

Appendix C
Phase I Environmental
Site Assessment

Central Hampshire Public Service District
Southwestern Hampshire County Water Extension Phase III –
Purgitsville Area Water Extension

Phase I Environmental Site Assessment

Prepared by:
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Consulting Engineers
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February, 2024

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ATTACHMENTS

- A.) Real Estate Assessment Data
- B.) Site Photographs
- C.) Drinking Water Data
- D.) Environmental and Historical Research Information

1.0 Executive Summary

The Central Hampshire Public Service District is proposing to design and construct a water line extension project along U.S. Route 220 from the Hardy County line in the south to just north of the community of Rada, West Virginia. This project will extend a previous USACE Section 571 project in the same area and will extend water service to an additional forty-nine (49) customers. The previous project phase took place over the fall and winter months of 2023 and the spring of 2024. It consisted of over 75,000 linear feet (LF) along Route 220, as well as a booster station and water tank. This phase of the project would consist of approximately 45,000 linear feet of separate water extensions, all installed on side roads connected to the main line just installed along Route 220.

Cerrone Associates, Inc., as the design and consulting engineers for this proposed project, was asked to conduct a Phase I Environmental Site Assessment on the project area. The purpose of the Phase I ESA is to provide information regarding recognized environmental conditions (RECs) that could affect soil and groundwater quality at the project site as well as adjacent sites. This report includes record reviews, site reconnaissance, and interviews.

This Assessment has revealed no direct evidence of recognized environmental conditions in connection to the project area.

2.0 Introduction

Cerrone Associates, Inc. conducted this Phase I ESA on the Purgitsville neighborhood in Central Hampshire, WV under its consulting agreement for the water line extension project located at the same USACE Section 571 project area.

2.1 Purpose

The Phase I ESA was performed in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Designation: 1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. The purpose of this practice is to define good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability (hereinafter, the “landowner liability protections,” or “LLPs”): that is, the practice that constitutes all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial and customary practice as define at 42 U.S.C. §9601(35)(B). Controlled substances are not included within the scope of this standard. The goal of the Phase I process is to identify recognized environmental conditions (RECs). ASTM defines RECs as:

“The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative or a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.” *De minimis conditions are not recognized environmental conditions.*

In addition to RECs, controlled recognized environmental conditions (CREC) and Historical recognized environmental conditions (HREC) may also be identified as part of this assessment.

ASTM defines a CREC as:

“A REC resulting from a past release of hazardous substance or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of

required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).”

ASTM defines a HREC as:

“A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).”

In congruence with identifying RECs, CRECs, and HRECs, de minimis conditions were also evaluated. According to ASTM standards, a de minimis condition does not generally present a threat to human health or the environment and that generally would not be the subject to enforcement action if brought to the attention of the appropriate governmental agency. Conditions determined to be de minimis are not recognized environmental conditions nor controlled recognized environmental conditions.

2.2 Detailed Scope of Services

In accordance with ASTM Standard E 1527-13, the Phase I ESA performed by Cerrone Associates, Inc. consisted of the following four components:

- Records review.
- Site reconnaissance.
- Interviews.
- Evaluation and preparation of Phase I ESA report.

The Phase I ESA does not include any testing or sampling of materials (for example, air, soil, water, building materials).

Records Review

The records review included a review of federal, state, and local government records and historical sources in order to identify RECs and to identify previous uses of the Property and surrounding area in order to determine the likelihood that these past uses may have resulted in RECs in the project area. The records review is summarized in Section 5.0.

Site Reconnaissance

The site reconnaissance included a visual and physical inspection of the project area and visual observations of adjoining properties in order to identify RECs. This does not include sampling or testing of any material. The site reconnaissance is summarized in Section 6.0.

Interviews

Interviews were conducted with past owners, key site manager, operators, and/or occupants to the extent that they have been identified to identify RECs. Select state and/or local agency officials were also interviewed. The objective of the interviews was to obtain information not otherwise available through other sources about current and historical property uses that may pose RECs. Information obtained during interviews is summarized in Section 7.0.

Evaluation and Preparation of Phase I ESA Report

An evaluation of the findings obtained as a result of the above tasks, and a formulation of conclusions regarding the potential presence of RECs identified during the Phase I ESA, shall be presented in the Phase I ESA report. The report shall include appropriate documentation to support the findings, opinions, and conclusions of the Phase I ESA. The Phase I ESA report shall include those matters required to be included in the report pursuant to various provisions of ASTM E 1527-13.

2.3 Special Terms, Conditions, and Significant Assumptions

It is assumed that the purpose of this Phase I ESA is to qualify the user for an LLP to CERCLA liability and to determine the presence of RECs on the project area. The possible contaminants of concern considered in this assessment include those listed under CERCLA and petroleum products.

2.4 Limitations and Exceptions

Cerrone Associates, Inc. completed this Phase I ESA in general conformance with the ASTM Designation: E 1527-13 standard practice and made appropriate inquiry consistent with good commercial or customary practice. The results of this Phase I ESA are based upon professional interpretation of the practically reviewable and reasonably ascertainable information available to Cerrone, given the time and budget constraints of this project. Cerrone has assumed that information provided by the cited references is factual, complete, and correct. Cerrone does not warrant that this report represents an

exhaustive study of all possible environmental concerns at the project area. Data gaps were evaluated through the process of completing this report and the following gaps were identified.

2.5 Considerations Beyond Scope

This Phase I ESA is strictly limited to the scope set forth in Section 2.2. Certain environmental conditions may exist on a property that is beyond the scope of this Phase I; however, they may warrant consideration. The need to include an investigation of any such conditions not included in the scope of services described in this report should be evaluated based upon, among other factors, the nature of the property and the reasons for performing the assessment.

2.6 Contractual Agreement

Cerrone Associates, Inc., the consultant engineering firm retained by the Central Hampshire PSD, conducted the Phase I ESA.

2.7 User Reliance

This Phase I ESA is certified to and can be used by the Central Hampshire PSD. This report may be unsuitable for other uses, and reliance on its contents by anyone other than the Central Hampshire PSD, is done at the sole risk of the user.

3.0 Property Description

3.1 Property Location and Legal Description

Due to the decentralized nature of the project, and the lack of any surface construction remaining after the job is complete, a sample parcel of property will be used as a representation of the project. The vast majority of the project is either in cow pastures or along county roads, and as such has no historical data for improvements or environmental issues. This report will encompass the entirety of the project area, unless directly noted.

The project area encompasses several roads branching off an area approximately three (3) miles along Route 220. Many of the branches will extend along the county roads for several miles. This neighborhood is located between Romney and Moorefield, in the Western corner of Hampshire County. The vast majority of the project will consist of underground water line work within road right of ways. There are no booster stations or water tanks for this project that would necessitate the purchase of any property. The piece of property chosen as the most representative of the project is located at the beginning of Mud Run Rd, coming off of Route 220. Property Maps and Tax Maps of the project area as well as this piece of property are located in Attachment A.

Tax Parcel: 14-06-0013-0015-0002

Legal Description: 180.60 AC RT 220; (174.26 AC TAXABLE)

3.2 Property and Vicinity General Characteristics

The project area (including The Property) is primarily zoned farmland, with a fairly large portion of it being zoned as residential.

