



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

August 14, 2014

WELL WORK PERMIT
Horizontal 6A Well

This permit, API Well Number: 47-9703857, issued to CNX GAS COMPANY LLC , is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: CENT 19 AHS
Farm Name: ROHR, WILLIAM P.
API Well Number: 47-9703857
Permit Type: Horizontal 6A Well
Date Issued: 08/14/2014

Promoting a healthy environment.

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

WW-6B
(9/13)

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

97 5 287

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

2) Operator's Well Number: CENT19AHS Well Pad Name: Century 19

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 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):
Formation - Marcellus, Depth - 7410', Thickness - 90', Pressure - 3000#

8) Proposed Total Vertical Depth: 7600'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 12589'

11) Proposed Horizontal Leg Length: 5468'

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

13) Method to Determine Fresh Water Depths: Reference offset wells

14) Approximate Saltwater Depths: None Reported

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

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

Depth: _____

Seam: _____

Owner: None of Declaration _____

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WW-6B
(9/13)

18) CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20"	N	L.S.	81.3#	80'	80'	Sand In
Fresh Water	13 3/8"	N	J-55	54.5#	600'	600'	CTS w/ Approved Class A Type Cement
Coal							
Intermediate	9 5/8"	N	J-55	36#	2000'	2000'	CTS w/ Approved Class A Type Cement
Production	5 1/2"	N	P-110	20#	12589'	12589'	2400 cu. ft. W/ 50/50 POZ Lead & Class A
Tubing	2 3/8"	N	J-55	4.7#	7900'	7900'	
Liners							

Billie Hayfield 3/26/2014

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
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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(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 12589'. Well to be drilled to a TVD of 7600' for logging purposes, formation at TVD - Onondaga. Well will be plugged back to an approximate depth of 6800' (approximate due to exact Kick of point being unknown). Plugging back will be done using the displacement method and solid cement 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.
Expected Max Pressure - 9500psi
Expected Max Rate - 100 bbl/min

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APR 23 2014

21) Total Area to be disturbed, including roads, stockpiles, etc., (acres): 25 Acres

22) Area to be disturbed for well pad only, less access road (acres): 16 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 fourth joint until inside Surface casing. Production - Rigid bow spring centralizer on first joint then every 2 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 is 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 is 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.

*Note: Attach additional sheets as needed.

Cement Additives

- Conductor – 2% CaCl₂
- Freshwater/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

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Office of Oil and Gas
WV Dept. of Environmental Protection

WW-9
(9/13)

API Number 47 - 097 - 03857
Operator's Well No. CENT19AHS

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name CNX Gas Company LLC OP Code 494458046

Watershed (HUC 10) Buckhannon River Quadrangle Century 7.5

Elevation 1582 County Upshur District Warren

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: _____

Will a synthetic liner be used in the pit? Yes No If so, what ml.? 60ml

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Recycle on other well on same pad or adjacent pads)

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Will closed loop system be used? If so, describe: No

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air and water based mud

-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? Bactericide, Polymers, and Weighting Agents

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? MeadowFill, Northwestern Landfill, Max Environmental Yukon Landfill and Bulger Landfill

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

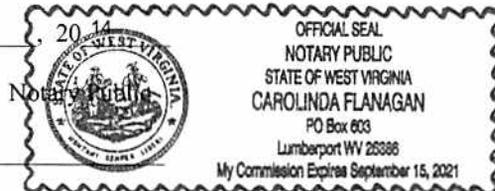
Company Official Signature *Jeremy Jones*

Company Official (Typed Name) Jeremy Jones

Company Official Title Designated Agent - General Manager, WV Gas Operations

Subscribed and sworn before me this 10th day of April

Carolina Flanagan
My commission expires 09/15/2021



Form WW-9

Operator's Well No. CENT19AHS

CNX Gas Company, LLC

Proposed Revegetation Treatment: Acres Disturbed 25 Prevegetation pH 6.5

Lime according to pH test Tons/acre or to correct to pH 7.0

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch Hay or Straw / 2 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Orchardgrass	25
Birdsfoot Trefoil	15
Landino Clover	10

