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**west virginia** department of environmental protection

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

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

October 08, 2013

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-103313, 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: PHL29EHS  
Farm Name: PHILIPPI DEVELOPMENT, INC.  
**API Well Number: 47-103313**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 10/08/2013

## 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

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



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601 57<sup>th</sup> Street  
Charleston, WV 25304  
(304) 926-0450 fax (304) 926-0452

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

**ORDER  
ISSUED UNDER  
WEST VIRGINIA CODE, CHAPTER 22, ARTICLE 6**

TO: CNX Gas Company LLC  
One Energy Drive  
Jane Lew, WV 26378

DATE: Oct 7, 2013

ORDER NO.: 2013-W-4

**INTRODUCTION**

This Order (hereinafter "Order") is issued by the Office of Oil and Gas (hereinafter "OOG"), by and through its Chief, pursuant to the authority of W. Va. Code §§ 22-1-1, 22-6-1 and 22-6A-1 *et seq.* to CNX Gas Company LLC (hereinafter "CNX" or "Operator"), collectively the "Parties."

**FINDINGS OF FACT**

In support of this Order, the Chief hereby finds the following:

1. OOG, an office within the West Virginia Department of Environmental Protection, is the agency with the duty and authority to execute and enforce W. Va. Code §§ 22-6-1 and 22-6A-1 *et seq.*, and the rules and regulations promulgated thereunder.
2. CNX is a "person" as defined by W. Va. Code § 22-6-1(n), with a corporate address as One Energy Drive, Jane Lew, WV 26378.
3. On June 18, 2013, CNX submitted applications for gas wells identified as 47-001-03309, 47-001-03310, 47-001-03311, 47-001-03312, and 47-001-03313, located on the Philippi 29 Pad in Barbour County, West Virginia.
4. On September 19, 2013, CNX requested a waiver for Wetland A and Wetland C, outlined in Exhibit 1, from well location restriction requirements in W. Va. Code § 22-6A-12(b) for a gas well permit applications identified as 47-001-03309, 47-001-03310, 47-001-03311, 47-001-03312, and 47-001-03313, located on the Philippi 29 Pad in Barbour County, West Virginia.

10/11/2013

**CONCLUSIONS OF LAW**

1. West Virginia Code § 22-1-6(d) requires, in part, that “[i]n addition to other powers, duties and responsibilities granted and assigned to the secretary by this chapter, the secretary is authorized and empowered to... (3) Enter private lands to make surveys and inspections for environmental protection purposes; to investigate for violations of statutes or rules which the Office of Oil and Gas is charged with enforcing; to serve and execute warrants and processes; to make arrests; issue orders, which for the purposes of this chapter include consent agreements; and to otherwise enforce the statutes or rules which the Office of Oil and Gas is charged with enforcing.”
2. West Virginia Code § 22-6A-2(a)(6) requires, in part, that “Concomitant with the broad powers to condition the issuance of well work permits, the secretary should also have broad authority to waive certain minimum requirements of this article when, in his or her discretion, such waiver is appropriate: *Provided*, That the secretary shall submit a written report of the number of waivers granted to the Legislature commencing January 1, 2013, and each year thereafter.”
3. West Virginia Code § 22-6A-12(b) requires, in part, that “[n]o well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the Office of Oil and Gas shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The Office of Oil and Gas may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary.”

**ORDER**

Therefore, the Office of Oil and Gas grants CNX Gas Company LLC a waiver for Wetland H from well location restriction requirements in W. Va. Code § 22-6A-12(b) for gas well permit applications identified as 47-001-003284, 47-001-003285 and 47-001-003286, located on the AUD7HS Pad in Barbour County, West Virginia. The Office of Oil and Gas hereby **ORDERS** that CNX Gas Company LLC shall meet the following site construction and operational requirements for the AUD7HS well pad:

CNX Gas Company, LLC shall meet the following site construction and operational requirements for the AUD7HS well pad:

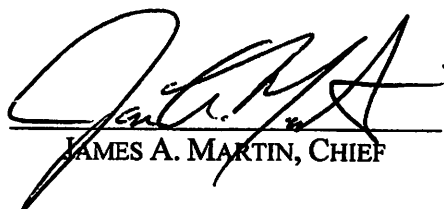
- a. A berm shall be constructed around the perimeter of the pad to contain any potential spills and storm water runoff. Berm is to be at least two feet (2') in height;
- b. Filter/silt socks and erosion control blankets shall be installed on all slopes and down gradient locations of the pad and topsoil pile areas as erosion and sediment controlling BMPs;
- c. Wetland A shall have a triple compost filter sock stack installed adjacent to the wetland;
- d. Wetland C shall have a triple compost filter sock stack installed no less than seventy-five feet (60') away from the eastern boundary of the wetland;
- e. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
- f. Drilling muds shall be disposed of in a permitted landfill;
- g. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
- h. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
- i. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
- j. Inspections of the storm water and spill prevention measures shall be conducted after any major storm event defined as a half inch (½") rain within any twenty-four (24) hour period;
- k. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
- l. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 7<sup>th</sup> day of October 2013.

