



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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Tuesday, January 10, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

NORTHEAST NATURAL ENERGY LLC
707 VIRGINIA STREET EAST
STE 1200
CHARLESTON, WV 25301

Re: Permit Modification Approval for SULLIVAN 5H
47-061-01918-00-00

Change Lateral Direction

NORTHEAST NATURAL ENERGY 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 blue ink signature of James A. Martin, written in a cursive style, positioned above the printed name and title.

Operator's Well Number: SULLIVAN 5H
Farm Name: ALAN SULLIVAN
U.S. WELL NUMBER: 47-061-01918-00-00
Horizontal 6A New Drill
Date Modification Issued: 01/10/2023

Promoting a healthy environment.

01/20/2023

CK # 85739
\$15000
Exp Mod

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

1) Well Operator: Northeast Natural Energy, 494498281 Operator ID, Monongalia County, Clay District, Grant Town Quadrangle

2) Operator's Well Number: 5H Well Pad Name: Sullivan

3) Farm Name/Surface Owner: Alan Sullivan Public Road Access: Route 27/1

4) Elevation, current ground: 1,520' Elevation, proposed post-construction: 1,476'

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 Expected Pressure(s): Marcellus, 8,247', 87', 5200 psi

8) Proposed Total Vertical Depth: 8,247'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 21,177'

11) Proposed Horizontal Leg Length: 12,377'

12) Approximate Fresh Water Strata Depths: 50', 1,262'

13) Method to Determine Fresh Water Depths: Drillers logs from offset wells

14) Approximate Saltwater Depths: 2,050', 2,580'

15) Approximate Coal Seam Depths: 500', 1,260'

16) Approximate Depth to Possible Void (coal mine, karst, other): NA

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: N/A Depth: Seam: Owner:

Digitally signed by Gayne Knitowski Date: 2023.01.06 16:27:25 -0500

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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	24"	New	NA	NA	100	100	GTS
Fresh Water	13-3/8"	New	J-55	54.5	1,505	1,475*	CTS
Coal							
Intermediate	9-5/8"	New	J-55	36	2,680	2,650	CTS
Production	5-1/2"	New	P-110	20	21,177'	21,147'	4,980
Tubing	2-7/8"	New	P-110	6.5	NA		
Liners							

*depth to cover Red Rock formation

Gayne Knitowski
Digitally signed by Gayne Knitowski
Date: 2023.01.06 16:27:42 -05'00'

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	24"	28	0.375	NA	NA	Type 1	1.18
Fresh Water	13-3/8"	17-1/2"	0.380	2,730	500	Class A or L	1.19
Coal							
Intermediate	9-5/8"	12-3/8"	0.395	3,520	2800	Class A or L	1.19
Production	5-1/2"	8-3/4"	0.361	14,360	11,400	50:50 POZ	1.07
Tubing	2-7/8"	NA	0.217	13,870	NA	NA	NA
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

Utilize auger rig to set cellar & conductor. The conductor will be grouted with cement to surface. Mobilize top hole drilling rig. Drill surface section on air. Run surface (freshwater & coal string) casing to desired depth. The surface section will not penetrate sea level. Surface casing will be cemented to surface. Drill intermediate section on air. Run intermediate casing to desired depth. Intermediate casing will be cemented to surface. Drill on air the production section to the start of the curve (KOP). The well will be loaded with synthetic oil base drilling mud (SOBM). Demobilize top hole rig. Mobilize horizontal drilling rig. Finish drilling the production section utilizing MWD surveys and geosteering practices to maintain the wellbore in the Marcellus shale and prevent anti-collision. Production casing will be ran to TD and cement top will be inside the intermediate casing.

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

A cement bond log will determine the top of production casing cement. The production casing will be pressure tested. The hydraulic fracturing equipment will then open the toe sleeves and begin pumping the first stage. The plug-and-perf method will be used for the remaining stages. The max anticipated pressure during frac is 11,200psi and a max rate of 90bpm. After frac, the drillout rig will drill all plugs out of the well. Land production tubing at desired depth. Then flowback well until ready to turn in line to production facilities.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 28.65

22) Area to be disturbed for well pad only, less access road (acres): 15.32

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23) Describe centralizer placement for each casing string:

Surface: shoe track & every 3rd joint to surface
Intermediate: shoe track & every 3rd joint to surface
Production: Rigid bow centralizers at shoe track & every other joint in the lateral to KOP. Bow springs from KOP to surface every third joint.

