



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

PERMIT MODIFICATION APPROVAL

May 23, 2014

CNX GAS COMPANY LLC
ONE ENERGY DRIVE
JANE LEW, WV 26378

Re: Permit Modification Approval for API Number 103308 , Well #: PHL3DHS

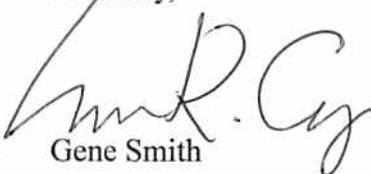
Extended Lateral

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,


for Gene Smith

Regulatory/Compliance Manager
Office of Oil and Gas

WW - 6B
(3/13)

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

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

2) Operator's Well Number: PLH3DMS Well Pad Name: PHL3HS

3 Elevation, current ground: 1444' Elevation, proposed post-construction: 1445'

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):
Formation - Marcellus, Depth - 7545', Thickness - 90', Pressure - 3000#

7) Proposed Total Vertical Depth: 7735'

8) Formation at Total Vertical Depth: Huntersville Chert

9) Proposed Total Measured Depth: 17,570'

10) Approximate Fresh Water Strata Depths: 328', 544', 665'

11) Method to Determine Fresh Water Depth: Reference Offset Wells

12) Approximate Saltwater Depths: None Reported

13) Approximate Coal Seam Depths: 544', 665'

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 544' & 665'

16) Describe proposed well work: Drill and stimulate new horizontal Marcellus well. Well to be drilled to a TMD of 17570'. Well to be drilled to a TVD of 7735' for logging purposes, formation at TVD - Huntersville Chert. Well will be plugged back to an approximate depth of 6735' (approximate due to exact kick off point being unknown). Plugging back will be done using the displacement method and Class A type cement. 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.

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): 25.6 Acres
WV Department of Environmental Protection

19) Area to be disturbed for well pad only, less access road (acres): 10.13 Acres

WW - 6B
(3/13)

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	N	J-55	94#	80'	80'	Grout to Surface
Fresh Water	13 3/8"	N	J-55	54.5#	750'	750'	CTS w/ Approved Class A Type Cement
Coal							
Intermediate	9 5/8"	N	J-55	36#	2300'	2300'	CTS w/ Approved Class A Type Cement
Production	5 1/2"	N	P-110	20#	17570'	17570'	2400 cu. ft. W/ 50/50 POZ Lead & Class A Tail
Tubing	2 3/8"	N	J-55	4.7#	8135'	8135'	
Liners							

Kimberly Baysch 3-5-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
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 3/8"	0.352	3520	Class A Type	1.18
Production	5 1/2"	8 3/4" & 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 and Gas MAR 17 2014
Sizes:	None				
Depths Set:	None				

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Environmental Protection

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 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.

