



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Tuesday, April 7, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit Modification Approval for ARMSTRONG S-11HU
47-051-02257-00-00

Modified Lateral for a TMD of 22,155' with AOR and SSP

TUG HILL OPERATING, LLC

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.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

A handwritten signature in blue ink, appearing to read 'James A. Martin', is written over the printed name and title.

Operator's Well Number: ARMSTRONG S-11HU
Farm Name: CONSOL RCPC, LLC
U.S. WELL NUMBER: 47-051-02257-00-00
Horizontal 6A New Drill
Date Modification Issued: April 7, 2020

Promoting a healthy environment.



west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street SE, Charleston, WV 25304
304-926-0499 Ext 1274

Randall M. Albert, Chairman
dep.wv.gov

February 19, 2020

Department of Environmental Protection
Office of Oil and Gas
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-051-02257

COMPANY: Tug Hill Operating, LLC

FARM: CONSOL RCPC, LLC Armstrong 1S-11HU

COUNTY: Marshall DISTRICT: Franklin QUAD: Powhatan Point

The deep well review of the application for the above company is Approved to drill to Trenton for Point Pleasant completion.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Comments to Notice of Deviation filed? No
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: **yes; Docket 292-293 Exception Location Hearing
4. Provided a plat showing that the proposed location is a distance of 400 feet from the nearest lease line or unit boundary with the exception of the toe which is 10 feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose
Administrator

4705102257 MEO

WW-6B
(04/15)

API NO. 47-051 -
OPERATOR WELL NO. Armstrong S-11HU
Well Pad Name: Armstrong

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Franklin Powhatan Point 7
Operator ID County District Quadrangle

2) Operator's Well Number: Armstrong S-11HU Well Pad Name: Armstrong

3) Farm Name/Surface Owner: CONSOL RCPC, LLC Public Road Access: Burch Ridge Road - CR 29

4) Elevation, current ground: 1279.12' Elevation, proposed post-construction: 1279.12'

5) Well Type (a) Gas x Oil _____ Underground Storage _____
Other _____

(b) If Gas Shallow _____ Deep x
Horizontal x

Joe
2/4/2020

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,221' - 11,101' - thickness of 120' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,371'

9) Formation at Total Vertical Depth: Trenton, plug back to Reedsville

10) Proposed Total Measured Depth: 22,155'

11) Proposed Horizontal Leg Length: 10,443.46'

12) Approximate Fresh Water Strata Depths: 70' ; 870'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 2,167'

15) Approximate Coal Seam Depths: Sewickley Coal - 776' ; Pittsburgh Coal - 869'

16) Approximate Depth to Possible Void (coal mine, karst, other): none

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	30"	NEW	BW	BW	120'	120'	259FT^3(CTS)
Fresh Water	20"	NEW	J55	106.5#	970'	970'	1,568FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2701'	2701'	1,906FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,110'	10,110'	3,300FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	22,155'	22,155'	5,247FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		10,747'	
Liners							

guc
11/2/19

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	20"	26"	.5	2,410	1,928	SEE # 24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE #24	1.99
Production	5 1/2"	8 1/2"	.415	16,510	10,864	SEE #24	1.18
Tubing	2 7/8"			11,385	11,624		
Liners							

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

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NOV 14 2019

WW-6B
(10/14)

4705102257 MOD
API NO. 47-051

OPERATOR WELL NO. Armstrong S-11HU

Well Pad Name: Armstrong

Ju
2/4/2020

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. Log vertical section and run a solid cement plug back to proposed KOP (10,247'). Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well to be completed with approximately 26,105,000 lb proppant and 333,759 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 12.64 acres

22) Area to be disturbed for well pad only, less access road (acres): 3.21 acres

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every third joint. Production casing will have one centralizer every third joint in lateral, one centralizer every joint through curve, one centralizer every third joint to surface.

24) Describe all cement additives associated with each cement type:

*See Attachment

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

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FEB 06 2020

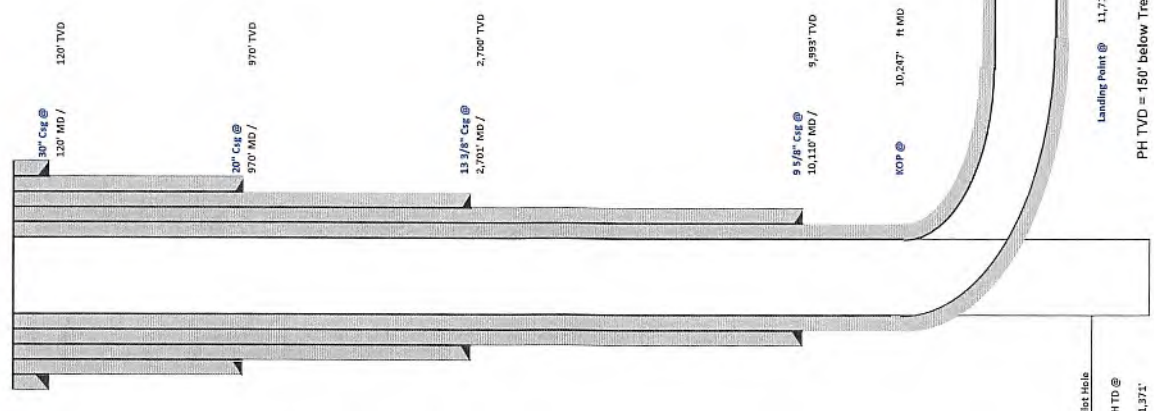
WV Department of
Environmental Protection

*Note: Attach additional sheets as needed.