3.3 Current Use of the Property

The Property itself currently used by the property owner to run cattle.

3.4 Description of Structures, Roads, Other Improvements on the Property

The Property is partially cleared and has an existing water line installed in the previous phase of this project. The valve cluster located in the Northeastern corner of the project is already set up for any future line extensions. There are no other utilities located on The Property.

3.5 Current Uses of Adjoining Properties

The Property is very similar to the many others in the area. The surrounding properties are also zoned farmland, although due to the terrain of the area much of the parcels can't reliably be used to either grow crops or run cattle.

4.0 User Provided Information

The owner is Randy McGhee, who has been instrumental in assisting Cerrone Associates and Central Hampshire PSD with the previous phase of the project. Several parcels along Route 220 are owned by him or his family, and he was very willing to allow the water line to be installed there. He has no knowledge of the property in question being used for anything other than a small number of cattle and the location of his barn. The land has been in his possession for several decades. There is a half-built concrete bridge that the State Department of Highways constructed long ago, back before US Route 220 was built. It was part of the original road in the area before the state had to abandon it for an unknown reason and move the road to where it is located today.

Please see attachemt D for questionnaires from the property owner, as well as property owners of adjacent and nearby properties.

5.0 Records Review

5.1 Standard Environmental Record Sources

Cerrone Associates, Inc. performed a records search on the Purgitsville neighborhood utilizing several federal, state, and local resources, including: EPA's National Priorities List, Brownfields and Land Revitalization Grants, NEPAassist, and Underground Storage Tanks (USTs) Finder as well as USGS Topography maps, Aerial photography, Historical Maps, and Tax maps. Additional information is provided below and supporting documentation is included in Attachment E

- ¼ Mile Radius from The Property:
 - Zero RECs
- ½ Mile Radius from The Property:
 - Zero RECs
- 1 Mile Radius from The Property:
 - Zero RECs

- Greater than 1 Mile from the Property:
 - Two RECs
 - Mill Creek Saw Shop: Located approximately 4.3 miles from the edge of the job boundaries, located approximately 6.6 miles from The Property.
 - It is not considered a risk
 - WVDOH Hardy County Spill Site: Located approximately 6.7 miles from the edge of the job boundaries, located approximately 9.5 miles from The Property.
 - It is not considered a risk

Based on the information above and in Attachment E, none of the additional sites identified are expected to have a negative impact on the soil or ground water quality at The Property or for the Spring Valley neighborhood.

5.2 Vapor Encroachment Screening

There are no vapor concerns for The Property or the Purgitsville neighborhood from the listed above.

5.3 Additional Environmental Record Sources

The following additional data was reviewed to determine historical and current land ownership use:

- Hampshire County GIS website
- Hampshire County Historical Maps
- Interview with WVDEP

5.4 Physical Setting Source(s)

The following was reviewed to determine the physical setting of The Property as well as the Purgitsville neighborhood.

- USGS Topography Map
- Hampshire County GIS
- Historical Maps

The Property is a valley with Mill Creek running through it. Part of The Property is below the FEMA 100-year floodplain, although any flood would not disturb the underground water line. The land is a creek between two ridges, with an elevation at the bottom of the valley approximately 900' and climbing

1000' to 1050' on either side.

5.5 Historical Use of the Property

The Property has been utilized as farmland for several decades, and no indication or clues to any change from before that. The property has fencing and a barn.

5.6 Historical use Information of Adjoining Properties

The surrounding properties are extremely similar; being used as some sort of farmland or pasture, or just never fully utilizing the entire property due to terrain.

6.0 Site Reconnaissance

6.1 Methodology and Limiting Conditions

The site was visited to identify RECs not found in the records search. No other RECs were discovered.

6.2 General Site Setting

The Property is located along Route 220 and the beginning of Mud Run Rd. It has a barn and fencing for the cattle. The entire area of concern is Residential or Farm Land.

6.3 Interior and Exterior Observations

The Property is undeveloped besides the barn, which was built in 1989.

7.0 Interviews

7.1 Randy McGee – Property Owner

Correspondence has occurred between Randy McGee and several employees with Cerrone Associates over the years. He was originally asked about any environmental issues or history that he knew of during the layout phase of the project, and has been a source of knowledge about the area as well. See Attachment D.

7.2 Denver Smith

Denver Smith lives along Russeldale Rd, near the northern end of the project. He owns property there, as well as some parcels near Randy McGee. He was approached and asked about any environmental issues across the project. See Attachment D.

7.3 Larsen McGee

The interviewee is the brother of Randy McGee, The Property's owner. He owns a large portion of

property across Mud Run Rd from the property in question.

7.4 Tom High

A member of the Mill Creek Ruritan Club. Was a part of the group who pushed to get the project funded. Owns property near the southern end of the project and knows the history of the area. See Attachment D.

7.5 FOIA Request Responses

DEP responses to a FOIA request pertaining to The Property.

8.0 Findings and Opinions

Based on the above information, the following findings and opinions are presented

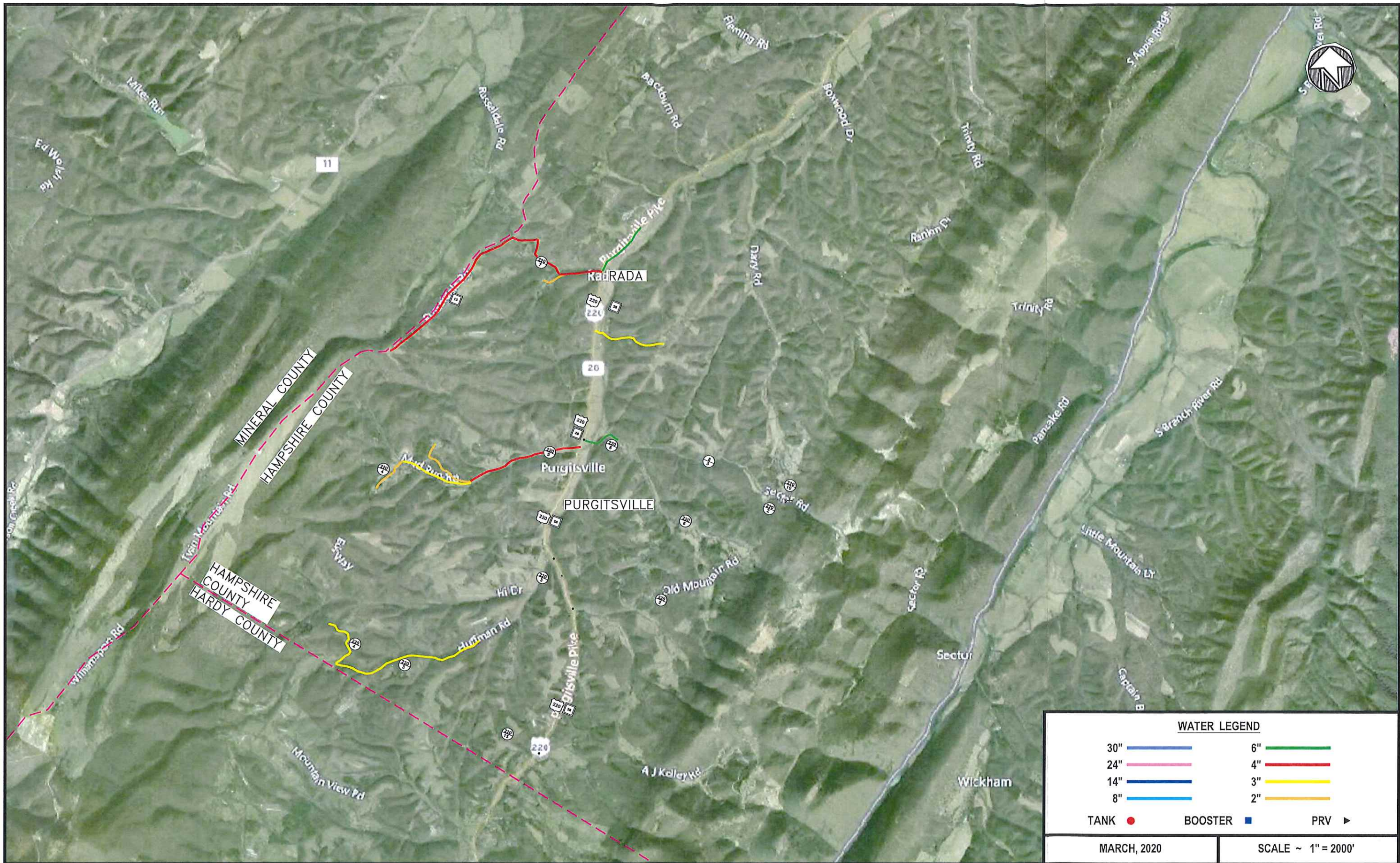
- Findings: The Property has remained relatively unchanged for many years. No structures have been recorded on any maps or online information, besides the barn built in 1989. This includes USGS topographic mapping ranging from 1891 and 2014, Tax information, satellite images and historical maps. The Purgitsville neighborhood and surrounding areas follow a similar trend. The relatively large residential parcels do not have much constructed on them besides small homesteads, and the parcels designated as farmland usually only have cattle or small farms in the flat areas. Larger farms run along the creek bank of Mill Creek, which runs alongside Route 220, but the vast majority of the project will not affect those areas.
- Opinions: Given the information shown in the report above, there is no indication that the site was ever developed.












