Passby at Location (cfs): 40.03

"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.

06/14/2013

Source Detail

WMP- 01180

API/ID Number: 047-069-00171

Operator: Chesapeake Energy

Carl Rotter OHI 1H - 837750

Source ID: 16213 Source Name: Little Wheeling Creek WP 1 (Rt. 40 Staging Area)
JDS Investments, LLC

Source Latitude: 40.078324
Source Longitude: -80.591145

HUC-8 Code: 5030106

Drainage Area (sq. mi.): 13.94 County: Ohio

Anticipated withdrawal start date: 7/1/2013

Anticipated withdrawal end date: 7/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 4,032,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 2,000

Regulated Stream?

Max. Simultaneous Trucks:

Proximate PSD?

Max. Truck pump rate (gpm)

Gauged Stream?

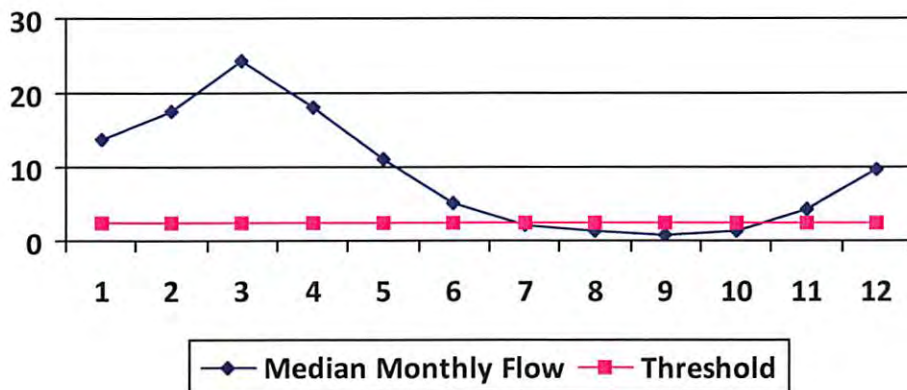
Reference Gaug: 3112000 WHEELING CREEK AT ELM GROVE, WV

Drainage Area (sq. mi.) 281.00

Gauge Threshold (cfs): 38

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	13.81	10.62	3.55
2	17.62	10.62	7.36
3	24.44	10.62	14.18
4	18.14	10.62	7.88
5	11.06	10.62	0.80
6	5.03	10.62	-5.23
7	2.22	10.62	-8.03
8	1.30	10.62	-8.96
9	0.83	10.62	-9.43
10	1.37	10.62	-8.89
11	4.31	10.62	-5.95
12	9.77	10.62	-0.49

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): 1.89

Upstream Demand (cfs): 3.34

Downstream Demand (cfs): 0.00

Pump rate (cfs): 4.46

Headwater Safety (cfs): 0.47

Ungauged Stream Safety (cfs): 0.47

Min. Gauge Reading (cfs): 64.80

Passby at Location (cfs): 2.83

"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.

06/14/2013



Water Management Plan: Secondary Water Sources



WMP-01180

API/ID Number

Operator:

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.

Purchased Water

Source ID:	16214	Source Name	Pennsylvania American Water Public Water Provider	Source start date:	7/1/2013
				Source end date:	7/1/2014
	Source Lat:		Source Long:		County
	Max. Daily Purchase (gal)		720,000	Total Volume from Source (gal):	4,032,000
DEP Comments:	Please ensure that the sourcing of this water confirms to all rules and guidance provided by PA DEP.				

WMP-01180

API/ID Number 047-069-00171

Operator:

Chesapeake Energy

Carl Rotter OHI 1H - 837750

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:

