November 18, 2013

WELL WORK PERMIT
Rework/Horizontal 6A Well

This permit, API Well Number: 47-5101472, issued to CNX GAS COMPANY LLC, 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: SHL6JHS
Farm Name: DAGUE, CHARLES W. & ELVIRA
API Well Number: 47-5101472
Permit Type: Rework/Horizontal 6A Well
Date Issued: 11/18/2013
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. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.

2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95% compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled Water Well Regulations, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
State of West Virginia  
Department of Environmental Protection  
Office of Oil and Gas  
Well Operator’s Report of Well Work

Farm Name: Dague, Charles W. & Elvira H.  
Operator Well No: SHL-6J-HS  
LOCATION: SHL 6  
Elevation: 834.05  
Quadrangle: MAJORSVILLE  
District: Sand Hill  
County: MARSHALL  
Latitude: _____ Feet South of _____ Deg. _____ Min. _____ Sec. 39.956050  
Longitude: _____ Feet South of _____ Deg. _____ Min. _____ Sec. -80.575520

Company: CNX Gas Company
Address: 200 Evergreen Drive  
Waynesburg, PA 15370
Agent: Steven Greene  
Inspector: Derek Haught  
Date Permit Issued: 7/5/2011  
Date Well Work Commenced: 7/27/2011  
Date Well Work Completed: 10/31/2012  
Verbal Plugging:  
Date Permission granted on: 7/27/2011

Casing & Tubing | Used in Drilling | Left in Well | Cement fill up Cu. Ft.  
--- | --- | --- | ---  
20 | 80.0 | 80.0 | Grouted in  
13 3/8 | 617.0 | 617.0 | 660 sxs (150 bbls) cement to surface  
9 5/8 | 2,895.0 | 2,895.0 | 948 sxs (215 bbls) cement to surface

Pilot Hole was plugged back with solid cement, a KOP was set with 552 sxs  
D901, 0.75% BWOC D065, 0.2% BWOC D046, 0.5% BWOC D201 yield 1.03, 107  
bbl @ 16.2

Rotary Cable Rig X  
Total Vertical Depth (ft): Original Hole – 8148' pilot hole  
Total Measured Depth (ft): 9,474'

Fresh Water Depth (ft): 200'  
Salt Water Depth (ft): None  
Is coal being mined in the area (N/Y)? Y  
Coal Depths (ft.): 314’ – 320’; Pittsburgh Seam

Void(s) encountered (N/Y) Depth(s)

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation: Marcellus  
Pay zone depth (ft): 6,208  
Gas: Initial open flow 603 MCF/d  
Oil: Initial open flow 4 Bbl/d  
Final open flow 925 MCF/d  
Final open flow 7 Bbl/d  
Time of open flow between initial and final tests 24 Hours  
Static rock Pressure 905 psig (surface pressure) after 24 Hours

Second producing formation:  
Pay zone depth (ft):  
Gas: Initial open flow  
Oil: Initial open flow  
Final open flow  
Final open flow  
Time of open flow between initial and final tests Hours  
Static rock Pressure psig (surface pressure) after Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Signature:  
Date: 11/22/2013
Were core samples taken? Yes__ No_x__
Were cuttings caught during drilling? Yes_x__ No__

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list: Gamma Ray Logs, Bond Log

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing or Stimulating:

<table>
<thead>
<tr>
<th>Top Depth (ft)</th>
<th>Bottom Depth (ft)</th>
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<tbody>
<tr>
<td>6,357.00</td>
<td>9,317.00</td>
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</table>

Plug Back Details including Plug Type and Depth(s): PBTD: 9347’

Surface:

Formations Encountered: See attached sheet
These are Measured Depths from the Pilot Hole.

