



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, February 4, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

CHEVRON APPALACHIA, LLC
700 CHERRINGTON PARKWAY
CORAOPOLIS, PA 15108

Re: Permit Modification Approval for HAZLETT M08H
47-051-02100-00-00

Change Freshwater Production Casing from 591' to 527', due to new water well data discovered.

CHEVRON 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

Operator's Well Number: HAZLETT M08H
Farm Name: IRENE HAZLETT - LIFE
U.S. WELL NUMBER: 47-051-02100-00-00
Horizontal 6A New Drill
Date Modification Issued: 02/04/2020

Promoting a healthy environment.

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

1) Well Operator: Chevron Appalachia, LLC 49449935 Marshall Union Moundsville, WV 7
Operator ID County District Quadrangle

2) Operator's Well Number: 8H Well Pad Name: Hazlett

3) Farm Name/Surface Owner: Hazlett Public Road Access: CR 10 Markey Lane

4) Elevation, current ground: 1148' Elevation, proposed post-construction: 1144'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 6164', 50' thick; pore pressure gradient 0.64 psi/ft

8) Proposed Total Vertical Depth: 6,164

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 21,341

11) Proposed Horizontal Leg Length: 14,462

12) Approximate Fresh Water Strata Depths: 477 ft below GL

13) Method to Determine Fresh Water Depths: Deepest known water well w/in 1 mi radius

14) Approximate Saltwater Depths: Potential Brine @ 630 ft, 1283 ft, 1302 ft, 1654 ft, 1731 ft and 2230 ft below GL

15) Approximate Coal Seam Depths: Pittsburgh Coal top @ 630 ft below GL

16) Approximate Depth to Possible Void (coal mine, karst, other): 630 ft below GL

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: _____

Handwritten signature and date: 11/20/19

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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			40'	40'	CTS
Fresh Water	20"	New	J-55	94	527'	527'	CTS
Coal	13-3/8"	New	J-55	54.5	724'	724'	CTS
Intermediate	9-5/8"	New	J-55	40	2,330'	2,330'	CTS
Production	5-1/2"	New	P-110	20	21,341'	21,341'	500' below 9-5/8" shoe
Tubing							
Liners							

Dec 11/20/19

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"					
Fresh Water	20"	26"	0.438"	2,110		Class A	1.2
Coal	13-3/8"	17-1/2"	0.38"	2,730	400	Class A	1.19
Intermediate	9-5/8"	12-3/8" to 12-1/4"	0.395"	3,950	500	Class A	1.19
Production	5-1/2"	8-1/2" to 8-3/4"	0.361"	14,360	2050	Class A, G, or H	1.25
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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Handwritten signature/initials

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

Drill vertical depth to the Marcellus at an estimated total vertical depth of approximately 6,164'. Drill horizontal leg.

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

9525 bbl fluid - 400,000 lbm sand/stage - 9,400 anticipated max psi - 100 bpm anticipated max rate

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 25.6

22) Area to be disturbed for well pad only, less access road (acres): 15

23) Describe centralizer placement for each casing string:

Surface: (1) on shoe track w/ stop collar & (1) per jt to surface; Intermediate: (1) on shoe track w/ stop collar & (1) per 3 jts; Production String: (1) centralizer every jt from TMD to planned TOC & (1) every other joint from planned TOC to surface.

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

For the Water String the blend will contain class A cement, 3% CaCl₂, and flake. The coal will contain class A cement, 3% CaCl₂, Salt, and flake. The Intermediate will contain class A cement, 3% CaCl₂, Salt, and flake. The Production cement will have a lead and tail cement. The lead will contain class A, G, or H cement, KCl, dispersant, suspension agent, and retarder. The tail will contain class A, G, or H cement, Calcium Carbonate, KCl, dispersant, de-foamer, suspension agent, and friction reducer.

25) Proposed borehole conditioning procedures:

Air sections ensured to be clean via air circulation once TD is reached. Fluid sections will be circulated a minimum of 2 bottoms up once casing point has been reached and until uniform mud properties are achieved.

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*Note: Attach additional sheets as needed.