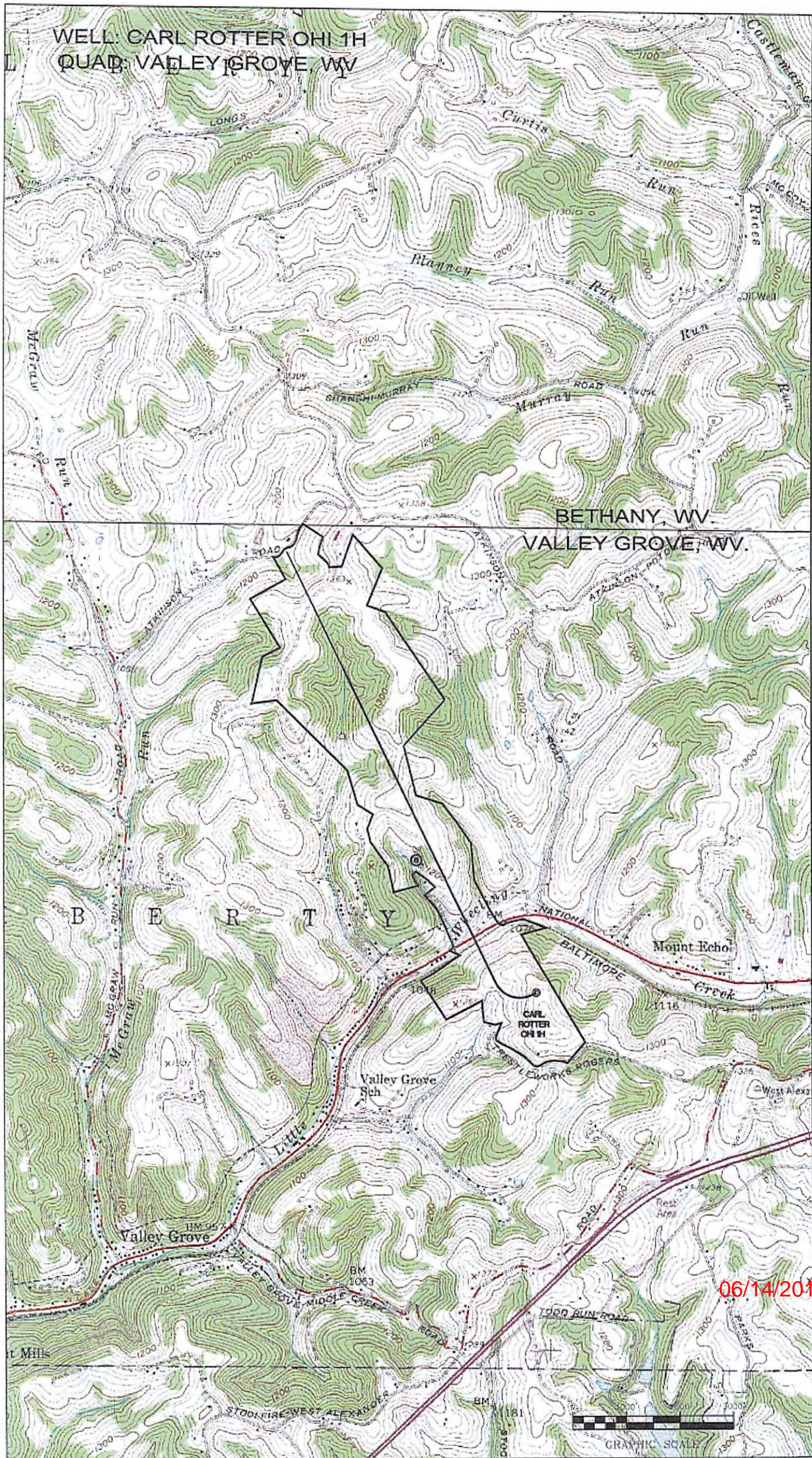
- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the 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:	16219	Source Name:	George Gantzer OHI 1H	Source start date:	7/1/2013
				Source end date:	7/1/2014
	Source Lat:		Source Long:		County:
	Max. Daily Purchase (gal):		Total Volume from Source (gal):		1,008,000
	DEP Comments:				

06/14/2013

WELL: CARL ROTTER OH 1H
QUAD: VALLEY GROVE WV



BETHANY, WV
VALLEY GROVE, WV.