Seed Type	lbs/acre
Orchardgrass	25
Birdsfoot Trefoil	15
Landino Clover	10

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Bill Halford

Comments: _____

Title: oil & gas inspector

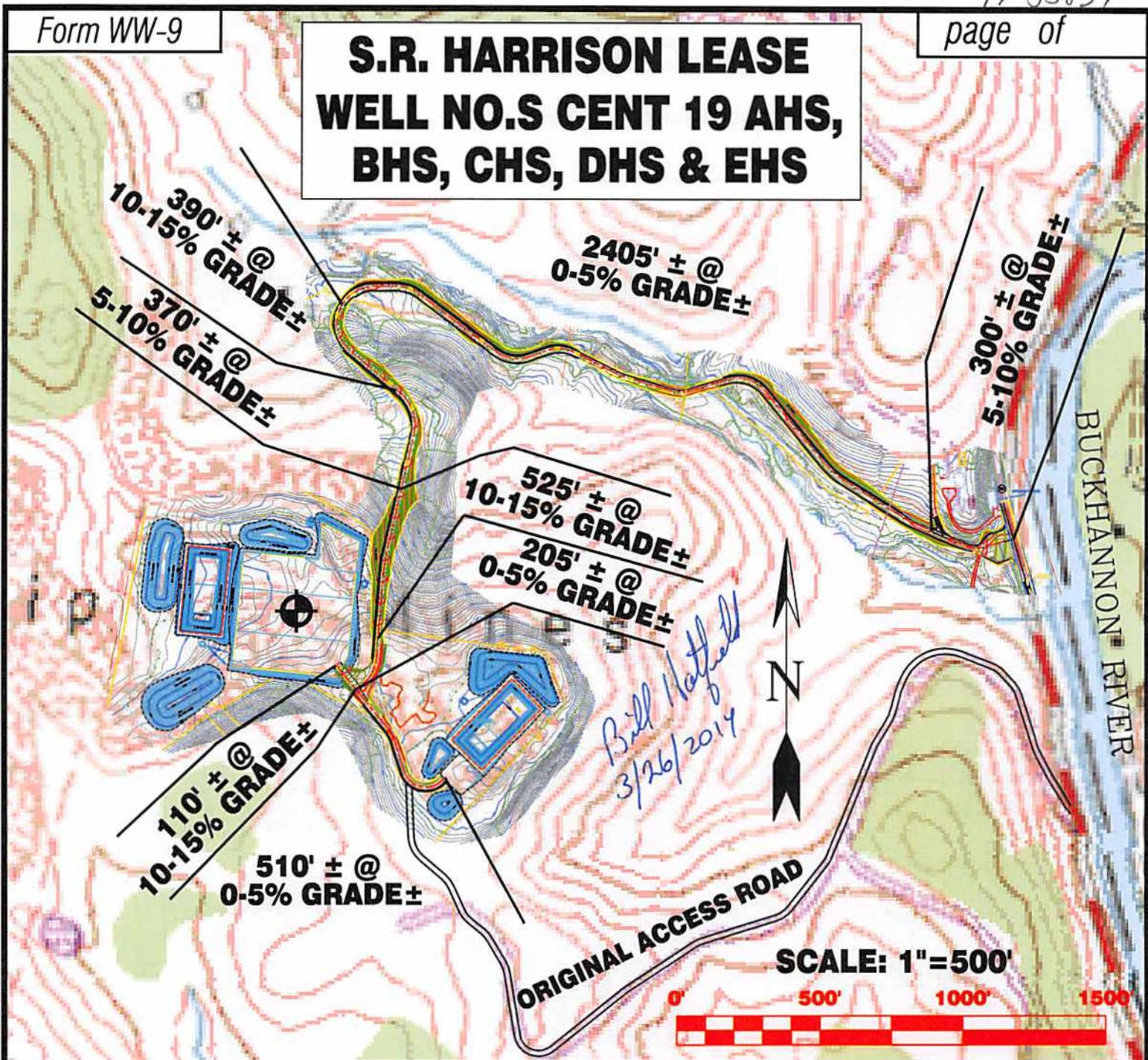
Date: 3/26/2014

Field Reviewed? () Yes () No

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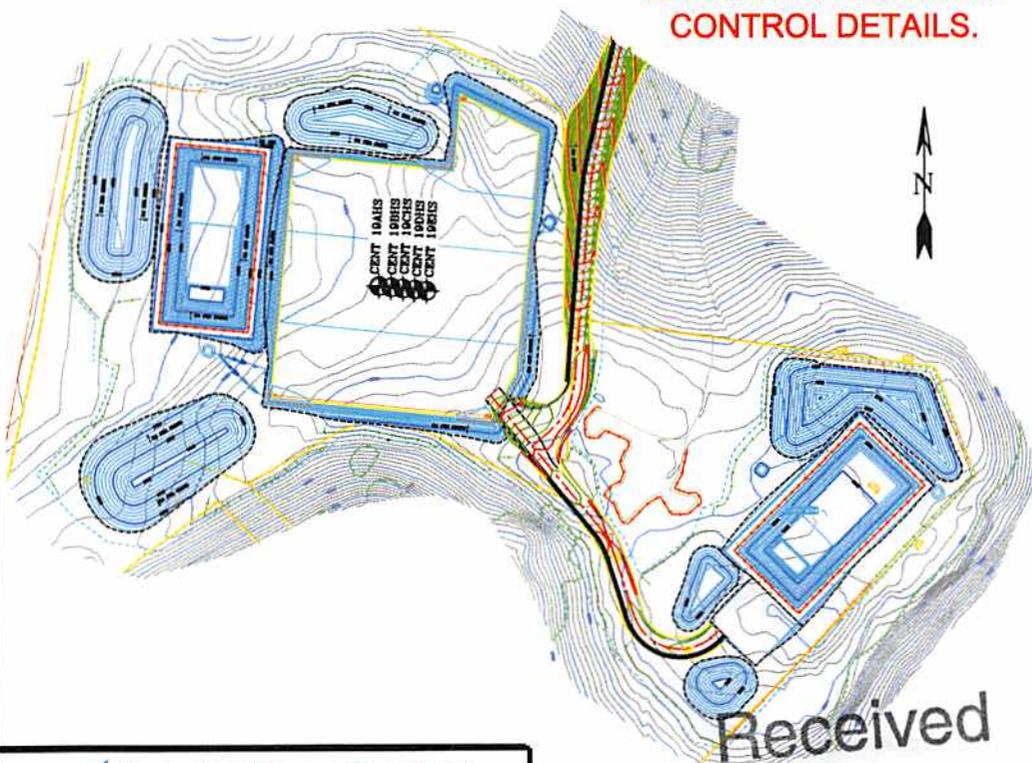
S.R. HARRISON LEASE WELL NO.S CENT 19 AHS, BHS, CHS, DHS & EHS



Detail Sketch for Proposed CENT 19 AHS, BHS, CHS, DHS & EHS

**NOTE: SEE SITE PLAN
CENT 19 FOR COMPLETE
CONSTRUCTION &
EROSION & SEDIMENT
CONTROL DETAILS.**

**NOTE: SEE SITE PLAN
CENT 19 FOR COMPLETE
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CONTROL DETAILS.**



ALL ROADS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED AND SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.E.P. OIL AND GAS BMP MANUAL ENTRANCES AT COUNTY/STATE ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATION. SEPARATE PERMITS MAY BE REQUIRED BY THE D.O.T.

SEDIMENT BASINS (TRAPS) AND APPROPRIATE EROSION CONTROL BARRIERS ARE TO BE CONSTRUCTED AT ALL CULVERT AND CROSS DRAIN INLETS AND OUTLETS AS REQUIRED IN THE WV D.E.P. OIL AND GAS BMP MANUAL. FIELD CONDITIONS (ROCK OUTCROPS AND BEDROCK) MAY PROHIBIT INLET TRAPS BEING INSTALLED. WHEN THESE CONDITIONS EXIST ADDITIONAL EROSION CONTROL MEASURES SHALL BE EVALUATED AND UTILIZED AS NEEDED.