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

Surface string cement will be a Type 1 + Max 3% bwoc Calcium Chloride Fresh Water blend.
Intermediate string cement will be a Type 1 Cement + Max 3% bwoc Calcium Chloride + Fresh Water.
Production string cement will be (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.

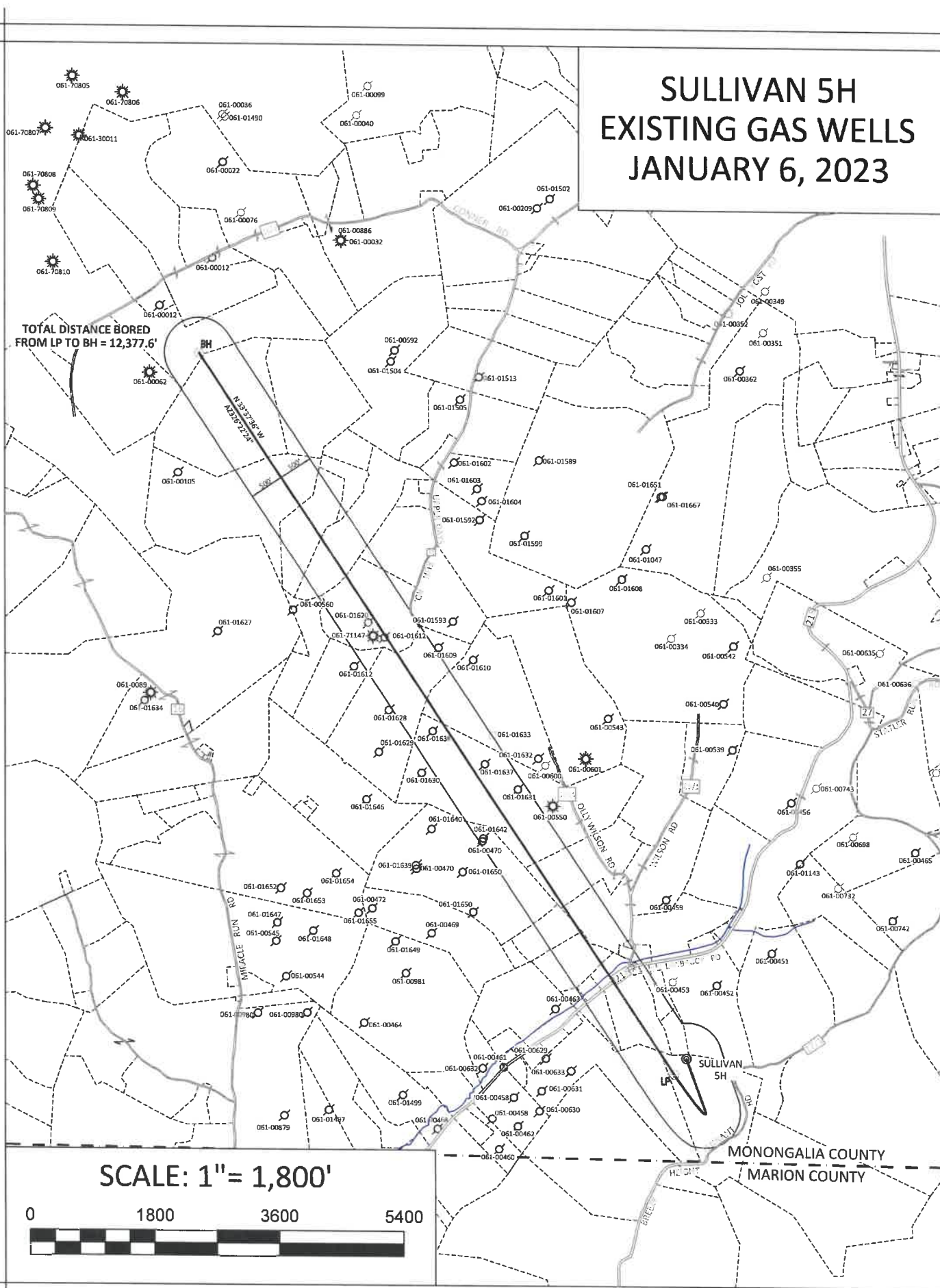
25) Proposed borehole conditioning procedures:

Surface & intermediate on air will utilize high volumetric flow rates of air to ensure the wellbore is clean prior to TOH.
Production section will utilize synthetic oil based drilling mud to properly clean the wellbore. At TD, pump rate and rotation will be maximized and tripping will not begin until shakers flow clean.
Production casing will be circulated prior to cementing to ensure a prepared wellbore for cement.

*Note: Attach additional sheets as needed.