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<thead>
<tr>
<th>Formations</th>
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<th>Base MD</th>
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<tr>
<td>Sand and Shale</td>
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<tr>
<td>Pittsburgh Coal</td>
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<tr>
<td>Dunkard Sand</td>
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<td>952.11</td>
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<td>Big Injun (Loyal Hanna)</td>
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<td>1445.06</td>
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<td>Middlesex</td>
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<tr>
<td>Hamilton</td>
<td>6051.63</td>
<td>6161</td>
</tr>
<tr>
<td>Marcellus</td>
<td>6161</td>
<td>not encountered</td>
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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: CNX Gas Company, LLC

2) Operator’s Well Number: SHL6JHS

3) Elevation, current ground: 831.06

4) Well Type: (a) Gas

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), AnticipatedThicknesses and Associated Pressure(s):
Marcellus 6161 - 6213; thickness 52'; pressure 4100 psi

7) Proposed Total Vertical Depth: 6148' TVD

8) Formation at Total Vertical Depth: Hamilton

9) Proposed Total Measured Depth: 9111'

10) Approximate Fresh Water Strata Depths: 200'

11) Method to Determine Fresh Water Depth: Seneca Technology nearest offset well

12) Approximate Saltwater Depths: none

13) Approximate Coal Seam Depths: 314-320

14) Approximate Depth to Possible Void (coal mine, karst, other): None encountered (well is drilled)

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine:

16) Describe proposed well work: The following well is planned to be re-completed in the previously stimulated Marcellus formation. A slickwater frac job will be performed with the addition of new perforations in the Marcellus formation.

17) Describe fracturing/stimulating methods in detail:
The stimulation will be multiple stages divided over the lateral length of the well. Stage spacing is dependent upon engineering design. Slickwater fracturing technique will be utilized on each stage using sand, water, and chemicals. See attached list.

18) Total area to be disturbed, including roads, stockpile area, pits, etc. (acres): 11.10

19) Area to be disturbed for well only, less access road (acres): 10.61

Page 1 of 3

NOV 12 2013

11/22/2013
### CASING AND TUBING PROGRAM

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Size</th>
<th>New or Used</th>
<th>Grade</th>
<th>Weight per ft.</th>
<th>FOOTAGE: For Drilling</th>
<th>INTERVALS: Left in Well</th>
<th>CEMENT: Fill-up (Cu. Ft.)</th>
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<td>Conductor</td>
<td>20&quot;</td>
<td>New</td>
<td>J-55</td>
<td>99#</td>
<td>80</td>
<td>80</td>
<td>CTS</td>
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<tr>
<td>Fresh Water</td>
<td>13 3/8&quot;</td>
<td>New</td>
<td>J-55</td>
<td>54#</td>
<td>637.8</td>
<td>637.8</td>
<td>585 sx (133 bbls) CTS</td>
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<tr>
<td>Coal</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Intermediate</td>
<td>9 5/8&quot;</td>
<td>New</td>
<td>J-55</td>
<td>36#</td>
<td>2667</td>
<td>2667</td>
<td>950 sx (216 bbls) CTS</td>
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<td>Production</td>
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<td>P-110</td>
<td>20#</td>
<td>9051</td>
<td>9051</td>
<td>1535 sx (347 bbls) Cement</td>
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<td>Tubing</td>
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<tr>
<td>Liners</td>
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<td></td>
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### Additional Details

- 9-4-15

### PACKERS

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<tr>
<td>Sizes:</td>
<td></td>
</tr>
<tr>
<td>Depths Set:</td>
<td></td>
</tr>
</tbody>
</table>
21) Describe centralizer placement for each casing string.  

NA - This well has already drilled.

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

NA - well is already drilled

23) Proposed borehole conditioning procedures.  

NA - well is already drilled

*Note: Attach additional sheets as needed.
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name: CNX Gas Company, LLC
Operator's Well No. SHL6JHS

Watershed (HUC 10) Wheeling Creek
Quadrangle Majorsville

Elevation 831.06 County Marshall
District Sand Hill

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 X No

If so, please describe anticipated pit waste: none anticipated

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

Proposed Disposal Method For Treated Pit Wastes:

- Underground Injection (UIC Permit Number

- Reuse (at API Number next anticipated well

- 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. NA this is a re-fracture

- If oil based, what type? Synthetic, petroleum, etc. None this is a re-fracture

Additives to be used in drilling medium? None this is a re-fracture

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. None this is a re-fracture

- If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust)

- Landfill or offsite name/permit number? see attached sheet

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: Daniel Bitz
Company Official (Typed Name): Director Environmental Permitting

Notary Public

Subscribed and sworn before me this 4th day of September, 2015.

