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

August 12, 2014

CNX GAS COMPANY LLC
POST OFFICE BOX 1248
JANE LEW, WV 26378

Re: Permit Modification Approval for API Number 1706414 , Well #: OXFD 11 KHS
Intermediate casing depth changed

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
Assistant Chief of Permitting
Office of Oil and Gas

08/15/2014

4701706414 MOD

CONSOL ENERGY

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

May 16, 2014

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

RE: OXFD11HS - Modifications (Intermediate Casing Depth Change)

Dear Laura,

Enclosed, please find for your approval and consideration, updated casing modifications where the intermediate casing depths have been changed. The casing modifications are for the following laterals:

WELL NUMBER	API NUMBER
OXFD11AHS	4701706409
OXFD11BHS	4701706410
OXFD11CHS	4701706411
OXFD11DHS	4701706412
OXFD11EHS	4701706413
OXFD11KHS	4701706414

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

Sincerely,

Carolinda Flanagan

RECEIVED
Office of Oil and Gas
MAY 20 2014
WV Department of
Environmental Protection

08/15/2014

WW-6B
(9/13)

4701706414 MOD

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	Doddridge	Southwest	Oxford
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: OXFD11KHS Well Pad Name: OXFD11HS

3) Farm Name/Surface Owner: I.L. Morris Public Road Access: Co. Rt. 19/11

4) Elevation, current ground: 1340' Elevation, proposed post-construction: 1310'

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

DCN 5-2-2014

6) Existing Pad: Yes or No NO

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target - Burkett, Depth - 6875', Thickness - 50', Pressure - 2000#

8) Proposed Total Vertical Depth: 6925'

9) Formation at Total Vertical Depth: Burkett

10) Proposed Total Measured Depth: 16096'

11) Proposed Horizontal Leg Length: 7420'

12) Approximate Fresh Water Strata Depths: 50', 620'

13) Method to Determine Fresh Water Depths: Offset Well

14) Approximate Saltwater Depths: 1180', 2085'

15) Approximate Coal Seam Depths: 620'

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 Department of
Environmental Protection

08/15/2014

4701706414 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	L.S.	81.3#	100'	100'	Grout to surface w/ Class A type cement
Fresh Water	13 3/8"	N	J-55	54.5#	690'	690'	CTS w/ Class A Type Cement
Coal							
Intermediate	9 5/8"	N	J-55	36#	2800'	2800'	CTS w/ Class A Type Cement
Production	5 1/2"	N	P-110	20#	16096'	16096'	2200 cu. ft. w/ 50/50 POZ Lead & Class A
Tubing	2 3/8"	N	J-55	4.7#	7375'	7375'	
Liners							

5-7-2014

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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Office of Oil and Gas

MAY 20 2014

WV Department of
Environmental Protection

08/15/2014

4701706414 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 16096'. Well to be drilled to a TVD of 6925', formation at TVD - Burkett. 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. Max Pressure - 9500 psi. Max Rate - 100 bbl/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 24.4 Acres

22) Area to be disturbed for well pad only, less access road (acres): 20.4 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.

*Note: Attach additional sheets as needed.