EARTHWORK CONTRACTORS ARE RESPONSIBLE FOR NOTIFICATION TO THE OPERATOR AND INSPECTOR PRIOR TO ANY DEVIATION FROM THIS PLAN.

TEMPORARY SEED & MULCH ALL SLOPES AFTER CONSTRUCTION OF LOCATION.

CUT & STACK ALL MARKETABLE TIMBER.

STACKED BRUSH MAY BE USED FOR SEDIMENT CONTROL.

APPLICATIONS FOR SEPARATE PLC PERMITS ON THE ACCESS ROAD STREAM CROSSINGS HAVE BEEN PREPARED (IF APPLIES)

- = EXISTING CULVERT
- = PROPOSED CULVERT 12" MIN. UNLESS OTHERWISE NOTED
- = PROPOSED STREAM CROSSING
- = PROPOSED LIMITS OF DISTURBANCE

APR 23 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

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

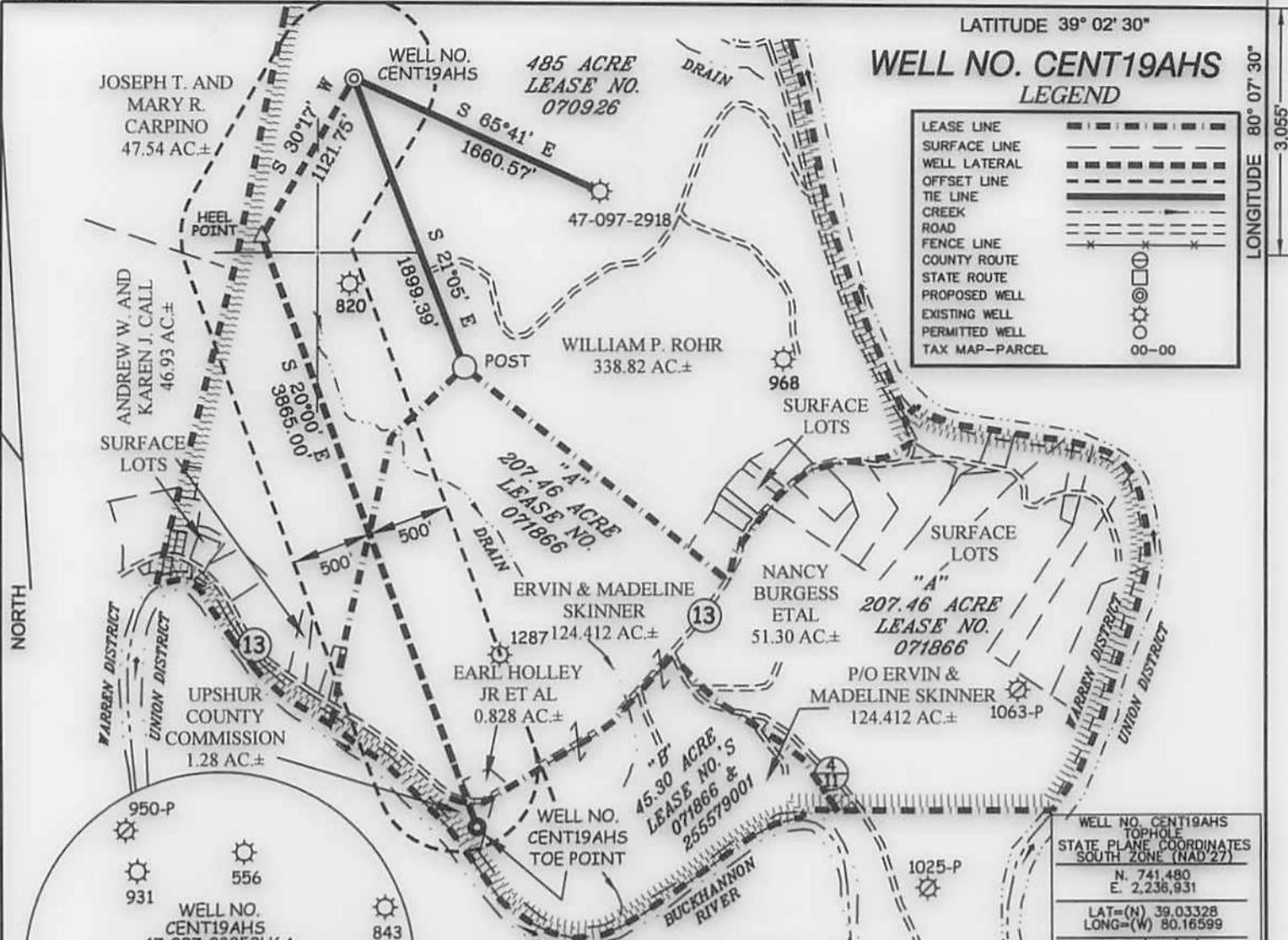
SLS
SURVEYORS
ENGINEERS
ENVIRONMENTAL
PROJECT MGMT.