9.0 Conclusions and Recommendations

Cerrone Associates, Inc. performed this Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 for The Property and the Purgitsville neighborhood for a proposed water line extension project.

This assessment has revealed no direct evidence of recognized environmental conditions in connection with The Property. The closest RECs have been determined to not be a risk to The Property or the proposed project.

The results of this study are based on interpretation of the information available to Cerrone Associates, Inc. Cerrone does not warrant that this report represents an exhaustive study of all possible environmental concerns potentially associated with the Property. However, the items investigated as part of this study do represent the most likely sources of environmental concerns associated with the RECs identified and are, consequently, believed to adequately address the client's needs at this time.



WATER LEGEND					
30"		6"			
24"		4"			
14"		3"			
8"		2"			
TANK		BOOSTER		PRV	

MARCH, 2020	SCALE ~ 1" = 2000'
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No.	DATE	DESCRIPTION	BY
1	5/2020	CREATED	PTB

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CERRONE ASSOCIATES, INC.
CONSULTING ENGINEERS • WATER & WASTEWATER SYSTEMS
97-14TH STREET, WHEELING, WV 26003-2497

FIELD LAYOUT	-
DRAWN BY	RRB
CONST CHECKED BY	-
RECORD CHECKED BY	-
ISSUE DATE	3/2020



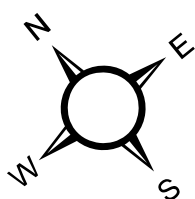
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	SOUTHWESTERN HAMPSHIRE COUNTY WATER EXTENSION	PROJECT NO. CE10-13W
DRAWING TITLE	PROJECT AREA MAP	DRAWING NO. -



WV LEGISLATIVE REGULATION
TITLE 189 SERIES 2009

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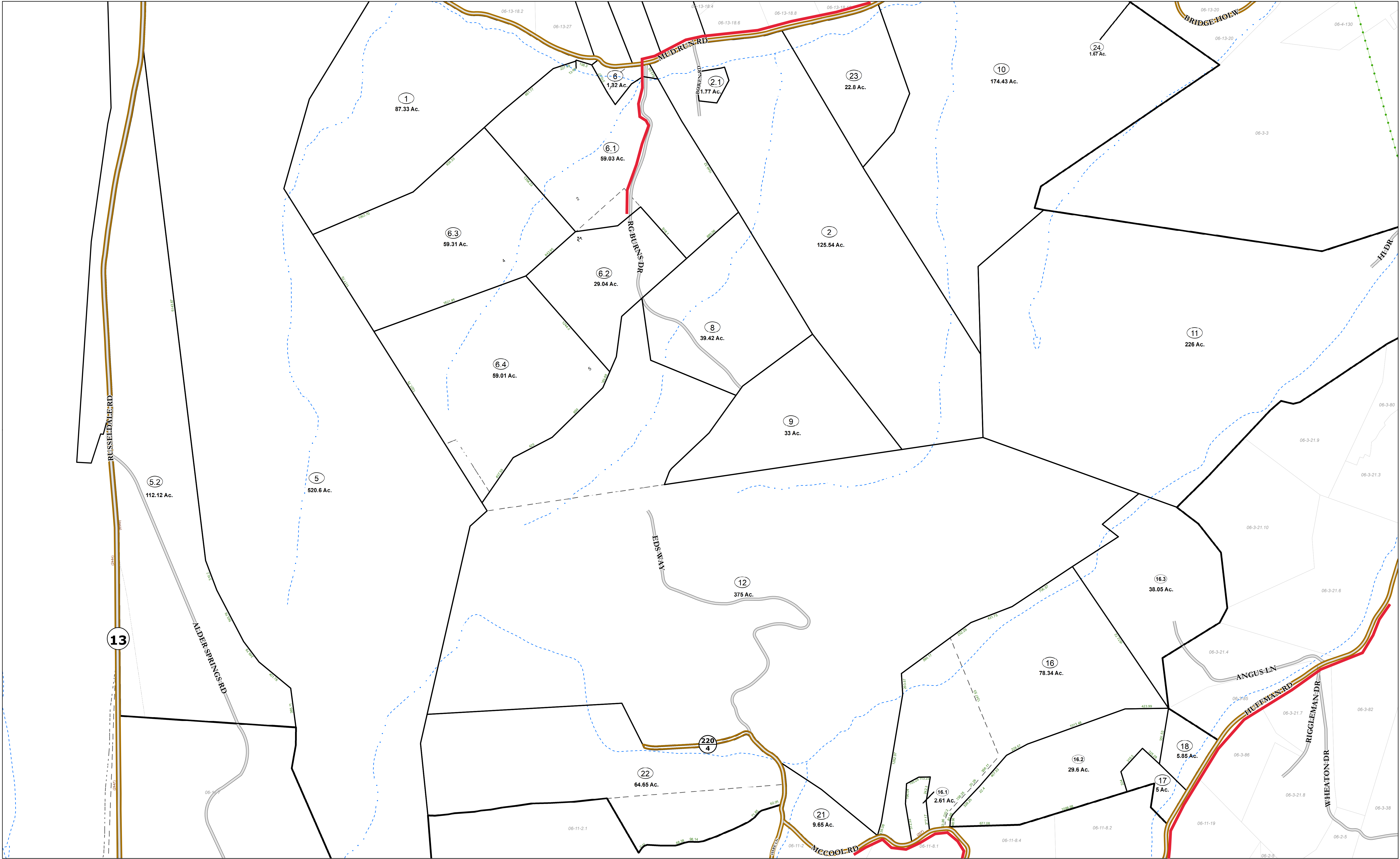
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District line	--- --	Lot line	--- --	Church	
County line	—+—+—+—	Road Centerline	—+—+—+—	Deed lot number	(25)
State line	—+—+—+—	Streams	—+—+—+—	Parcel or index number	(23)
Property Line	—+—+—+—	Trans Line	—+—+—+—	Parcel acreage	6.27 Ac
Right of Way	—+—+—+—	Cemetery	—+—+—+—		

