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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 9703851 , Well #: CENT 19 EHS  
**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



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



February 26, 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: CENT19AHS - API# 47-097-03857 (Lateral Extension – extending 5381.18' more)
- CENT19BHS - API# 47-097-03848 (Lateral Extension – extending 4551.42 more)
- CENT19CHS - API# 47-097-03849 (Lateral Extension – extending 4519.26' more)
- CENT19DHS - API# 47-097-03850 (Lateral Extension – extending 1031.66 more)
- CENT19EHS - API# 47-097-03851 (Lateral Extension – extending 2765.22' more)

Dear Laura,

Enclosed, please find modifications for the CENT19AHS – CENT19EHS to extend the laterals due to additional leasing being obtained. I have attached an updated casing plans, mylar plats, and lease breakdowns.

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

Sincerely,

  
Carolinda Flanagan

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Office of Oil and Gas  
MAR 2 2015  
WV Department of  
Environmental Protection

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

1) Well Operator: CNX Gas Company LLC  
Operator ID: 494458046 County: Upshur District: Warren Quadrangle: Century

2) Operator's Well Number: CENT19EHS Well Pad Name: CENT19HS

3) Farm Name/Surface Owner: William Rohr Public Road Access: County Route 13

4) Elevation, current ground: 1582' Elevation, proposed post-construction: 1585'

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

Other

(b) If Gas Shallow X Deep

Horizontal X

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Target - Marcellus, Depth - 7410' (Top), Thickness - 90', Pressure - 5000#

8) Proposed Total Vertical Depth: 7600'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 17596'

11) Proposed Horizontal Leg Length: 7590'

12) Approximate Fresh Water Strata Depths: 130', 550'

13) Method to Determine Fresh Water Depths: Offset Well Information

14) Approximate Saltwater Depths: None Anticipated

15) Approximate Coal Seam Depths: 105', 550'

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 X

(a) If Yes, provide Mine Info: Name: RECEIVED  
Depth: Office of Oil and Gas  
Seam: MAR 2 2015  
Owner:

WV Department of Environmental Protection

WW-6B  
(10/14)

API NO. 47-097 - 03851

OPERATOR WELL NO. CENT19EHS

Well Pad Name: CENT19HS

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	90.3/ CTS
Fresh Water	13.375	N	J-55	54.5	650	600	312.5/ CTS
Coal							
Intermediate	9.675	N	J-55	36	2050	2000	469.7/ CTS
Production	5.5	N	P-110	20	17596	17546	2991.9
Tubing	2.375	N	J-55	4.7		7500	
Liners							

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	9.675	12.25	0.352	3520	1724.8	Class A	1.18
Production	5.5	8.75	0.361	14360	6290.3	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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MAR 2 2015

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Environmental Protection

WW-6B  
(10/14)

API NO. 47-097 - 03851  
OPERATOR WELL NO. CENT19EHS  
Well Pad Name: CENT19HS

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 17596'. Well to be drilled to a TVD of 7600', formation at TVD - Onondaga. Well will be plugged back to an approximate depth of 6800' (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. There will not be any production, perforation, or stimulation of any formations below the target formation.

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): 25

22) Area to be disturbed for well pad only, less access road (acres): 16

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.)

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

Conductor - 2% CaCl<sub>2</sub>.  
Surface - 3% CaCl<sub>2</sub> & 1#/sk Celloflake LCM.  
Intermediate - 3% CaCl<sub>2</sub> & 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.