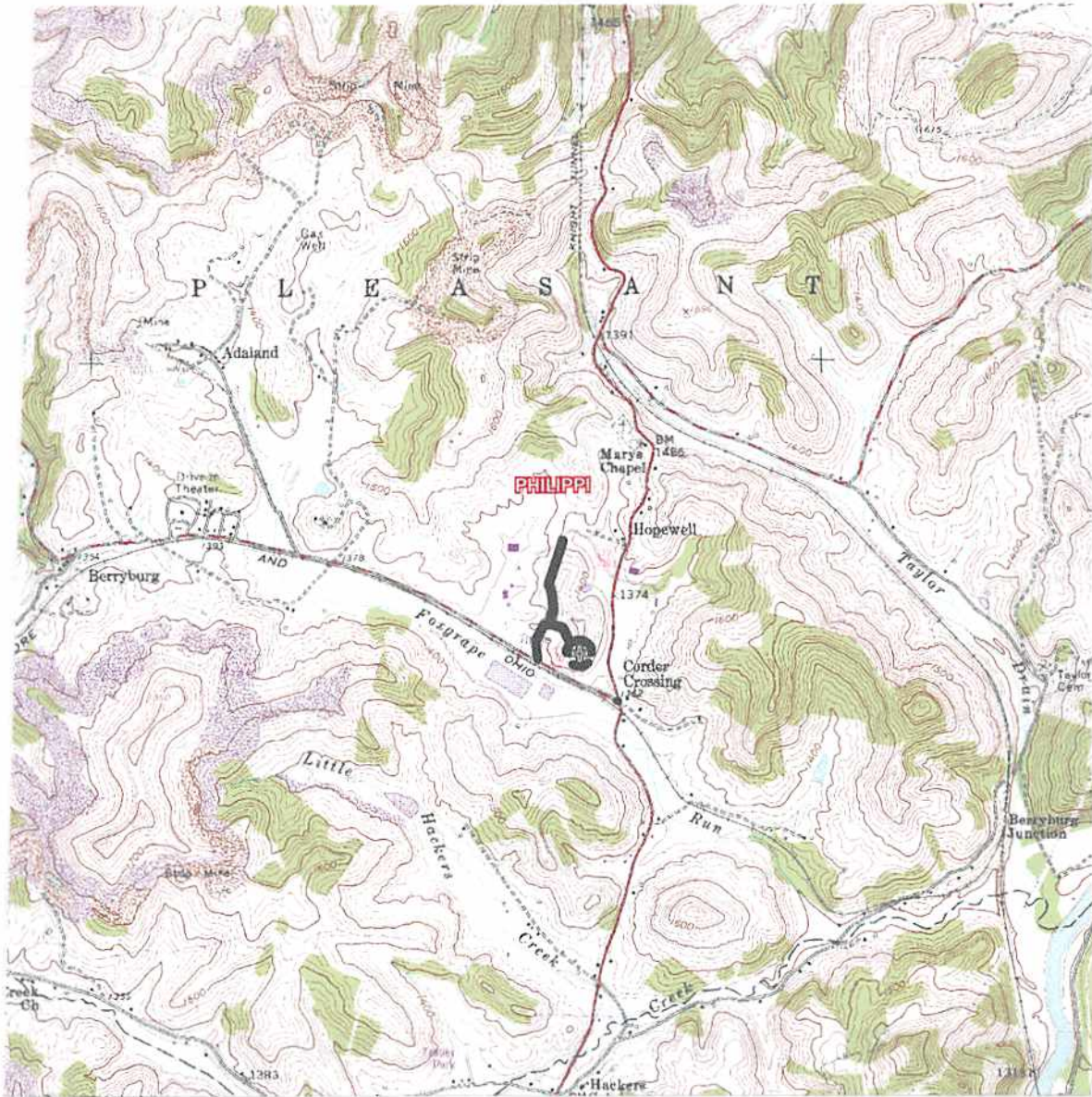
23) Proposed borehole conditioning procedures. Conductor - The hole is augered/drilled w/ air and casing ran in air. Apart From insuring the hole is clean via air circulation at TD there are no other conditioning procedures. Fresh Water/Coal - The hole is drilled w/ air and casing is ran in air. Once 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 the hole gets wet/damp during the drilling of all air holes with the exception of the Conductor). Production - The hole is 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 min. of one hole volume prior to pumping cement.

*Note: Attach additional sheets as needed.

