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west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Friday, September 25, 2020  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

HG ENERGY II APPALACHIA, LLC  
5260 DUPONT ROAD

PARKERSBURG, WV 26101

Re: Permit Modification Approval for ANTONIO 1206 N-1H  
47-033-05978-00-00

**Lateral Length**

HG ENERGY II APPALACHIA, 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 positioned to the right of the typed name and title.

Operator's Well Number: ANTONIO 1206 N-1H  
Farm Name: CHARLES R. & FRANKLIN L. SUTTON  
U.S. WELL NUMBER: 47-033-05978-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 09/25/2020

Promoting a healthy environment.

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

1) Well Operator: HG Energy II Appalachia, LLC 494519932 Harrison Grant West Milford 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Antonio 1206 N-1H Well Pad Name: Antonio 1206

3) Farm Name/Surface Owner: HG Energy II Appalachia, LLC Public Road Access: Hackers Creek Rd @ SR 19

4) Elevation, current ground: 1364' Elevation, proposed post-construction: 1350'

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 Expected Pressure(s):  
Marcellus at 7081'/7260' and 179' in thickness. Anticipated pressure at 4314#.

8) Proposed Total Vertical Depth: 7252'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 21,980'

11) Proposed Horizontal Leg Length: 13,268'

12) Approximate Fresh Water Strata Depths: 135', 480', 637', 731'

13) Method to Determine Fresh Water Depths: Nearest offset well data

14) Approximate Saltwater Depths: No S/W depths found on WR-35's for offset wells, salt water expected to be below elevation.

15) Approximate Coal Seam Depths: 623', 1010' to 1015'

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

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

*SDW*  
*8/21/2020*

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	LS	157.5	120'	120'	Drilled In
Fresh Water/Coal	20"	NEW	J-55	94	1100'	1100'	40% excess, CTS
Intermediate 1	13 3/8"	NEW	J-55	68	2200'	2200'	40% excess, CTS
Intermediate 2	9 5/8"	NEW	J-55	40	3000'	3000'	40% excess tail, CTS
Production	5 1/2"	NEW	P-110	23	21980'	21980'	20% excess tail, CTS
Tubing							
Liners							

*SOW  
8/21/2020*

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"	30"	.500				Drilled In
Fresh Water/Coal	20"	24"	.438	2110	1200	Type 1, Class A	40 % excess yield = 1.20, CTS
Intermediate 1	13 3/8"	17 1/2"	.480	3450		Type 1/Class A	Lead 40% excess, Tail 0% excess
Intermediate 2	9 5/8"	12 1/4"	.395	3950		Type 1/Class A	Lead 40% excess, Tail 0% Excess
Production	5 1/2"	8 1/2"	.415	16240	12500	Type 1/Class A	20% excess yield = 1.15, tail yield 1.34
Tubing							
Liners							

**PACKERS**

Kind:				
Sizes:				
Depths Set:				

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

Drill the vertical depth to the Marcellus at an estimated total vertical depth of approximately 7252 feet. Drill horizontal leg to estimated 13,268' lateral length, 21,980' TMD. Hydraulically fracture stimulate and be capable of producing from the Marcellus Formation. Should we encounter an unanticipated void in the coal, we will install a minimum of 20' of casing below the void but not more than 100' below the void, set a basket and grout to surface. We plan to run an ECP above the Gantz/Dominion Storage interval to aid in sealing off and isolating the storage interval.

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

The stimulation will be completed with 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. See attached list. Maximum pressure not to exceed 12,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 68.187 acres

22) Area to be disturbed for well pad only, less access road (acres): 11.058 acres

23) Describe centralizer placement for each casing string:

No centralizers will be used with conductor casing.  
Freshwater - centralized every 3 joints to surface.  
Coal - Bow Spring on every joint, will also be running ACP for isolating storage zone  
Intermediate - Bow Spring on first 2 joints then every third joint to 100' from surface.  
Production - Run 1 spiral centralizer every 5 joints from the top of the curve to surface. Run 1 spiral centralizer every 3 joints from the 1st 5.5' long joint to the top of the curve.