SULLIVAN 5H EXISTING GAS WELLS JANUARY 6, 2023

TOTAL DISTANCE BORED
FROM LP TO BH = 12,377.6'



SCALE: 1" = 1,800'



01/20/2023

Sullivan 5H AREA OF REVIEW

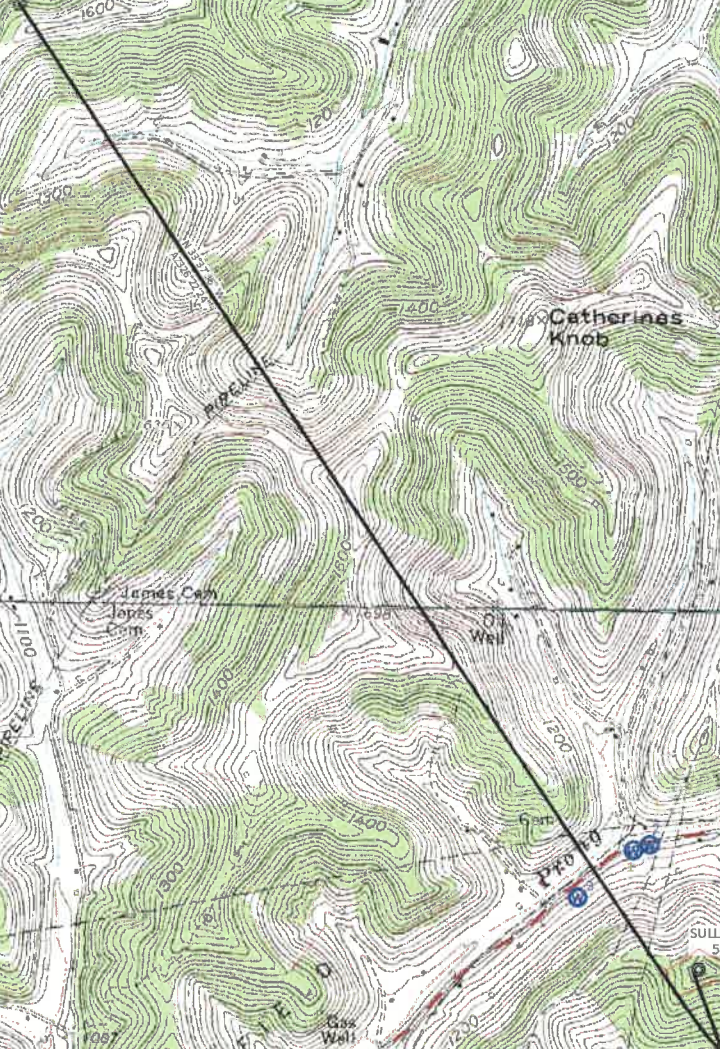
API Number	Well Name	Well Number	Operator	Latitude (NAD 83)	Longitude (NAD 83)	TMP	TVD	Notes
✓ 061-00470	Kenneth Albert	5	East Resources Inc	39.622091	-80.237035	4-26-12	NA	Plugged 9/8/05
✓ 061-01642	Kenneth Albert	NA	Eastern Associated / Peabody Coal Company	39.623338	-80.233621	4-26-12	NA	Plugged 5/24/12
✓ 061-01631	Micheal Latocha	6	Eastern Associated / Peabody Coal Company	39.625135	-80.231389	4-19-49	NA	Plugged 7/28/11
✓ 061-01637	Micheal Latocha	10	Eastern Associated / Peabody Coal Company	39.626102	-80.233105	4-19-49	NA	Plugged 12/20/11
✓ 061-01638	Micheal Latocha	NA	Eastern Associated / Peabody Coal Company	39.62734	-80.235811	4-19-49	NA	Plugged 2/6/12
✓ 061-01633	Micheal Latocha	4	Eastern Associated / Peabody Coal Company	39.627233	-80.232718	4-19-48	NA	Plugged 10/20/11
✓ 061-01612	Edith Darrah	NA	Eastern Associated / Peabody Coal Company	39.629732	-80.244009	4-19-31	NA	NA
✓ 061-01620	Billy Ray Tennant	2	Eastern Associated / Peabody Coal Company	39.630968	-80.238352	4-19-31	NA	Plugged 7/26/11
✓ 061-71147	NA	NA	NA	39.631043	-80.238536	4-19-31	NA	Pre 1929 farm well

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WELL NAME: SULLIVAN 5H
GRANT TOWN, WV