4705102257 *Mod*

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DEC 04 2019
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Environmental Protection

WELL NAME: Armstrong S-11HU
STATE: WV COUNTY: Marshall
DISTRICT: Franklin
DF Elev: 1,279' GL Elev: 1,279'
TD: 22,155'
TH Latitude: 39.75382662
TH Longitude: -80.8083189
BH Latitude: 39.727245
BH Longitude: -80.792038



Formation	Depth TVD
Deepest Fresh Water	870'
Sewickley Coal	776'
Pittsburgh Coal	868'
Big Lime	2,002'
Berea	2,544'
Tully	6,344'
Marcellus	6,403'
Onondaga	6,455'
Salina	7,147'
Lockport	8,176'
Utica	10,846'
Point Pleasant	11,201'
Landing Depth	11,151'
Trenton	11,221'
Pilot Hole TD	11,371'

CASING SUMMARY						
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Top of Cement
Conductor	36	30	120'	120'	BW	Surface
Surface	26	20	970'	970'	106.5	Surface
Intermediate 1	17 1/2	13 3/8	2,703'	2,700'	54.5	Surface
Intermediate 2	12 1/4	9 5/8	10,110'	9,993'	47	Surface
Production	8 1/2	5 1/2	22,155'	11,334'	23	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	none	
1,691	A	15.6	Air	3 Centralizers at equal distance	
2,065	A	15	Air	1 Centralizer every other jt	
2,799	A	14.5	Air	1 Centralizer every other jt	
4,645	A	15	Air / SOBMM	1 every other joint in lateral; 1 per joint in curves; 1 every other ft to SIC	

Handwritten signature

Lateral TD @ 22,155' R MD
11,334' R TVD

Landing Point @ 11,713' MD / 11,151' TVD
PH TVD = 150' below Trenton Top

Pilot Hole
PH TD @ 11,371'



4705102257 MOD



Tug Hill Operating, LLC Casing and Cement Program
Armstrong S-11HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	970'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,701'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,110'	CTS
Production	5 1/2"	HCP110	8 1/2"	22,155'	CTS

Cement

- Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate 1: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.2
- Intermediate 2: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99
- Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.18

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DEC 04 2019

WV Department of
Environmental Protection

4705102257



Well Site Safety Plan

Tug Hill Operating, LLC

John 11/1/19

Well Name: Armstrong S-11HU

Pad Location: Armstrong Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,400,452.53

