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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](http://www.dep.wv.gov)

## PERMIT MODIFICATION APPROVAL

March 06, 2015

CNX GAS COMPANY LLC  
POST OFFICE BOX 1248  
JANE LEW, WV 26378

Re: Permit Modification Approval for API Number 103290 , Well #: AUD3CHS

**Extend 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,

Gene Smith  
Assistant Chief of Permitting  
Office of Oil and Gas

47 00 103290 m64



Carolinda Flanagan  
Permitting Analyst  
P.O. Box 1248  
Jane Lew, WV 26378  
(304) 884-2057



January 28, 2015

West Virginia Department of Environmental Protection  
Office of Oil & Gas  
Attn: Laura Adkins  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304-2345

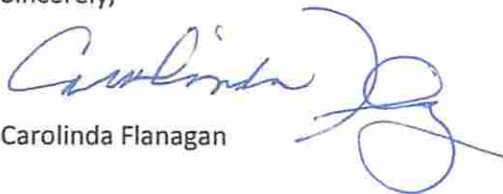
RE: **AUD3AHS - API# 47-001-03288 (Lateral Extension – extending 1195' more)**  
**AUD3BHS - API# 47-001-03289 (Lateral Extension – extending 2750' more)**  
**AUD3CHS - API# 47-001-03290 (Lateral Extension – extending 1630' more)**

Dear Laura,

Enclosed, please find modifications for the AUD3AHS-AUD3CHS to extend the laterals due to additional leasing being obtained. I have attached an updated casing plan, mylar plat, lease breakdown, and road letters where applicable.

Should you need any further information, please contact me at (304) 884-2057 or by email at [carolindaflanagan@consolenergy.com](mailto:carolindaflanagan@consolenergy.com). Thank you!

Sincerely,

  
Carolinda Flanagan

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4700103289M00

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    Philippi    Audra  
Operator ID    County    District    Quadrangle

2) Operator's Well Number: AUD3CHS    Well Pad Name: AUD3HS

3) Farm Name/Surface Owner: Mike Ross, Inc.    Public Road Access: US Rt. 119

4) Elevation, current ground: 1537'    Elevation, proposed post-construction: 1537'

5) Well Type (a) Gas X    Oil    Underground Storage

Other

(b)If Gas Shallow X    Deep

Horizontal X

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Target - Marcellus, Depth - 7505', Thickness - 90', Pressure - 4500#

8) Proposed Total Vertical Depth: 7695'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 18600'

11) Proposed Horizontal Leg Length: 8830

12) Approximate Fresh Water Strata Depths: 330', 370'

13) Method to Determine Fresh Water Depths: Reference offset wells (API #'s 47-001-00511 and 47-001-00358)

14) Approximate Saltwater Depths: None Anticipated

15) Approximate Coal Seam Depths: 270', 410', 450'

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

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes  No

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(a) If Yes, provide Mine Info: Name: \_\_\_\_\_

Depth: \_\_\_\_\_

Seam: \_\_\_\_\_

Owner: \_\_\_\_\_

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18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20	N	J-55	94	80	80	112.9/ CTS
Fresh Water	13.375	N	J-55	54.5	550	500	260.4/ CTS
Coal							
Intermediate	9.625	N	J-55	36	4200	4150	974.6/ CTS
Production	5.5	N	P-110	20	18420	18370	2774.8
Tubing	2.375	N	J-55	4.7	N/A	7550	
Liners							

AP 514  
3/5/15

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Max. Associated Surface Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20	26	0.438	2110	0	Class A	1.18
Fresh Water	13.375	17.5	0.380	2730	0	Class A	1.39
Coal							
Intermediate	9.625	12.25	0.352	3520	1249.1	Class A	1.18
Production	5.5	8.75	0.361	14360	6249.1	Class A	1.26
Tubing	2.375	5.5" CSG	0.190	7700			
Liners							

PACKERS

Kind:	None			
Sizes:	None			
Depths Set:	None			

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and stimulate new horizontal Marcellus well. Well to be drilled to a TMD of 18600'. Well to be drilled to a TVD of 7695', formation at TVD - Onondaga. The well bore will not be drilled any deeper than 100' beyond the Onondaga top, nor will there be any perforation, stimulation, or production of any formations below the target formation. Well will be plugged back to an approximate depth of 5000' (approximate due to exact kick off 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.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

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.  
Max Pressure - 9500 psi. Max Rate - 100 bbl/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.2

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22) Area to be disturbed for well pad only, less access road (acres): 8.42

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23) Describe centralizer placement for each casing string:

Conductor - No centralizers used.  
Surface - Rigid Bow spring centralizers on first joint then every third joint to surface.  
Intermediate - Rigid Bow spring centralizers one on the first two joints and every third joint to surface.  
Production - Rigid bow spring centralizer on first joint then every casing joint (free floating) through the lateral and every other joint in the curve. (Note: cementing the 5 1/2" casing completely in open hole lateral and curve.)