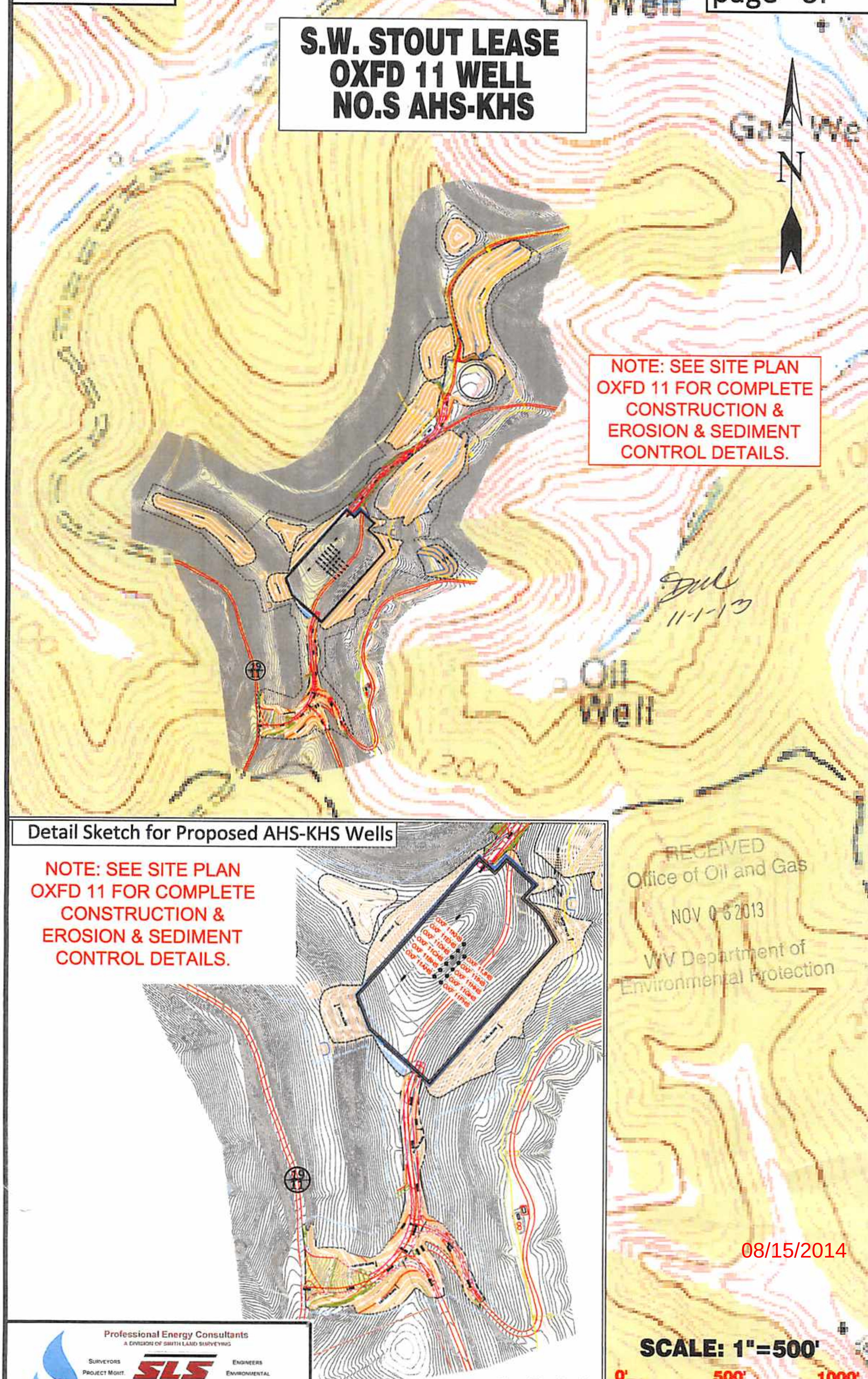
08/15/2014

Form WW-9

017 - 06414

page of

S.W. STOUT LEASE
OXFD 11 WELL
NO.S AHS-KHS



Professional Energy Consultants
A DIVISION OF SMITH LAND SURVEYING

Surveyors · Project Mgmt. · Engineers · Environmental

SLS

226 West Main St, P.O. Box 150, Glenville, WV 26351, (304) 462-5634

55065 Dilles Bottom Road, Shadyside, OH 43947, (740) 671-9911

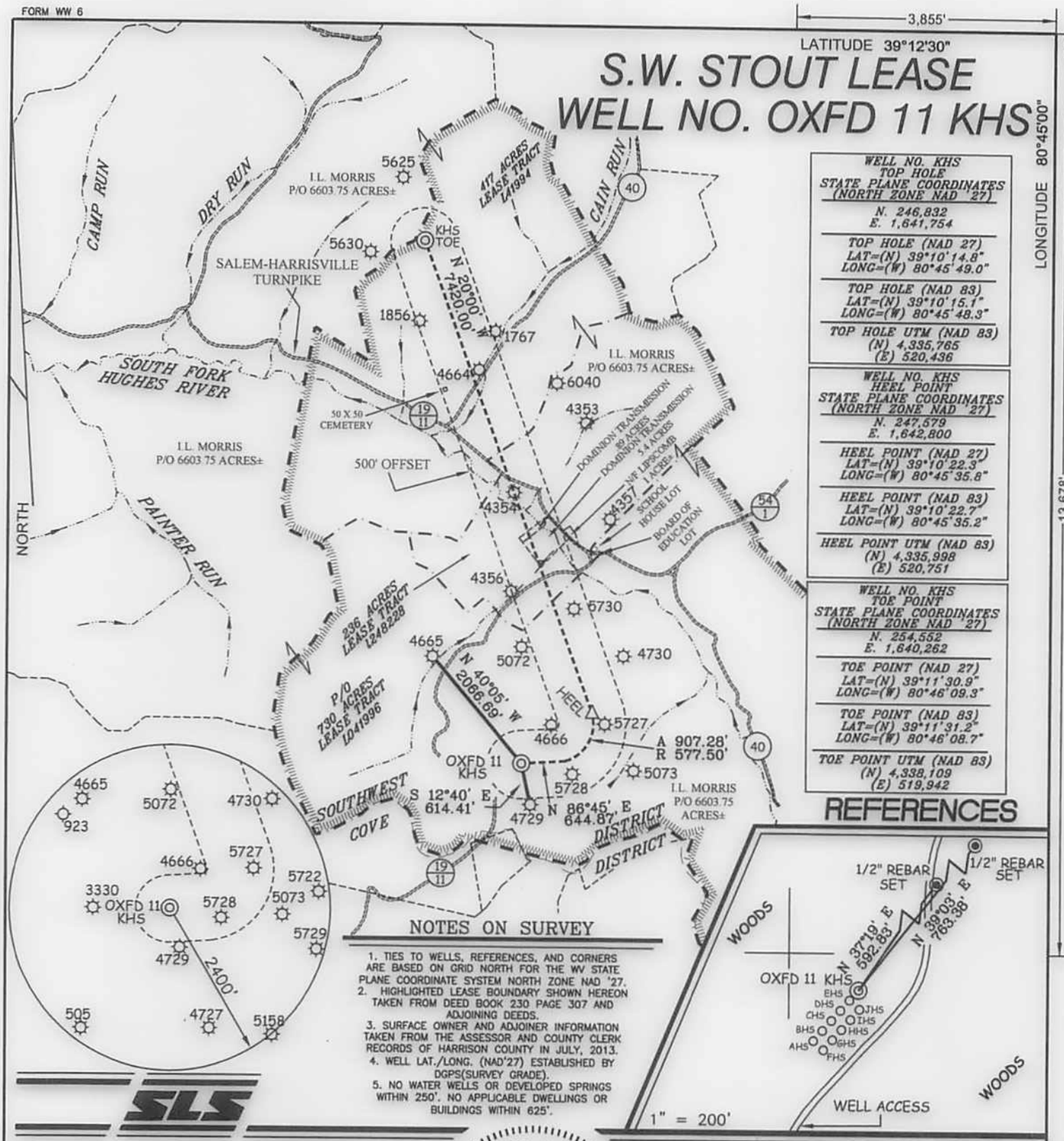
Honesty, Integrity, Quality

DRAWN BY	FILE NO.	DATE	CADD FILE:
K.D.W.	7981	10-17-13	7981REC-AHS.dwg

TOPO SECTION OF OXFORD 7.5' USGS TOPO QUADRANGLE

FORM WW 6

S.W. STOUT LEASE
WELL NO. OXFD 11 KHS



NOTES ON SURVEY

1. TIES TO WELLS, REFERENCES, AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
2. HIGHLIGHTED LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 230 PAGE 307 AND ADJOINING DEEDS.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF HARRISON COUNTY IN JULY, 2013.
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'.