Hazlett M08H

Clay Twp, Marshall Co, WV		Ground Level Elev. (ft above SL):		1148				
11/11/2019 12:48		**All depths below reference GL**						
DRILLING FLUID / BIT TYPE / TFA	CENTRALIZER PROGRAM	CASING SIZE / FORMATION	DEPTH		WELLHEAD DESIGN FMC UH-S 13 5/8"	HOLE SIZE (IN)	CASING SPECS	CEMENT PROGRAM
			MD (FT)	TVD (FT)				
Core Barrel / Auger	2 Bowspring per Jt	30" Conductor	40	40	INC	36	Conductor 30" 118.2# X-42 29.25 Minimum 40 ft from GL or at least 10 ft into bedrock	Grout to Surface
Air DRL with Mist and additives / 26" Hammer	Bow Spring: (1) on shoe track w/ stop collar & (1) per jt over coupling to surface	20" Casing	527	527	AZM	26	Surface Casing 20" 94# J-55 BTC 0.438" Wall Coupling OD (in) 21.000 ID (in) 19.124 Drift ID (in) 18.937 Burst (psi) 2110 Collapse (psi) 520 Yield (Jt Strength 1,000 lbs) 1402 Capacity (bbl/ft) 0.3553 Annulus (bbl/ft) 0.2681	Surface Blend (Class A) Cement to surface 30% Excess
Air DRL with Mist and additives	Bow Spring: (1) on shoe track w/ stop collar & (1) per jt over coupling (1) installed 100 ft from surface Basket Placement Secured w/ (2) lock rings above and (1) below	Basket Placement Top of Coal Deepest Coal	724	724		17.50	Coal String 13-3/8" 54.5# J-55 BTC 0.385" Wall Coupling OD (in) 14.375 ID (in) 12.615 Drift ID (in) 12.455 Burst (psi) 2730 Collapse (psi) 1130 Yield (Jt Strength 1,000 lbs) 953	Intermediate I Blend (Class A) Cement grout to surface Shoe Job Vol. (50% Excess) Grout Job Vol. (100% Excess)
Air DRL with Mist and additives	Bow Spring: (1) on shoe track w/ stop collar & (1) per 3 jts over coupling	9-5/8" Casing	2,330	2,330		12.25	Intermediate Casing 9-5/8" 40# J-55 BTC Wall 0.395 Coupling OD (in) 10.625 ID (in) 8.835 Drift ID (in) 8.679 Burst (psi) 3,550 Collapse (psi) 2,570 Yield (Jt Strength 1,000 lbs) 630	Intermediate II Blend (Class A) Cement to surface 30% Excess
	Surface - TOC (1) per every other jt TOC-Curve KOP (1) per jt of csg Curve KOP-TMD (1) per jt of csg 10' Marker Jt of Csg 100' above KOP	KOP				8.5 to 8.75	Production Casing 5-1/2" 20# P110EC DW/C-IS-Plus .381" Wall Coupling OD (in) 6.300 ID (in) 4.778 Drift ID (in) 4.653 Burst (psi) 14360 Collapse (psi) 12090 Yield (Jt Strength 1,000 lbs) 729	Production Lead Slurry (Class A, G, H) Cement top approximately 500' below 9-5/8" shoe
Planned MW: 11.5ppg SBM - 12.5ppg SBM	Float Equip. (2) Jts of Csg Float Equip.	Est. BHT deg. F 5-1/2" Casing	21,341	6,164		8,500		Production Tail Slurry (Class A, G, H)

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WV Department of
Environmental Protection

Joe
11/20/19



Chevron

**Appalachian LLC
WV Well Site Safety Plan**

**Pad: Hazlett Pad A
Well # M08H**

*Done
11/20/19*

**28 Timmi Lane
Glen Dale, WV 26038
Glen Dale District
Marshall County, WV**

Access Point – [39.964486°N, 80.719328°W]

Well Site – [39.961756°N, 80.717081°W]

Marshall County, West Virginia

Revised 11/14/2018:

- Contact List Updated
- H2S Notification Process Updated
- Flare Location Map Updated