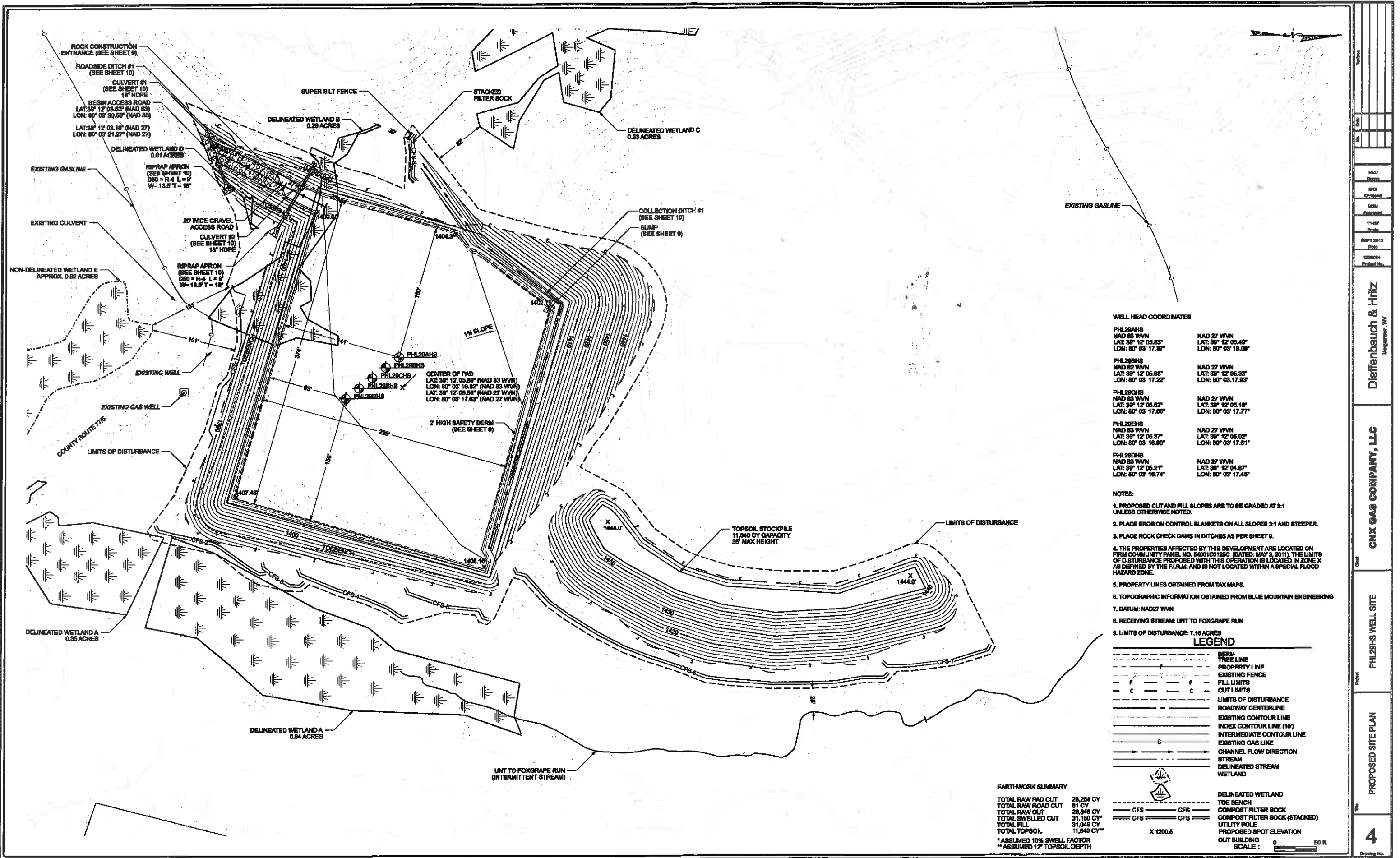
IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

By:



