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

June 09, 2014

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

Re: Permit Modification Approval for API Number 103284 , Well #: AUD7BHS
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

1-03284 MOD

CONSOL ENERGY

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

March 26, 2014

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

RE: AUD7BHS - API# 47-001-03284 (Lateral Extension)

Dear Laura,

Enclosed, please find a modification for the AUD7BHS for extending the lateral. I have attached an updated casing plan, mylar plat, and lease breakdown.

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

Received
APR 18 2014
Office of Oil and Gas
WV Dept. of Environmental Protection

1-03284 MOD

WW-6B
(9/13)

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 (Operator ID) | Barbour (County) | Philippi (District) | Audra (Quadrangle)

2) Operator's Well Number: AUD7BHS Well Pad Name: AUD7HS

3) Farm Name/Surface Owner: Brian E. & Lisa L. Murphy Public Road Access: Delta Rt. 8

4) Elevation, current ground: 1568' Elevation, proposed post-construction: 1571'

5) Well Type (a) Gas ■ Oil ■ Underground Storage ____
Other ____
(b)If Gas Shallow ■ Deep ____
Horizontal ■

6) Existing Pad: Yes or No NO

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target - Marcellus, Depth - 7950', Thickness - 90', Pressure - 4000#

8) Proposed Total Vertical Depth: 7950'

9) Formation at Total Vertical Depth: Oriskany Sand

10) Proposed Total Measured Depth: 18620'

11) Proposed Horizontal Leg Length: 9460'

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

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

14) Approximate Saltwater Depths: None Reported

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 ☑

(a) If Yes, provide Mine Info: Name: ____
Depth: ____
Seam: ____
Owner: ____

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WV Dept. of Environmental Protection

1-03284 MOD

WW-6B
(9/13)

18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20"	N	J-55	94#	79'	79'	Grout to surface w/ Class A type cement
Fresh Water	13 3/8"	N	J-55	54.5#	500'	500'	CTS w/ Class A Type Cement
Coal							
Intermediate	9 5/8"	N	J-55	36#	2000'	2000'	CTS w/ Class A Type Cement
Production	5 1/2"	N	P-110	20#	18620'	18620'	2200 cu. ft. w/ 50/50 POZ Lead & Class A
Tubing	2 3/8"	N	J-55	4.7#	8450'	8450'	
Liners							

Lionel Gigolch 3-27-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
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			
Sizes:	None			
Depths Set:	None			

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APR 18 2014

Office of Oil and Gas
WV Dept of Environmental Protection

1-03284/MOD

WW-6B
(9/13)

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 18620'. Well to be drilled to a TVD of 7950', formation at TVD - Oriskany Sand. 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): 19.0 Acres

22) Area to be disturbed for well pad only, less access road (acres): 17.0 Acres

23) 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 forth joint until inside surface casing. Production - Rigid bow spring centralizer on first joint then every 2 casing joints (free floating) through the lateral and 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. 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

25) Proposed borehole conditioning procedures:

Conductor - The hole is 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 will be 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 minimum of one hole volume prior to pumping cement.