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

Conductor -N/A. Casing to be drilled in w/ Dual Rotary Rig.  
Fresh Water - 15.6 ppg PNE-1 + 3% bwoc CaCl<sub>2</sub>, 40% Excess Yield = 1.20, CTS  
Intermediate 1 - "Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl<sub>2</sub>0% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl zero% Excess. CTS"  
Intermediate 2 - "Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl<sub>2</sub>0% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl zero% Excess. CTS"  
Production - "Lead: 14.5 ppg POZ:PNE-1 + 0.3% bwoc R3 + 1% bwoc EC1 + 0.75 gal/sk FP13L + 0.3% bwoc MPA170Tail: 14.8 ppg PNE-1 + 0.35% bwoc R3 + 0.75 gal/sk FP13L + 50% bwoc ASCA1 + 0.5% bwoc MPA17020% ExcessLoad Yield=1.19Tail Yield=1.94CTS"

25) Proposed borehole conditioning procedures:

Conductor - Ensure the hole is clean at TD.  
Fresh Water - Once casing is at setting depth, circulate a minimum of one hole volume with Fresh Water prior to pumping cement.  
Coal - Once casing is at setting depth, Circulate and condition at TD. Circulate a minimum of one hole volume prior to pumping cement.  
Intermediate - Once casing is at setting depth, Circulate and condition mud at TD. Circulate a minimum of one hole volume prior to pumping cement.  
Production - Once on bottom/TD with casing, circulate at max allowable pump rate for at least 2x bottoms up, or until returns and pump pressures indicate the hole is clean. Circulate a minimum of one hole volume prior to pumping cement.

\*Note: Attach additional sheets as needed.



**1206 N-1H**  
**Marcellus Shale Horizontal**  
**Harrison County, WV**

Ground Elevation

1350'

1206 N-1H SHL

14220780.27N 1815474.77E

Azm 340.538 & 337.516°

1206 N-1H LP

14219939.72N 1812638.84E

14232319.62N 1807891.49E

WELLBORE DIAGRAM

HOLE

CASING

GEOLOGY

TOP

BASE

MUD

CEMENT

CENTRALIZERS

CONDITIONING

COMMENTS

30"

30" 157.5# LS

Conductor

0

120

AIR

N/A. Casing to be drilled in w/ Dual Rotary Rig

N/A

Ensure the hole is clean at TD.

Conductor casing = 0.5" wall thickness

24"

20" 94# J-55

Fresh Water

0

1015

1015

AIR

15.6 ppg PNE-1 + 3% bwoc CaCl  
40% Excess  
Yield=1.20 / CTS

Centralized every 3 joints to surface

Once casing is at setting depth, circulate a minimum of one hole volume with Fresh Water prior to pumping cement.

17.5"

13-3/8" 68# J-55 BTC

Little/Big Lime Injun / Gantz (Storage)

1555 / 1596

1575 / 1658

AIR / KCL Salt Polymer

Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl  
40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl  
zero% Excess. CTS

Bow Spring on every joint  
*\*will also be running ACP for isolating storage zone\**

Once casing is at setting depth, Circulate and condition at TD. Circulate a minimum of one hole volume prior to pumping cement.

Intermediate casing = 0.480" wall thickness  
Burst=3450 psi

12.25"

9-5/8" 40# J-55 BTC

Filly / Thiny Foot Gordon Stray / Gordon 5th Sand Bayard / Warren

2095 / 2182

2157 / 2200

AIR / KCL Salt Polymer

Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl  
40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl  
zero% Excess. CTS

Bow Spring on first 2 joints then every third joint to 100' form surface

Once casing is at setting depth, Circulate and condition mud at TD. Circulate a minimum of one hole volume prior to pumping cement.