JAMES A. MARTIN, CHIEF



WELL HEAD COORDINATES

PHL2BAHS NAD 83 WVN LAT: 38° 12' 05.83" LON: 80° 03' 17.37"	NAD 27 WVN LAT: 38° 12' 05.49" LON: 80° 03' 18.06"
PHL2BBHS NAD 83 WVN LAT: 38° 12' 05.88" LON: 80° 03' 17.22"	NAD 27 WVN LAT: 38° 12' 05.33" LON: 80° 03' 17.95"
PHL2BCHS NAD 83 WVN LAT: 38° 12' 05.82" LON: 80° 03' 17.06"	NAD 27 WVN LAT: 38° 12' 05.18" LON: 80° 03' 17.77"
PHL2BHS NAD 83 WVN LAT: 38° 12' 05.37" LON: 80° 03' 16.80"	NAD 27 WVN LAT: 38° 12' 05.02" LON: 80° 03' 17.61"
PHL2BDHS NAD 83 WVN LAT: 38° 12' 05.21" LON: 80° 03' 16.74"	NAD 27 WVN LAT: 38° 12' 04.87" LON: 80° 03' 17.45"

NOTES:

1. PROPOSED CUT AND FILL SLOPES ARE TO BE GRADED AT 2:1 UNLESS OTHERWISE NOTED.
2. PLACE EROSION CONTROL BLANKETS ON ALL SLOPES 3:1 AND STEEPER.
3. PLACE ROCK CHECK DAMS IN DITCHES AS PER SHEET 9.
4. THE PROPERTIES AFFECTED BY THIS DEVELOPMENT ARE LOCATED ON FIRM COMMUNITY PANEL NO. 54001C0125C (DATED: MAY 3, 2011). THE LIMITS OF DISTURBANCE PROPOSED WITH THIS OPERATION IS LOCATED IN ZONE X AS DEFINED BY THE F.I.R.M. AND IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD ZONE.
5. PROPERTY LINES OBTAINED FROM TAX MAPS.
6. TOPOGRAPHIC INFORMATION OBTAINED FROM BLUE MOUNTAIN ENGINEERS
7. DATUM: NAD27 WVN
8. RECEIVING STREAM: UNT TO FOXGRAPE RUN
9. LIMITS OF DISTURBANCE: 7.16 ACRES

LEGEND

	BERM
	TREE LINE
	PROPERTY LINE
	EXISTING FENCE
	FILL LIMITS
	CUT LIMITS
	LIMITS OF DISTURBANCE
	ROADWAY CENTERLINE
	EXISTING CONTOUR LINE
	INDEX CONTOUR LINE (10')
	INTERMEDIATE CONTOUR LINE
	EXISTING GAS LINE
	CHANNEL FLOW DIRECTION
	STREAM
	DELINEATED STREAM
	WETLAND
	DELINEATED WETLAND
	TOE BENCH
	COMPOST FILTER SOCK
	COMPOST FILTER SOCK (STACKED)
	UTILITY POLE
	PROPOSED SPOT ELEVATION
	OUT BUILDING

EARTHWORK SUMMARY

TOTAL RAW PAD CUT	28,264 CY
TOTAL RAW ROAD CUT	81 CY
TOTAL RAW CUT	28,345 CY
TOTAL SWELLED CUT	31,180 CY**
TOTAL FILL	31,048 CY
TOTAL TOPSOIL	11,840 CY**

\* ASSUMED 10% SWELL FACTOR  
\*\* ASSUMED 12" TOPSOIL DEPTH

	DELINEATED WETLAND
	TOE BENCH
	COMPOST FILTER SOCK
	COMPOST FILTER SOCK (STACKED)
	UTILITY POLE
	PROPOSED SPOT ELEVATION
	OUT BUILDING

SCALE: 0 50 FT.

Revision	
Date	
No.	
Author	
Checked	
Approved	
Scale	1"=60'
Date	SEP 2013
Project No.	128804
Diefenbach & Hritz Madison, WI	
CNX GAS COMPANY, LLC	
PHL2BHS WELL SITE	
PROPOSED SITE PLAN	
4	

1-03313

10/11/2013

WW - 6B  
(3/13)

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WELL WORK PERMIT APPLICATION

01      06      545

1) Well Operator: CNX Gas Company LLC      494458046      Barbour      Pleasant      Philippi  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: PHL29EHS      Well Pad Name: Philippi 29

3 Elevation, current ground: 1406'      Elevation, proposed post-construction: 1406'

4) Well Type: (a) Gas  Oil  Underground Storage \_\_\_\_\_  
Other \_\_\_\_\_  
(b) If Gas: Shallow  Deep \_\_\_\_\_  
Horizontal

5) Existing Pad? Yes or No: NO

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):  
Target - Marcellus, Depth - 7475, Thickness - 90', Pressure - 4700#

7) Proposed Total Vertical Depth: 7665' ✓

8) Formation at Total Vertical Depth: Onondaga Group

9) Proposed Total Measured Depth: 18225'

10) Approximate Fresh Water Strata Depths: 474', 595'

11) Method to Determine Fresh Water Depth: Offset Wells

12) Approximate Saltwater Depths: None Anticipated

13) Approximate Coal Seam Depths: 474', 595'

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

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: Yes, Sentinel Mine (474' & 595') ✓

16) Describe proposed well work: Drill & stimulate new horizontal Marcellus well. Well to be drilled to a TMD of 18225'. Well to be drilled to a TVD of 7665', formation @ TVD - Onondaga Group. Well will be plugged back to an approximate depth of 7200' (approximate due to exact Kick of point being unknown). Plugging back will be done using the displacement method and Class A type cement. A solid cement plug will be set from TD to KOP. If an unexpected void is encountered, plan will be to set casing at a minimum of 30' past void and cement to surface with approved Class A type cement. Well bore will not be drilled any deeper than 100' into the Onondaga Group, nor will there be any production, perforation, or stimulation of any formations below the target 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.