SLS

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 OCTOBER 17 , 20 13

OPERATORS WELL NO. OXFD 11 KHS

API WELL NO. 47 (STATE) - 017 (COUNTY) - 06414 (PERMIT) H6A

MINIMUM DEGREE OF ACCURACY 1 / 200

PROVEN SOURCE OF ELEVATION DGPS (SUBMETER MAPPING GRADE)

FILE NO. 7981PKHS(457-21)

SCALE 1" = 2,000'

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 1,340' WATERSHED SOUTH FORK HUGHES RIVER

DISTRICT SOUTHWEST COUNTY DODDRIDGE QUADRANGLE OXFORD 7.5'

SURFACE OWNER I.L. MORRIS ACREAGE 6603.75±

ROYALTY OWNER LINDSAY A EDMONDSON, ETAL & STATE OF WEST VIRGINIA(SALEM HARRISVILLE TURNPIKE) ACREAGE 730, 236, & 08/15/2014

PROPOSED WORK : LEASE NO. L041996, L248228, & L41994

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 BURKETT

ESTIMATED DEPTH 6,925' TVD / TMD 16,096"

COUNTY NAME

PERMIT

WELL OPERATOR CNX GAS COMPANY, LLC. DESIGNATED AGENT JEREMY JONES

ADDRESS P.O. BOX 1248 JANE LEW, WV 26378

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