Easting: 516,420.45

Updated November 2019

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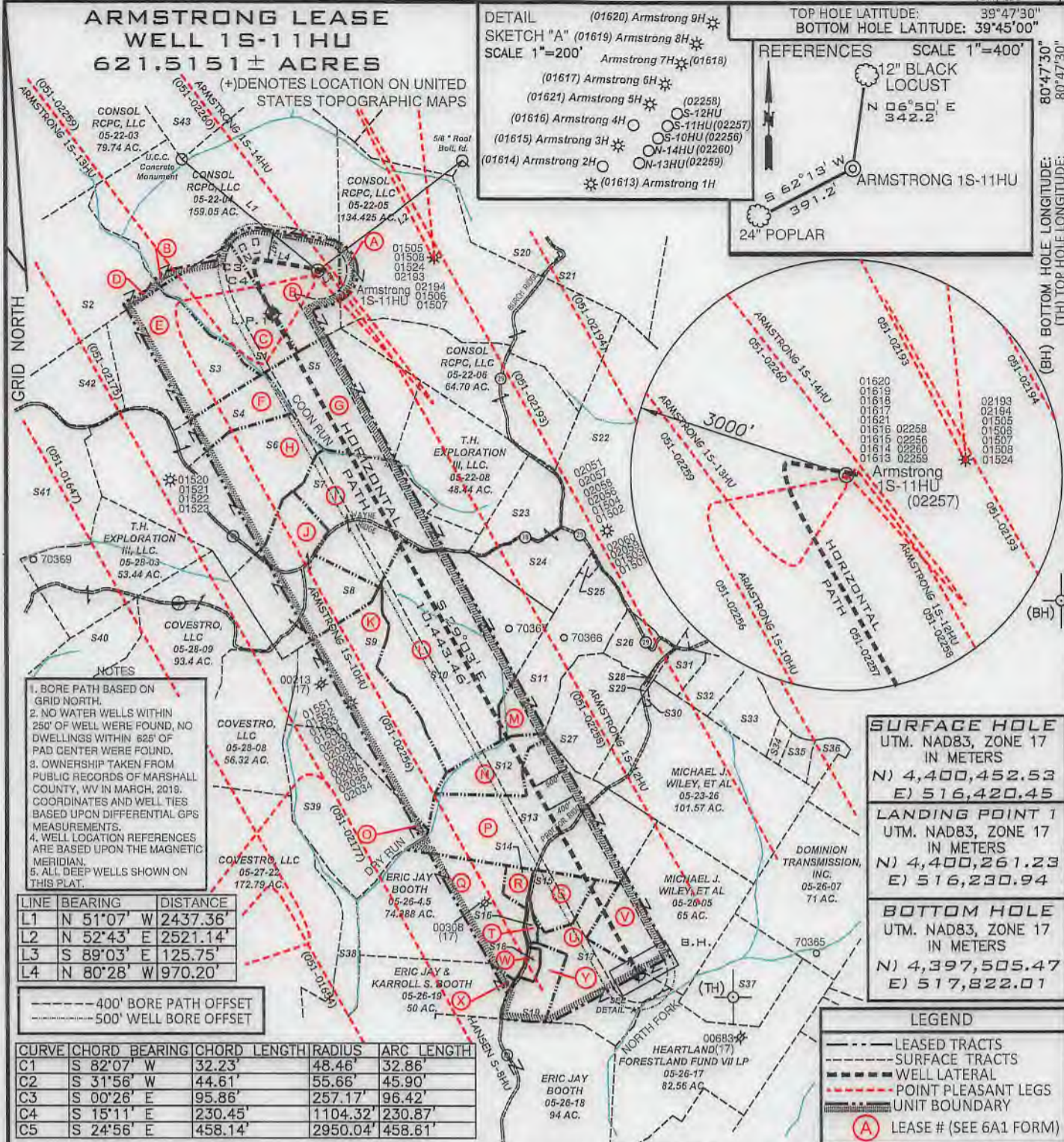
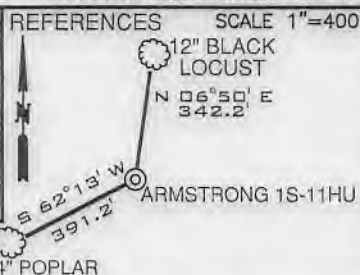
WV Department of
Environmental Protection

**ARMSTRONG LEASE
WELL 1S-11HU
621.5151 ± ACRES**

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

DETAIL (01620) Armstrong 9H
SKETCH "A" (01619) Armstrong 8H
SCALE 1"=200'
Armstrong 7H (01618)
(01617) Armstrong 6H
(01621) Armstrong 5H (02258)
(01616) Armstrong 4H
(01615) Armstrong 3H
(01614) Armstrong 2H
ARMSTRONG 1H (01613)
ARMSTRONG 1S-11HU (02257)
ARMSTRONG 1S-10HU (02256)
ARMSTRONG 1S-12HU (02257)
ARMSTRONG 1S-13HU (02259)

TOP HOLE LATITUDE: 39°47'30"
BOTTOM HOLE LATITUDE: 39°45'00"



- NOTES**
1. BORE PATH BASED ON GRID NORTH.
 2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
 3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2019. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
 5. ALL DEEP WELLS SHOWN ON THIS PLAT.

LINE	BEARING	DISTANCE
L1	N 51°07' W	2437.36'
L2	N 52°43' E	2521.14'
L3	S 89°03' E	125.75'
L4	N 80°28' W	970.20'

----- 400' BORE PATH OFFSET
----- 500' WELL BORE OFFSET

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	S 82°07' W	32.23'	48.46'	32.86'
C2	S 31°56' W	44.61'	55.66'	45.90'
C3	S 00°28' E	95.86'	257.17'	96.42'
C4	S 15°11' E	230.45'	1104.32'	230.87'
C5	S 24°56' E	458.14'	2950.04'	458.61'

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,400,452.53
E) 516,420.45

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,400,261.23
E) 516,230.94

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,397,505.47
E) 517,822.01

LEGEND

- LEASE TRACTS
- SURFACE TRACTS
- WELL LATERAL
- POINT PLEASANT LEGS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

FILE NUMBER _____
DRAWING NUMBER: **ARMSTRONG 1S-11HU_REV 1**
SCALE 1" = 2000'
MINIMUM DEGREE OF ACCURACY 1/200
PROVEN SOURCE OF ELEVATION **SUBMETER MAPPING**
GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. 708 *David L Jackson*



JACKSON SURVEYING INC.
P.O. Box 1460
Clerksburg, WV 26302
304-623-5851

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET, SE
CHARLESTON, WV 25304

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP X SHALLOW ___
LOCATION ELEVATION 1279.12' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER
DISTRICT FRANKLIN COUNTY MARSHALL
QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE WW-6A1 Form