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18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 7.04 Acres 11/5/2013

19) Area to be disturbed for well pad only, less access road (acres): 6.69 Acres

WW - 6B  
(3/13)

20)

CASING AND TUBING PROGRAM

*AMcBout  
6-12-13*

<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"	N	L.S.	81.3#	80	80	Sand In
Fresh Water	13 3/8"	N	J-55	54.5#	675	675	CTS w/ approved Class A Type Cement
Coal							
Intermediate	9 5/8"	N	J-55	36#	2000	2000	CTS w/ approved Class A Type Cement
Production	5 1/2"	N	P-110	20#	18225	18225	2400 cu. ft. w/ 50/50 POZ Lead & Class A Tail
Tubing	2 3/8"	N	J-55	4.7#	7950	7950	
Liners							

<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"	26"	0.438	2110	Class A Type	1.18
Fresh Water	13 3/8"	17 1/2"	0.380	2730	Class A Type	1.39
Coal						
Intermediate	9 5/8"	12 1/4"	0.352	3520	Class A Type	1.18
Production	5 1/2"	8 3/4" and 8 1/2"	0.361	12640	Class A Type	1.26
Tubing	2 3/8"	5 1/2" CSG	0.190	7700	.....	.....
Liners						

PACKERS

Kind:	None				Received Office of Oil & Gas  JUN 12 2013
Sizes:	None				
Depths Set:	None				



WW - 6B  
(3/13)

21) Describe centralizer placement for each casing string. Conductor - No centralizers used. Fresh Water & Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface. Intermediate - Bow spring centralizers one on the first two joints and every fourth joint until inside surface casing. Production - Rigid bow spring centralizer on first joint then every 2 casing joints (free floating) through the lateral and the curve.  
(Note: cementing the 5 1/2" casing completely in open hole lateral and curve.)

22) Describe all cement additives associated with each cement type. Conductor - 2% CaCl2.  
Fresh Water/Coal - 2% CaCl2. Intermediate - 2% CaCl2. Production - 2.6% Cement extender, 0.7% Fluid loss additive, 0.5% High Temperature Retarder, 0.2% Friction Reducer

23) Proposed borehole conditioning procedures. Conductor - The hole is drilled w/ air and casing ran in air. Apart from insuring the hole is clean via air circulation at TD, there are no other conditioning procedures. Fresh Water/Coal - The hole is drilled w/ air and casing is ran in air. Once casing is on bottom, the casing shoe will be cleared with fresh water and gel prior to cementing. Intermediate - The hole is drilled w/ air and casing is ran in air. Once casing is on bottom, the casing shoe will be cleared with fresh water and gel prior to cementing. (Note: Drilling soap may be utilized if hole gets wet/damp during the drilling of all air holes with the exception of the conductor). Production - The hole will be drilled with synthetic oil base mud and once at TD the hole is circulated at a drilling pump rate until the hole is clean. Once casing is ran the hole is circulated for a minimum of one hole volume prior to pumping cement.

\*Note: Attach additional sheets as needed.

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## Cement Additives

- Conductor – 2% CaCl<sub>2</sub>
- Freshwater/Coal – 2% CaCl<sub>2</sub>
- Intermediate - 2% CaCl<sub>2</sub>
- Production -
  - 2.6% Cement extender
  - 0.7% Fluid Loss Additive
  - 0.5% High Temperature Retarder
  - 0.2% Friction Reducer

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name CNX Gas Company LLC OP Code 494458046

Watershed (HUC 10) Foxgrape Run Quadrangle Philippi

Elevation 1406' County Barbour District Pleasant

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

Will a pit be used for drill cuttings? Yes \_\_\_\_\_ No X

If so, please describe anticipated pit waste: N/A

Will a synthetic liner be used in the pit? Yes \_\_\_\_\_ No X If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_ )
- Reuse (at API Number \_\_\_\_\_ )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Recycle on other well on same pad or adjacent pads)

Will closed loop system be used? Yes \_\_\_\_\_

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

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

Additives to be used in drilling medium? Bactericide, Polymers and Weighting Agents