Revised 11/11/2019

- Casing changes

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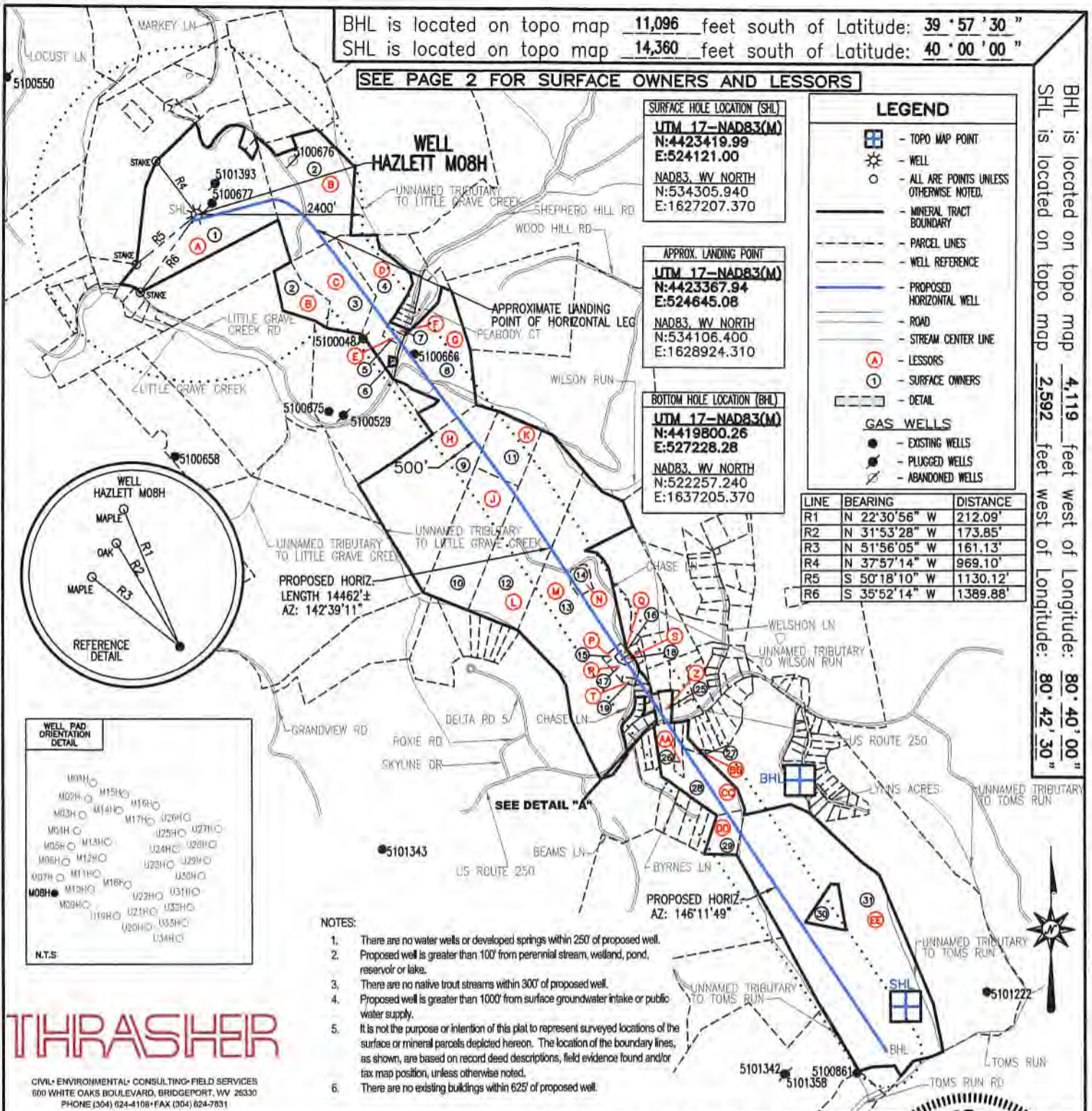
NOV 22 2019

WV Department of
Environmental Protection

BHL is located on topo map 11,096 feet south of Latitude: 39° 57' 30"
 SHL is located on topo map 14,360 feet south of Latitude: 40° 00' 00"

SEE PAGE 2 FOR SURFACE OWNERS AND LESSORS

BHL is located on topo map 4,119 feet west of Longitude: 80° 40' 00"
 SHL is located on topo map 2,592 feet west of Longitude: 80° 42' 30"



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CIVIL · ENVIRONMENTAL · CONSULTING · FIELD SERVICES
 800 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
 PHONE (304) 624-4108 · FAX (304) 624-7831

FILE #: HAZLETT M08H
 DRAWING #: HAZLETT M08H
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

DATE: NOVEMBER 11, 2019
 OPERATOR'S WELL #: HAZLETT M08H
 API WELL #: 47 51 02100 MOD1
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep Gas Liquid Injection Storage Shallow

WATERSHED: SHORT CREEK-OHIO RIVER ELEVATION: 1148.00'

COUNTY/DISTRICT: MARSHALL / UNION QUADRANGLE: MOUNDSVILLE, WV 7.5'