B E R T Y

NATIONAL BALTIMORE
Creek

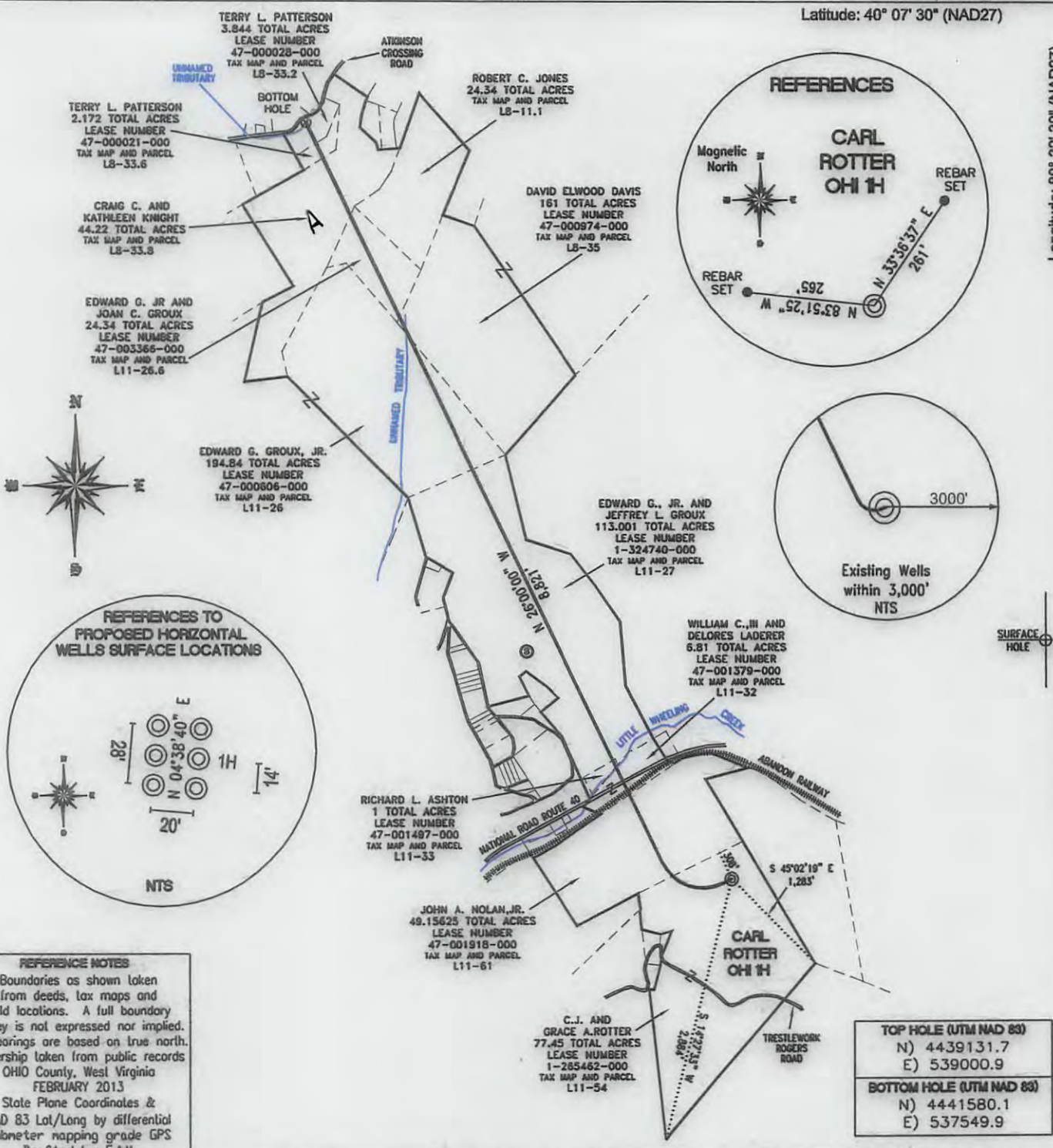
CARL ROTTER OH 1H

Valley Grove Sch.

Valley Grove

06/14/2013

GRAPHIC SCALE



REFERENCE NOTES
 Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records OHIO County, West Virginia FEBRUARY 2013
 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
 Drafted by: E.A.H.

TOP HOLE (UTM NAD 83)
N) 4439131.7
E) 539000.9
BOTTOM HOLE (UTM NAD 83)
N) 4441580.1
E) 537549.9

FILE #: CHE 113
 DRAWING #: 2159
 SCALE: 1" = 1,600'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
 Signed: _____
 L.L.S. #2124: Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
WVDEP OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

DATE: MARCH 19, 2013
 OPERATOR'S WELL #: CARL ROTTER OHI 1H
 API WELL #: 47 69 00171 H6A
 STATE COUNTY PERMIT






Well Type: Oil Waste Diposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1,340'
 COUNTY/DISTRICT: OHIO / LIBERTY QUADRANGLE: VALLEY GROVE, WV
 SURFACE OWNER: CARL J. AND GRACE A. ROTTER ACREAGE: 77.45 +/-
 OIL & GAS ROYALTY OWNER: CARL J. AND GRACE A. ROTTER ACREAGE: 733.136 + **06/14/2013**
 LEASE NUMBERS: _____

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,580' TMD: 15,787'
 WELL OPERATOR: CHESAPEAKE APPALACHIA, LLC DESIGNATED AGENT: ERIC GILLESPIE
 ADDRESS: PO BOX 18496 ADDRESS: PO BOX 6070
 CITY: OKLAHOMA CITY STATE: OK ZIP CODE: 73154-0496 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

Legend

-  STATE
-  COUNTY
- PROPOSED
-  ACTIVE
-  PENDING
-  ABANDONED



**OHIO
COUNTY**

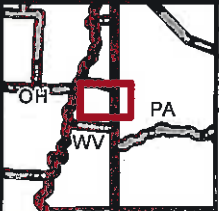

-80.542628, 40.101504
Carl Rotter OHI 1H

Received
Office of Oil & Gas

Coal / Marcellus South

Carl Rotter OHI 1H
Ohio County, WV

Updated: 3/20/2013
Scale: 1 inch = 300 feet
Author: Rick Neidmeyer
Projection: NAD 1927 UTM Zone 17N

06/14/2013