My commission expires November 23, 2015

11/22/2013
CNX Gas Company, LLC

Proposed Revegetation Treatment: Acres Disturbed ________________ Prevegetation pH ________________

Lime __________ Tons/acre or to correct to pH ________________

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

Mulch __________ Tons/acre

Seed Mixtures

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Area I lbs/acre</th>
<th>Seed Type</th>
<th>Area II lbs/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tall Fescue</td>
<td>40</td>
<td>Tall Fescue</td>
<td>40</td>
</tr>
<tr>
<td>Ladino Clover</td>
<td>5</td>
<td>Ladino Clover</td>
<td>5</td>
</tr>
</tbody>
</table>

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments:

Title: Oil and Gas Inspector

Field Reviewed? ( ) Yes ( ) No

Date: 9-4-13

Office of Oil & Gas
RECEIVED SEP 05 2013

WV Department of Environmental Protection 11/22/2013
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.
# Purchased Water

**Source Summary**

| WMP: 01543 | API Number: 047-051-01472 | Operator: Noble Energy, Inc |

## Purchased Water

### West Virginia American Water - Weston Water Treatment

- **Lewis**
- **Owner:** West Virginia American Water

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Total Volume (gal)</th>
<th>Max. daily purchase (gal)</th>
<th>Intake Latitude</th>
<th>Intake Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/29/2013</td>
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<td>4,000,000</td>
<td>500,000</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>

- Regulated Stream? **Stonewall Jackson Dam**
- Ref. Gauge ID: 3061000
- WEST FORK RIVER AT ENTERPRISE, WV

- **Max. Pump rate (gpm):** 64,000
- **Min. Gauge Reading (cfs):** 170.57
- **Min. Passby (cfs):** -

### Bethlehem Water Department

- **Ohio**
- **Owner:** Bethlehem Water Department

<table>
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<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Total Volume (gal)</th>
<th>Max. daily purchase (gal)</th>
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- Regulated Stream? **Ohio River Min. Flow**
- Ref. Gauge ID: 9999999
- Ohio River Station: Willow Island Lock & Dam

- **Max. Pump rate (gpm):** 64,000
- **Min. Gauge Reading (cfs):** 6,468.00
- **Min. Passby (cfs):** -

**DEP Comments:**

Bethlehem Water Department purchases all its water from the City of Wheeling. Thresholds are set based on the location of the City of Wheeling’s raw water intake.

### Wellsburg Water Department

- **Brooke**
- **Owner:** Wellsburg Water Department

<table>
<thead>
<tr>
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<th>End Date</th>
<th>Total Volume (gal)</th>
<th>Max. daily purchase (gal)</th>
<th>Intake Latitude</th>
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<tbody>
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<td>200,000</td>
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- Regulated Stream? **Ohio River Min. Flow**
- Ref. Gauge ID: 9999999
- Ohio River Station: Willow Island Lock & Dam

- **Max. Pump rate (gpm):** 64,000
- **Min. Gauge Reading (cfs):** 6,468.00
- **Min. Passby (cfs):** -

**DEP Comments:**

This alluvial groundwater well is, to some extent, under the influence of the Ohio River. Please adhere to stated minimum flow requirements on the Ohio River for withdrawals. [http://www.erh.noaa.gov/er/ohrfc/flows.shtml](http://www.erh.noaa.gov/er/ohrfc/flows.shtml)
<table>
<thead>
<tr>
<th>Source</th>
<th>Moundsville Water Board</th>
<th>Marshall</th>
<th>Owner: Moundsville Water Treatment Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>8/29/2013</td>
<td>End Date</td>
<td>8/29/2014</td>
</tr>
<tr>
<td>Total Volume (gal)</td>
<td>4,000,000</td>
<td>Max. daily purchase (gal)</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Intake Latitude:</td>
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<td>Intake Longitude:</td>
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<tr>
<td>Max. Pump rate (gpm):</td>
<td></td>
<td>Min. Gauge Reading (cfs):</td>
<td>6,468.00</td>
</tr>
<tr>
<td>DEP Comments:</td>
<td>This alluvial groundwater well is, to some extent, under the influence of the Ohio River. Please adhere to stated minimum flow requirements on the Ohio River for withdrawals. <a href="http://www.erh.noaa.gov/er/ohrfc/flows.shtml">http://www.erh.noaa.gov/er/ohrfc/flows.shtml</a></td>
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<thead>
<tr>
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<th>Dean's Water Service</th>
<th>Ohio</th>
<th>Owner: Dean's Water Service</th>
</tr>
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<tbody>
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<td>Start Date</td>
<td>8/29/2013</td>
<td>End Date</td>
<td>8/29/2014</td>
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<tr>
<td>Total Volume (gal)</td>
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<td>Max. Pump rate (gpm):</td>
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<td>Min. Gauge Reading (cfs):</td>
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<td>DEP Comments:</td>
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<th>Ohio</th>
<th>Owner: Wheeling Water Department</th>
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<tbody>
<tr>
<td>Start Date</td>
<td>8/29/2013</td>
<td>End Date</td>
<td>8/29/2014</td>
</tr>
<tr>
<td>Total Volume (gal)</td>
<td>4,000,000</td>
<td>Max. daily purchase (gal)</td>
<td>17,500</td>
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<tr>
<td>Intake Latitude:</td>
<td></td>
<td>Intake Longitude:</td>
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<tr>
<td>Max. Pump rate (gpm):</td>
<td></td>
<td>Min. Gauge Reading (cfs):</td>
<td>6,468.00</td>
</tr>
<tr>
<td>DEP Comments:</td>
<td>Refer to the specified station on the National Weather Service's Ohio River forecasts at the following website: <a href="http://www.erh.noaa.gov/ohrfc//flows.shtml">http://www.erh.noaa.gov/ohrfc//flows.shtml</a></td>
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</table>