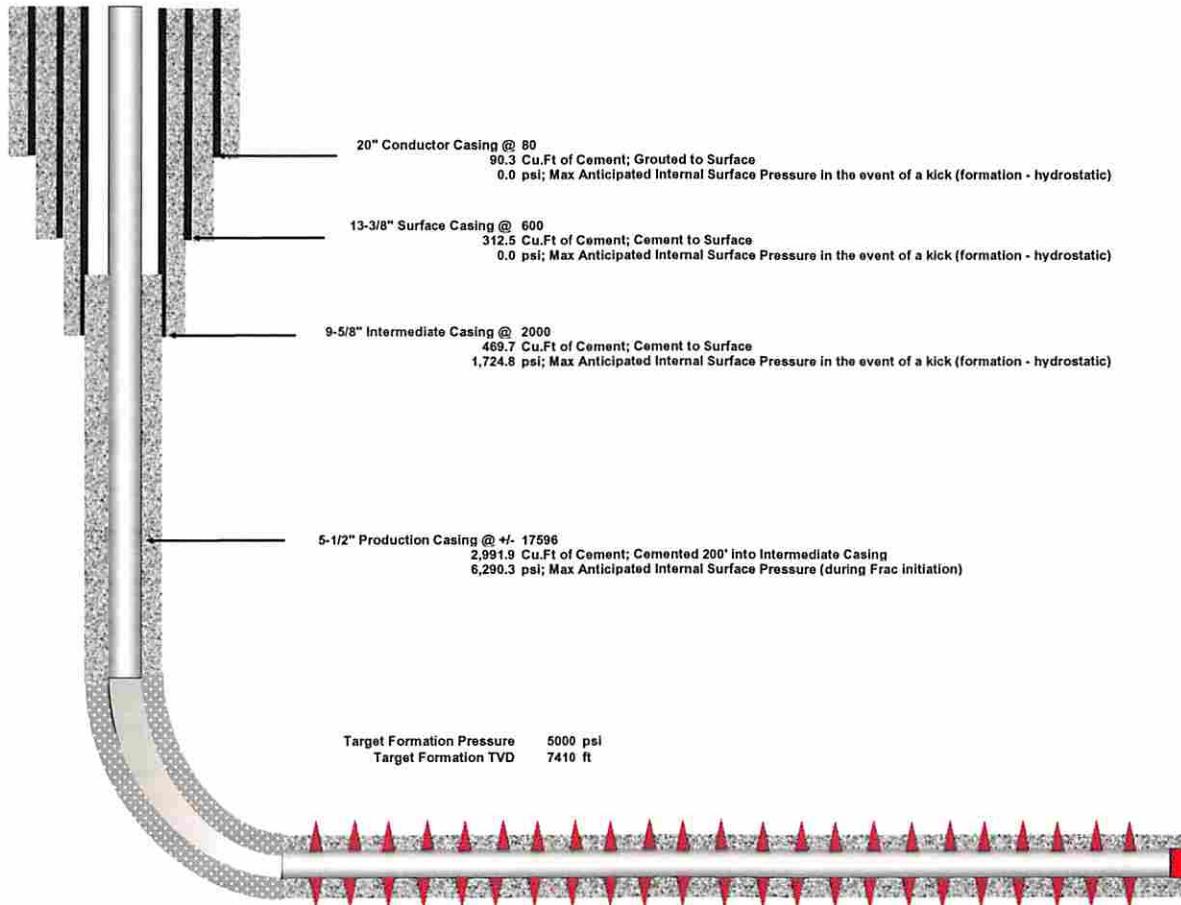
\*Note: Attach additional sheets as needed.



**CENT19EHS**

**Casing Schematic**

SCHEMATIC NOT TO SCALE



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Environmental Protection

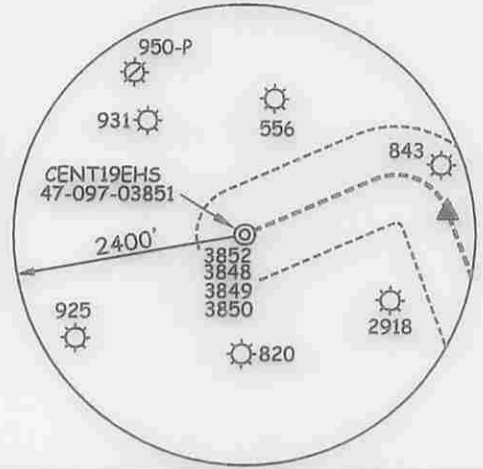
03/06/2015

NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.

