



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 9703850 , Well #: CENT 19 DHS
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 0 9 7 0 3 8 5 0 MOD



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 57th Street, SE
Charleston, WV 25304-2345

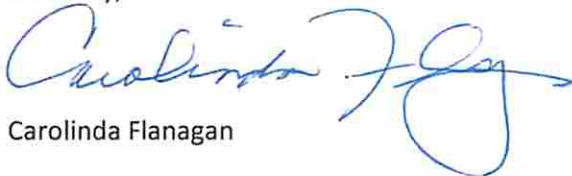
RE: CENT19AHS - API# 47-097-03857 (Lateral Extension – extending 5381.18' more)
CENT19BHS - API# 47-097-03848 (Lateral Extension – extending 4551.42 more)
CENT19CHS - API# 47-097-03849 (Lateral Extension – extending 4519.26' more)
CENT19DHS - API# 47-097-03850 (Lateral Extension – extending 1031.66 more)
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!

Sincerely,


Carolinda Flanagan

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03/06/2015

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 Upshur Warren Century
Operator ID County District Quadrangle

2) Operator's Well Number: CENT19DHS 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: 17925'

11) Proposed Horizontal Leg Length: 8823'

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 RECEIVED Office of Oil and Gas

(a) If Yes, provide Mine Info: Name: _____ MAR 2 2015

Depth: _____

Seam: _____

Owner: _____

WV Department of Environmental Protection

4709703850 *MOO*

WW-6B
(10/14)

API NO. 47-097 - 03850

OPERATOR WELL NO. CENT19DHS

Well Pad Name: CENT19HS

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
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	17925	17875	3054.2
Tubing	2.375	N	J-55	4.7		7500	
Liners							

RISN
3/5/15

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Max. Associated Surface Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
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				RECEIVED Office of Oil and Gas MAR 2 2015
Sizes:	None				WV Department of Environmental Protection
Depths Set:	None				

WW-6B
(10/14)

API NO. 47-097 - 03850

OPERATOR WELL NO. CENT19DHS

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 17925'. 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

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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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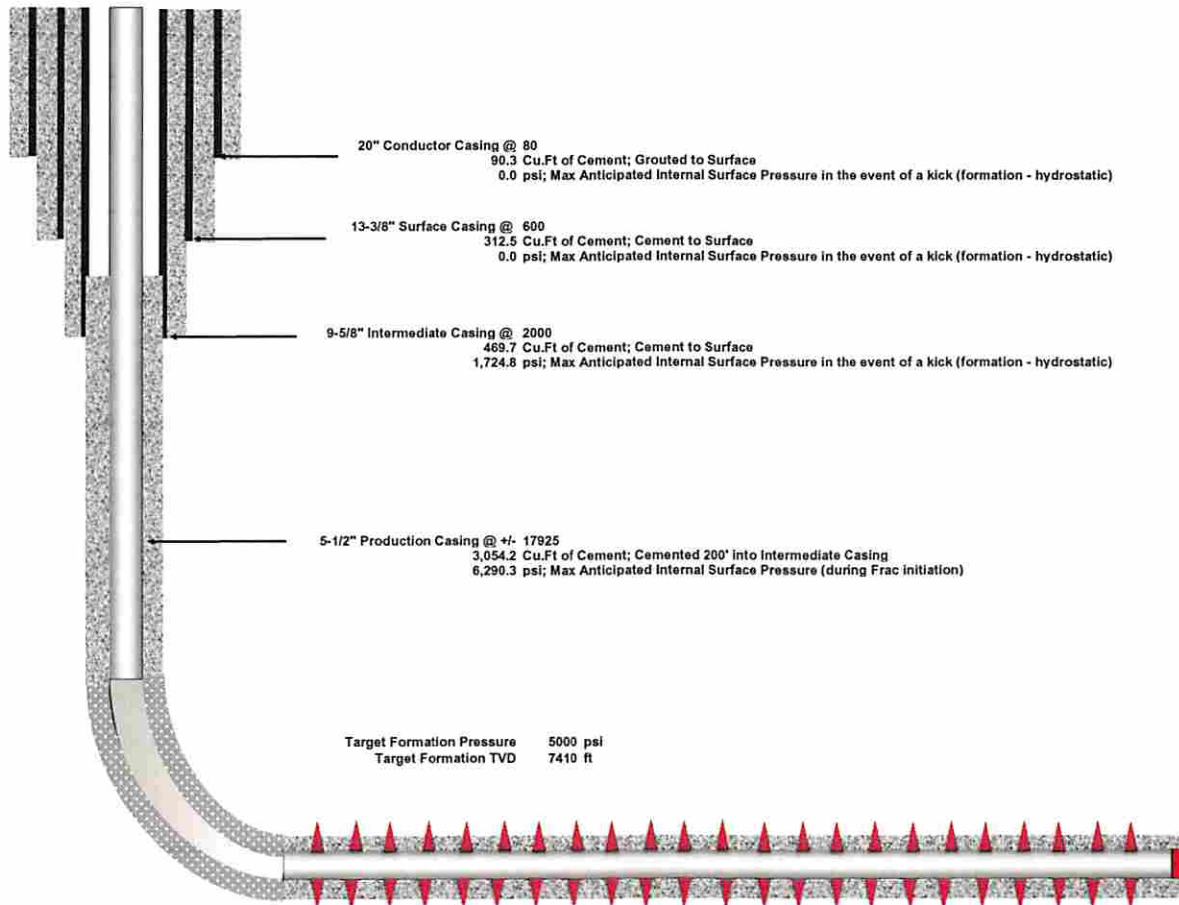
*Note: Attach additional sheets as needed.