11/22/2013
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<tr>
<th>Source</th>
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<th>Ohio County PSD</th>
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</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>End Date</td>
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</tr>
<tr>
<td>8/29/2013</td>
<td>8/29/2014</td>
<td>4,000,000</td>
</tr>
</tbody>
</table>

Max. Pump rate (gpm): 

Min. Gauge Reading (cfs): **6,468.00**

Min. Passby (cfs)

**Source Detail**

- **WMP**: 01543
- **API/ID Number**: 047-051-01472
- **Operator**: Noble Energy, Inc
- **Source ID**: 27597
- **Source Name**: West Virginia American Water - Weston Water Treatment Plant
- **HUC-8 Code**: 5020002
- **Drainage Area (sq. mi.)**: 104.83
- **County**: Lewis
- **Endangered Species?**: No
- **Trout Stream**: No
- **Regulated Stream**: Yes
- **Proximate PSD?**: Yes
- **Gauged Stream**: Yes
- **Anticipated withdrawal start date**: 8/29/2013
- **Anticipated withdrawal end date**: 8/29/2014
- **Total Volume from Source (gal)**: 4,000,000
- **Max. Pump rate (gpm)**: 2000
- **Max. Simultaneous Trucks**: 2
- **Max. Truck pump rate (gpm)**: 1000

**Reference Gauge**

- **Gauge Number**: 3061000
- **Gauge Name**: WEST FORK RIVER AT ENTERPRISE, WV
- **Drainage Area (sq. mi.)**: 759.00
- **Gauge Threshold (cfs)**: 234

**Water Availability Profile**

- **Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (cfs)</th>
<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
</tr>
</thead>
<tbody>
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<td>3</td>
<td>465.85</td>
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<td>4</td>
<td>266.43</td>
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<td>5</td>
<td>273.47</td>
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<td>6</td>
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<td>57.83</td>
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<td>11</td>
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<tr>
<td>12</td>
<td>247.76</td>
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</tbody>
</table>

**Water Availability Assessment of Location**

- **Base Threshold (cfs)**: -
- **Upstream Demand (cfs)**: 24.32
- **Downstream Demand (cfs)**: 0.00
- **Pump rate (cfs)**: -
- **Headwater Safety (cfs)**: 8.08
- **Ungauged Stream Safety (cfs)**: 0.00
- **Min. Gauge Reading (cfs)**: -
- **Passby at Location (cfs)**: -

*Threshold, as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.*
Source ID: 27598  
Source Name: Bethlehem Water Department

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

Endangered Species?  
Trout Stream?  
Regulated Stream?  
Proximate PSD?  
Gauged Stream?