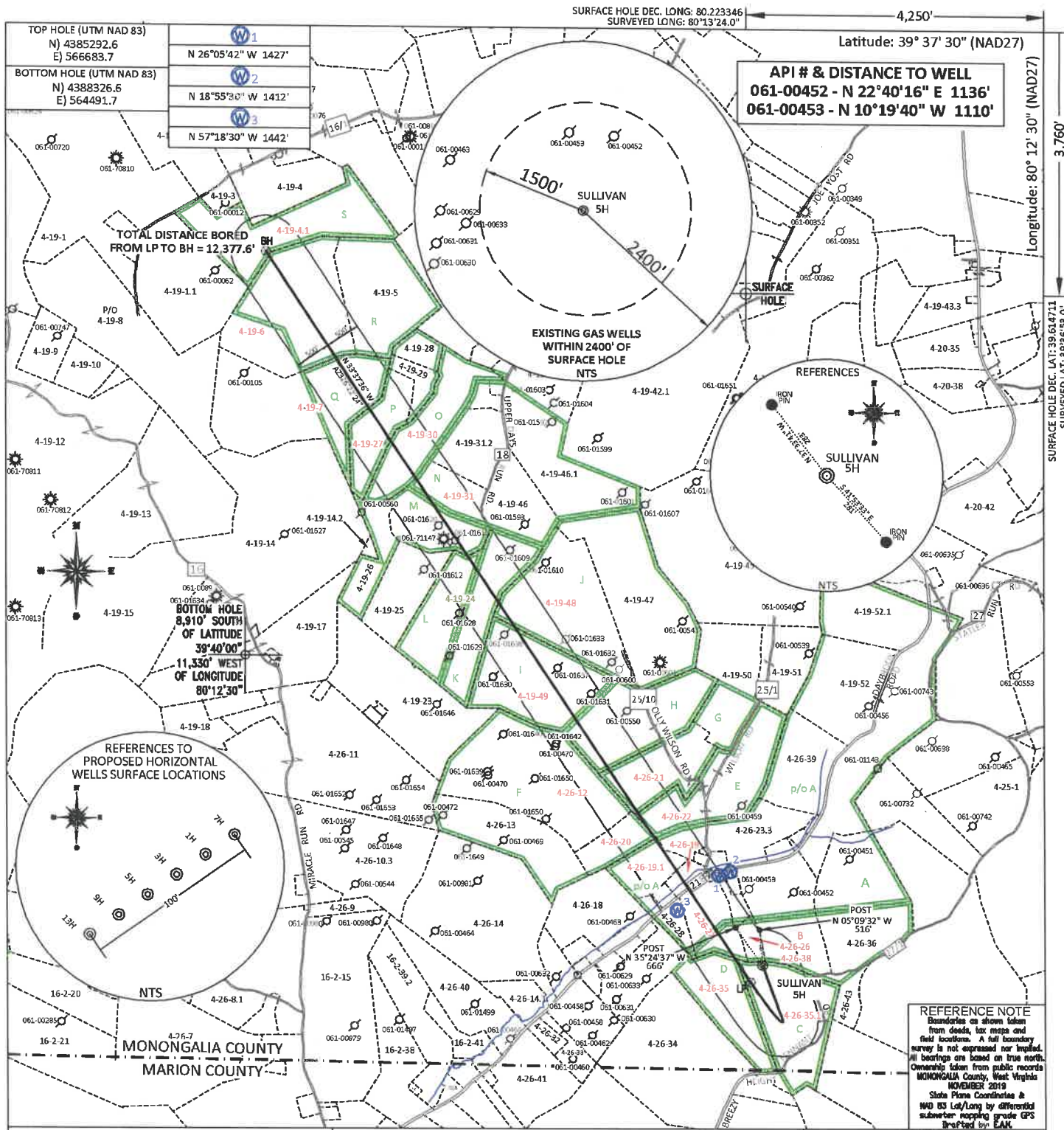
TOTAL DISTANCE BORED
FROM LP TO BH = 12,377.6'



01/20/2023



GRAPHIC SCALE



FILE #: NNE20
 DRAWING #: 3048
 SCALE: PLAT: 1" = 2000'
 TICK: 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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
 Signed: *[Signature]*
 L.L.S. #2124 : Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304
 Well Type: Oil Waste Dposal Production Deep
 Gas Liquid Injection Storage Shallow
 WATERSHED: UPPER MONONGAHELA RIVER
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: ALAN SULLIVAN
 OIL & GAS ROYALTY OWNER: ALAN SULLIVAN
 LEASE NUMBERS: _____