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24) Describe all cement additives associated with each cement type:

Conductor - 2% CaCl2.  
Surface - 3% CaCl2 & 1#/sk Celloflake LCM.  
Intermediate - 3% CaCl2 & 0.5#/sk Celloflake LCM.  
Production - 2.6% Cement extender, 0.7% Fluid loss additive, 0.5% High Temperature Retarder, 0.2% Friction Reducer

25) Proposed borehole conditioning procedures:

Conductor - The hole is auger drilled w/ air and casing ran in air.  
Surface - The hole is drilled w/ air and casing is ran in air. Once casing is on bottom, the casing string will be circulated w/ fresh water prior to cementing.  
Intermediate - The hole is drilled w/ air and casing is ran in air. (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 will be drilled with synthetic oil base mud. At TD the hole is circulated at optimum pump rate until shale shaker deem 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.

03/06/2015

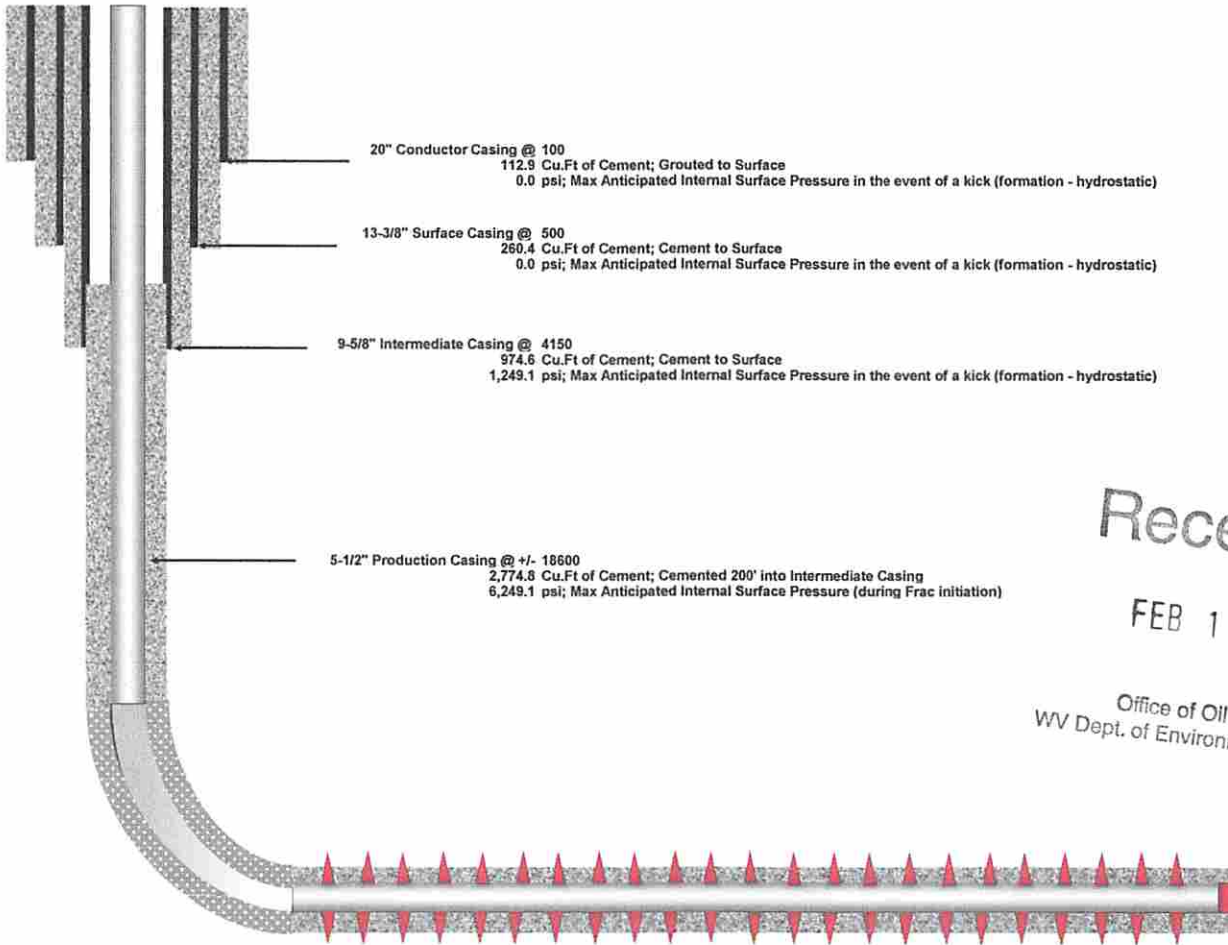




# AUD3CHS

## Casing Schematic

SCHEMATIC NOT TO SCALE



20" Conductor Casing @ 100  
112.9 Cu.Ft of Cement; Grouted to Surface  
0.0 psi; Max Anticipated Internal Surface Pressure in the event of a kick (formation - hydrostatic)