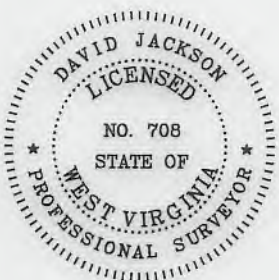
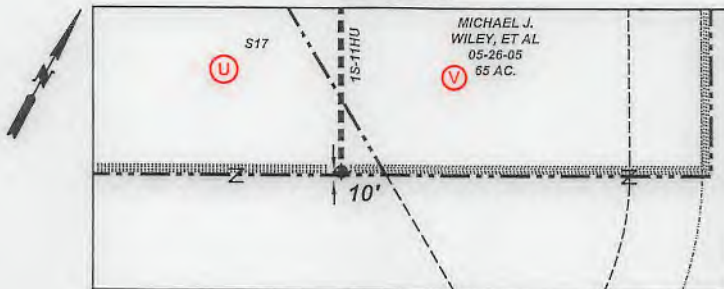
SURFACE OWNER CONSOL RCPC, LLC. ACREAGE 159.05
OIL & GAS ROYALTY OWNER CONSOL RCPC, LLC. LEASE ACREAGE 159.05
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) _____
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH TVD: 11,371' TMD: 22,155'
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
CT CORPORATION SYSTEM
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
FORT WORTH, TX 76107 CHARLESTON, WV 25313

COUNTY NAME
PERMIT

**ARMSTRONG LEASE
WELL 1S-11HU
621.5151± ACRES**

Number	TAX MAP-PARCEL	SURFACE OWNER	ACRES
S1	C 05-22-17	Consol RCPC, LLC.	159.05
S2	D 05-22-18	Edward R. Yoho, Jr.	77.13
S3	E 05-22-16	Edward R. Yoho, Jr.	57.0
S4	F 05-22-12	T.H. Exploration III, LLC.	61.49
S5	G 05-22-10	T.H. Exploration III, LLC.	58.40
S6	H 05-22-11	T.H. Exploration III, LLC.	55.65
S7	I 05-22-9	T.H. Exploration III, LLC.	63.44
S8	J 05-28-4	T.H. Exploration III, LLC.	48.44
S9	K 05-28-6	Ula F. Nelson	70.0
S10	L 05-28-5	T.H. Exploration III, LLC.	105.9
S11	M 05-23-28	Gregg D. Minor	39.43
S12	N 05-26-1	Edwin Booth Anderson & Mark W. Booth	12.94
S13	P 05-26-2	Edwin Booth Anderson & Mark W. Booth	67.5
S14	R 05-26-4	James R. & Melody A. Anderson	3.887
S15	S 05-26-4.6	Otis F. Rush Jr.	12.268
S16	T 05-26-4.2	Otis S. Rush, et ux	1.58
S17	U 05-26-4.4	Otis F. & Glenda M. Rush	39.436
S18	W 05-26-4.3	Crystal & Randolph F. Matask	2.253
S19	Y 05-26-4.1	Otis S. Rush, et ux	12.188
S20	05-19-18.2	Paul V. & Carol Neely	32.672
S21	05-19-18	Mark E. Yoho, et ux	55.948
S22	05-23-1	Patricia Accettolo, et al	146.66
S23	05-22-7.1	XcL Exploration II, LLC & Atinum Marcellus I, LLC	20.68
S24	05-22-7	Patricia Accettolo, et al	25.02
S25	05-23-28.1	Troy W. & Erin M. Thomas	1.0
S26	05-23-28.2	Tammac Holdings Corporation	10.8
S27	05-23-27	Michael J. Wiley, et al	33.140
S28	05-23-23	Michael J. Wiley, et al	1.0
S29	05-23-24	Michael J. Wiley, et al	0.25
S30	05-23-25	Arthur A. Wiley	0.43
S31	05-23-22	Daniel D. Rhyand & Laurel R. Greene	6.25
S32	05-23-17.1	Curtis E. Hall, et ux	10.051
S33	05-23-17.2	Dick Rowan, Jr. & Carol J. Rowan	14.920
S34	05-23-17.4	Tammy D. Meadows	2.605
S35	05-23-17	Tammy & Thomas E. Brown	4.62
S36	05-23-17.3	William & Katherine Flewelling	5.018
S37	05-26-6	Heartwood Forestland Fund VII LP	36.17
S38	05-27-23	Robert. F. Rothlisberger	35.77
S39	O 05-28-7	Carl L. Corfield, Sr. & Lana R. Coffield	64.0
S40	05-27-5	Michael J. Wiley, et al	65.0
S41	05-22-13	John M. Moore, Theresa F. Moore, & Andrea S. Moore	40.57
S42	05-22-15	Edward R. Yoho, Jr.	25.5
S43	05-19-21	Sammy E. Whitlatch, et al	116.45