DATE: JANUARY 6, 2023
 OPERATOR'S WELL #: SULLIVAN 5H
 API WELL #: 47 61 01918
 STATE COUNTY PERMIT
 CURRENT ELEVATION: 1,520'
 PROPOSED ELEVATION: 1,476.4'
 QUADRANGLE: GRANT TOWN
 ACREAGE: 1,124.250 +/-
 ACREAGE: 25.870 +/- **01/20/2023**

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____
 TARGET FORMATION: MARCELLUS
 ESTIMATED DEPTH: TVD: 8,247' TMD: 21,177.1'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301
 DESIGNATED AGENT: JOHN ADAMS
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

4-26-35	RANDY LEE & TRINA TENNANT
4-19-30	BILLIE & JEFFERSON PRICE
4-19-27	JAMES TENNANT
4-19-31	JIMMY R & PAMELA K TENNANT; BILLY RAY & ROXANA CAHILL
4-19-48	JAMES F & LINDA KARUS
4-26-38	ADAM CLAY DARRAH
4-19-49	MICHAEL J LATOCHA
4-26-21	MARVIN L WILSON II
4-26-22	LINDA KAY FOGT
4-26-19	LINDA R PARKER
4-26-19.1	SANDRA L LONG
4-19-24	EDITH L DARRAH
4-26-27	NNE MIDSTREAM LLC
4-26-12	KENNETH W & RUTH E ALBERT
4-26-35.1	ALAN SULLIVAN
4-26-26	NNE MIDSTREAM LLC
4-26-20	KENNETH W & RUTH E ALBERT
4-19-6	JIMMY R & PAMELA K TENNANT; RAY & ROXANA CAHILL
4-19-7	STEPHEN R WILSON, ET AL
4-19-4.1	KEMBLE D TATE

LEASE INDEX			
A	WV-061-000160-001-ACT	K	WV-061-003931-001
B	WV-061-000160-001-ACT	L	WV-061-003931-011
C	WV-061-005448-002	M	WV-061-003931-011
D	WV-061-000160-001-ACT	N	WV-061-006350-001
E	WV-061-000160-001-ACT	O	WV-061-003931-011
F	WV-061-005998-001	P	WV-061-003931-011
G	WV-061-000160-001-ACT	Q	WV-061-005906-004
H	WV-061-000160-001-ACT	R	WV-061-005906-004
I	WV-061-000160-001-ACT	S	WV-061-005876-002
J	WV-061-001851-0014		

01/20/2023

FILE #: NEE20

DATE: JANUARY 6, 2023

DRAWING #: 3048

OPERATOR'S WELL #: SULLIVAN 5H

SCALE: N/A

API WELL #: 47 61 01918
STATE COUNTY PERMIT

WW-6A1 Form

Operators Well No. Sullivan 5H

Tract	Lease Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book	Page
A	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
B	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
C	WV-061-005448-002	Alan Sullivan	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	466
D	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
E	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
F	WV-061-005998-001	Ridgetop Appalachia, LLC	Northeast Natural Energy, LLC	12.5% Royalty or More	1785	204
G	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
H	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
I	WV-061-000160-001-ACT	EQT Production Company	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	44
J	WV-061-001851-0014	Terrance W. Mason	Northeast Natural Energy, LLC	12.5% Royalty or More	1568	321
	WV-061-001851-032	Judith Ann Munkittrick	Northeast Natural Energy, LLC	12.5% Royalty or More	1570	113
	WV-061-001851-027	Debra L. Frazier	Northeast Natural Energy, LLC	12.5% Royalty or More	1567	814
	WV-061-001851-026	Gary W. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1727	240
	WV-061-001851-026	Donna G. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1727	240
	WV-061-001851-026	William Bruce Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1727	240
	WV-061-001851-026	Samuel Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1727	240
	WV-061-001851-026	Jason Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1727	240
K	WV-061-003931-001	Margaret A. Berdine	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	523
	WV-061-002923-001	Ryan C. Radtka	Northeast Natural Energy, LLC	12.5% Royalty or More	1402	615
	WV-061-003931-002	Gary L. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	516
	WV-061-003931-002	Linda K. Statler	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	516
	WV-061-003931-002	Kenneth R. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	516
	WV-061-003931-002	Susan L. Heiskell	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	516
	WV-061-003931-008	LaNelle C. Stiles	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	531
	WV-061-003931-007	Jody Lynn Maley	Northeast Natural Energy, LLC	12.5% Royalty or More	1565	417
	WV-061-003931-014	Jill Renee Maley	Northeast Natural Energy, LLC	12.5% Royalty or More	1557	756
	WV-061-003931-019	Kelli D. Wilson	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	526
	WV-061-003931-019	Lorri E. Kuhn	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	526
	WV-061-003931-019	Gary D. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	526
	WV-061-003931-016	Brett L. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	521
	WV-061-003931-016	Cheral A. Skinner	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	521
	WV-061-003931-016	Kami D. Elliott	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	521
	WV-061-003931-005	Dennis L. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	529
	WV-061-003931-003	David D. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1568	112
	WV-061-003931-006	Michael G. Phillips	Northeast Natural Energy, LLC	12.5% Royalty or More	1568	283
	WV-061-003931-013	Melinda P. Heidekat	Northeast Natural Energy, LLC	12.5% Royalty or More	1557	754
	WV-061-003931-011	Connie Sharon Copeland	Northeast Natural Energy, LLC	12.5% Royalty or More	1562	416
	WV-061-003931-010	Randy D. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1562	397
	WV-061-003931-018	Phillip D. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1560	255
	WV-061-003931-020	Nancy A. Maggard	Northeast Natural Energy, LLC	12.5% Royalty or More	1567	820
WV-061-003931-004	Gerald Wayne Stiles	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	513	
WV-061-003931-015	Diana L. Fulps	Northeast Natural Energy, LLC	12.5% Royalty or More	1557	758	