13-3/8" Surface Casing @ 500  
260.4 Cu.Ft of Cement; Cement to Surface  
0.0 psi; Max Anticipated Internal Surface Pressure in the event of a kick (formation - hydrostatic)

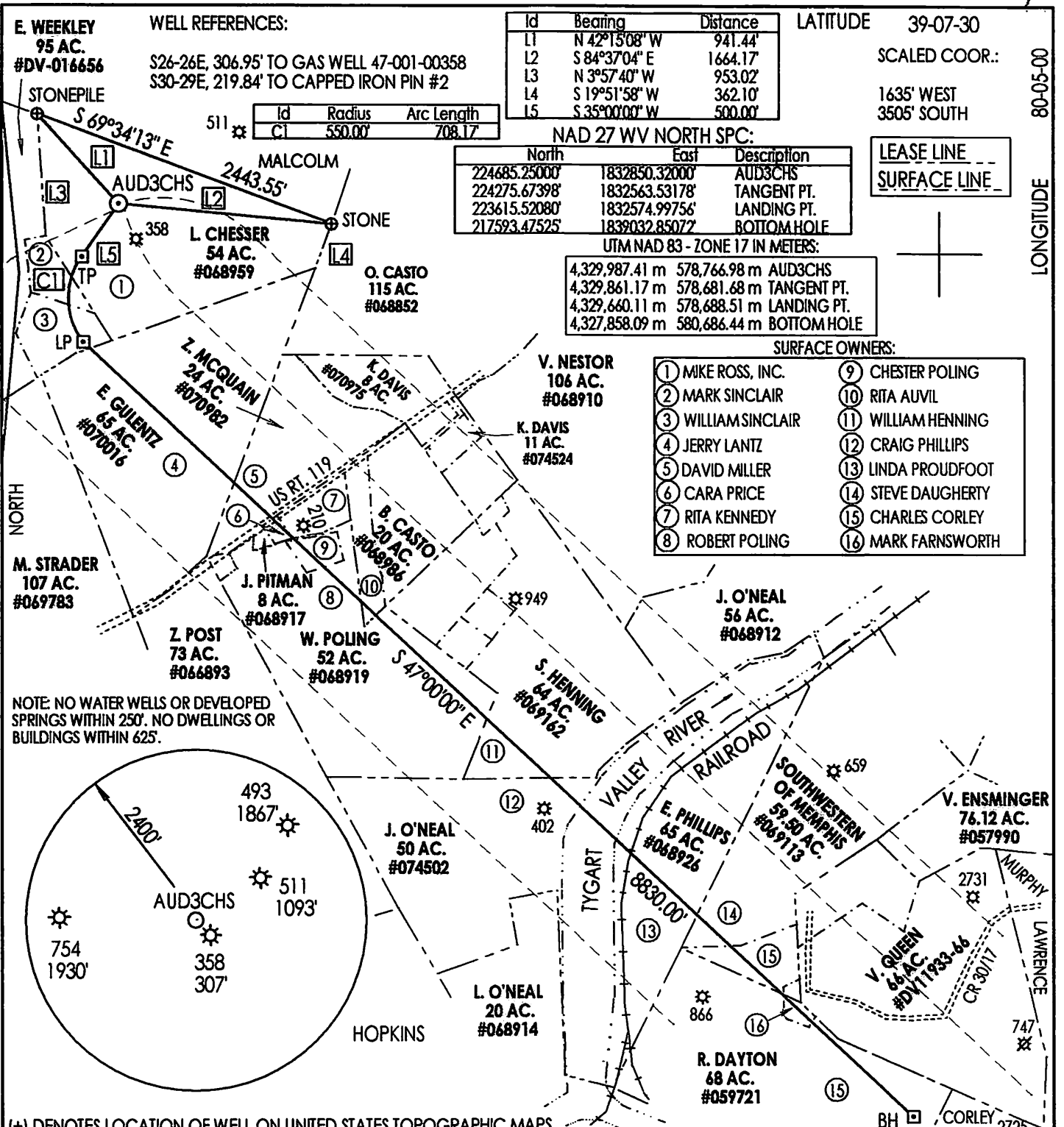
9-5/8" Intermediate Casing @ 4150  
974.6 Cu.Ft of Cement; Cement to Surface  
1,249.1 psi; Max Anticipated Internal Surface Pressure in the event of a kick (formation - hydrostatic)

5-1/2" Production Casing @ +/- 18600  
2,774.8 Cu.Ft of Cement; Cemented 200' into Intermediate Casing  
6,249.1 psi; Max Anticipated Internal Surface Pressure (during Frac initiation)