Intermediate casing = 0.395" wall thickness  
Burst=3950 psi

8.5" Vertical

Speechley

3204

3224

9.0ppg SOBMM

Lead: 14.5 ppg POZ/PNE-1 + 0.3% bwoc R3 + 1% bwoc EC1 + 0.75 gal/sk FP13L + 0.3% bwoc MPA170

Run 1 spiral centralizer every 5 joints from the top of the curve to surface.

Once on bottom/TD with casing, circulate at max allowable pump rate for at least 2x bottoms up, or until returns and pump pressures indicate the hole is clean. Circulate a minimum of one hole volume prior to pumping cement.

Production casing = 0.415" wall thickness  
Burst=16240 psi  
Note: Actual centralizer schedules may be changed due to hole conditions

8.5" Curve

5-1/2" 23# P-110 HP CDC HTQ

Cashaqua Middlesex West River Burkett Tully Limestone Hamilton Marcellus

6651

6751

6783

6854

6864

6972

7081

8.5" Lateral

TMD / TVD (Production)

21980

7252

11.5ppg-12.5ppg SOBMM

Lead Yield=1.19  
Tail Yield=1.94  
CTS

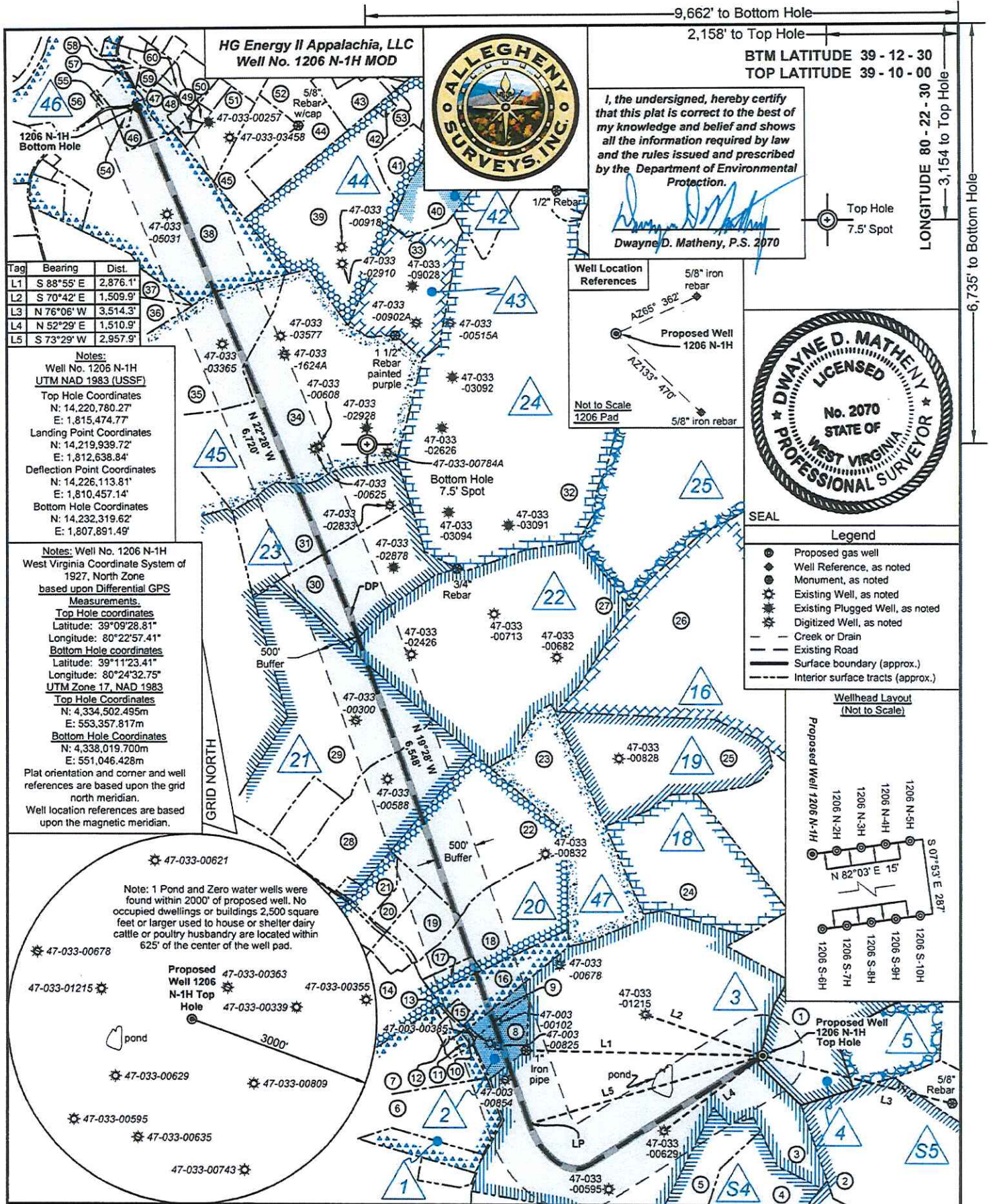
Run 1 spiral centralizer every 3 joints from the 1st 5.5' long joint to the top of the curve.