Revisions			
1 AS OF JULY 1 1996 KWS	6 AS OF JULY 1 2001 JVB	11 AS OF JULY 1 2007 JVB	16 AS OF JAN 1 2014 ASC
2 AS OF JULY 1 1997 KWS	7 AS OF JULY 1 2002 JVB	12 AS OF JULY 1 2008 RIR	17 AS OF JAN 1 2015 ASC
3 AS OF JULY 1 1998 JVB	8 AS OF JULY 1 2003 JVB	13 AS OF JULY 1 2011 ASC	18 AS OF JAN 1 2017 ASC
4 AS OF JULY 1 1999 JVB	9 AS OF JULY 1 2004 JVB	14 AS OF MAR 29 2012 ASC	19 AS OF JAN 31 2020 AGD
5 AS OF JULY 1 2000 JVB	10 AS OF JULY 1 2005 JVB	15 AS OF JAN 1 2013 ASC	20 AS OF JAN 31 2022 AGD
			21 AS OF JAN 31 2023 AGD

STATE OF WEST VIRGINIA
COUNTY OF HAMPSHIRE
Office of Assessor

06-12	06-3
06-11	06-2

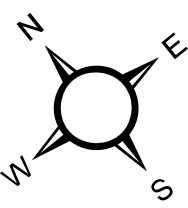
Mill Creek
Map: 11
Created: 1/17/2023
Scale: 1 in = 400 ft



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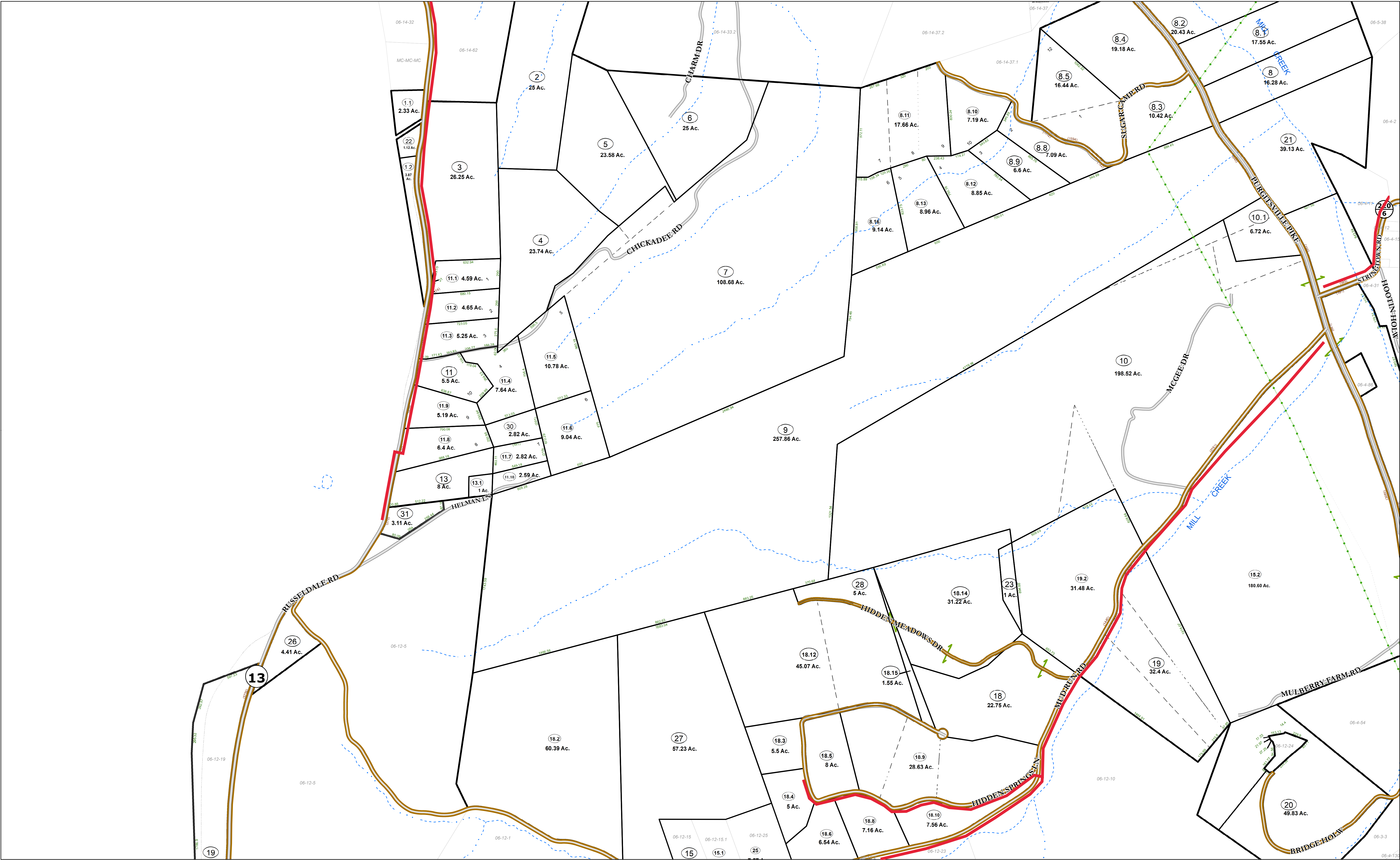
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District line	---	Lot line	---
County line	---	Road Centerline	---
State line	---	Church	---
Property Line	---	Deed lot number	(25)
Right of Way	---	Parcel or index number	(23)
		Parcel acreage	627.3

Revisions			
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2 AS OF JULY 1 1997 KWS	7 AS OF JULY 1 2002 JVB	12 AS OF JULY 1 2008 RIR	17 AS OF JAN 1 2015 ASC
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STATE OF WEST VIRGINIA
COUNTY OF HAMPSHIRE
Office of Assessor