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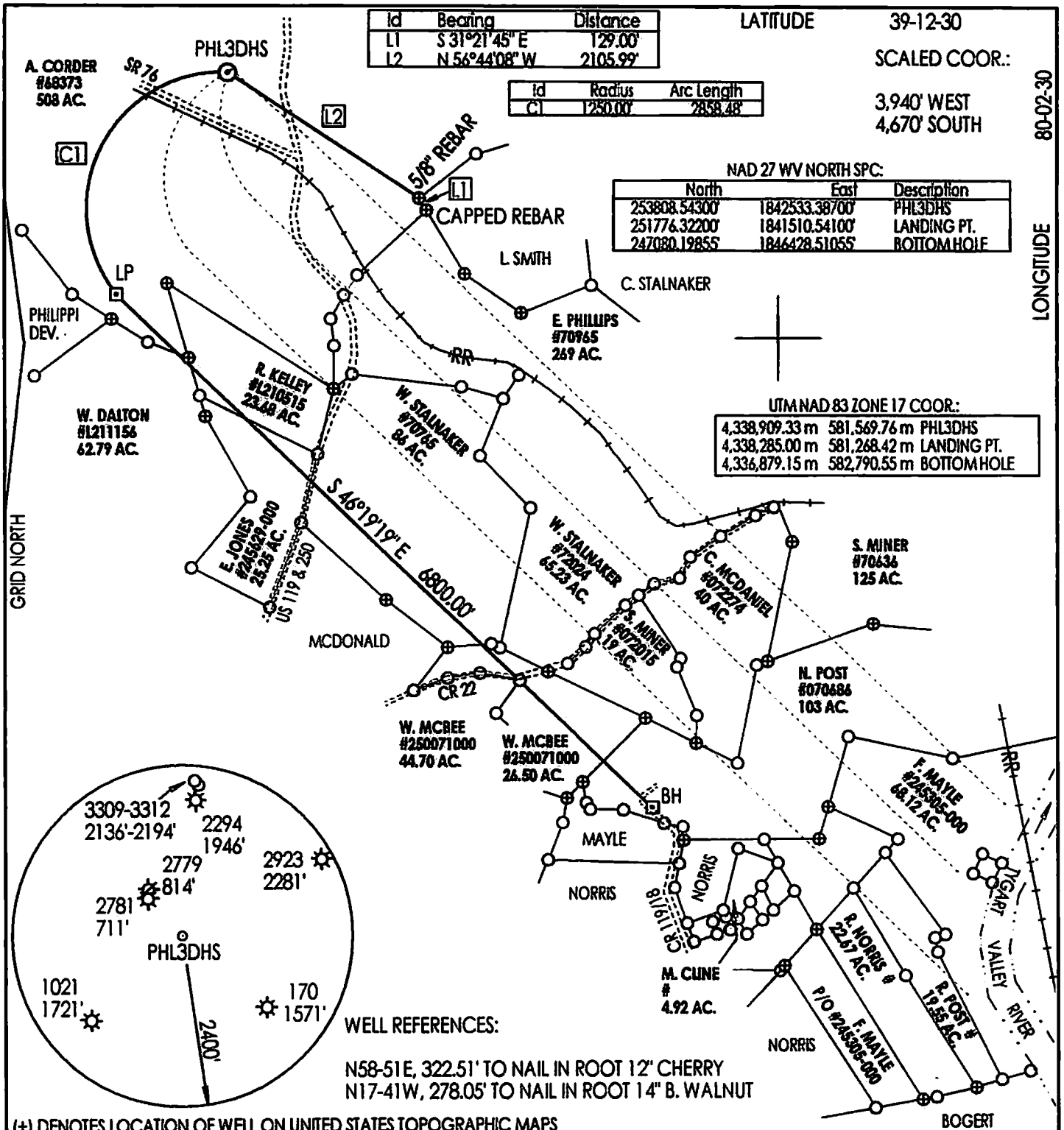
Received
Office of Oil & Gas

MAY 21 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.: PHL3DHS
DATE:	03/28/13 PAGE 4 of 4

05/30/2014



FILE NUMBER: _____
 DRAWING NUMBER: CNXPHL3DHSR2.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

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

DATE: APRIL 11, 2014
 OPERATORS WELL NO.: PHL3DHS
 API WELL NO. (LEASE NAME/NUMBER REVISION): 47-001-03308 H6A MOD
 STATE: WV COUNTY: BARBOUR PERMIT: 1395.07

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

LOCATION: ELEVATION 1444.50' 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 1395.07

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 = 7735' TMD = 17,570'

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

LONGITUDE 80-02-30

COUNTY NAME PERMIT