LP @ 7252' TVD / 8712' MD

8.5" Hole - Cemented Long String 5-1/2" 23# P-110 HP CDC HTQ

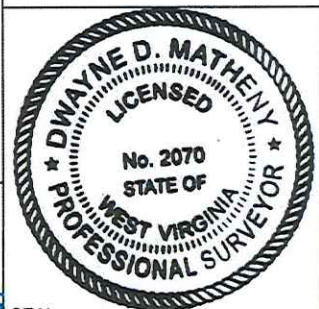
TD @ +/-7252' TVD +/-21980' MD  
X=centralizers



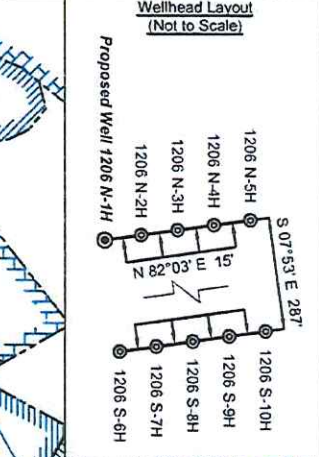


I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

*Dwayne D. Matheny*  
 Dwayne D. Matheny, P.S. 2070



- Legend**
- Proposed gas well
  - Well Reference, as noted
  - Monument, as noted
  - Existing Well, as noted
  - Existing Plugged Well, as noted
  - Digitized Well, as noted
  - Creek or Drain
  - Existing Road
  - Surface boundary (approx.)
  - Interior surface tracts (approx.)



FILE NO: 06-36-12-G-H-19  
 DRAWING NO: 1206 N-1H Well Plat  
 SCALE: 1" = 1500'  
 MINIMUM DEGREE OF ACCURACY: Submeter  
 PROVEN SOURCE OF ELEVATION: CORS, Bridgeport, WV

**STATE OF WEST VIRGINIA**  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

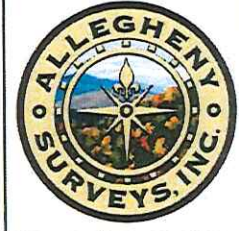
DATE: August 13 2020  
 OPERATOR'S WELL NO. 1206 N-1H  
 API WELL NO  
 47 - 033 -  
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: 1,350' WATERSHED: Middle West Fork Creek  
 DISTRICT: Grant QUADRANGLE: West Milford  
 COUNTY: Harrison  
 SURFACE OWNER: Charles R. & Franklin L. Sutton ACREAGE: 30.00  
 ROYALTY OWNER: Charles R. Sutton LEASE NO: ACREAGE: 30.00

PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD - BHL + DP 7,252' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 21,980' MD

WELL OPERATOR: HG Energy II Appalachia, LLC DESIGNATED AGENT: Diane C. White  
 ADDRESS: 5260 Dupont Road ADDRESS: 5260 Dupont Road  
 Parkersburg, WV 26101 Parkersburg, WV 26101