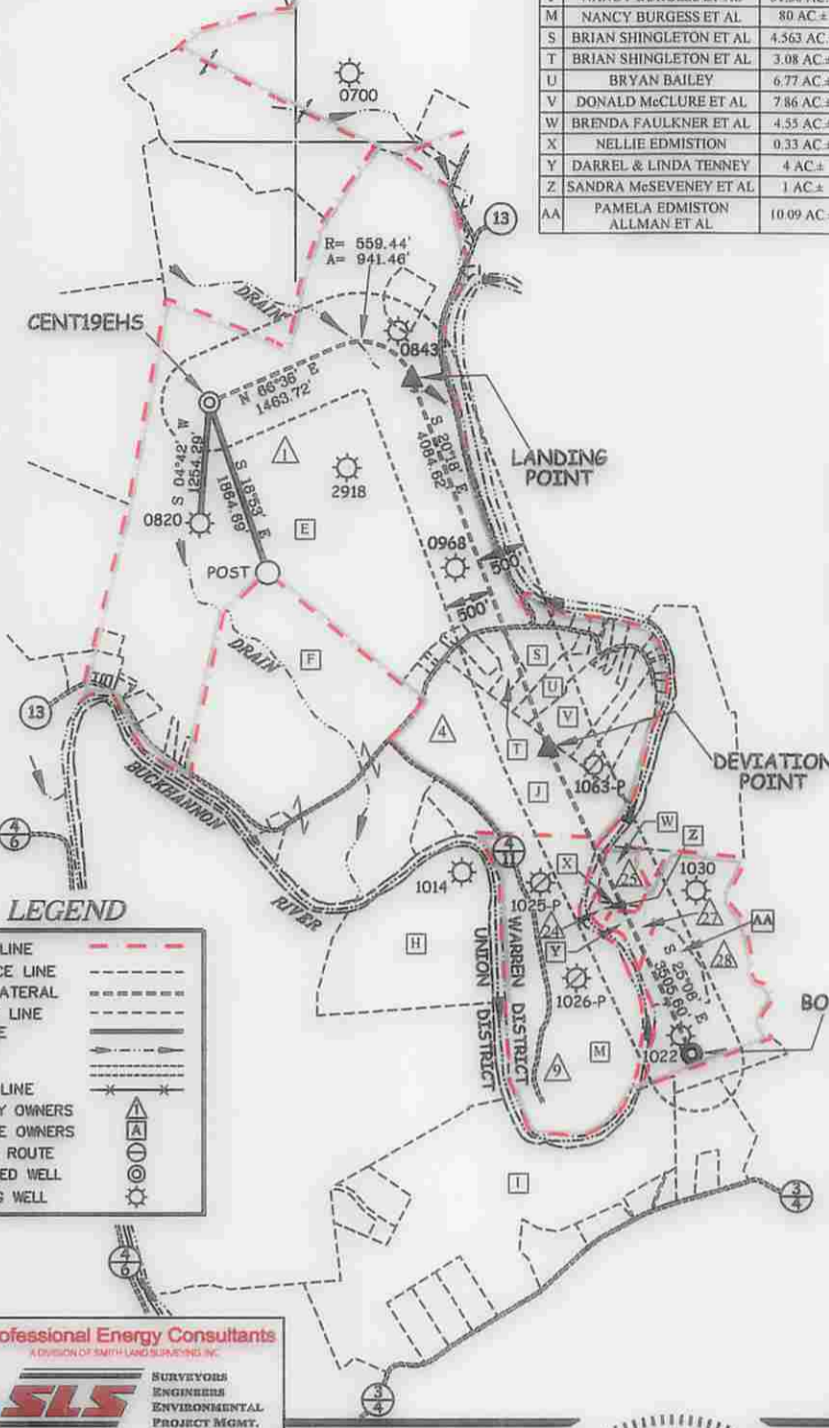
SURFACE OWNERS		
E	WILLIAM P. ROHR	338.82 AC±
F	ERVIN & MADELINE SKINNER	124.41 AC±
H	TIMOTHY G. HUNTER	50.16 AC±
J	HOWARD G. BLUM	113.65 AC±
J	NANCY BURGESS ET AL.	51.30 AC±
M	NANCY BURGESS ET AL.	80 AC±
S	BRIAN SHINGLETON ET AL.	4,563 AC±
T	BRIAN SHINGLETON ET AL.	3.08 AC±
U	BRYAN BAILEY	6.77 AC±
V	DONALD McCLURE ET AL.	7.86 AC±
W	BRENDA FAULKNER ET AL.	4.55 AC±
X	NELLIE EDMISTON	0.33 AC±
Y	DARREL & LINDA TENNEY	4 AC±
Z	SANDRA McSEVENEY ET AL.	1 AC±
AA	PAMELA EDMISTON ALLMAN ET AL.	10.09 AC±

LATITUDE 39°02'30"



LONGITUDE 80°07'30"

NAD'27 GRID NORTH



WELL NO. CENT19EHS

(S.P.C. SOUTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT) N. 741,472 E. 2,237,010  
 NAD'27 GEO. LAT-(N) 39.03325 LONG-(W) 80.16571  
 NAD'83 UTM (M) N. 4,320,809 E. 572,226

LANDING POINT

NAD'27 S.P.C.(FT) N. 741,719 E. 2,239,118  
 NAD'27 GEO. LAT-(N) 39.03388 LONG-(W) 80.15829  
 NAD'83 UTM (M) N. 4,320,884 E. 572,868

