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

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,

for Gene Smith

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

4709703851 MOD

CONSOL ENERGY

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

February 26, 2015

West Virginia Department of Environmental Protection
Office of Oil & Gas
Attn: Laura Adkins
601 57th 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!

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MAR 2 2015
WV Department of
Environmental Protection

Sincerely,

Carolinda Flanagan

Carolinda Flanagan

47 0 9 7 0 3 8 5 1 MOD

WW-6B
(10/14)

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

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

			97	05	287
1) Well Operator:	CNX Gas Company LLC	494458046	Upshur	Warren	Century
		Operator ID	County	District	Quadrangle

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: _____
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	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							

MGM 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	9.675	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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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% 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.

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*Note: Attach additional sheets as needed.

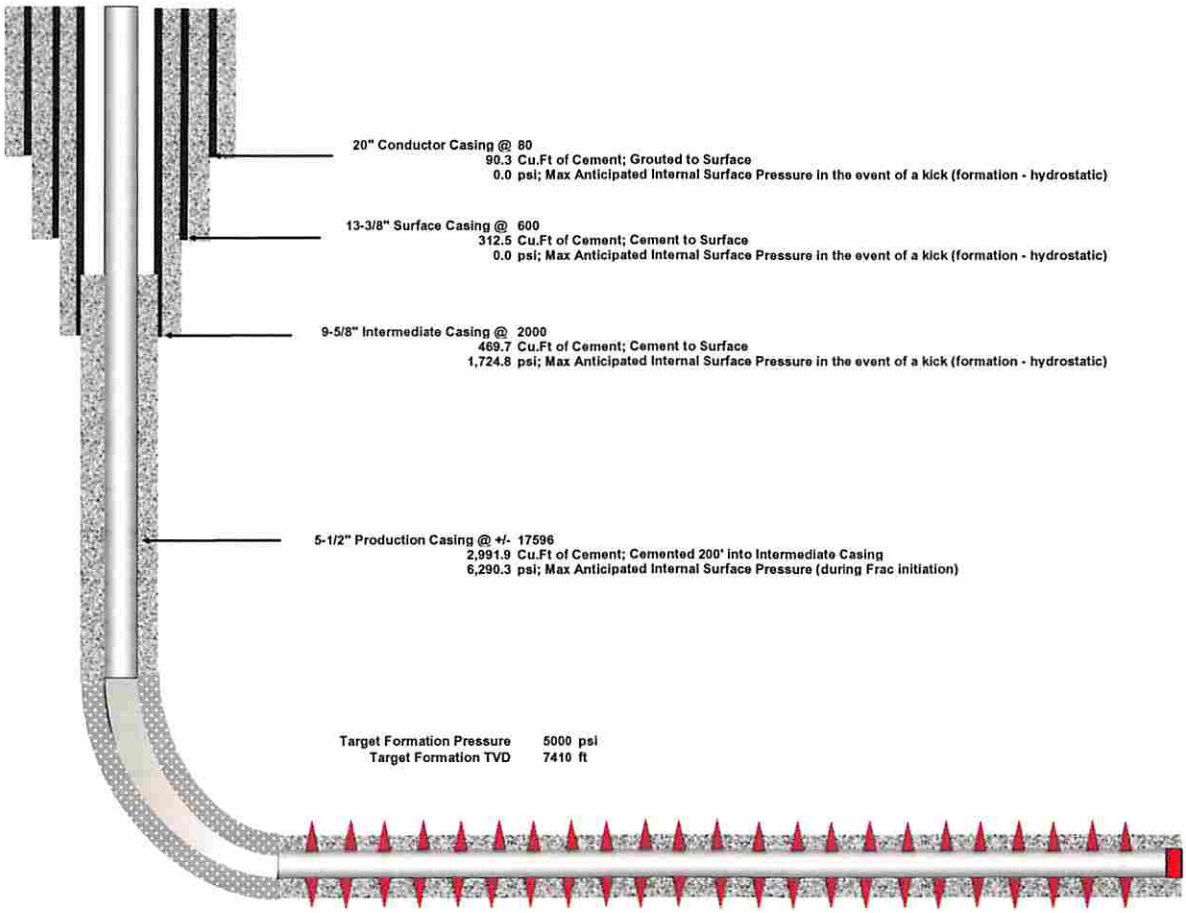
4709703851 MCD

CONSOL ENERGY

CENT19EHS

Casing Schematic

SCHEMATIC NOT TO SCALE



20" Conductor Casing @ 80
90.3 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 @ 600
312.5 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 @ 2000
469.7 Cu.Ft of Cement; Cement to Surface
1,724.8 psi; Max Anticipated Internal Surface Pressure in the event of a kick (formation - hydrostatic)