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Tract	Lease Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book	Page
	WV-061-003931-012	Linda M. Sutphin	Northeast Natural Energy, LLC	12.5% Royalty or More	1560	264
	WV-061-003915-008	Judith J. Radcliff	Northeast Natural Energy, LLC	12.5% Royalty or More	1559	125
	WV-061-003915-005	James Swiger	Northeast Natural Energy, LLC	12.5% Royalty or More	1560	258
	WV-061-003933-001	Gary S. Williams	Northeast Natural Energy, LLC	12.5% Royalty or More	1567	818
L	WV-061-003931-011	Connie Sharon Copeland	Northeast Natural Energy, LLC	12.5% Royalty or More	1562	416
	WV-061-003931-009	Danny J. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1567	425
	WV-061-003931-015	Diana L. Fulps	Northeast Natural Energy, LLC	12.5% Royalty or More	1557	758
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	WV-061-003931-013	Melinda P. Heidekat	Northeast Natural Energy, LLC	12.5% Royalty or More	1557	754
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	WV-061-002923-001	Ryan C. Radtka	Northeast Natural Energy, LLC	12.5% Royalty or More	1402	615
N	WV-061-006350-001	MM-Marcellus II, L.P.	Northeast Natural Energy, LLC	12.5% Royalty or More	1796	77
O	WV-061-003931-011	Connie Sharon Copeland	Northeast Natural Energy, LLC	12.5% Royalty or More	1562	416
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	WV-061-003931-006	Michael G. Phillips	Northeast Natural Energy, LLC	12.5% Royalty or More	1568	283