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06-12	06-3
06-11	06-2

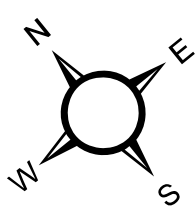
Mill Creek
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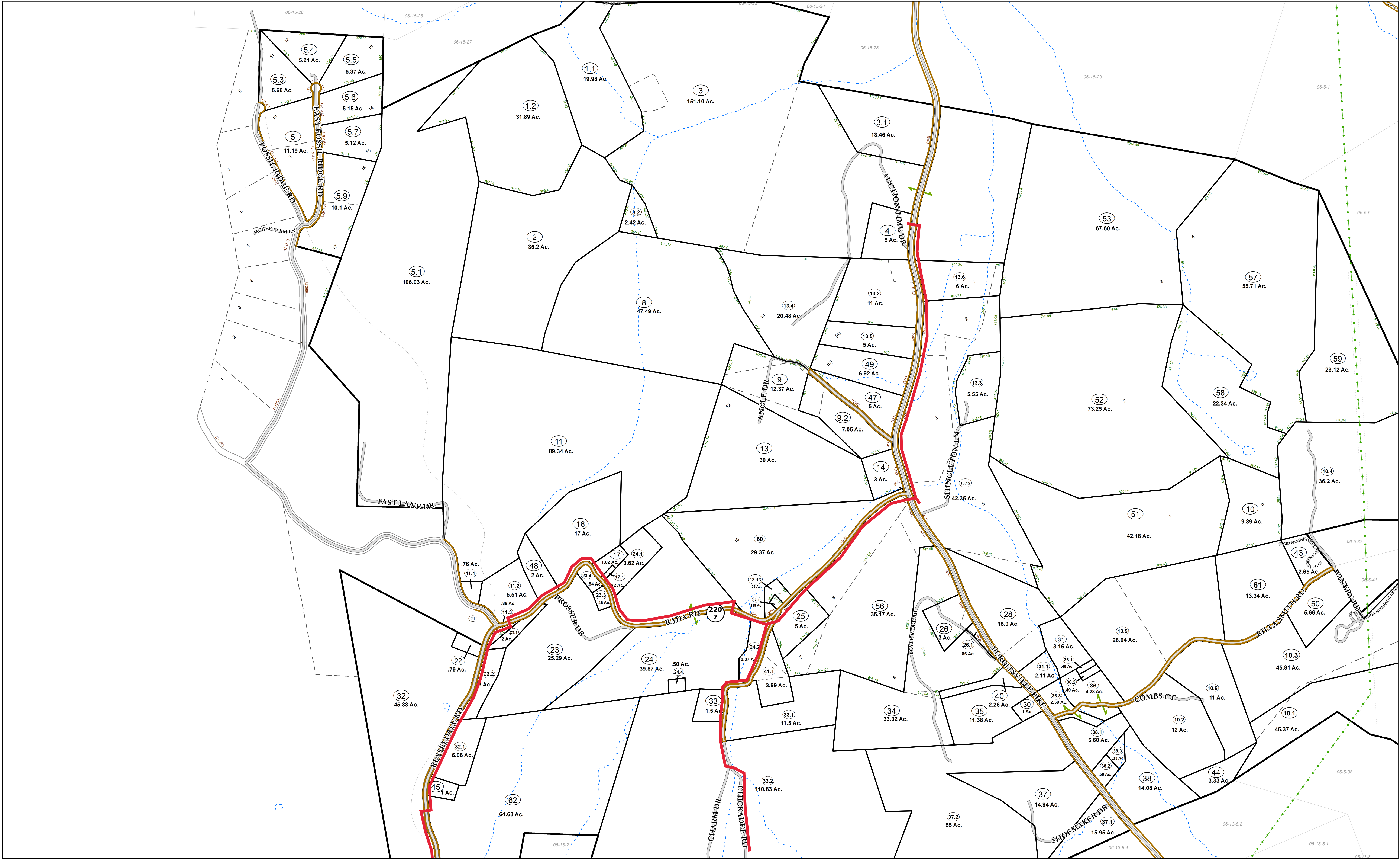
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District line	---	Lot line	---	Church	—C—
County line	---	Road Centerline	---	Deed lot number	(25)
State line	---	Streams	---	Parcel or index number	(23)
Property Line	---	Trans Line	---	Parcel acreage	527.5
Right of Way	---	Cemetery	—††—		

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STATE OF WEST VIRGINIA
COUNTY OF HAMPSHIRE
Office of Assessor

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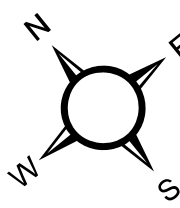
Mill Creek
Map: 13
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		Trans Line	---
		Cemetery	---
		Parcel acreage	5.27 Ac

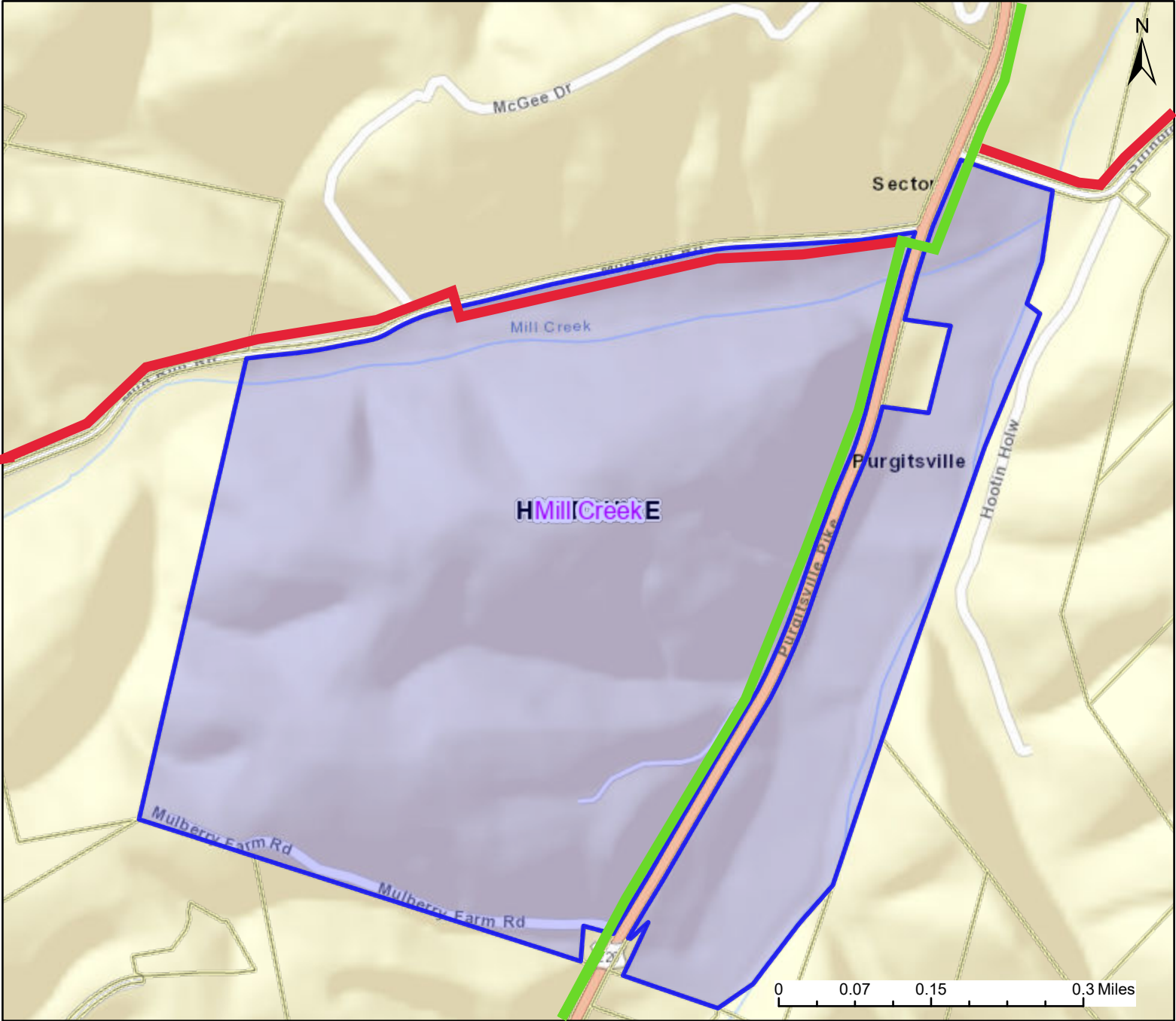
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STATE OF WEST VIRGINIA
COUNTY OF HAMPSHIRE
Office of Assessor