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

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

-Landfill or offsite name/permit number? Meadowfill, Northwestern Landfill, Max Environmental Yukon Landfill, & Bulger Landfill

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

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

Company Official Signature \_\_\_\_\_

Company Official (Typed Name) Jeremy Jones

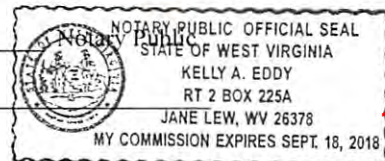
Company Official Title Designated Agent General Manager WV Gas Operations

Received  
Office of Oil & Gas

Subscribed and sworn before me this 14th day of June, 20 13

Kelly A. Eddy

My commission expires September 18, 2018



10/11/2013

Form WW-9

Operator's Well No. PHL29EHS

**CNX Gas Company LLC**

Proposed Revegetation Treatment: Acres Disturbed 7.34 Prevegetation pH 6.5

Lime according to pH test Tons/acre or to correct to pH 7.0

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

Mulch Hay or Straw 2 Tons/acre

Seed Mixtures

Area I		Area II	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	25	Orchard Grass	25
Birdsfoot Trefoil	15	Birdsfoot Trefoil	15
Ladino Clover	10	Ladino Clover	10

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: JAMcCourt

Comments: Two pen record will be placed on well 47-01-2294 during drilling and stimulation process

Title: Inspector

Date: 6-12-13

Field Reviewed? (  ) Yes (  ) No

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✓ 6/18



# Water Management Plan: Primary Water Sources



WMP-01316

API/ID Number: 047-001-03313

Operator:

Consol Energy - WV

PHL29EHS

**Important:**

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

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

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

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

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

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

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

APPROVED JUN 20 2013

10/11/2013

## Source Summary

WMP-01316

API Number:

047-001-03313

Operator:

Consol Energy - WV

PHL29EHS

### Stream/River

● Source **Tygart Valley River** Barbour Owner: **Consol Energy**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/1/2014	4/1/2015	13,000,000		39.190421	-80.017423

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

Max. Pump rate (gpm): **1,470** Min. Gauge Reading (cfs): **355.01** Min. Passby (cfs) **344.41**

DEP Comments:

**10/11/2013**

## Source Detail

WMP- 01316

API/ID Number: 047-001-03313

Operator:

Consol Energy - WV

PHL29EHS

Source ID: 20187 Source Name Tygart Valley River  
Consol Energy

Source Latitude: 39.190421  
Source Longitude: -80.017423

HUC-8 Code: 5020001

Drainage Area (sq. mi.): 931.43 County: Barbour

Anticipated withdrawal start date: 4/1/2014

Anticipated withdrawal end date: 4/1/2015

Endangered Species?  Mussel Stream?

Total Volume from Source (gal): 13,000,000

Trout Stream?

Tier 3?

Regulated Stream?

Max. Pump rate (gpm): 1,470

Proximate PSD? Taylor County PSD

Max. Simultaneous Trucks: 0

Gauged Stream?

Max. Truck pump rate (gpm)

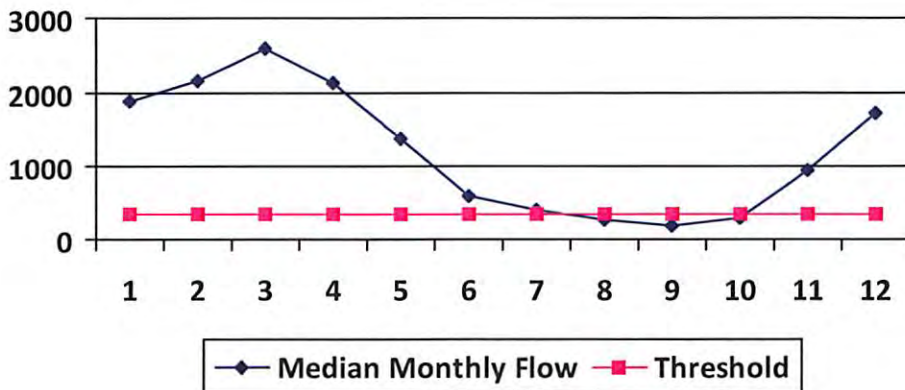
Reference Gaug 3054500 TYGART VALLEY RIVER AT PHILIPPI, WV

Drainage Area (sq. mi.) 914.00

Gauge Threshold (cfs): 341

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	1,901.06	361.51	1,542.64
2	2,155.51	361.51	1,797.09
3	2,600.93	361.51	2,242.51
4	2,132.23	361.51	1,773.82
5	1,375.48	361.51	1,017.07
6	586.10	361.51	227.69
7	402.01	361.51	43.59
8	280.57	361.51	-77.84
9	177.42	361.51	-181.00
10	286.75	361.51	-71.66
11	950.89	361.51	592.48
12	1,738.34	361.51	1,379.92