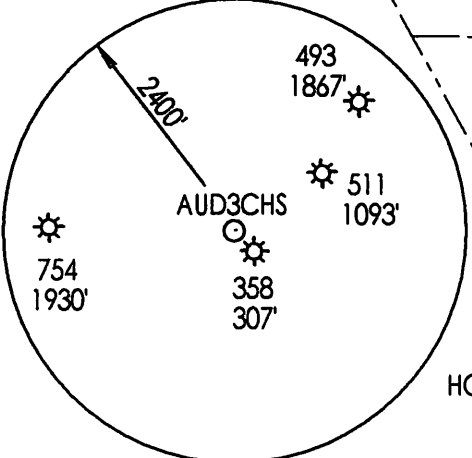
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NOTE: NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250'. NO DWELLINGS OR BUILDINGS WITHIN 625'.

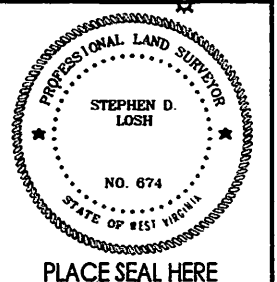


(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER: \_\_\_\_\_  
 DRAWING NUMBER: CNXAUD3CHSR4.PCS  
 SCALE: 1" = 1100'  
 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: JANUARY 07, 2015  
 OPERATORS WELL NO.: AUD3CHS  
 API WELL NO. 47-001-03290 MOD  
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION 1537.31' WATERSHED ELK CREEK  
 DISTRICT PHILIPPI COUNTY BARBOUR  
 QUADRANGLE AUDRA LEASE NUMBER AS SHOWN

SURFACE OWNER MIKE ROSS, INC. ACREAGE 52.00 (19-05)  
 OIL & GAS ROYALTY OWNER LUCILLE CHESSER, ET. AL. LEASE ACREAGE 1262.62

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

PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_  
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD = 7695' TMD = 18600'

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

LONGITUDE 80-05-00  
 COUNTY NAME PERMIT

## Attachment - Form WW-6A1 for AUD3CHS:

Lease	Grantor, Lessor, etc	Grantee, Lessee, etc	Royalty	Book/Page
✓ 068959/ 132398000	Lucille & Page P.A. Chesser, H/W Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.13125	41/417 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 070016/ 132474000	Elmira Gulentz Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	<u>.125</u>	<u>42/326</u> 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 070982/ 132530000	<u>Zora McQuain</u> Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	<u>Hope Natural Gas Company</u> Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	<u>.125</u>	<u>44/283</u> 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 068917/ 132379000	J.H. Pitman & Mertie Pitman Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	41/78 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 068919/ 132381000	W.J. & Neva Pearl Poling Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	41/84 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 068986/ 132401000	Bovey & Neva Casto Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	41/251 53/261 99/481 51/795 58/362 151/423 16/577 17/1

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Environmental Protection 03/06/2015



## Attachment - Form WW-6A1 for AUD3CHS:

Lease	Grantor, Lessor, etc	Grantee, Lessee, etc	Royalty	Book/Page
✓ 069162/ 132429000	S. Henning Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	60/227 99/481 51/795 58/362 151/423 16/577 17/1
✓ 074502/ 132690000	James M. O'Neal Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	53/262 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 068926/ 132385000	Elizabeth Teter Phillips and C.O. Phillips Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	41/276 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 069113/ 132423000	Southwestern of Memphis Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.125	99/481 51/795 58/362 151/423 16/577 17/1
✓ 059721/ 131750000	Ruth Woods & Arthur S. Dayton, H/W Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corp Consolidated Gas Transmission Corp CNG Transmission Corp Dominion Transmission Inc Consol Energy Holdings LLC XVI Consol Gas Company CNX Gas Company LLC	0.15	26/27 53/261 99/481 51/795 58/362 151/423 16/577 17/1

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03/06/2015



January 28, 2015

Ms. Laura Adkins  
WV DEP Office of Oil & Gas  
601 57<sup>th</sup> St., SE  
Charleston, WV 25304

RE: CONSOL Energy's proposed AUD3CHS Well, in Barbour County, West Virginia  
Drilling under State Route 119

Dear Laura:

CONSOL Energy, Inc. (CNX) is applying for a drilling permit for the above referenced well. The State of West Virginia has raised some concern as to CNX's right to drill under State Route 119. Please be advised that according to the title information we have relied on in submitting this application, the State owns no oil and gas rights under said road(s) and/or railroad(s) that CNX has leased said rights from the appropriate parties as set forth on the accompanying Form WW-6A1.

Very truly yours,

A handwritten signature in blue ink that reads 'Kelly Eddy'.

Kelly Eddy  
Supervisor - Permitting

03/06/2015