06-15	06-6
06-14	06-5
06-13	06-4

Mill Creek
Map: 14
Created: 1/17/2023
Scale: 1 in = 400 ft

PARCEL ID: 14-06-0013-0015-0002



Legend

District

Districts

Parcel

WVParcels

Proposed Water Line

Existing Water Line

User Notes:

Map created on March 8, 2024

Owner(s):
MCGEE RANDY & TERESA

Address:
354 MULBERRY FARM RD

Class Type:
Farm

Legal Description:
180.60 AC RT 220; (174.26 AC TAXABLE)

Attachment A
Real Estate
Assessment Data

WV Real Estate Assessment Data


[About](#)
[New Search](#)
[Structure Drawing](#)

Parcel ID	14-06-0013-0015-0002	Tax Year	2023	County	Hampshire	Date	3/8/2024
Root PID	14060013001500020000						

Property Owner and Mailing Address

Owner(s)	MCGEE RANDY & TERESA
Mailing Address	PO BOX 314, PURGITSVILLE, WV 26852

Property Location

Physical Address	354 MULBERRY FARM RD
E-911 Address	354 MULBERRY FARM RD Purgitsville WV 26852
Parcel ID	14-06-0013-0015-0002
County	14 - Hampshire
District	6 - Mill Creek District
Map	0013 (Click for PDF tax map)
Parcel No.	0015
Parcel Suffix	0002
Map View Link	https://mapwv.gov/parcel/?pid=14-06-0013-0015-0002

General Information

Tax Class	Book / Page	Deeded Acres	Calculated Acres	Legal Description
2	501 / 225	174.260	172.74	180.60 AC RT 220 (174.26 AC TAXABLE) T.O.D
			172.74	

Cost Value

Dwelling Value	\$55,700
Other Bldg/Yard Values	\$19,590
Commercial Value	---

Appraisal Value

Land Appraisal	\$79,800
Building Appraisal	\$75,300
Total Appraisal	\$155,100

Building Information

Property Class	F - Farm
Land Use	112 - Active Farm
Sum of Structure Areas	1,152

of Buildings (Cards) 1

Card	Year Built	Stories	CG	Architectural Style	Exterior Wall	Basement Type	Square Footage (SFLA)	Building Value
1	1989	1	1P	Ranch	Aluminum	Full	1,152	\$55,700
							1,152	\$55,700

Card	Year Built	Attic	Fuel	Heat System	Heat/AC	Bedrooms	Full Baths	Half Baths	Total Rooms
1	1989	None	Gas	Warm Air	Central	3	2		6
						3	2		6

Other Building and Yard Improvements

Bldg/ Card #	Line	Type	Year Built	CG	Units	Size	Area	Replace Cost	Adjusted Replace Cost
1	1	Frame or CB Detached Garage	1990	11	1	24x30	720	\$6,580	\$5,860
1	2	Frame Utility Shed	1990	11	1	8x12	96	\$620	\$180
1	4	Four Side Open Wood Pole Barn	2002	22	1	24x24	576	\$3,080	\$2,140
1	5	Metal Utility Shed	2011	22	1	8x10	80	\$690	\$610
1	6	Canopy Canopy	2012	22	1	18x21	378	\$1,810	\$2,160
1	7	Flat Barn Barn	1920	22	1	40x42	1,680	\$13,980	\$5,540
1	8	Frame Utility Shed	1920	22	1	16x20	320	\$2,070	\$610
1	9	Flat Barn Barn	1925	22	1	20x30	600	\$6,320	\$2,490
					8		4,450	\$35,150	\$19,590

Flood Zone Information Learn more at [WV Flood Tool](#)

Acres (c.)	Risk	
172.74	High	This parcel appears to be in a HIGH RISK flood hazard zone.

Parcel History

Tax Year	Tax Class	Owner	Owner Address	Book/ Page	Legal Description	Land	Building	Total
2023	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE) T.O.D	\$79,800	\$75,300	\$155,100
2022	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE) T.O.D	\$81,400	\$75,500	\$156,900
2021	2	MCGEE RANDY & TERESA	PO BOX 314 PURGITSVILLE , WV 26852	501 / 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$81,400	\$72,500	\$153,900
2020	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$81,400	\$73,300	\$154,700
2019	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$81,400	\$72,700	\$154,100
2018	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$79,800	\$66,200	\$146,000
2017	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$80,200	\$66,900	\$147,100
2016	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$78,800	\$69,000	\$147,800
2015	2	MCGEE RANDY & TERESA	PO BOX 314, PURGITSVILLE, WV 26852	501/ 225	180.60 AC RT 220 (174.26 AC TAXABLE)	\$63,400	\$65,900	\$129,300

Show/Hide Parcel History Prior to 2015

Attachment B
Site Photos



Proposed Water Line Extension

Existing Water Line



Proposed Water Line Extension

Attachment C
Drinking Water
Data

my copy

2018 Edition of the Drinking Water Standards and Health Advisories Tables

The 2012 Drinking Water Standards and Health Advisories (DWSHA) Tables were amended March 2018 to fix typographical errors and add health advisories published after 2012.



2018 Edition of the Drinking Water Standards and Health Advisories

EPA 822-F-18-001

**Office of Water
U.S. Environmental Protection Agency
Washington, DC**

March 2018

Recycled/Recyclable Printed
on paper that contains at
least 50% recycled fiber.



Drinking Water Standards and Health Advisories

March 2018

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The Health Advisory (HA) Program, sponsored by the EPA's Office of Water (OW), publishes concentrations of drinking water contaminants at Drinking Water Specific Risk Level Concentration for cancer (10^{-4} Cancer Risk) and concentrations of drinking water contaminants at which noncancer adverse health effects are not anticipated to occur over specific exposure durations - One-day, Ten-day, and Lifetime - in the *Drinking Water Standards and Health Advisories* (DWSHA) tables. The One-day and Ten-day HAs are for a 10 kg child and the Lifetime HA is for a 70 kg adult. The daily drinking water consumption for the 10 kg child and 70 kg adult are assumed to be 1 L/day and 2 L/day, respectively. The Lifetime HA for the drinking water contaminant is calculated from its associated Drinking Water Equivalent Level (DWEL), obtained from its RfD, and incorporates a drinking water Relative Source Contribution (RSC) factor of contaminant-specific data or a default of 20% of total exposure from all sources. Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for some regulated drinking water contaminants are also published.

