

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-103-03006 County WETZEL District MAGNOLIA
Quad PORTERS FALLS 7.5' Pad Name Lackawanna Field/Pool Name _____
Farm name M.B. INVESTMENTS Well Number LAKAWANNA No. U-3H
Operator (as registered with the OOG) GASTAR EXPLORATION INC.
Address 229 W MAIN STREET, STE 301 City CLARKSBURG State WV Zip 26301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,384,049.34 Easting 512,301.60
Landing Point of Curve Northing N/A Easting N/A
Bottom Hole Northing 4,384,048.83 Easting 512,300.36

Elevation (ft) 1306' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
N/A

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DEC 4 2017
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Date permit issued 6/16/2014 Date drilling commenced 11/03/2014 Date drilling ceased 11/20/2014
Date completion activities began N/A Date completion activities ceased N/A
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 1,125' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,777' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 1,022'-1,026' & 1,117'-1,125' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

Reviewed by:
DMH

02/16/2018

API 47- 103 - 03006 Farm name M.B. INVESTMENTS Well number LAKAWANNA No. U-3H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30"	26'	40'	NEW	PE / 85.68 #/ft	N/A	YES
Surface	24"	20"	1,300'	NEW	J-55 / 106.5 #/ft	80'	YES
Coal	17-1/2"	N/A	OH 2,480'	N/A	N/A	N/A	N/A
Intermediate 1	N/A						
Intermediate 2							
Intermediate 3							
Production	N/A						
Tubing							
Packer type and depth set		N/A					

Comment Details **See attached

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	53	15.6	1.21	64	Surface	12
Surface	Class A	1593	15.6	1.21	1912	Surface	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) 2,480' Loggers TD (ft) N/A
 Deepest formation penetrated Big Injun Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) N/A

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____
Surface - 3 Centralizers at 300' Spacing

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

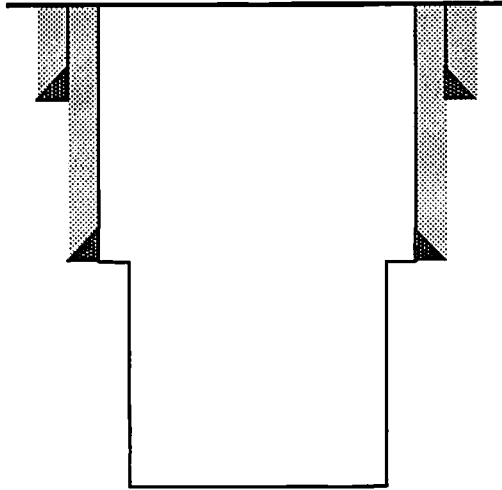
WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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**Gastar Exploration
Marshall County WV
Lackawanna U-3H**

November 24, 2014



Cement to surface
40' 26" Fresh Water String

Open hole size 24"
Cement to surface

1254' 20" Casing, Coal String

Open hole size 17-1/2"

2480' TD, Hole came in on us while running casing.
Pulled casing and loaded hole with 9.1 high viscosity gel
and capped well

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Lackawanna U-3H Cement Additives