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs): 347.50

Upstream Demand (cfs): 10.73

Downstream Demand (cfs): 0.00

Pump rate (cfs): 3.28

Headwater Safety (cfs): 0.00

Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): 355.01

Passby at Location (cfs): 347.50

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

10/11/2013



# Water Management Plan: Secondary Water Sources



WMP- 01316

API/ID Number 047-001-03313

Operator:

Consol Energy - WV

PHL29EHS

### Important:

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

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

## Lake/Reservior

Source ID:	20188	Source Name	Little Hackers Creek Impoundment (WV83489)		Source start date:	4/1/2014
					Source end date:	4/1/2015
	Source Lat:	39.1889	Source Long:	-80.0653	County	Barbour
	Max. Daily Purchase (gal)			Total Volume from Source (gal):		13,000,000
DEP Comments:	Little Hackers Creek Impoundment (WV83489) used by Wolf Run Mining Company - Sentinel Mine					



**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**

Source ID: 20189	Source Name	Warder North Impoundment	Source start date:	4/1/2014	
			Source end date:	4/1/2015	
Source Lat:	39.192505	Source Long:	-80.025198	County	Barbour
Max. Daily Purchase (gal)		Total Volume from Source (gal):	13,000,000		

DEP Comments:

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

Reference: WMP-189

Source ID: 20190	Source Name	Warder South Impoundment	Source start date:	4/1/2014	
			Source end date:	4/1/2015	
Source Lat:	39.19097	Source Long:	-80.025198	County	Barbour
Max. Daily Purchase (gal)		Total Volume from Source (gal):	13,000,000		

DEP Comments:

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

Reference: WMP-190

**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:	20191	Source Name	Alton 1 Freshwater Impoundment		Source start date:	4/1/2014	
					Source end date:	4/1/2015	
		Source Lat:	38.794961	Source Long:	-80.184542	County	Upshur
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		13,000,000	

DEP Comments:

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

Reference: WMP-194

Source ID:	20192	Source Name	Alton 2 Freshwater Impoundment		Source start date:	4/1/2014	
					Source end date:	4/1/2015	
		Source Lat:	38.806146	Source Long:	-80.195108	County	Upshur
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		13,000,000	

DEP Comments:

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

Reference: WMP-195

**Important:**

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- 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:	20193	Source Name	ALT 1 Flowback Pit		Source start date:	4/1/2014	
					Source end date:	4/1/2015	
		Source Lat:	38.793967	Source Long:	80.183196	County	Barbour
		Max. Daily Purchase (gal)		Total Volume from Source (gal):			13,000,000
		DEP Comments:					

Source ID:	20194	Source Name	PHL 1 Flowback Pit		Source start date:	4/1/2014	
					Source end date:	4/1/2015	
		Source Lat:	39.192372	Source Long:	-80.018833	County	Barbour
		Max. Daily Purchase (gal)		Total Volume from Source (gal):			13,000,000
		DEP Comments:					