HAs serve as the informal technical guidance for unregulated drinking water contaminants to assist Federal, State and local officials, and managers of public or community water systems in protecting public health as needed. They are not to be construed as legally enforceable Federal standards. EPA's OW has provided MCLs, MCLGs, RfDs, One-Day HAs, Ten-day HAs, DWELs, Lifetime HAs, Drinking Water Specific Risk Level Concentration for cancer (10^{-4} Cancer Risk), and Cancer Descriptors in the DWSHA tables. HAs are intended to protect against noncancer effects. The 10^{-4} Cancer Risk level provides information concerning cancer effects. The MCL values for specific drinking water contaminants must be used for regulated contaminants in public drinking water systems.

The DWSHA tables are revised periodically by the OW so that the benchmark values are consistent with the most current Agency assessments. Reference dose (RfD) values are updated to reflect the values in the Integrated Risk Information System (IRIS) and the Office of Pesticide Programs (OPP) Reregistration Eligibility Decisions (REDs) documents. The associated DWEL is recalculated accordingly. The 2018 DWSHA tables **do not** reflect assessments from IRIS or OPP published from 2012 to 2018. The DWSHA tables are currently undergoing a modernization effort to move the relevant HA information into a web-based format. This posting of the 2018 DWSHA tables is an intermediate step to address typographical errors and include health advisories published since the 2012 tables were published.

A Lifetime noncancer benchmark is made available to risk assessment managers for comparison to the cancer risk level drinking water concentration (10^{-4} Cancer Risk) and to determine whether the noncancer Lifetime HA or the cancer risk level drinking water concentration provides a more meaningful scenario-specific risk reduction. In this regard, the Office of Water defines the Lifetime HA as the concentration in drinking water that is not expected to cause any adverse noncarcinogenic effects for a lifetime of exposure, whereas the 10^{-4} Cancer Risk is the concentration of the chemical contaminant in drinking water that is associated with a specific probability of cancer. The Office of Water also advises consideration of the more conservative cancer risk levels (10^{-5} , 10^{-6}), found in the IRIS or OPP RED source documents, if it is considered more appropriate for exposure-specific risk assessment.

Drinking Water Standards and Health Advisories

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Many of the values on the DWSHA tables have been revised since the original HAs were published. Revised RfDs, 10^{-4} Cancer Risk values, and cancer designations or descriptors obtained from Integrated Risk Information System (IRIS) are presented in **BOLD** type. Revised RfDs, 10^{-4} Cancer Risk values, and cancer designations or descriptors obtained from Office of Pesticide Program's Registration Eligibility Decision (OPP RED) are presented in **BOLD ITALICS** type.

The summaries of IRIS Toxicological Reviews from which the RfDs and cancer benchmarks, as well as the associated narratives and references can be accessed at: <http://www.epa.gov/IRIS>. Those from OPP REDs can be accessed at: <http://www.epa.gov/pesticides/reregistration/status.htm>.

In some cases, there is an HA value for a contaminant but there is no reference to an HA document. Such HA values can be found in the Drinking Water Criteria Document for the contaminant.

With a few exceptions, the RfDs, Health Advisories, and Cancer Risk values have been rounded to one significant figure following the convention adopted by IRIS.

For unregulated chemicals with current IRIS or OPP REDs RfDs, the Lifetime Health Advisories are calculated from the associated DWELs, using the RSC values published in the HA documents for the contaminants.


The DWSHA tables may be reached from the Water Science home page at: <http://www.epa.gov/waterscience/>. The DWSHA tables are accessed under the Drinking Water icon.

Copies of the Tables may be ordered free of charge from

SAFE DRINKING WATER HOTLINE
1-800-426-4791
Monday thru Friday, 9:00 AM to 5:30 PM EST

DEFINITIONS

The following definitions for terms used in the DWSHA tables are not all-encompassing, and should not be construed to be “official” definitions. They are intended to assist the user in understanding terms used in the DWSHA tables.

 **Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. For **example**, it is the level of lead or copper which, if exceeded in over **10% of the homes** tested, triggers treatment for corrosion control.

100% Tested

Cancer Classification: A descriptive weight-of-evidence judgment as to the likelihood that an agent is a human carcinogen and the conditions under which the carcinogenic effects may be expressed. Under the 2005 EPA *Guidelines for Carcinogen Risk Assessment*, Cancer Descriptors replace the earlier alpha numeric Cancer Group designations (US EPA 1986 guidelines). The Cancer Descriptors in the 2005 EPA *Guidelines for Carcinogen Risk Assessment* are as follows:

- “carcinogenic to humans” (H)
- “likely to be carcinogenic to humans” (L)
- “likely to be carcinogenic above a specified dose but not likely to be carcinogenic below that dose because a key event in tumor formation does not occur below that dose” (L/N)
- “suggestive evidence of carcinogenic potential” (S)
- “inadequate information to assess carcinogenic potential” (I)
- “not likely to be carcinogenic to humans” (N)

The letter abbreviations provided parenthetically above are now used in the DWSHA tables in place of the prior alpha numeric identifiers for chemicals that have been evaluated under the new guidelines (the 2005 guidelines or the 1996 and 1999 draft guidelines) or whose records in the DWSHA tables have been revised.

Cancer Group: A qualitative weight-of-evidence judgment as to the likelihood that a chemical may be a carcinogen for humans. Each chemical was placed into one of the following five categories (US EPA 1986 guidelines). The Cancer Group designations are given in the Tables for chemicals that have not yet been evaluated under the new guidelines or whose records in the DWSHA tables have been revised.

Group Category

- A** Human carcinogen
- B** Probable human carcinogen:
 - B1** indicates limited human evidence
 - B2** indicates sufficient evidence in animals and inadequate or no evidence in humans
- C** Possible human carcinogen
- D** Not classifiable as to human carcinogenicity
- E** Evidence of noncarcinogenicity for humans

Drinking Water Standards and Health Advisories

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10⁻⁴ Cancer Risk: The concentration of a chemical in drinking water corresponding to an excess estimated lifetime cancer risk of 1 in 10,000.

Drinking Water Advisory: A nonregulatory concentration of a contaminant in water that is likely to be without adverse effects on health and aesthetics for the period it is derived.

DWEL: Drinking Water Equivalent Level. A DWEL is a drinking water lifetime exposure level, assuming **100%** exposure from that medium, at which adverse, noncarcinogenic health effects would not be expected to occur.

HA: Health Advisory. An estimate of acceptable drinking water levels for a chemical substance based on health effects information; an HA is not a legally enforceable Federal standard, but serves as technical guidance to assist Federal, State, and local officials.

One-Day HA: The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to one day of exposure. The One-Day HA is intended to protect a 10-kg child consuming 1 liter of water per day.

Ten-Day HA: The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure. The Ten-Day HA is also intended to protect a 10-kg child consuming 1 liter of water per day.

Lifetime HA: The concentration of a chemical in drinking water that is not expected to cause any adverse **noncarcinogenic effects** for a lifetime of exposure, incorporating a drinking water RSC factor of contaminant-specific data or a default of 20% of total exposure from all sources. The Lifetime HA is based on exposure of a 70-kg adult consuming 2 liters of water per day. For Lifetime HAs developed for drinking water contaminants before the Lifetime HA policy change to develop Lifetime HAs for all drinking water contaminants regardless of carcinogenicity status in this DWSHA update, the Lifetime HA for Group C carcinogens, as indicated by the 1986 Cancer Guidelines, includes an uncertainty adjustment factor of 10 for possible carcinogenicity.