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	WV-061-003931-013	Melinda P. Heidekat	Northeast Natural Energy, LLC	12.5% Royalty or More	1557	754
	WV-061-003931-005	Dennis L. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1564	529
	WV-061-003931-003	David D. Yost	Northeast Natural Energy, LLC	12.5% Royalty or More	1568	112
	WV-061-002923-001	Ryan C. Radtka	Northeast Natural Energy, LLC	12.5% Royalty or More	1402	615
Q	WV-061-005906-004	Gary W. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	426
	WV-061-005906-001	Donna G. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	420
	WV-061-005906-003	William Bruce Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	424
	WV-061-005906-005	Samuel Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1778	798
	WV-061-005906-002	Jason Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	422
	WV-061-005916-002	Derrick Wayne Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1774	689
	WV-061-005916-001	Eric Blaine Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1774	687
	WV-061-005916-004	Darrian Marie Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	54
	WV-061-005904-002	Donald G. Tennant II	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	121
	WV-061-005904-001	Craig Alan Dintaman	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	119
	WV-061-005916-003	Yolanda Krotzer Davis	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	788
	WV-061-005934-003	Rachel Haught	Northeast Natural Energy, LLC	12.5% Royalty or More	1781	561
	WV-061-005904-003	Jack R. Tuttle	Northeast Natural Energy, LLC	12.5% Royalty or More	1794	532
	WV-061-005788-003	Kenneth D. Brame	Northeast Natural Energy, LLC	12.5% Royalty or More	1793	350
	WV-061-005788-006	Paul McBride	Northeast Natural Energy, LLC	12.5% Royalty or More	1794	506
	WV-061-005788-004	Paula McBride	Northeast Natural Energy, LLC	12.5% Royalty or More	1794	630
	WV-061-005788-007	Brian Keith Clark	Northeast Natural Energy, LLC	12.5% Royalty or More	1794	508
	WV-061-005788-005	Cheryl Lee Clark	Northeast Natural Energy, LLC	12.5% Royalty or More	1794	504
	WV-061-005788-002	Toni Lindsey Greene	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	840
	WV-061-005788-001	Sandy L. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1748	762
	WV-061-006074-005	LeeAnn Shumiloff	Northeast Natural Energy, LLC	12.5% Royalty or More	1793	436
	WV-061-006074-004	Christopher B. Wilson	Northeast Natural Energy, LLC	12.5% Royalty or More	1793	434
	WV-061-006074-001	Susan Brinegar	Northeast Natural Energy, LLC	12.5% Royalty or More	1789	502
	WV-061-006074-003	Justin Wilson	Northeast Natural Energy, LLC	12.5% Royalty or More	1789	411
	WV-061-006074-002	Deken Wilson	Northeast Natural Energy, LLC	12.5% Royalty or More	1789	409
	WV-061-005916-007	John C. Jones	Northeast Natural Energy, LLC	12.5% Royalty or More	1789	443
	WV-061-005916-005	Janet D. Crabtree	Northeast Natural Energy, LLC	12.5% Royalty or More	1786	625
	WV-061-005916-006	Loruma B. Brokaw	Northeast Natural Energy, LLC	12.5% Royalty or More	1786	627
	WV-061-005916-008	Thomas D. Jones	Northeast Natural Energy, LLC	12.5% Royalty or More	1794	534
	WV-061-006032-001	Marsha Catherine Wilson	Northeast Natural Energy, LLC	12.5% Royalty or More	1788	522
	WV-061-006021-005	Nancy A. Kallas	Northeast Natural Energy, LLC	12.5% Royalty or More	1788	514
	WV-061-006021-004	Pamela Lane Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	88
	WV-061-006021-001	Patricia Jane Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	82
	WV-061-006021-003	Kimberly Dawn Huggins Coker	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	86
	WV-061-006021-002	James David Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	84
	WV-061-005934-001	Tonya Smerdell	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	824
	WV-061-005934-002	Tina Bragg	Northeast Natural Energy, LLC	12.5% Royalty or More	1775	826
	WV-061-006019-002	Roxana Cahill	Northeast Natural Energy, LLC	12.5% Royalty or More	1788	512
	WV-061-006016-001	Jimmy Randall Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	72
	WV-061-006017-001	Pamela Kay Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	74
	WV-061-006019-001	Billy Ray Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	78

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Tract	Lease Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book	Page
R	WV-061-005906-004	Gary W. Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	426
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	WV-061-005906-003	William Bruce Moore	Northeast Natural Energy, LLC	12.5% Royalty or More	1772	424
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	WV-061-005934-003	Rachel Haught	Northeast Natural Energy, LLC	12.5% Royalty or More	1781	561
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	WV-061-006074-005	LeeAnn Shumiloff	Northeast Natural Energy, LLC	12.5% Royalty or More	1793	436
	WV-061-006074-004	Christopher B. Wilson	Northeast Natural Energy, LLC	12.5% Royalty or More	1793	434
	WV-061-006074-001	Susan Brinegar	Northeast Natural Energy, LLC	12.5% Royalty or More	1789	502
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	WV-061-006017-001	Pamela Kay Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	74
	WV-061-006019-001	Billy Ray Tennant	Northeast Natural Energy, LLC	12.5% Royalty or More	1787	78
S	WV-061-005876-002	Kemble D. Tate	Northeast Natural Energy, LLC	12.5% Royalty or More	1782	291

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Well Location Plat
Page 4 Cross Section

Northeast Natural Energy, LLC
Applicant / Well Operator Name

DEP ID#

Sullivan Pad
Monongalia Co., WV
WELL DEP Datum @ 1476.0usft (Original Well Elev)

Well #
Sullivan 5H



WELL PLAN
Operator Name: **Northeast Natural Energy**

DEP
Use
Only

Permit #

Well/Farm Name: **Sullivan Pad**

NOTES:

Name	TVD	Latitude	Longitude	TMD
Sullivan-5H_SHL	0.0	39.6147920	-80.2231444	0
Sullivan-5H_KOP	4696.0	39.6147920	-80.2231444	4696
Sullivan-5H_LP	8247.0	39.6141549	-80.2237476	8799.5
Sullivan-5H_PBHL	8247.0	39.6422952	-80.2483825	21177.1