Conductor: Class A + 3% CaCl + ¼ #per sack flake

Freshwater: Class A + 3% CaCl + ¼ #per sack flake

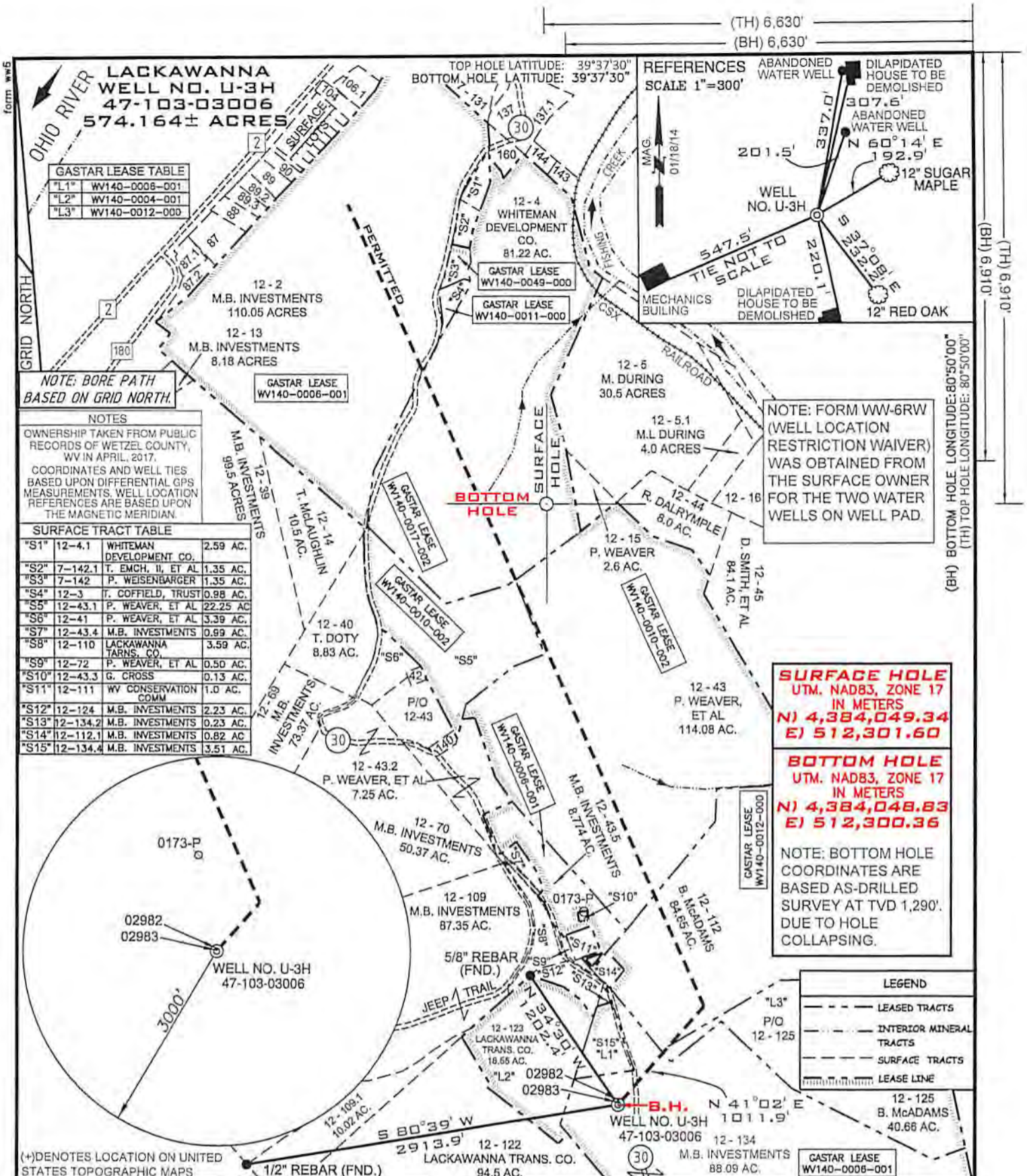
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Lackawanna U-3H Drilling & Casing Summary

The Lackawanna U-3H well was initially drilled to a depth of 180' feet utilizing a 30 inch bit. 26 inch conductor pipe was installed and cemented to surface. The well was then drilled to 1303' MD utilizing a 24" bit. 20" casing was installed to 1254' MD and cemented to surface. The well was then drilled to 2480' MD utilizing a 17 1/2". An attempt was made to run 13 3/8" casing but casing sat down and was not able to drop past 1427' MD. Decision was made to pull the casing and not set 13 3/8" casing resulting in open hole from 1254' to 2480' MD. Final well TD is 2480' MD. The well was subsequently filled with 9.5 lb/gal brine water and capped to await additional drilling.