SURFACE OWNER: IRENE HAZLETT-LIFE ACREAGE: 77.24±

OIL & GAS ROYALTY OWNER: DONALD BOYD YOHO, KELLY ANN MEASE, ZANE EDWARD NEILSEN, NANCY A. BAKER, LARRY JOHN MCCrackEN, PATRICIA ANN MCCrackEN, ROBERT JAY MCCrackEN, FLORENCE HAZLETT ET AL ACREAGE: 593.211±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION

PERFORATE NEW FORMATION PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE

(SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,164' ± TMD: 21,340.62' ±

WELL OPERATOR CHEVRON APPALACHIA, LLC DESIGNATED AGENT KENNETH E. TAWNEY
 Address 700 CHERRINGTON PARKWAY Address 500 LEE STREET, EAST SUITE 1600
 City CORAOPOLIS State PA Zip Code 15108 City CHARLESTON State WV Zip Code 25301-3202

HAZLETT

M08H

PAGE 2 OF 2

	SURFACE OWNER	DIST-TM/PAR
1	IRENE HAZLETT-LIFE	13-12/49
2	CITY OF GLENDALE	13-12/44
3	HUBERT C. OTTE ET AL	13-12/43
4	GARY A. ROBINSON	13-12/43.1
5	DAVID R. & JOAN M. BURKETT	13-12/42.2
6	SAMUEL RICHARD DERROW ET UX	13-12/42.8
7	DAVID R. & JOAN M. BURKETT	13-12/42.5
8	DAVID R. BURKETT ET UX	14-3/5
9	HUBERT C. OTTE ET AL	14-3/44
10	DONNA L. CLAYTON	14-3/42
11	DONALD HILL	14-3/43
12	DONNA L. CLAYTON	14-3/41
13	DENNIS G. O'NEIL ET UX	14-3/40
14	GARRETT D. O'NEIL	14-3/40.3
15	ARCHIE KURTIS & SABRINA STEVEY	14-3B/19
16	MICHAEL SNEIGLE	14-3B/15
17	DANIEL L. STEVEY ET UX	14-3B/21
18	ARCHIE K. & SABRINA STEVEY	14-3B/14
19	DAVID L. & MALINDA L. STEVEY	14-3B/16
20	WILLIAM L. BANDY ET UX	14-3B/11
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24	SANDREA M. SCHANE	14-3/35
25	DAVID W. & DENISE ARMS	14-3/33
26	OLLIE C. HUGGINS	14-7/31.1
27	WANDA K. SULLIVAN	14-7/32
28	HAROLD C. SCHWING ET UX	14-7/31
29	MICHAEL J. & ANGELA PHILLIPS	14-7/30
30	WHEELING POWER CO.	14-7/42.1
31	WILLIAM H., III & LINDA BARDALL	14-7/42

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A	DONALD BOYD YOHO	13-12/49
	KELLY ANN MEASE	
	ZANE EDWARD NEILSEN	
	NANCY A. BAKER	
	LARRY JOHN MCCrackEN	
	PATRICIA ANN MCCrackEN	
	ROBERT JAY MCCrackEN	
	FLORENCE HAZLETT ET AL	
B	JOHN CARL HAZLETT	13-12/44
	FLORENCE HAZLETT	
C	RICHARD JOSEPH OTTE	13-12/43
	CAROLINE PENTZIEN	
	PATRICIA GAIL FOSTER	
	NANCY JEAN CUNNINGHAM	
	REBECCA ANN YOHO	
	HUBERT C. OTTE ET UX	
	MICHAEL P. OTTE	
	MARK DOUGLAS OTTE	
D	GARY A. ROBINSON	13-12/43.1
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R	DENNIS O'NEIL ET UX	14-3B/21
S	DENNIS O'NEIL ET UX	14-3B/14
T	DENNIS O'NEIL ET UX	14-3B/16
U	DENNIS O'NEIL ET UX	14-3B/11
V	DENNIS O'NEIL ET UX	14-3B/10
W	DENNIS O'NEIL ET UX	14-3B/9
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DD	MICHAEL J. PHILLIPS ET UX	14-7/30
EE	EDWARD LOUIS LEHASKY JR.	14-7/42
	ELLEN BEAM RUDY ET VIR	
	WILLIAM DORSEY BEAM ET UX	
	ROSS BELL JR.	
	WILLIAM DORSEY ET UX	

SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83(M)
N:4423419.99
E:524121.00
 NAD83, WV NORTH
 N:534305.940
 E:1627207.370