**Important:**

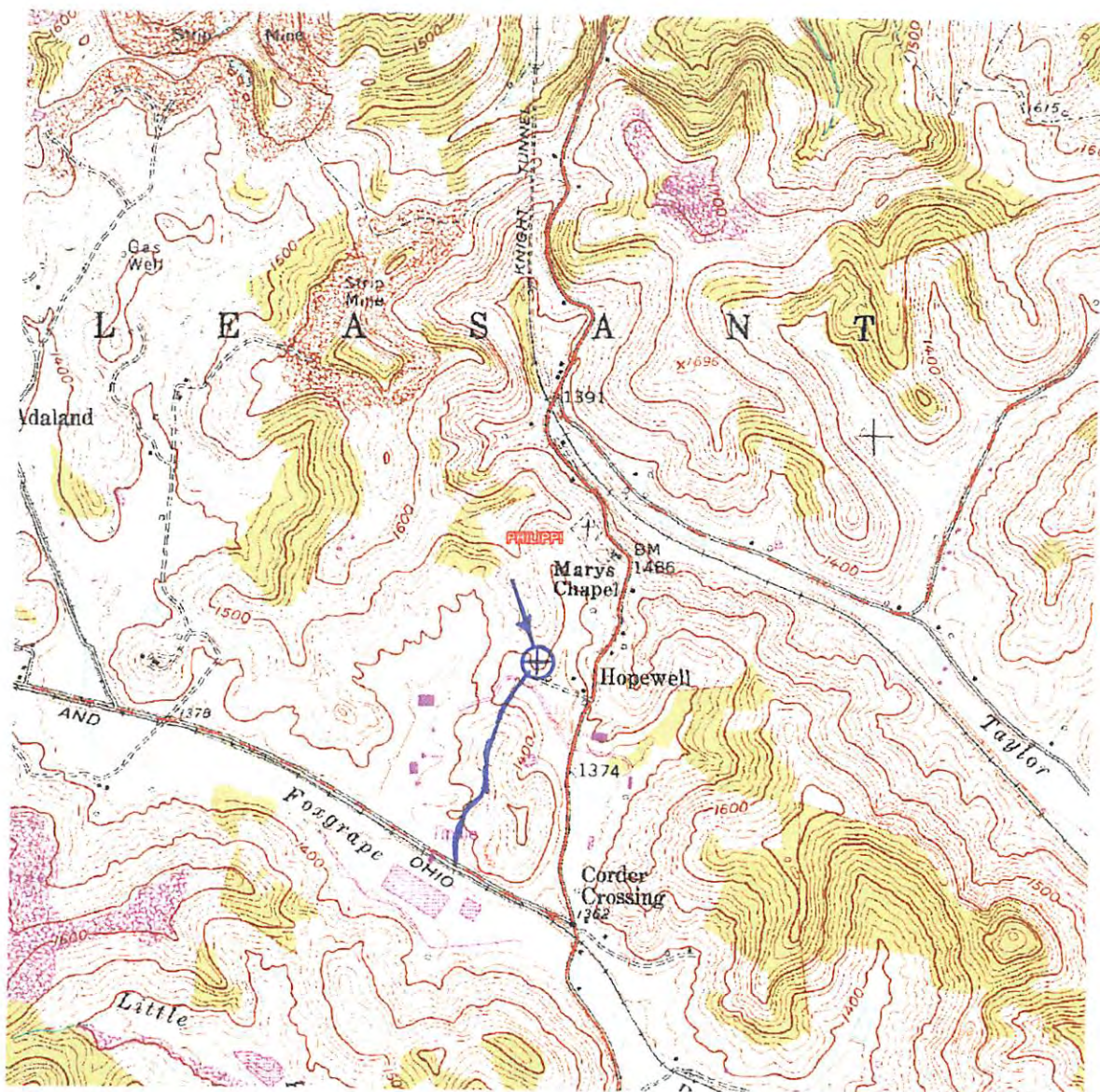
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Source ID:	20195	Source Name	PHL1; PHL13; PHL29; PHL4; ALT2; ALT7	Source start date:	4/1/2014
				Source end date:	4/1/2015
		Source Lat:	Source Long:	County	
		Max. Daily Purchase (gal)		Total Volume from Source (gal):	13,000,000
		DEP Comments:			

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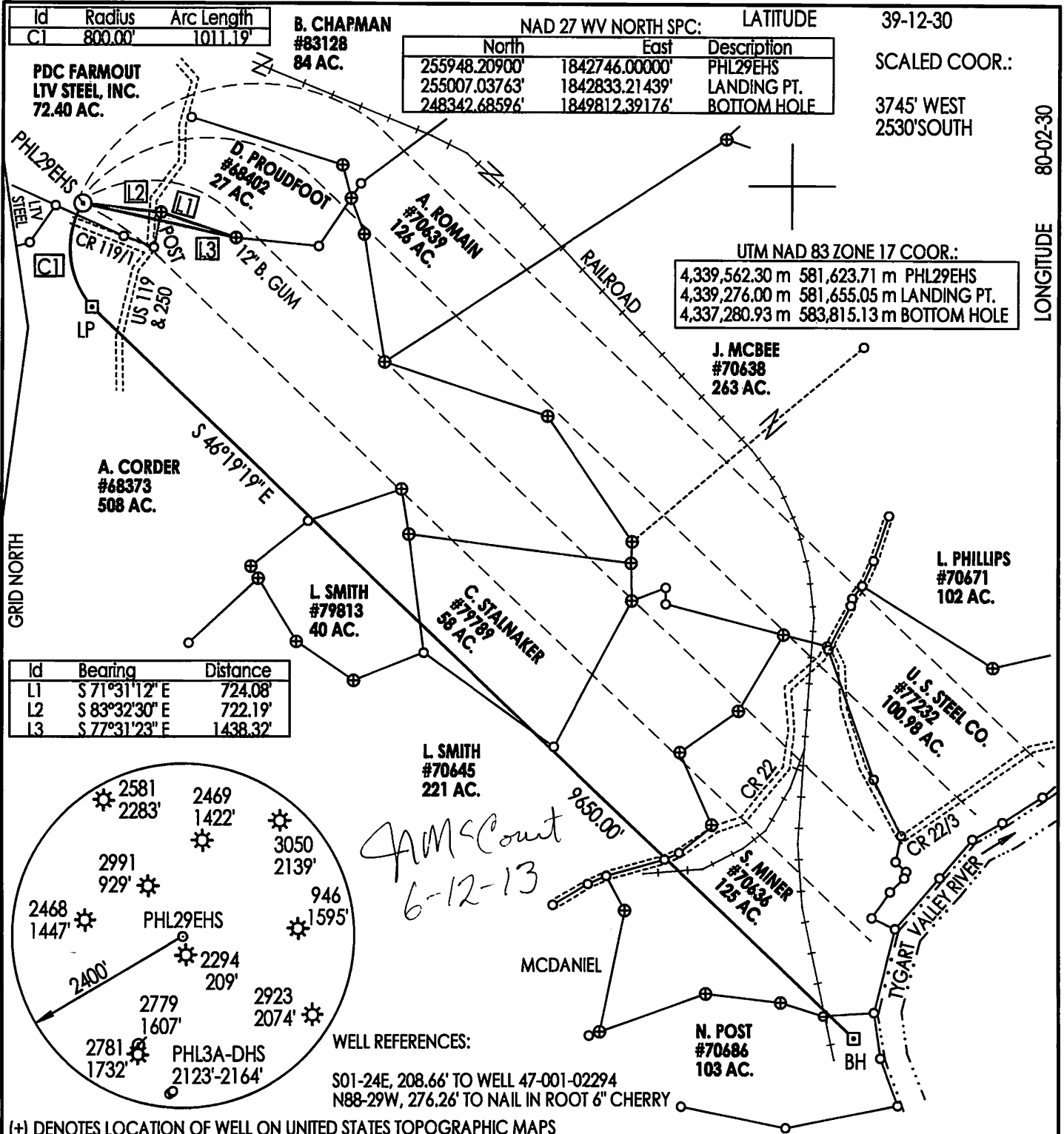
*J McCourt*  
6-12-13