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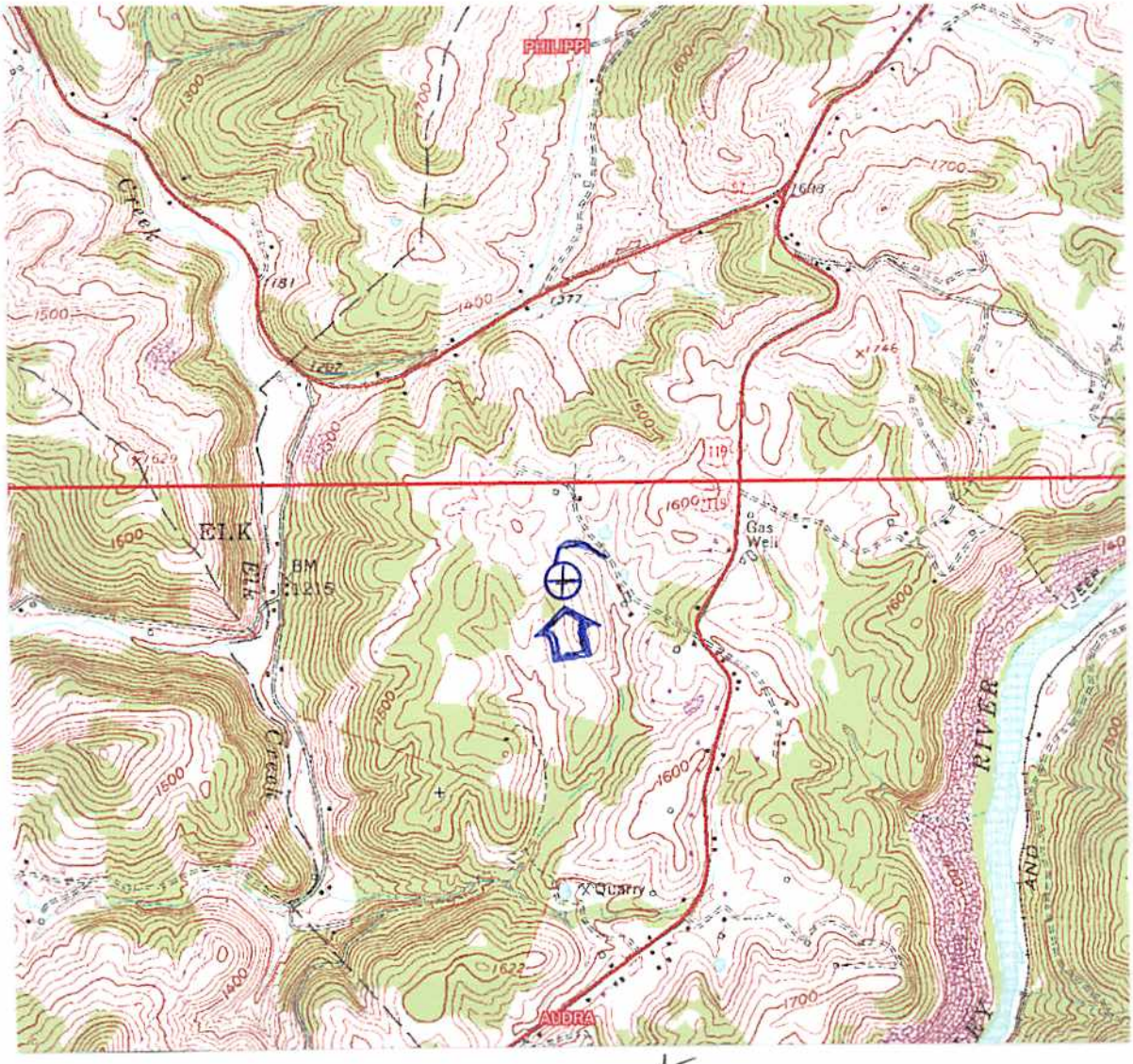
*Note: Attach additional sheets as needed.

1-03284



JMcCourt
8-30-12

DRAWINGS TO ACCOMPANY FORM WW-9

CNX GAS COMPANY LLC

P. O. BOX 1248

JANE LEW, WV 26378

WATERSHED: ELK CREEK

DISTRICT: PHILIPPI **COUNTY:** BARBOUR

QUADRANGLE: AUDRA **WELL NO.:** AUD7BHS

DATE: 07/20/12 **PAGE** ____ **of** ____

RECEIVED
Office of Oil and Gas

SEP 14 2012

WV Department of
Environmental Protection

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

LATITUDE 39-07-30

NAD 83 ZONE 17 UTM COORDINATES:		
AUD7BHS =	4,330,725.91 m	579,210.42 m
LAND PT. =	4,330,609.83 m	579,425.81 m
BOT. HOLE =	4,328,679.24 m	581,566.30 m