APPROX. LANDING POINT
UTM 17-NAD83(M)
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E:524645.08
 NAD83, WV NORTH
 N:534106.400
 E:1628924.310

BOTTOM HOLE LOCATION (BHL)
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N:4419800.26
E:527228.28
 NAD83, WV NORTH
 N:522257.240
 E:1637205.370



* - DENOTES PARCEL WITHIN 30 FEET OF PLANNED WELL BORE

NOVEMBER 11, 2019

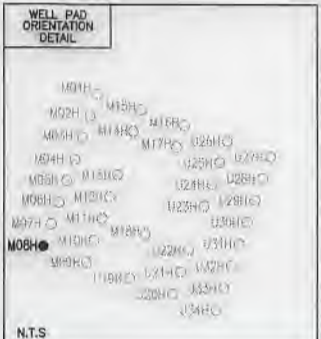
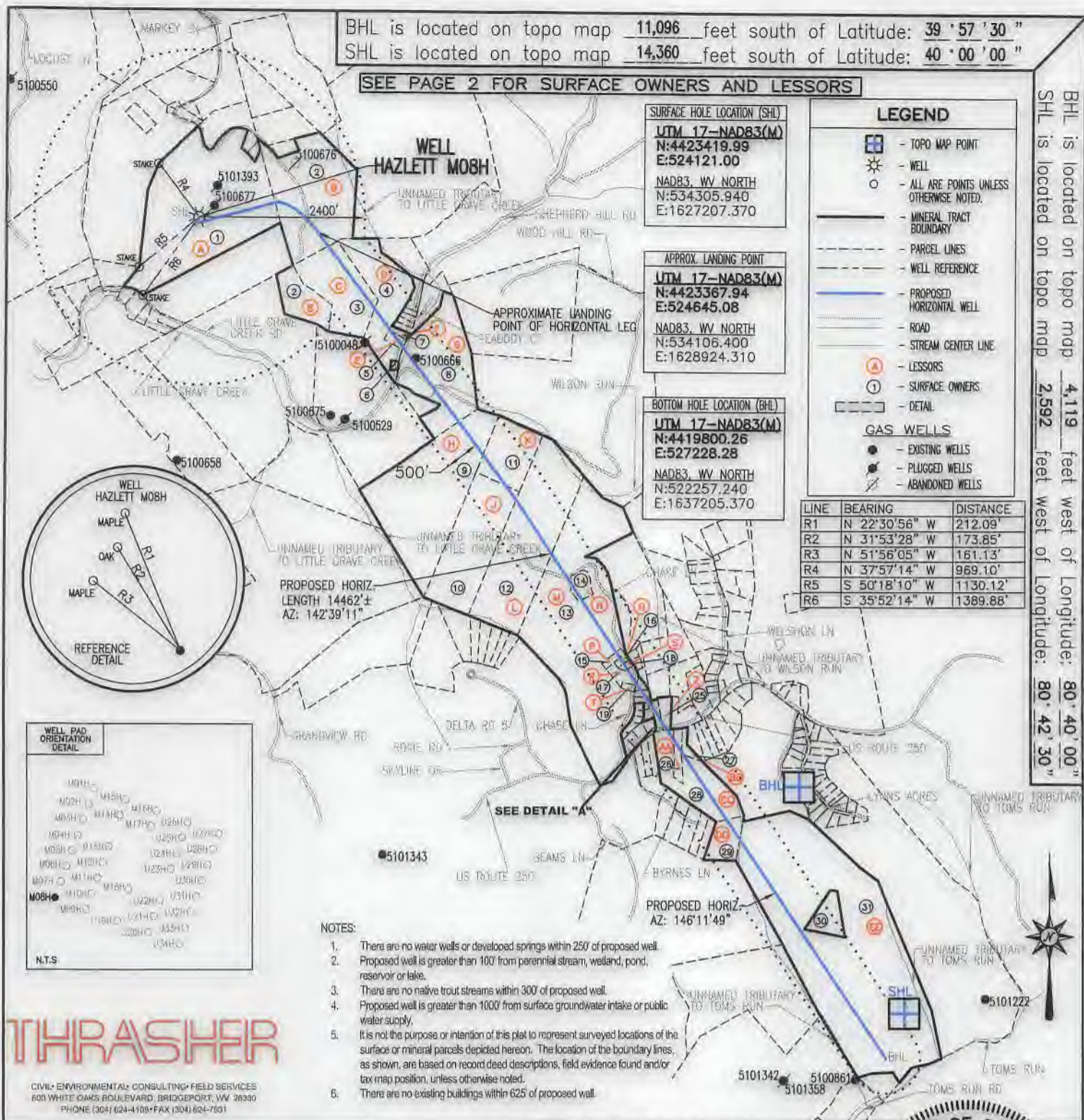
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PROPOSED HORIZ.
 LENGTH 14462±
 AZ: 142°39'11"