5-1/2" Production Casing @ +/- 17596
2,991.9 Cu.Ft of Cement; Cemented 200' into Intermediate Casing
6,290.3 psi; Max Anticipated Internal Surface Pressure (during Frac initiation)

Target Formation Pressure 5000 psi
Target Formation TVD 7410 ft

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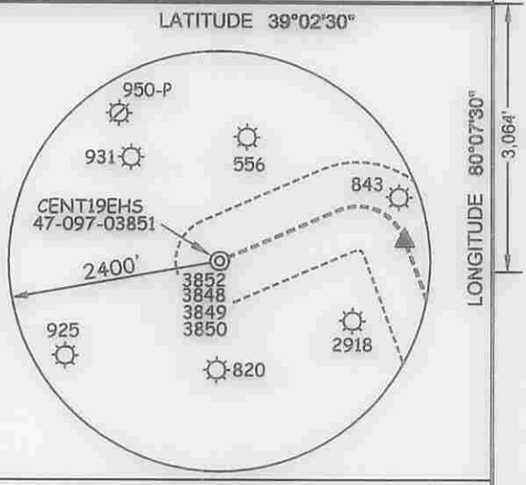
FORM WW 6

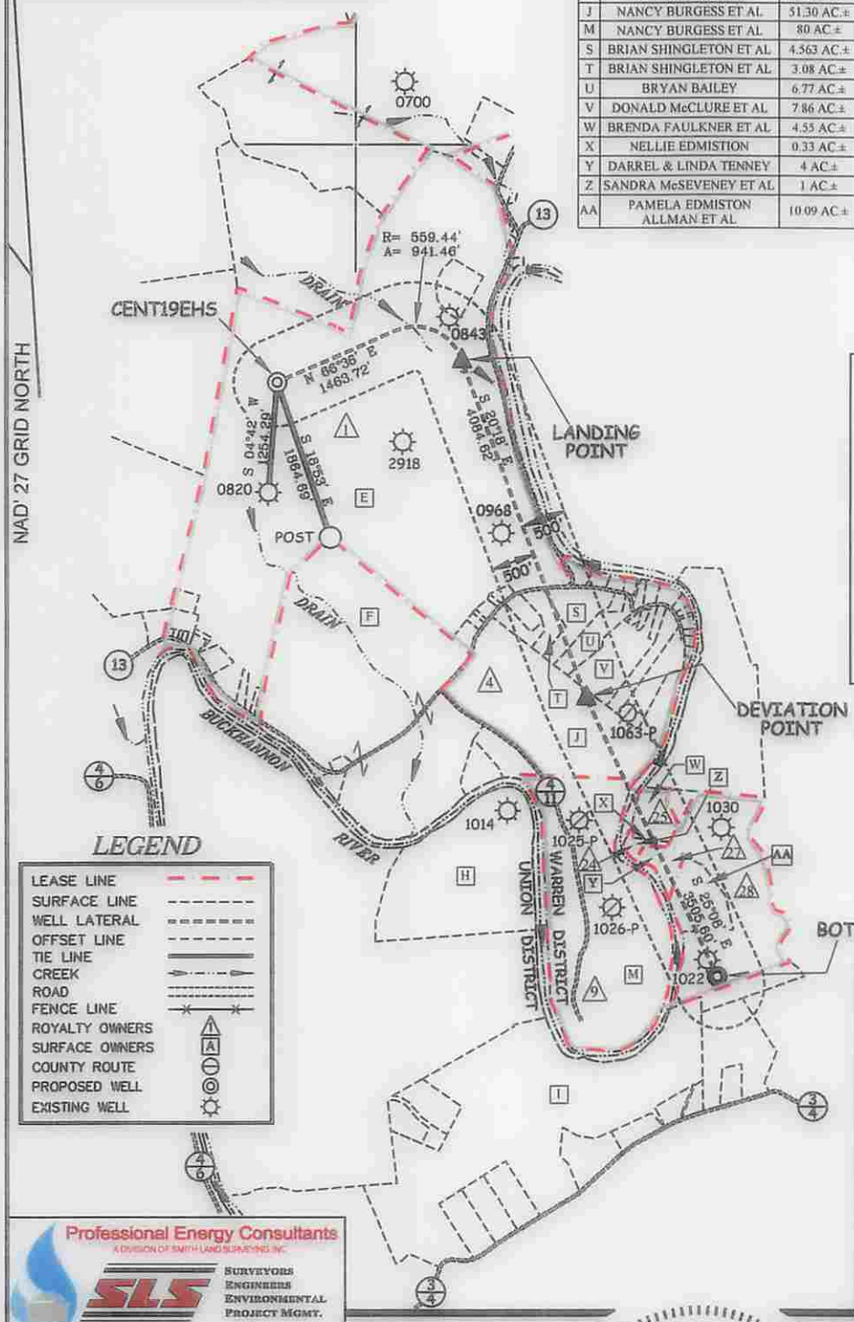
11,566'