BOTTOM HOLE

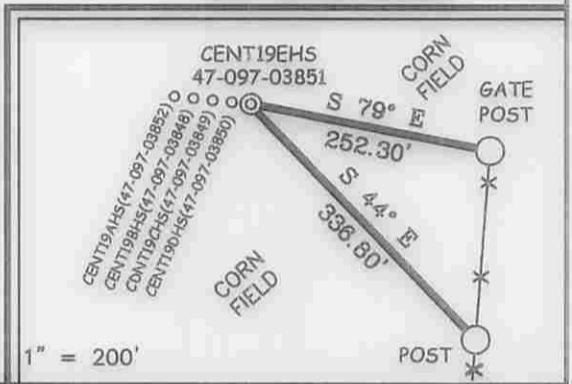
NAD'27 S.P.C.(FT) N. 734,715 E. 2,242,025  
 NAD'27 GEO. LAT-(N) 39.01458 LONG-(W) 80.14828  
 NAD'83 UTM (M) N. 4,318,750 E. 573,754

ROYALTY OWNERS			
TRACT 1	VIRGINIA M. P. MEIER ET AL.	485 AC±	LEASE NO. 132520000
TRACT 4	VIRGINIA M. P. MEIER ET AL.	109.90 AC±	LEASE NO. 132557000
TRACT 9	NANCY TALBOTT ET AL.	80 AC±	LEASE NO. 259867000
TRACT 24	NELLIE EDMISTON ET AL.	1 AC±	LEASE NO. 254222000
TRACT 25	TRIO PETROLEUM ET AL.	9.43 AC±	LEASE NO. 249412000
TRACT 27	NELLIE EDMISTON ET AL.	4 AC±	LEASE NO. 254222000
TRACT 28	NELLIE EDMISTON ET AL.	53.75 AC±	LEASE NO. 254222000

LEGEND

LEASE LINE	---
SURFACE LINE	---
WELL LATERAL	---
OFFSET LINE	---
TIE LINE	---
CREEK	---
ROAD	---
FENCE LINE	---
ROYALTY OWNERS	▲
SURFACE OWNERS	▲
COUNTY ROUTE	○
PROPOSED WELL	⊙
EXISTING WELL	⊙

REFERENCES



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

DATE APRIL 08, 20 13

REVISED FEBRUARY 10, 20 15

OPERATORS WELL NO. CENT19EHS

API NO. 47

WELL NO. 47

STATE COUNTY PERMIT

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



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. Gregory A. Smith  
 677



MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7830P19EHSR6

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE) SCALE 1" = 2000'

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

LOCATION: GROUND PROPOSED ELEVATION 1583.3' 1585.0' WATERSHED BUCKHANNON RIVER

DISTRICT WARREN COUNTY UPSHUR QUADRANGLE CENTURY 7.5'

SURFACE OWNER WILLIAM P. ROHR ACREAGE 338.82±

ROYALTY OWNER HARRIET M. JARVIS ET AL ACREAGE 485±

PROPOSED WORK: LEASE NO. 13520000

DRILL  CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION \_\_\_ PLUG AND ABANDON \_\_\_ CLEAN OUT AND REPLUG \_\_\_ OTHER \_\_\_

PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS

ESTIMATED DEPTH TVD 7,600' / TMD 17,596'

WELL OPERATOR CNX GAS COMPANY, LLC. DESIGNATED AGENT MATTHEW IMRICH

ADDRESS P.O. BOX 1248 ADDRESS P.O. BOX 1248

JANE LEW, WV 26378 JANE LEW, WV 26378

COUNTY NO. PERMIT

03/06/2015

## Attachment - Form WW-6A1 for CENT19EHS:

<u>Tract #</u>	<u>Grantor, Lessor, etc</u>	<u>Grantee, Lessee, etc</u>	<u>Royalty</u>	<u>Book/Page</u>
✓ 1	Harriet M. Jarvis et al Hope Natural Gas Company Consolidated Gas Supply Corp. Consolidate Gas Transmissino 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	1/8 Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change	37/513 53/261 99/481 51/795 58/362 151/423 16/577 17/1
✓ 3, 4, 6	Virginia P. Meier Trust/ WV Wesleyan College 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	1/8 Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change Merger/Name Change	47/97 20/342 51/795 58/362 151/423 16/577 17/1
✓ 9	Nancy Talbott Neff Burgess	CNX Gas Company LLC	12.50%	O&G 96/287
✓ 25	Trio Petroleum Corp, Waco Oil and Gas, Inc., Mike Ross	CNX Gas Company LLC	12.50%	98/738
✓ 24, 27, 28	Mathew Edmiston Jr., Attorney-in-Fact for Nellie Edmiston and C. H. Grove, single J & J Enterprise Inc. Eastern American Energy Corporation Energy Corporation of America	J & J Enterprise Inc. Eastern American Energy Corporation Energy Corporation of America CNX Gas Company LLC	12.50% Assignment Merger/Name Change Assignment	OG 47/313 AB 26/534 AOI 20/310 164/551

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03/06/2015