DETAIL "A"



4705102257 MDD

P.S. 708 *David L Jackson*



TUG HILL
OPERATING

OPERATOR'S
WELL #: Armstrong 1S-11HU
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API: 47-051-02257

WELL PLAT
PAGE 2 OF 4
DATE: 07/22/2019
REVISED: 11/05/2019

**ARMSTRONG LEASE
WELL 1S-11HU
621.5151± ACRES**

Lease No.	Tags	Parcel	Grantor, Lessor, Etc.	Book	Page
10*19529	A	5-22-5	CNX GAS COMPANY LLC	733	500
10*14033	B	5-22-4	LAMOYNE BAKER	665	554
10*14034	B	5-22-4	LAWRENCE C AND LORRAINE J MCWHORTER	665	391
10*14035	B	5-22-4	PEGGY MAE WHITE	695	446
10*14036	B	5-22-4	WILDA WINTERS	701	579
10*14037	B	5-22-4	JUDITH L CHAMBERS	701	577
10*14038	B	5-22-4	HAYHURST COMPANY A FLORIDA PARTNERSHIP	724	7
10*14039	B	5-22-4	CHESTNUT HOLDINGS LLC	827	554
10*14507	C	5-22-17	MARY THERESA SOLEAU AND THOMAS SOLEAU	749	524
10*14508	C	5-22-17	JEAN W FOSTER	752	200
10*14509	C	5-22-17	JAMES ROBERT WELLS	752	202
10*14510	C	5-22-17	MARY AGNES CARROLL	749	528
10*14511	C	5-22-17	ELIZABETH JANE KELLER	754	242
10*14513	C	5-22-17	CAROLYN LYNN PORTER	767	256
10*14514	C	5-22-17	CHARLES ARTHUR WELLS	768	494
10*14515	C	5-22-17	JERRY TODD WELLS	773	572
10*14516	C	5-22-17	JAMES NESBITT WELLS BY JOANIE WELLS AIF	773	570
10*14517	C	5-22-17	CARL W BACH JR	852	250
10*14518	C	5-22-17	RAE ELLEN FLOYD AND KENNETH FLOYD	854	599
10*14519	C	5-22-17	DOUGLAS M BACH	854	597
10*16471	C	5-22-17	CNX GAS COMPANY LLC	905	155
10*16652	C	5-22-17	MARY JUDITH BRANSON AND MICHAEL L BRANSON	942	35
10*16674	C	5-22-17	CHARLOTTE A KASTELIC	942	37
10*26910	C	5-22-17	BRIDGET S AND DARRELL T GATES	1045	419
10*26940	C	5-22-17	PATRICK N WELLS	1045	413
10*14457	D	5-22-18	HARRY LEE GOUDY	731	140
10*14457	E	5-22-16	HARRY LEE GOUDY	731	140
10*14418	F	5-22-12	PPG INDUSTRIES, INC.	878	610
10*14418	G	5-22-10	PPG INDUSTRIES, INC.	878	610
10*14418	H	5-22-11	PPG INDUSTRIES, INC.	878	610
10*14418	I	5-22-9	PPG INDUSTRIES, INC.	878	610
10*14418	J	5-28-4	PPG INDUSTRIES, INC.	878	610
10*14572	K	5-28-6	VICKI LYNN WOOD	681	326
10*14573	K	5-28-6	AARON DEAN LITMAN	681	317
10*14574	K	5-28-6	KLOVA ANN MORRIS	681	320
10*14575	K	5-28-6	REVA JUNE ICARD	681	323
10*14576	K	5-28-6	WILLIAM L LITMAN	681	329
10*14577	K	5-28-6	ULA F NELSON	681	332
10*14578	K	5-28-6	BETTY KNOWLES	767	36
10*14304	L	5-28-5	RUTH MAE DULANEY	749	530
10*14305	L	5-28-5	HELEN BOWMAN	749	362
10*14306	L	5-28-5	RANDY GODDARD	759	248
10*14418	L	5-28-5	PPG INDUSTRIES, INC.	878	610



4705102257 MOD

P.S. 708

David L Jackson



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: Armstrong 1S-11HU
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API: 47-051-02257