Mussel Stream?  
Ohio River Min. Flow  
City of Wheeling

Anticipated withdrawal start date: 8/29/2013
Anticipated withdrawal end date: 8/29/2014
Total Volume from Source (gal): 4,000,000
Max. Pump rate (gpm):

Max. Simultaneous Trucks:
Max. Truck pump rate (gpm)

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

Drainage Area (sq. mi.) 25,000.00
Gauge Threshold (cfs): 6468

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

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

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.
Source Detail

WMP: 01543  API/ID Number: 047-051-01472  Operator: Noble Energy, Inc

Source ID: 27599  Source Name: Wellsburg Water Department
HUC-8 Code: 5030106  Drainage Area (sq. mi.): 25000  County: Brooke

☐ Endangered Species?  ☑ Mussel Stream?
☐ Trout Stream?  ☐ Tier 3?
☑ Regulated Stream?  Ohio River Min. Flow
☑ Proximate PSD?  Wellsburg Water Department
☑ Gauged Stream?

Anticipated withdrawal start date: 8/29/2013  Total Volume from Source (gal): 4,000,000
Anticipated withdrawal end date: 8/29/2014
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

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (+ pump) (cfs)</th>
<th>Threshold Estimated Available water (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45,700.00</td>
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<tr>
<td>2</td>
<td>49,200.00</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
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<td>6</td>
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<td>12,800.00</td>
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<tr>
<td>11</td>
<td>26,300.00</td>
<td>-</td>
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<tr>
<td>12</td>
<td>41,300.00</td>
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</table>

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

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): -
Source ID: 27600  Source Name: Moundsville Water Board
Moundsville Water Treatment Plant

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

Anticipated withdrawal start date: 8/29/2013
Anticipated withdrawal end date: 8/29/2014
Total Volume from Source (gal): 4,000,000

☐ Endangered Species? ☑ Mussel Stream?
☐ Trout Stream?  ☐ Tier 3?
☑ Regulated Stream?  Ohio River Min. Flow
☐ Proximate PSD?
☑ Gauged Stream?

Reference Gauge: 9999999  Ohio River Station: Willow Island Lock & Dam
Drainage Area (sq. mi.) 25,000.00  Gauge Threshold (cfs): 6468

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (cfs)</th>
<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>2</td>
<td>49,200.00</td>
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<td>7</td>
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<td>26,300.00</td>
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<tr>
<td>12</td>
<td>41,300.00</td>
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</table>

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

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.
**Source Detail**

WMP: 01543  API/ID Number: 047-051-01472  Operator: Noble Energy, Inc

**Source ID: 27601**  Source Name: Dean’s Water Service

- **HUC-8 Code:** 5030106
- **Drainage Area (sq. mi.):** 25000
- **County:** Ohio
- **Source Latitude:** -
- **Source Longitude:** -
- **Endangered Species?**
- **Trout Stream?**
- **Regulated Stream?**
- **Proximate PSD?**
- **Gauged Stream?**

**Mussel Stream?**

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (cfs)</th>
<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45,700.00</td>
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</tr>
<tr>
<td>2</td>
<td>49,200.00</td>
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<tr>
<td>3</td>
<td>65,700.00</td>
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<td>4</td>
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<td>13,400.00</td>
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<td>26,300.00</td>
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</tr>
<tr>
<td>12</td>
<td>41,300.00</td>
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</tbody>
</table>

**Water Availability Assessment of Location**

- **Base Threshold (cfs):** -
- **Upstream Demand (cfs):** 0.00
- **Downstream Demand (cfs):** 0.00
- **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.

**Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.**

11/22/2013
Source Detail

WMP: 01543  API/ID Number: 047-051-01472  Operator: Noble Energy, Inc

Source ID: 27603  Source Name: Wheeling Water Department

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

Endangered Species?  Mussel Stream?
Trout Stream?  Tier 3?
Regulated Stream?  Ohio River Min. Flow
Proximate PSD?  Wheeling Water Department
Gauged Stream?

Anticipated withdrawal start date: 8/29/2013
Anticipated withdrawal end date: 8/29/2014
Total Volume from Source (gal): 4,000,000
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

<table>
<thead>
<tr>
<th>Month</th>
<th>Median monthly flow (cfs)</th>
<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45,700.00</td>
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<td>-</td>
</tr>
<tr>
<td>2</td>
<td>49,200.00</td>
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</tr>
<tr>
<td>3</td>
<td>65,700.00</td>
<td>-</td>
<td>-</td>
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<tr>
<td>4</td>
<td>56,100.00</td>
<td>-</td>
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</tr>
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<td>5</td>
<td>38,700.00</td>
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<td>6</td>
<td>24,300.00</td>
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<td>7</td>
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<td>9</td>
<td>12,800.00</td>
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<tr>
<td>10</td>
<td>15,500.00</td>
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<td>-</td>
</tr>
<tr>
<td>11</td>
<td>26,300.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>41,300.00</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Water Availability Profile

Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

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.