SCALED COOR.:
150' WEST
1095' SOUTH

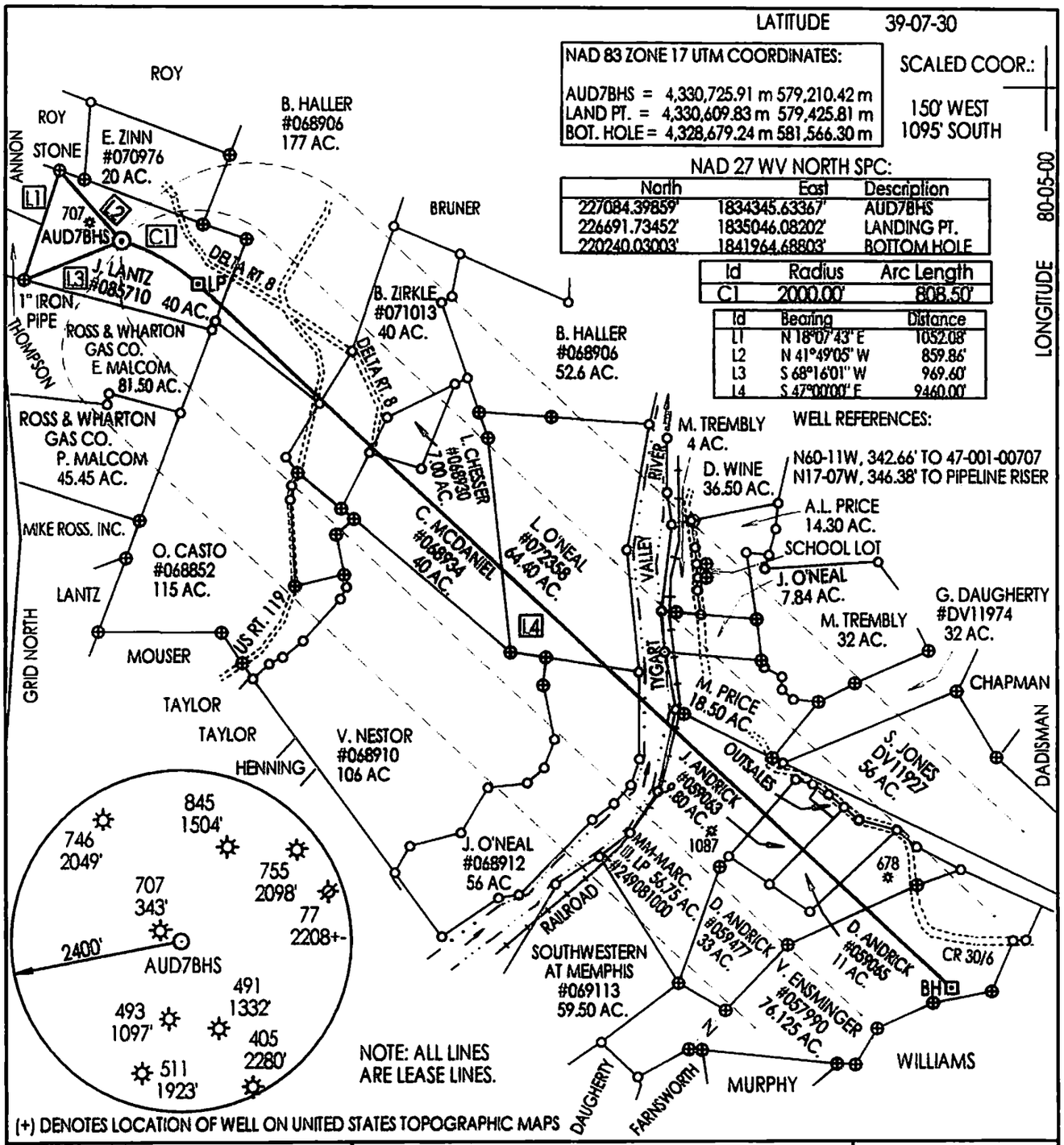
NAD 27 WV NORTH SPC:

North	East	Description
227084.39859'	1834345.63367'	AUD7BHS
226691.73452'	1835046.08202'	LANDING PT.
220240.03003'	1841964.68803'	BOTTOM HOLE

Id	Radius	Arc Length
C1	2000.00'	808.50'

Id	Bearing	Distance
L1	N 18°07'43" E	1052.08'
L2	N 41°49'05" W	859.86'
L3	S 68°16'01" W	969.60'
L4	S 47°00'00" E	9460.00'

WELL REFERENCES:
N60-11W, 342.66' TO 47-001-00707
N17-07W, 346.38' TO PIPELINE RISER



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

FILE NUMBER:
DRAWING NUMBER: CNXAUD7BHSR1.PCS
SCALE: 1" = 1300'
MINIMUM DEGREE OF ACCURACY: SUBMETER
PROVEN SOURCE OF ELEVATION: DGPS SURVEY
RTK CENTIMETER 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

PROFESSIONAL LAND SURVEYOR
STEPHEN D LOSH
NO. 674
STATE OF WEST VIRGINIA
PLACE SEAL HERE

FORM WW-6

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: MARCH 17, 2014
OPERATORS WELL NO.: AUD7BHS
REV. PLAT FOR LEG EXTENSION
API WELL NO.
47 — 001 — 03284 H6A MOD
STATE COUNTY PERMIT

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

LOCATION: ELEVATION 1568' WATERSHED ELK CREEK
DISTRICT PHILIPPI COUNTY BARBOUR
QUADRANGLE AUDRA LEASE NUMBER SEE ABOVE
SURFACE OWNER BRIAN E. & LISA L. MURPHY ACREAGE 38.00 (13-10)
OIL & GAS ROYALTY OWNER O. CASTO, ET. AL. UNIT LEASE ACREAGE 1048.63

PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) HORIZONTAL
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD = 7950' TMD = 18620'
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

08-05-00
LONGITUDE
COUNTY NAME
PERMIT