CENT19DHS

Casing Schematic

SCHEMATIC NOT TO SCALE



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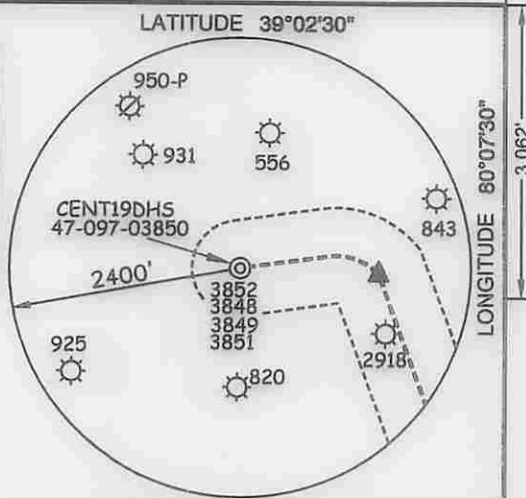
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03/06/2015

SURFACE OWNERS		
E	WILLIAM P. ROHR	338.82 AC±
F	ERVIN & MADELINE SKINNER	124.41 AC±
G	T & B VENTURES LLC BKHN RIVER PROPS. LP	314.25 AC±
H	TIMOTHY G. HUNTER	50.16 AC±
I	HOWARD G. BLUM	113.65 AC±
J	NANCY BURGESS ET AL	51.30 AC±
L	TIMOTHY G. HUNTER	4.7 AC±
M	NANCY BURGESS ET AL	80 AC±
O	CODY CLEM ET AL	0.73 AC±
P	WILLIAM STRUBLE ET AL	0.24 AC±
Q	WILLIAM STRUBLE ET AL	0.46 AC±
R	LLOYD & LOIS ARBOGAST	2 AC±