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LITHOLOGY/FORMATION	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL , GAS, H ₂ S, ETC)
Undifferentiated Fm	0	1022	0	1022	Interbedded sandstone, siltstone, limestone and shale
Sewickley Coal	1022	1026	1022	1026	Coal
Undifferentiated Fm	1026	1117	1026	1117	Interbedded sandstone, siltstone, limestone and shale
Pittsburgh Coal	1117	1122	1117	1122	Coal
Undifferentiated Fm	1122	1777	1122	1777	Interbedded sandstone, siltstone, limestone and shale
Salt Sand	1777	1807	1777	1807	Sandstone
Undifferentiated Fm	1807	2159	1807	2159	Interbedded sandstone, siltstone and shale
Maxton Sandstone	2159	2194	2159	2194	Sandstone
Undifferentiated Fm	2194	2294	2194	2294	Interbedded sandstone, siltstone and shale
Big Lime	2294	2410	2294	2410	Limestone
Big Injun	2410	2480	2410	2480	Sandstone



FILE NUMBER W0110309
 DRAWING NUMBER LACKAWANNA_WP_U-3H_AD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY 1/200
 PROVEN SOURCE SUBMETER MAPPING
 OF ELEVATION 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

P.S. 2122 *Jonathan N. White*



DATE: APRIL 30, 2017

OPERATORS WELL NO. LACKAWANNA NO. U-3H AS-DRILLED

API WELL NO. 47-103-03006

STATE WV COUNTY WETZEL PERMIT 02/16/2018

LOCATION ELEVATION 1306' WATERSHED (HUC 10) OUTLET MIDDLE ISLAND CREEK (UNDEFINED)

DISTRICT MAGNOLIA COUNTY WETZEL

QUADRANGLE PORTERS FALLS 7.5' LEASE NUMBER WV140-0017-002, WV140-0049-000, WV140-0011-000, WV140-0006-001, WV140-0010-002, WV140-0012-000, WV140-0004-001