(304) 462-5634
WWW.SLSURVEYS.COM

DRAWN BY K.D.W.	FILE NO. 7830	DATE 03/18/14	CADD FILE: 7830REC.PLAN.DWG
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WELL NO. CENT19AHS LEGEND

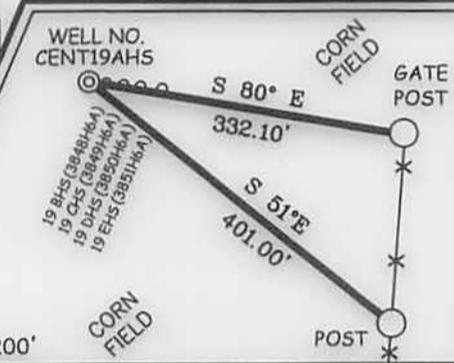
LEASE LINE	---
SURFACE LINE	---
WELL LATERAL	---
OFFSET LINE	---
TIE LINE	---
CREEK	---
ROAD	---
FENCE LINE	---
COUNTY ROUTE	---
STATE ROUTE	---
PROPOSED WELL	☉
EXISTING WELL	☼
PERMITTED WELL	⊙
TAX MAP-PARCEL	00-00



WELL NO. CENT19AHS TOPHOLE STATE PLANE COORDINATES SOUTH ZONE (NAD'27)	
N. 741,480	E. 2,238,931
LAT=(N) 39.03328	LONG=(W) 80.16599
UTM (NAD'83)	
N. 4,320,811	E. 572,202

WELL NO. CENT19AHS HEEL POINT STATE PLANE COORDINATES SOUTH ZONE (NAD'27)	WELL NO. CENT 19 AHS TOE POINT STATE PLANE COORDINATES SOUTH ZONE (NAD'27)
N. 740,511 E. 2,236,365	N. 736,879 E. 2,237,687
HEEL POINT (NAD'27) LAT=(N) 39.03063 LONG=(W) 80.16801	TOE POINT (NAD'27) LAT=(N) 39.02063 LONG=(W) 80.16348
HEEL POINT UTM (NAD'83) N. 4,320,516 E. 572,029	TOE POINT UTM (NAD'83) N. 4,319,410 E. 572,432

REFERENCES



NOTES ON SURVEY

1. TIES TO WELLS, REFERENCES, AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM SOUTH ZONE NAD '27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM A DEED BOOK 85 PAGE 259 AND ADJOINING DEEDS.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF UPSHUR COUNTY IN JULY, 2014.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE).
5. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250'. NO APPLICABLE DWELLINGS OR BUILDINGS WITHIN 625'.

ROYALTY OWNERS	ACRES	LEASE NO.
A VIRGINIA P. MEIER TRUST/WV WESLEYAN COLLEGE	207.46	071866
B VIRGINIA P. MEIER TRUST/WV WESLEYAN COLLEGE & FRANKLIN W. WHITE	45.30	071866 255579001



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. 2266 *[Signature]*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE APRIL 8, 20 13
 REVISED MARCH 18 & AUGUST 11, 20 14
 OPERATORS WELL NO. CENT19AHS
 API WELL NO. 47-97-03857H6A
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7830P19AHSR7 (422-02)
 PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE) SCALE 1" = 1000'

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 PROPOSED
 ELEVATION 1582.0' 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 LEASE 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 12,589'

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