ROYALTY OWNERS			
TRACT 1	HARRIET M. JARVIS ET AL	485 AC±	LEASE NO. 132520000
TRACT 3	VIRGINIA M. P. MEIER ET AL	5.36 AC±	LEASE NO. 132557000
TRACT 4	VIRGINIA M. P. MEIER ET AL	109.80 AC±	LEASE NO. 132557000
TRACT 6	VIRGINIA M. P. MEIER ET AL	4.70 AC±	LEASE NO. 259887000
TRACT 9	NANCY TALBOTT ET AL	80 AC±	LEASE NO. 251768001
TRACT 12	MABEL & RAYMOND STEEL	113.12 AC±	LEASE NO. 251768002
	ANDREW & CAROLYN BRINKLEY		LEASE NO. 267296000
TRACT 21	MABEL & RAYMOND STEEL	2 AC±	LEASE NO. 251768001
	ANDREW & CAROLYN BRINKLEY		LEASE NO. 251768002
	PORTER & ROSA BRINKLEY		LEASE NO. 267296000



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	⊛

WELL NO. CENT19DHS

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

NAD'27 S.P.C.(FT) N. 741,474 E. 2,236,990
 NAD'27 GEO. LAT-(N) 39.03326 LONG-(W) 80.16578
 NAD'83 UTM (M) N. 4,320,810 E. 572,220

LANDING POINT

NAD'27 S.P.C.(FT) N. 741,417 E. 2,238,430
 NAD'27 GEO. LAT-(N) 39.03307 LONG-(W) 80.16072
 NAD'83 UTM (M) N. 4,320,792 E. 572,658

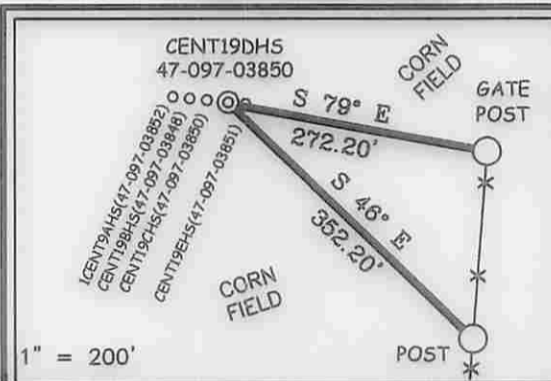
BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 733,126 E. 2,241,447
 NAD'27 GEO. LAT-(N) 39.01023 LONG-(W) 80.15036
 NAD'83 UTM (M) N. 4,318,267 E. 573,578