No.	TM / Par	Owner	Bk / Pg	Ac.
1	426 / 72	Charles R. & Franklin L. Sutton	1301 / 98	30.00
2	446 / 3	Antonio P. LLC	1503 / 291	200.00
3	426 / 71	Antonio P. LLC	1503 / 291	233.35
4	446 / 2	Antonio P. LLC	1503 / 291	43.90
5	446 / 1	Antonio P. LLC	1503 / 291	24.10
6	425 / 30.1	James W. & Susan A. Freeman	1139 / 386	30.00
7	425 / 30	Earl H. & Melissa J. Graham	1337 / 366	21.39
8	425 / 23.6	Joshua D. Messenger, et ux	1425 / 1133	8.50
9	425 / 23	George P. Koutsobans, et ux	— / —	2.76
10	425 / 23.5	Rhonda R. & George P. Koutsobans	1411 / 1231	0.29
11	425 / 23.3	Rhonda R. & George P. Koutsobans	1420 / 93	0.54
12	425 / 29.1	Rhonda R. & George P. Koutsobans	1420 / 93	0.27
13	425 / 23.4	Mariene & Robert V. Shepherd	1201 / 12	0.80
14	425 / 29	Marva Shepherd	W166 / 413	53.04
15	425 / 22	Duck Creek Mission Church Trust	1024 / 964	0.912
16	425 / 21	Judith H. Russell	1212 / 1074	15.26
17	425 / 20	Jeffery L. & Parry S. Harvey	1394 / 607	3.00
18	425 / 19	Antonio P. LLC	1503 / 291	31.00
19	425 / 10	Joy L. Jarrett	1272 / 348	9.60
20	425 / 11.1	Linda Snyder	1124 / 768	5.12
21	425 / 11	Linda Snyder	1124 / 768	6.29
22	425 / 18	Antonio P. LLC	1503 / 291	46.00
23	425 / 17	Antonio P. LLC	1503 / 291	48.00
24	426 / 38	Antonio P. LLC	1503 / 291	50.75
25	426 / 37	Antonio P. LLC	1503 / 291	54.00
26	426 / 13	Antonio P. LLC	1503 / 291	149.74
27	425 / 16	Antonio P. LLC	1503 / 291	122.25
28	425 / 12	Antonio P. LLC	1503 / 291	42.30
29	425 / 14	WVDNR	W85 / 624	73.60
30	425 / 15	WVDNR	W85 / 624	40.85
31	405 / 81	WVDNR	W85 / 624	42.00
32	405 / 82	Jim K. Stutler	1563 / 89	206.52
33	405 / 66	Antonio P. LLC	1503 / 291	33.00
34	405 / 74	Mary Lou Smith	W117 / 1179	107.76
35	405 / 73	Mary Lou Smith	W117 / 1179	45.00
36	405 / 62.2	Danny Joe Miller	1521 / 1108	9.93
37	405 / 62	Evelyn Marie Ward, LE	— / —	56.18
38	405 / 63.8	Kimberly K. & John T. Lough	1518 / 822	80.25
39	405 / 64	Robert M. Lewis, Jr.	1518 / 814	62.26
40	405 / 65.1	Kermit P. & Deborah B. Stutler	1181 / 306	20.65
41	405 / 64.1	Tracy L. Davis	1443 / 766	8.20
42	405 / 64.6	Edward G. Lewis (LE)	1394 / 367	0.82
43	405 / 49	Connie J. & Robert M. Lewis, Jr.	1221 / 898	12.12
44	405 / 48	Connie J. & Robert M. Lewis, Jr.	1518 / 814	13.20
45	405 / 47	Robin Ann Stark	1518 / 809	14.06
46	405 / 63.4	Kimberly K. & John T. Lough	1518 / 822	5.27
47	405 / 41.6	Linger Consulting LLC	1538 / 770	4.59
48	405 / 41	Luella Cayton, et al	— / —	1.20
49	405 / 86	Shirley E. Everett (LE)	1139 / 416	0.84
50	405 / 41.5	Carole & Robert L. Norton, Jr.	1474 / 616	1.02
51	405 / 41.4	Christopher S. Cutlip & Ashley N. Mullooly	1464 / 1184	9.90
52	405 / 50	Connie J. & Robert M. Lewis, Jr.	1518 / 814	16.22
53	405 / 51	Connie J. & Robert M. Lewis, Jr.	1518 / 814	0.80
54	405 / 63.9	Michael J. & Carolyn L. Thomas	1348 / 92	1.01
55	405 / 63.1	Larry D. Myers Revocable Trust	W191 / 1279	0.53
56	405 / 63	Larry D. Myers Revocable Trust	W191 / 1279	32.60
57	405 / 35.2	Joseph R. & Tammy A. Romano	1192 / 512	1.00
58	405 / 38	Mary Huff	1143 / 1013	1.92
59	405 / 39	Barbara J. Campbell	W160 / 998	3.98
60	405 / 41.3	Jeremy D-Wayne & Kimberly Lynn Louk	1399 / 518	2.49