SURFACE OWNER M.B. INVESTMENTS ACREAGE 88.09

OIL & GAS ROYALTY OWNER M.B. INVESTMENTS, ET AL LEASE ACREAGE 574.164

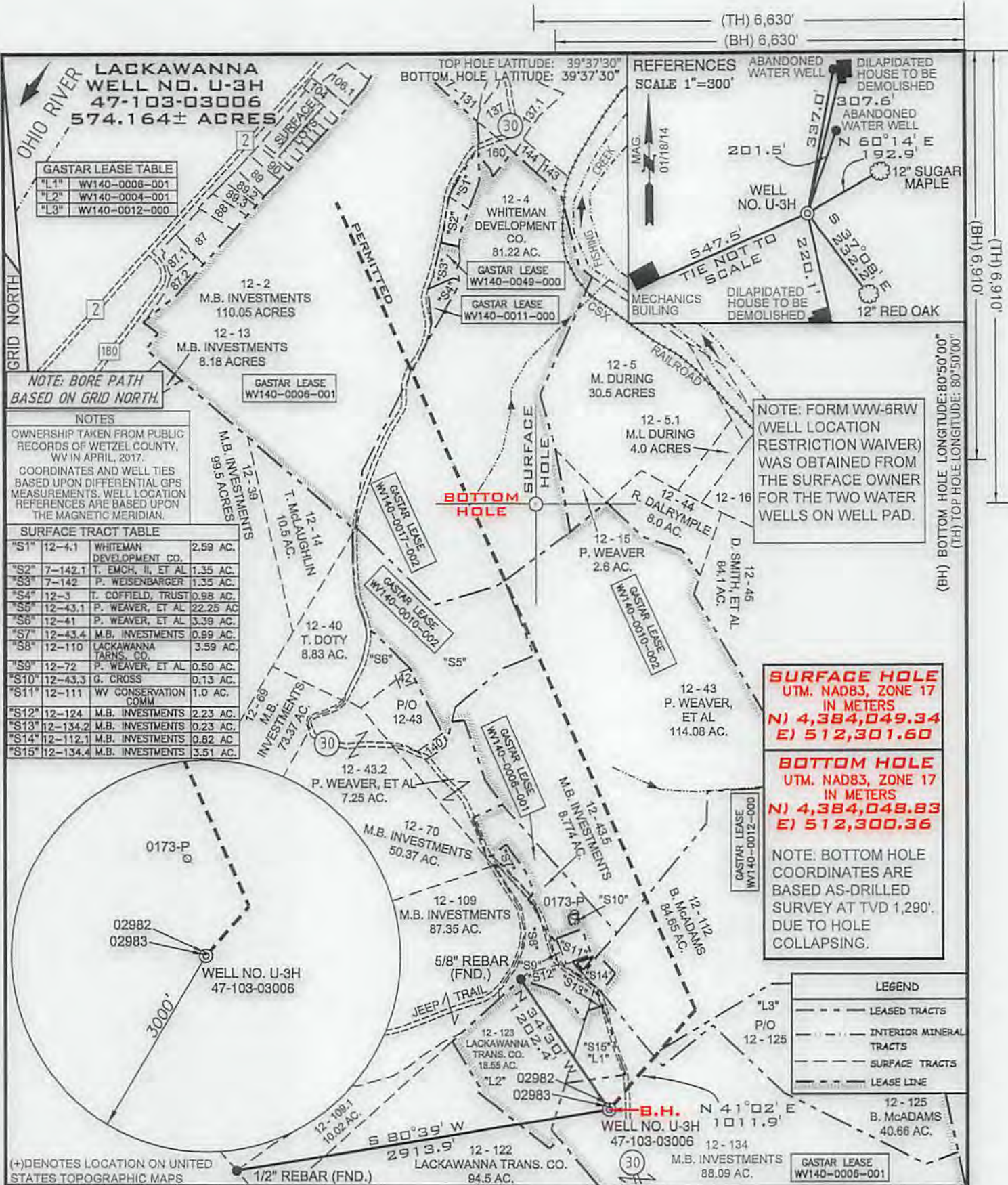
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION Big Injun PLUG & ABANDON CLEAN OUT & REPLUG

WELL OPERATOR GASTAR EXPLORATION INC. ESTIMATED DEPTH TVD: 2,480' TMD: 2,480'

DESIGNATED AGENT MICHAEL McCOWN

ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301



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P.S. Jonathan N. White
 2122



DATE: APRIL 30, 2017

OPERATORS WELL NO. LACKAWANNA NO. U-3H AS-DRILLED
 API WELL NO. 47-103-03006
 STATE COUNTY PERMIT

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

LOCATION ELEVATION 1306' WATERSHED (HUC 10) MIDDLE ISLAND CREEK (UNDEFINED)
 DISTRICT MAGNOLIA COUNTY WETZEL

QUADRANGLE PORTERS FALLS 7.5' LEASE NUMBER WV140-0017-002, WV140-0049-000, WV140-0011-000, WV140-0006-001, WV140-0010-002, WV140-0012-000, WV140-0004-001
 SURFACE OWNER M.B. INVESTMENTS ACREAGE 88.09
 OIL & GAS ROYALTY OWNER M.B. INVESTMENTS, ET AL LEASE ACREAGE 574.164

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION Big Injun PLUG & ABANDON CLEAN OUT & REPLUG
 WELL OPERATOR GASTAR EXPLORATION INC. ESTIMATED DEPTH TVD: 2,480' TMD: 2,480'
 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 DESIGNATED AGENT MICHAEL McCOWN
 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301

02/16/2018

COUNTY NAME PERMIT