NOTES ON SURVEY

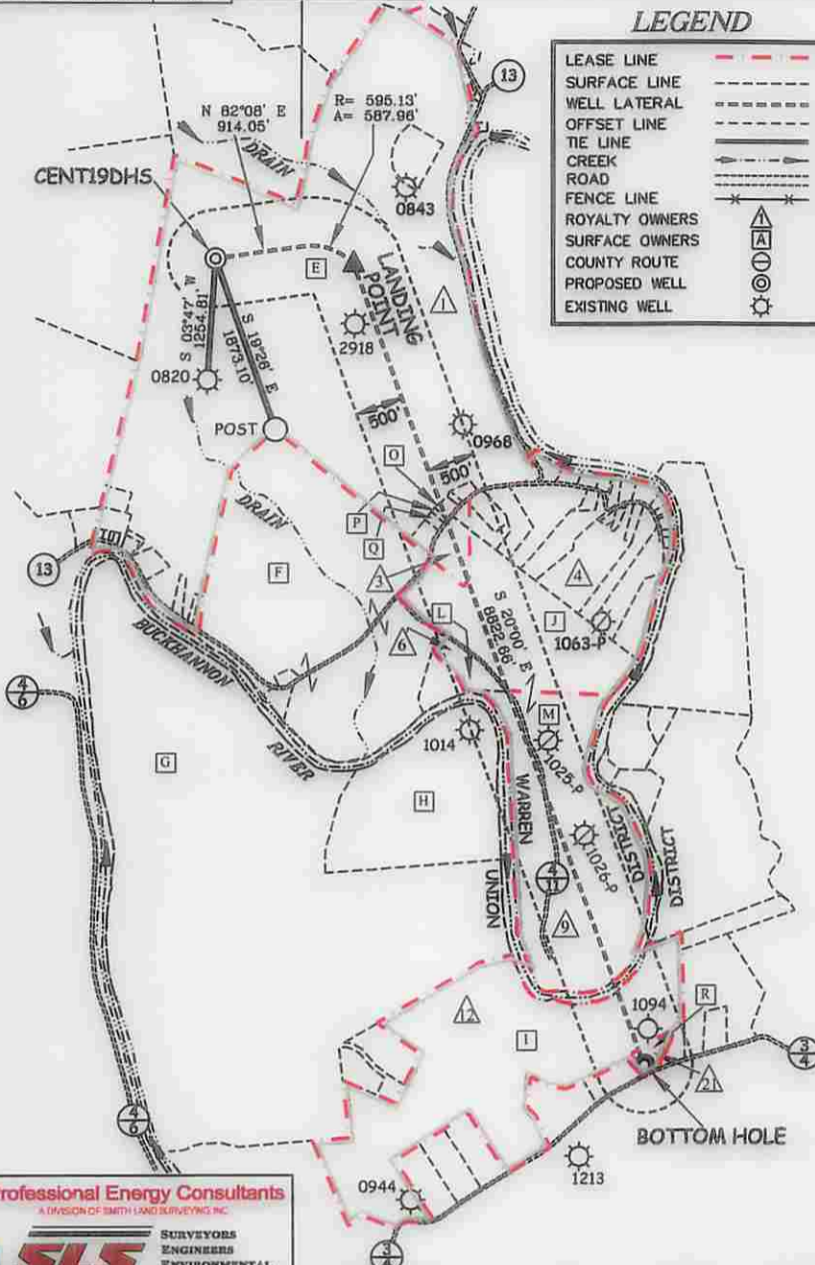
1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.

REFERENCES



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE APRIL 08, 20 13
 REVISED FEBRUARY 10, 20 15
 OPERATORS WELL NO. CENT19DHS
 API WELL NO. 47-97-03850 **WAD**
 STATE WV COUNTY UPSHUR PERMIT 03/06/2015

NAD' 27 GRID NORTH



Professional Energy Consultants
 A DIVISION OF SMITH LAND SURVEYING, INC.

 SURVEYORS
 ENGINEERS
 ENVIRONMENTAL
 PROJECT MGMT.
 (304) 462-5634 WWW.SLSURVEYS.COM

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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



MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7830P19DHSR5
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE) SCALE 1" = 2000'

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

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: GROUND 1582.6' 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: 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 17,925'

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 CENT19DHS:

<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	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
✓ 12, 21	Mabel & Raymond Steel, Andrew & Carolyn Brinkley, and Porter & Rosa Brinkley C.L. Eleson Sunset International Petroleum Corporation SIPCO, Inc. Sunset International Petroleum Corporation Marth Oil Co. Crown Central Petroleum Corporation Johnson Energy Co. Glenn H. Johnson Mountain V Oil & Gas, Inc. North Coast Energy Eastern, Inc. EXCO - North Coast Energy Eastern, Inc. EXCO Resources, Inc.	C.L. Eleson Sunset International Petroleum Corporation SIPCO, Inc. Sunset International Petroleum Corporation Marth Oil Co. Crown Central Petroleum Corporation Johnson Energy Co. Glenn H. Johnson Mountain V Oil & Gas, Inc. North Coast Energy Eastern, Inc. EXCO - North Coast Energy Eastern, Inc. EXCO Resources, Inc. CNX Gas Company LLC	12.50% Assignment Merger/Name Change Merger/Name Change Assignment Assignment Assignment Assignment Assignment Assignment Merger/Name Change Assignment Assignment	LB 46/430 AB 8/165 AOI 4/149 AOI 4/164 DB 221/228 DB 221/228 AB 21/203 AB 32/274 AB 33/551 AB 46/54 AOI 20/269 RB 149/1 56/285

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