ID	Lease
1	A.C. Thrasher, et al
2	Hiram E. Edmonds, et al
3	C. Earl Snider, et al
4	Alton Bell, et al
5	Alton Bell
16	Lewis M. Stout, et al
18	H.D. Smith, et al
19	Suzanne D. Simmons, et al
20	Mae Gaston, et al
21	Charles H. Gaston, et al
22	Rachel S. Hershey, et al
23	Rachel S. Hershey, et al
24	Mary A. Lowther, et al
25	Porter Maxwell, et al
42	Hattie O. West, et al
43	Petitto Brothers, Inc.
44	Jettie Cox, et al
45	Robert & Betty Stevenson, et al
46	Roscoe Allman, et ux
47	WV Division of Natural Resources
54	Creed W. Snider, et al
55	Lloyd Stout

FILE NO: 06-36-12-G-H-19  
DRAWING NO: 1206 N-1H Well Plat  
SCALE: 1" = 1500'  
MINIMUM DEGREE OF ACCURACY:  
Submeter  
PROVEN SOURCE OF ELEVATION:  
CORS, Bridgeport, WV



DATE: August 13 2020  
OPERATOR'S WELL NO. 1206 N-1H  
API WELL NO  
47 — 033 —  
STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
(IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
LOCATION: ELEVATION: 1,350' WATERSHED: Middle West Fork Creek QUADRANGLE: West Milford  
DISTRICT: Grant COUNTY: Harrison  
SURFACE OWNER: Charles R. & Franklin L. Sutton ACREAGE: 30.00  
ROYALTY OWNER: Charles R. Sutton LEASE NO: ACREAGE: 30.00  
PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD - BHL + DP 7,252' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 21,980' MD

WELL OPERATOR: HG Energy II Appalachia, LLC DESIGNATED AGENT: Diane C. White  
ADDRESS: 5260 Dupont Road ADDRESS: 5260 Dupont Road  
Parkersburg, WV 26101 Parkersburg, WV 26101



**HG Energy, LLC**  
5260 Dupont Road  
Parkersburg, WV 26101  
(304) 420-1100 - Office  
(304) 863-3172 - Fax

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August 13, 2020

Mr. James Kennedy  
WVDEP  
Division of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, West Virginia 25304

RE: Antonio 1206 N-1H (47-033-05978)  
Grant District, Harrison County  
West Virginia

Dear Mr. Kennedy:

Per our discussion, enclosed are revised forms (survey plat, mylar, WW-6B and casing schematic) for the 1206 N-1H well work permit. We request the drill permit be modified as the lateral has been lengthened. No additional leases have been secured to lengthen the lateral.

Please let me know if you have any questions or require additional information. I can be reached at (304) 420-1119 or [dwhite@hgenergyllc.com](mailto:dwhite@hgenergyllc.com).

Very truly yours,

*Diane White*

Diane C. White

Enclosures

cc: Sam Ward - Inspector

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