WELL PLAT
PAGE 3 OF 4
DATE: 07/22/2019
REVISED: 11/05/2019

**ARMSTRONG LEASE
WELL 1S-11HU
621.5151± ACRES**

Lease No.	Tags	Parcel	Grantor, Lessor, Etc.	Book	Page
10*21218	M	5-23-28	GREGG D MINOR	952	647
10*22330	M	5-23-28	GREGG D MINOR	963	156
10*14916	N	5-26-1	MARK W BOOTH	836	110
10*14917	N	5-26-1	EDWIN BOOTH ANDERSON	836	108
10*14065	O	5-28-7	CARL COFFIELD	665	363
10*14916	P	5-26-2	MARK W BOOTH	836	110
10*14917	P	5-26-2	EDWIN BOOTH ANDERSON	836	108
10*17137	Q	5-26-4.5	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	Q	5-26-4.5	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46
10*17137	R	5-26-4	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	R	5-26-4	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46
10*17137	S	5-26-4.6	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	S	5-26-4.6	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46
10*17137	T	5-26-4.2	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	T	5-26-4.2	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46
10*17137	U	5-26-4.4	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	U	5-26-4.4	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46
10*14742	V	5-26-5	SUSAN E GORE	790	505
10*14744	V	5-26-5	THE SAMUEL MILTON SHEETS TRUST PAULINE RUTH SHEETS TRUSTEE	791	637
10*14745	V	5-26-5	RALPH B TAYLOR	794	485
10*17716	V	5-26-5	MICHAEL J AND BARBARA L WILEY	919	638
10*17777	V	5-26-5	MICHELLE E AND ROBERT T BAKER	921	128
10*21420	V	5-26-5	DAVID D BURKETT	957	3
10*21421	V	5-26-5	BRYANNA FLYNN RANKIN	957	5
10*21437	V	5-26-5	REBECCA MCMILLAN AND ROBERT MCMILLAN	957	1
10*21821	V	5-26-5	LINDA K TAYLOR AND RAY P MAGEE	951	631
10*25633	V	5-26-5	CHESTNUT HOLDINGS LLC	1034	546
10*17137	W	5-26-4.3	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	W	5-26-4.3	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46
10*19908	X	5-26-19	GOLDA K ANDERSON	945	434
10*21935	X	5-26-19	KARROLL S BOOTH AND LOIS E BOOTH	940	593
10*22015	X	5-26-19	ERIC JAY BOOTH	942	217
10*17137	Y	5-26-4.1	MARK E SMITH AND VALERIE SMITH LIFE TENANT	685	521
10*17153	Y	5-26-4.1	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	687	46

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P.S. 708 *David L Jackson*



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: Armstrong 1S-11HU
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API: 47-051-02257

WELL PLAT
PAGE 4 OF 4
DATE: 07/22/2019
REVISED: 11/05/2019

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(5/13)

Operator's Well No. Armstrong S-11HU

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
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*See attached pages



***Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.**

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

CT

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Tug Hill Operating, LLC
 By: Amy L. Miller *Amy Miller*
 Its: Permitting Specialist - Appalachia Region

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 Amendment and Gas
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 WV Department of
 Environmental Protection

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*14516	C	5-22-17	JAMIES NESBITT WELLS BY IOANIE WELLS AIF	GASTAR EXPLORATION USA INC	1/8+	773	570	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14515	C	5-22-17	JERRY TODD WELLS	GASTAR EXPLORATION USA INC	1/8+	773	572	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14514	C	5-22-17	CHARLES ARTHUR WELLS	GASTAR EXPLORATION USA INC	1/8+	768	494	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14513	C	5-22-17	CAROLYN LYNN PORTER	GASTAR EXPLORATION USA INC	1/8+	767	256	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14511	C	5-22-17	ELIZABETH JANE KELLER	GASTAR EXPLORATION USA INC	1/8+	754	242	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14510	C	5-22-17	MARY AGNES CARROLL	GASTAR EXPLORATION USA INC	1/8+	749	528	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14509	C	5-22-17	JAMES ROBERT WELLS	GASTAR EXPLORATION USA INC	1/8+	752	202	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14038	B	5-22-4	HAYHURST COMPANY A FLORIDA PARTNERSHIP	CHESAPEAKE APPALACHIA LLC	1/8+	724	7	NA	NA	25/582 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14037	B	5-22-4	JUDITH L CHAMBERS	GASTAR EXPLORATION USA INC	1/8+	701	577	NA	NA	27/321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14036	B	5-22-4	WILDA WINTERS	GASTAR EXPLORATION USA INC	1/8+	701	579	NA	NA	23/353 Gaster Exploration USA Inc to Atinum Marcellus LLC	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14035	B	5-22-4	PEGGY MAE WHITE	GASTAR EXPLORATION USA INC	1/8+	695	446	NA	NA	23/353 Gaster Exploration USA Inc to Atinum Marcellus LLC	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14034	B	5-22-4	LAWRENCE C AND LORRAINE J MCWHORTER	GASTAR EXPLORATION USA INC	1/8+	665	391	NA	NA	23/353 Gaster Exploration USA Inc to Atinum Marcellus LLC	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14033	B	5-22-4	LAMOYNE BAKER	GASTAR EXPLORATION USA INC	1/8+	665	554	NA	NA	23/353 Gaster Exploration USA Inc to Atinum Marcellus LLC	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*19529	A	5-22-5	CNX GAS COMPANY LLC	TH EXPLORATION, LLC	1/8+	733	500	NA	NA	23/353 Gaster Exploration USA Inc to Atinum Marcellus LLC	NA	NA	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC