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.±
I	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 EDMISTION	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.±





WELL NO. CENT19EHS

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

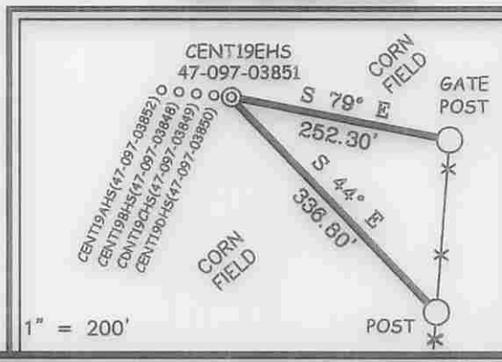
NAD'27 S.P.C.(FT)	N. 741,472	E. 2,237,010
NAD'27 GEO.	LAT-(N) 39.03325	LONG-(W) 80.16571
NAD'83 UTM (M)	N. 4,320,809	E. 572,226
LANDING POINT		
NAD'27 S.P.C.(FT)	N. 741,719	E. 2,239,118
NAD'27 GEO.	LAT-(N) 39.03388	LONG-(W) 80.15829
NAD'83 UTM (M)	N. 4,320,884	E. 572,868
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	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. 259887000
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



Professional Energy Consultants
A DIVISION OF SMITH LAND SURVEYING INC.
SLS
SURVEYORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT.
(304) 462-5634
WWW.SLSSURVEYS.COM

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. 677 Gregory A. Smith

GREGORY A. SMITH
LICENSED
No. 677
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

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

DATE APRIL 08 , 20 13

REVISED FEBRUARY 10 , 20 15

OPERATORS WELL NO. CENT19EHS

API WELL NO. 47 — 097 — 03851
STATE COUNTY PERMIT

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

SCALE 1" = 2000'

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE)

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

WELL TYPE: OIL ____ GAS X LIQUID INJECTION ____ WASTE DISPOSAL ____ IF "GAS" PRODUCTION X STORAGE ____ DEEP ____ SHALLOW X

LOCATION: ELEVATION GROUND 1583.3' PROPOSED 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 X CONVERT ____ DRILL DEEPER ____ REDRILL ____ FRACTURE OR STIMULATE X 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 NAME

PERMIT

Attachment - Form WW-6A1 for CENT19EHS:

Tract #	Grantor, Lessor, etc	Grantee, Lessee, etc	Royalty	Book/Page
1	**Harriet M. Jarvis et al**	**Hope Natural Gas Company**	**1/8**	**37/513**
	Hope Natural Gas Company	Consolidated Gas Supply Corp.	Merger/Name Change	53/261
	Consolidated Gas Supply Corp.	Consolidated Gas Transmission Corp.	Merger/Name Change	99/481
	Consolidate Gas Transmissino Corp.	CNG Transmission Corp	Merger/Name Change	51/795
	CNG Transmission Corp	Dominion Transmission, Inc.	Merger/Name Change	58/362
	Dominion Transmission, Inc.	Consol Energy Holdings, LLC, XVI	Merger/Name Change	151/423
	Consol Energy Holdings, LLC, XVI	Consol Gas Company	Merger/Name Change	16/577
	Consol Gas Company	CNX Gas Company LLC	Merger/Name Change	17/1
3, 4, 6	**Virginia P. Meier Trust/ WV Wesleyan College**	Consolidated Gas Supply Corp.	**1/8**	47/97
	Consolidated Gas Supply Corp.	Consolidated Gas Transmission Corp.	Merger/Name Change	20/342
	Consolidated Gas Transmission Corp.	CNG Transmission Corp	Merger/Name Change	51/795
	CNG Transmission Corp	Dominion Transmission, Inc.	Merger/Name Change	58/362
	Dominion Transmission, Inc.	Consol Energy Holdings, LLC, XVI	Merger/Name Change	151/423
	Consol Energy Holdings, LLC, XVI	Consol Gas Company	Merger/Name Change	16/577
	Consol Gas Company	CNX Gas Company LLC	Merger/Name Change	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.**	**12.50%**	**OG 47/313**
	J & J Enterprise Inc.	Eastern American Energy Corporation	Assignment	AB 26/534
	Eastern American Energy Corporation	Energy Corporation of America	Merger/Name Change	AOI 20/310
	Energy Corporation of America	CNX Gas Company LLC	Assignment	164/551

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