Received  
Office of Oil & Gas

JUN 18 2013

LAND SURVEYING SERVICES  
21 CEDAR LANE  
BRIDGEPORT, WV 26330  
PHONE: 304-842-2018 OR 5762

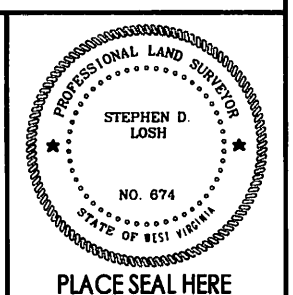
DRAWINGS TO ACCOMPANY FORM WW-9	
CNX GAS COMPANY LLC	
P. O. BOX 1248	
JANE LEW, WV 26378	
WATERSHED:	FOXGRAPE RUN
DISTRICT:	PLEASANT COUNTY: BARBOUR
QUADRANGLE:	PHILIPPI WELL NO.: PHL29EHS
DATE:	05/24/13 PAGE 5 of 5



FILE NUMBER: \_\_\_\_\_  
 DRAWING NUMBER: CNXPHL29EHSR1.PCS  
 SCALE: 1" = 1300'  
 MINIMUM DEGREE OF ACCURACY: SUBMETER  
 PROVEN SOURCE OF ELEVATION: DGPS SURVEY  
RTK SYSTEM

I THE UNDERSIGNED, HEREBY STATE 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 ENERGY.

(SIGNED) \_\_\_\_\_  
 STEPHEN D. LOSH, P.S. #674



STATE OF WEST VIRGINIA  
 DIVISION OF ENVIRONMENTAL PROTECTION  
 OFFICE OF OIL AND GAS  
 #10 McJUNKIN ROAD  
 NITRO, WV 25143-2506

FORM WW-6

LAND SURVEYING SERVICES  
 21 CEDAR LANE, BRIDGEPORT, WV 26330  
 PHONE: 304-842-2018 OR 842-5762

DATE: MAY 29, 2013  
 OPERATORS WELL NO.: PHL29EHS  
 API WELL NO. 47-001-03313 H6A

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  CBM   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW  STATE COUNTY PERMIT

LOCATION: ELEVATION 1406.00' WATERSHED FOXGRAPE RUN  
 DISTRICT PLEASANT COUNTY BARBOUR

QUADRANGLE PHILIPPI LEASE NUMBER SEE ABOVE  
 SURFACE OWNER PHILIPPI DEVELOPMENT, INC. ACREAGE 2385.55 (20-23)  
 OIL & GAS ROYALTY OWNER A. CORDER, ET. AL. LEASE ACREAGE 1728.98

PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION   
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) HORIZONTAL

TARGET FORMATION MARCELLUS PLUG & ABANDON  CLEAN OUT & REPLUG   
 ESTIMATED DEPTH TVD = 7665' TMD = 18,225'

WELL OPERATOR CNX GAS COMPANY LLC DESIGNATED AGENT JEREMY JONES  
 ADDRESS P. O. BOX 1248 JANE LEW, WV 26378 ADDRESS P. O. BOX 1248 JANE LEW, WV 26378

COUNTY NAME  
 PERMIT