11/22/2013
west virginia department of environmental protection
11/7/2013 3:10:32 PM
Flow on this stream is regulated by the Army Corps of Engineers. Please adhere to the stated thresholds to maintain the minimum guaranteed flow requirements.

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

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.

Multi-site impoundment

<table>
<thead>
<tr>
<th>Source ID: 27605</th>
<th>Source Name: SHL #3 Pad Tank Farm</th>
<th>Source start date: 8/29/2013</th>
<th>Source end date: 8/29/2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Lat: 39.971171</td>
<td>Source Long: -80.556856</td>
<td>County: Marshall</td>
<td>Total Volume from Source (gal): 4,000,000</td>
</tr>
</tbody>
</table>

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

Reference: WMP-1435
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.

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**Source ID:** 27606  
**Source Name:** SHL #4 Pad Tank Farm

| Source Lat: | 39.956739 |
| Source Long: | -80.5515 |

**Source start date:** 8/29/2013  
**Source end date:** 8/29/2014

**County:** Marshall  
**Total Volume from Source (gal):** 4,000,000

**DEP Comments:**

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

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**Source ID:** 27607  
**Source Name:** SHL #1 Centralized Freshwater Impoundment

| Source Lat: | 39.979696 |
| Source Long: | -80.579465 |

**Source start date:** 8/29/2013  
**Source end date:** 8/29/2014

**County:** Marshall  
**Total Volume from Source (gal):** 4,000,000

**DEP Comments:**

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

---

**Source ID:** 27608  **Source Name:** SHL #2 Centralized Waste Pit  
Source start date: 8/29/2013  
Source end date: 8/29/2014  
Source Lat: 39.966973  
Source Long: -80.561377  
County: Marshall  
Max. Daily Purchase (gal):  
Total Volume from Source (gal): 4,000,000  
DEP Comments: WV51-WPC-00001

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.  
Reference: WMP-201

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**Source ID:** 27609  **Source Name:** SHL #3 Centralized Waste Pit  
Source start date: 8/29/2013  
Source end date: 8/29/2014  
Source Lat: 39.974133  
Source Long: -80.55527  
County: Marshall  
Max. Daily Purchase (gal):  
Total Volume from Source (gal): 4,000,000  
DEP Comments: WV51-WPC-00002

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.  
Reference: WMP-202

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west virginia department of environmental protection  
11/7/2013 3:10:36 PM

11/22/2013
Important:

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

• For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

• For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 27610  Source Name: SHL #4 Centralized Waste Pit
Source Lat: 39.963284  Source Long: -80.562743  County: Marshall
Max. Daily Purchase (gal): 4,000,000
Total Volume from Source (gal): 4,000,000
DEP Comments: WV51-WPC-00003

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

Reference: WMP-204

Purchased Water

Source ID: 27602  Source Name: Bridgeport Ohio Water Department
Public Water Provider
Source Lat: 40.08348  Source Long: -80.736488  County
Max. Daily Purchase (gal): 200,000  Total Volume from Source (gal): 4,000,000
DEP Comments: Please ensure that purchases from this source are approved by, and completed in accordance with, requirements set forth by the State of Ohio Department of Environmental Protection.
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.

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**Recycled Frac Water**

<table>
<thead>
<tr>
<th>Source ID:</th>
<th>27611</th>
<th>Source Name</th>
<th>Various</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Lat:</td>
<td></td>
<td>Source Long:</td>
<td></td>
</tr>
<tr>
<td>Max. Daily Purchase (gal)</td>
<td></td>
<td>Total Volume from Source (gal):</td>
<td>4,000,000</td>
</tr>
<tr>
<td>DEP Comments:</td>
<td>Sources include, but are not limited to, the SHL8 and WEB4 well pads</td>
<td>Source start date:</td>
<td>8/29/2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source end date:</td>
<td>8/29/2014</td>
</tr>
</tbody>
</table>