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10*14517	C	5-22-17	CARL W BACH JR	GASTAR EXPLORATION INC	1/8+	852	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14518	C	5-22-17	RAE ELLEN FLOYD AND KENNETH FLOYD	GASTAR EXPLORATION INC	1/8+	854	599	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14519	C	5-22-17	DOUGLAS M BACH	GASTAR EXPLORATION INC	1/8+	854	597	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*16471	C	5-22-17	CNX GAS COMPANY LLC	TH EXPLORATION, LLC	1/8+	905	155	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10*16652	C	5-22-17	MARY JUDITH BRANSON AND MICHAEL L BRANSON	TH EXPLORATION, LLC	1/8+	942	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10*16674	C	5-22-17	CHARLOTTE A KASTEJIC	TH EXPLORATION, LLC	1/8+	942	37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10*26910	C	5-22-17	BRIDGET S AND DARRELL T GATES *	TH EXPLORATION, LLC	1/8+	1045	419	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10*26940	C	5-22-17	PATRICK N WELLS *	TH EXPLORATION, LLC	1/8+	1045	413	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10*14457	D	5-22-18	HARRY LEE GOUDY	GASTAR EXPLORATION USA INC	1/8+	731	140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14457	E	5-22-16	HARRY LEE GOUDY	GASTAR EXPLORATION USA INC	1/8+	731	140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14418	F	5-22-12	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	878	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14418	G	5-22-10	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	878	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14418	H	5-22-11	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	878	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14418	I	5-22-9	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	878	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14418	J	5-28-4	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	878	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14572	K	5-28-6	WICKI LYNN WOOD	CHEESAPEAKE APPALACHIA LLC	1/8+	681	326	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36/9 Gaster Exploration Inc to TH Exploration II LLC

36/9 Gaster Exploration Inc to TH Exploration II LLC

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10*14573	K	5-28-6	AARON DEAN LITMAN	CHEESAPEAKE APPALACHIA LLC	1/8+	681	317	NA	NA	NA	NA	NA	NA	277321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA Inc and Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14574	K	5-28-6	KLOVA ANN MORRIS	CHEESAPEAKE APPALACHIA LLC	1/8+	681	320	NA	NA	NA	NA	NA	NA	277321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA Inc and Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14575	K	5-28-6	REVA JUNE ICARD	CHEESAPEAKE APPALACHIA LLC	1/8+	681	323	NA	NA	NA	NA	NA	NA	277321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA Inc and Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14576	K	5-28-6	WILLIAM L LITMAN	CHEESAPEAKE APPALACHIA LLC	1/8+	681	329	NA	NA	NA	NA	NA	NA	277321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA Inc and Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14577	K	5-28-6	ULA F NELSON	CHEESAPEAKE APPALACHIA LLC	1/8+	681	332	NA	NA	NA	NA	NA	NA	277321 Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA Inc and Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14578	K	5-28-6	BETTY KNOWLES	GASTAR EXPLORATION USA INC	1/8+	767	36	NA	NA	NA	NA	NA	NA	26/639 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14304	L	5-28-5	RUTH MAE DULANEY	GASTAR EXPLORATION USA INC	1/8+	749	530	NA	NA	NA	NA	NA	NA	26/639 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14305	L	5-28-5	HELEN BOWMAN	GASTAR EXPLORATION USA INC	1/8+	749	362	NA	NA	NA	NA	NA	NA	26/639 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14306	L	5-28-5	RANDY GODDARD	GASTAR EXPLORATION USA INC	1/8+	759	248	NA	NA	NA	NA	NA	NA	35/144 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14418	L	5-28-5	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	878	610	NA	NA	NA	NA	NA	NA	35/144 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*21218	M	5-23-28	GREGG D MINOR	TH EXPLORATION, LLC	1/8+	952	647	NA	NA	NA	NA	NA	NA	NA	NA	NA
10*22330	M	5-23-28	GREGG D MINOR	TH EXPLORATION, LLC	1/8+	963	156	NA	NA	NA	NA	NA	NA	32/428 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14916	N	5-26-1	MARK W BOOTH	GASTAR EXPLORATION USA INC	1/8+	836	110	NA	NA	NA	NA	NA	NA	32/428 Gastar Exploration USA Inc to Atrium Marcellus I LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC

Operator's Well No. Armstrong S - 11HU

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Operator's Well No. Armstrong S - 11HU