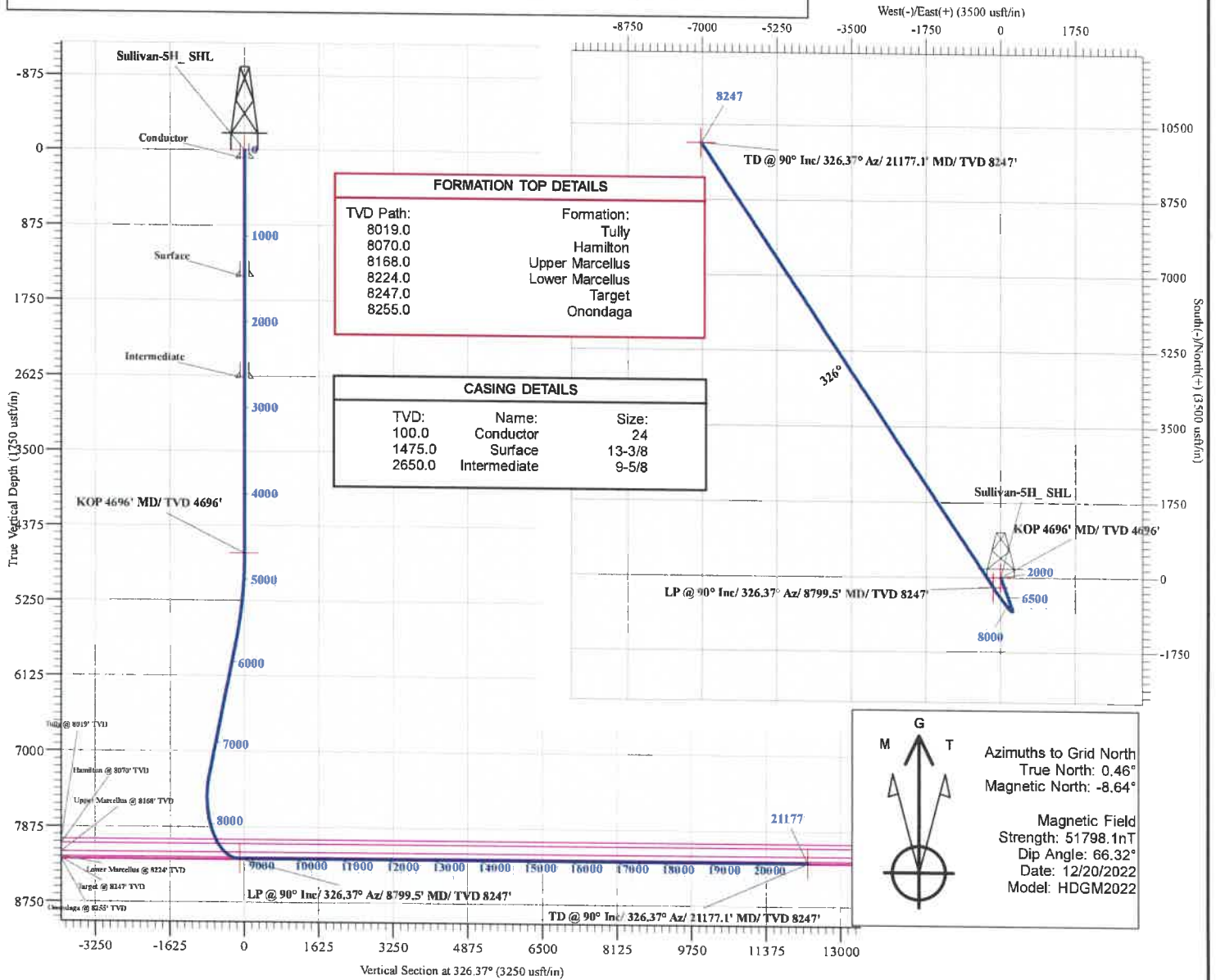
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SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSEct	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
4696.0	0.00	0.00	4696.0	0.0	0.0	0.00	0.00	0.0	KOP 4696' MD/ TVD 4696'
5746.1	21.00	159.88	5722.7	-178.7	65.5	2.00	159.88	-185.0	Hold 21° Inc
7419.6	21.00	159.88	7285.1	-741.9	271.8	0.00	0.00	-768.2	Curve KOP 8°/100
8799.5	90.00	326.37	8247.0	-230.7	-171.8	8.00	165.57	-96.9	LP @ 90° Inc/ 326.37° Az
21177.1	90.00	326.37	8247.0	10075.7	-7026.3	0.00	0.00	12280.7	TD @ 90° Inc/ 326.37° Az



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