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NOTES:

1. There are no water wells or developed springs within 250' of proposed well.
2. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
3. There are no native trout streams within 300' of proposed well.
4. Proposed well is greater than 1000' from surface groundwater intake or public water supply.
5. It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.
6. There are no existing buildings within 625' of proposed well.

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CIVIL, ENVIRONMENTAL, CONSULTING, FIELD SERVICES
 600 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
 PHONE (304) 624-4108 • FAX (304) 624-7531

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WELL OPERATOR CHEVRON APPALACHIA, LLC DESIGNATED AGENT KENNETH E. TAWNEY
 Address 700 CHERRINGTON PARKWAY Address 500 LEE STREET, EAST SUITE 1600
 City CORAOPOLIS State PA Zip Code 15108 City CHARLESTON State WV Zip Code 25301-3202

HAZLETT

M08H

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	FLORENCE HAZLETT	
C	RICHARD JOSEPH OTTE	13-12/43
	CAROLINE PENTZIE	
	PATRICIA GAIL FOSTER	
	NANCY JEAN CUNNINGHAM	
	REBECCA ANN YOHO	
	HUBERT C. OTTE ET UX	
	MICHAEL P. OTTE	
	MARK DOUGLAS OTTE	
D	GARY A. ROBINSON	13-12/43.1
E	DAVID & JOAN BURKETT	13-12/42.2
F	DAVID & JOAN BURKETT	13-12/42.5
G	DAVID R. BURKETT ET UX	14-3/5
H	RICHARD JOSEPH OTTE	14-3/44
	CAROLINE PENTZIE	
	PATRICIA GAIL FOSTER	
	NANCY JEAN CUNNINGHAM	
	REBECCA ANN YOHO	
	HUBERT C. OTTE ET UX	
	MICHAEL P. OTTE	
	MARK DOUGLAS OTTE	
J	DONNA L. CLAYTON	14-3/42
K	DONALD HILL	14-3/43
L	DONNA L. CLAYTON	14-3/41
M	DENNIS O'NEIL ET UX	14-3/40
N	GARRET D. O'NEIL	14-3/40.3
P	DENNIS O'NEIL ET UX	14-3B/19
Q	DENNIS O'NEIL ET UX	14-3B/15
R	DENNIS O'NEIL ET UX	14-3B/21
S	DENNIS O'NEIL ET UX	14-3B/14
T	DENNIS O'NEIL ET UX	14-3B/16
U	DENNIS O'NEIL ET UX	14-3B/11
V	DENNIS O'NEIL ET UX	14-3B/10
W	DENNIS O'NEIL ET UX	14-3B/9
X	*DENNIS O'NEIL ET UX	14-3B/20
Y	THOMAS L. SCHANE ET UX	14-3/35
Z	BRIDGET MARIE CARMICHAEL	14-3/33
AA	OLLIE C. HUGGINS	14-7/31.1
BB	WANDA K. SULLIVAN	14-7/32
CC	HAROLD C. SCHWING ET UX	14-7/31
DD	MICHAEL J. PHILLIPS ET UX	14-7/30
EE	EDWARD LOUIS LEHASKY JR.	14-7/42
	ELLEN BEAM RUDY ET VIR	
	WILLIAM DORSEY BEAM ET UX	
	ROSS BELL JR.	
	WILLIAM DORSEY ET UX	

SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83(M)
N:4423419.99
E:524121.00
 NAD83, WV NORTH
 N:534305.940
 E:1627207.370

APPROX. LANDING POINT
UTM 17-NAD83(M)
N:4423367.94
E:524645.08
 NAD83, WV NORTH
 N:534106.400
 E:1628924.310

BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83(M)
N:4419800.26
E:527228.28
 NAD83, WV NORTH
 N:522257.240
 E:1637205.370



* - DENOTES PARCEL WITHIN 30 FEET OF PLANNED WELL BORE

NOVEMBER 11, 2019

THRASHER

API WELL #: 47 51 **02100 MDD1**
 STATE COUNTY PERMIT