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10*14917	N	5-26-1	EDWIN BOOTH ANDERSON	GASTAR EXPLORATION USA INC	1/8+	836	108	NA	NA	NA	32/428 Gaster Exploration USA Inc to Athnum Marcellus LLC	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14065	O	5-28-7	CARL COFFIELD	GASTAR EXPLORATION USA INC	1/8+	665	363	NA	NA	NA	23/353 Gaster Exploration USA Inc to Athnum Marcellus LLC	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14916	P	5-26-2	MARK W BOOTH	GASTAR EXPLORATION USA INC	1/8+	836	110	NA	NA	NA	32/428 Gaster Exploration USA Inc to Athnum Marcellus LLC	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*14917	P	5-26-2	EDWIN BOOTH ANDERSON	GASTAR EXPLORATION USA INC	1/8+	836	108	NA	NA	NA	33/424 Statoil USA Onshore Properties Inc to SWN LLC	Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC
10*17137	Q	5-26-4.5	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17153	Q	5-26-4.5	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17137	R	5-26-4	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17153	R	5-26-4	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17137	S	5-26-4.6	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17153	S	5-26-4.6	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17137	T	5-26-4.2	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17153	T	5-26-4.2	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17137	U	5-26-4.4	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*17153	U	5-26-4.4	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange Titleholder LLC merger into SWN Production Company	41/256 SWN Production Company LLC to TH Exploration LLC
10*14742	V	5-26-5	SUSAN E GORE	GASTAR EXPLORATION USA INC	1/8+	790	505	NA	NA	NA	29/157 Gaster Exploration USA Inc to Athnum Marcellus LLC	21/41 Gaster Exploration USA Inc and Gaster Exploration Inc merger	36/9 Gaster Exploration Inc to TH Exploration II LLC

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10*14744	V	5-26-5	THE SAMUEL MILTON SHEETS TRUST PAULINE RUTH SHEETS TRUSTEE	GASTAR EXPLORATION USA INC	1/8+	791	637	NA	NA	NA	29/157 Gastar Exploration LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*14745	V	5-26-5	RALPH B TAYLOR	GASTAR EXPLORATION USA INC	1/8+	794	485	NA	NA	NA	806/1 Gastar Exploration USA Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II LLC
10*17716	V	5-26-5	MICHAEL J AND BARBARA L WILEY	TH EXPLORATION, LLC	1/8+	919	638	NA	NA	NA	NA	NA	NA
10*17777	V	5-26-5	MICHELLE E AND ROBERT T BAKER	TH EXPLORATION, LLC	1/8+	921	128	NA	NA	NA	NA	NA	NA
10*21420	V	5-26-5	DAVID D BURKETT	TH EXPLORATION, LLC	1/8+	957	3	NA	NA	NA	NA	NA	NA
10*21421	V	5-26-5	BRYANNA FLYNN RANKIN	TH EXPLORATION, LLC	1/8+	957	5	NA	NA	NA	NA	NA	NA
10*21437	V	5-26-5	REBECCA MCMILLAN AND ROBERT MCMILLAN	TH EXPLORATION, LLC	1/8+	957	1	NA	NA	NA	NA	NA	NA
10*21821	V	5-26-5	LINDA K TAYLOR AND RAY P MAGEE	TH EXPLORATION, LLC	1/8+	951	631	NA	NA	NA	NA	NA	NA
10*25633	V	5-26-5	CHESTNUT HOLDINGS LLC	TH EXPLORATION, LLC	1/8+	1034	546	NA	NA	NA	NA	19/624 SWN Exchange	NA
10*17137	W	5-26-4.3	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	830/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange	41/256 SWN Production Company LLC to TH Exploration LLC
10*17153	W	5-26-4.3	ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	830/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange	41/256 SWN Production Company LLC to TH Exploration LLC
10*19908	X	5-26-19	GOLDA K ANDERSON	TH EXPLORATION, LLC	1/8+	945	434	NA	NA	NA	NA	NA	NA
10*21935	X	5-26-19	KARROLL S BOOTH AND LOIS E BOOTH	AMERICAN PETROLEUM PARTNERS LLC	1/8+	940	593	NA	NA	NA	NA	NA	41/224 American Petroleum Partners Operating LLC to TH Exploration LLC
10*22015	X	5-26-19	ERIC JAY BOOTH	AMERICAN PETROLEUM PARTNERS LLC	1/8+	942	217	NA	NA	NA	NA	19/624 SWN Exchange	41/224 American Petroleum Partners Operating LLC to TH Exploration LLC
10*17137	Y	5-26-4.1	MARK E SMITH AND VALERIE SMITH LIFE TENANT	CHESAPEAKE APPALACHIA LLC	1/8+	685	521	22/235 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	830/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC	19/624 SWN Exchange	41/256 SWN Production Company LLC to TH Exploration LLC

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10*17153	Y	5-26-4.1 ALLEN SMITH & BARBARA SMITH REMAINDERMAN	CHESAPEAKE APPALACHIA LLC	1/8+	687	46	23/16 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc	33/110 Chesapeake Appalachia LLC to SWN Production Company LLC	850/396 Statoil USA Onshore Properties Inc and SWN Production Company LLC agreement	33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titlholder LLC	19/624 SWN Exchange Titlholder LLC merger into SWN Production Company LLC	41/256 SWN Production Company LLC to TH Exploration LLC
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* Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.