MCLG: Maximum Contaminant Level Goal. A non-enforceable health benchmark goal which is set at a level at which no known or anticipated adverse effect on the health of persons is expected to occur and which allows an adequate margin of safety.

MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available analytical and treatment technologies and taking cost into consideration. MCLs are enforceable standards.

Oral cancer slope factor: The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day.

RfD: Reference Dose. An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

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Risk Specific Level Concentration: The concentration of the chemical contaminant in drinking water or air providing cancer risks of 1 in 10,000, 1 in 100,000, or 1 in 1,000,000.

SDWR: Secondary Drinking Water Regulations. Non-enforceable Federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water.

TT: Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.

Unit Risk: The unit risk is the quantitative estimate in terms of either risk per $\mu\text{g/L}$ drinking water or risk per $\mu\text{g/m}^3$ air breathed.

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ABBREVIATIONS

D	Draft
DWEL	Drinking Water Equivalent Level
DWSHA	Drinking Water Standards and Health Advisories
F	Final
HA	Health Advisory
I	Interim
IRIS	Integrated Risk Information System
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NA	Not Applicable
NOAEL	No-Observed-Adverse-Effect Level
OPP	Office of Pesticide Programs
OW	Office of Water
P	Proposed
Pv	Provisional
RED	Registration Eligibility Decision
Reg	Regulation
RfD	Reference Dose
TT	Treatment Technique

Drinking Water Standards and Health Advisories

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Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		10-kg Child		RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10 ⁻⁴ Cancer Risk	
						One-day (mg/L)	Ten-day (mg/L)					
INORGANICS												
Ammonia	7664-41-7	-	-	-	D '92	-	-	-	-	30	-	D
Antimony	7440-36-0	F	0.006	0.006	F '92	0.01	0.01	0.0004	0.01	0.006	-	D
Arsenic	7440-38-2	F	zero	0.01	-	-	-	0.0003	0.01	-	0.002	A
Asbestos (fibers/l >10Fm length)	1332-21-4	F	7 MFL ¹	7 MFL	-	-	-	-	-	-	700-MFL	A ²
Barium	7440-39-3	F	2	2	D '93	0.7	0.7	0.2	7	-	-	N
Beryllium	7440-41-7	F	0.004	0.004	F '92	30	30	0.002	0.07	-	-	-
Boron	7440-42-8	-	-	-	F '08	3	3	0.2	7	6	-	I
Bromate	7789-38-0	F	zero	0.01	D '98	0.2	-	0.004	0.14	-	0.005	B2
Cadmium	7440-43-9	F	0.005	0.005	F '87	0.04	0.04	0.0005	0.02	0.005	-	D
Chloramine ³	10599-90-3	F	4 ⁴	4 ⁴	D '95	-	-	0.1	3.5	3.0	-	-
Chlorine	7782-50-5	F	4 ⁴	4 ⁴	D '95	3	3	0.1	5	4	-	D
Chlorine dioxide	10049-04-4	F	0.8 ⁴	0.8 ⁴	D '98	0.8	0.8	0.03	1	0.8	-	D
Chlorite	7758-19-2	F	0.8	1	D '98	0.8	0.8	0.03	1	0.8	-	D
Chromium (total)	7440-47-3	F	0.1	0.1	F '87	1	1	0.003 ⁵	0.1	-	-	D
Copper (at tap)	7440-50-8	F	1.3	TT ⁶	D '98	-	-	-	-	-	-	D
Cyanide	143-33-9	F	0.2	0.2	F '87	0.2	0.2	0.0006 ⁷	-	-	-	D
Fluoride	7681-49-4	F	4	4	-	- ⁸	-	0.06 ⁹	-	-	-	I
Lead (at tap)	7439-92-1	F	zero	TT ⁶	-	-	-	-	-	-	-	-
Manganese	7439-96-5	-	-	-	F '04	1	1	0.14 ¹⁰	1.6	0.3	-	B2
Mercury (inorganic)	7487-94-7	F	0.002	0.002	F '87	0.002	0.002	0.0003	0.01	0.002	-	D
Molybdenum	7439-98-7	-	-	-	D '93	0.08	0.08	0.005	0.2	0.04	-	D
Nickel	7440-02-0	F	-	-	F '95	1	1	0.02	0.7	0.1	-	-

¹ MFL = million fibers per liter

² Carcinogenicity based on inhalation exposure

³ Monochloramine, measured as free chlorine.

⁴ 1998 Final Rule for Disinfectants and Disinfection By-products. MRDLG=Maximum Residual Disinfection Level Goal, and MRDL=Maximum Residual Disinfection Level

⁵ IRIS value for chromium VI

⁶ Copper action level 1.3 mg/L; lead action level 0.015 mg/L.

⁷ This RfD is for hydrogen cyanide.

⁸ In case of overfeed of the fluoridation chemical see CDC Guidelines in Engineering and Administrative Recommendations on Water Fluoridation

⁹ Based on dental fluorosis in children, a cosmetic effect. MCLG based on skeletal fluorosis.

¹⁰ Dietary manganese. The lifetime health advisory includes a 3 fold modifying factor to account for increased bioavailability from drinking water.

CANCER

Prob. Cancer

Drinking Water Standards and Health Advisories

March 2018

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Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		10-kg Child		RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10 ⁻⁴ Cancer Risk	
						One-day (mg/L)	Ten-day (mg/L)					
Nitrate (as N)	14797-55-8	F	10	10	D '93	10 ¹	10 ¹	1.6	-	-	-	-
Nitrite (as N)	14797-65-0	F	1	1	D '93	1 ¹	1 ¹	0.16	-	-	-	-
Nitrate + Nitrite (both as N)		F	10	10	D '93	-	-	-	-	-	-	-
Perchlorate ²	14797-73-0	-	-	-	I '08	-	-	0.007	0.025	0.015	-	L/N
Selenium	7782-49-2	F	0.05	0.05	-	-	-	0.005	0.2	0.05	-	D
Silver	7440-22-4	-	-	-	F '92	0.2	0.2	0.005 ³	0.2	0.1 ³	-	D
Strontium	7440-24-6	-	-	-	D '93	25	25	0.6	20	4	-	D
Thallium	7440-28-0	F	0.0005	0.002	F '92	0.007	0.007	-	-	-	-	I
White phosphorous	7723-14-0	-	-	-	F '90	-	-	0.00002	0.0005	0.0001	-	D
Zinc	7440-66-6	-	-	-	D '93	6	6	0.3	10	2	-	I
RADIONUCLIDES												
Beta particle and photon activity (formerly man-made radionuclides)		F	zero	4 mrem/yr	-	-	-	-	-	-	4 mrem/yr	A
Gross alpha particle activity		F	zero	15 pCi/L	-	-	-	-	-	-	15 pCi/L	A
Combined Radium 226 & 228	7440-14-4	F	zero	5 pCi/L	-	-	-	-	-	-	-	A
Radon	10043-92-2	P	zero	300 pCi/L AMCL ⁴ 4000 pCi/L	-	-	-	-	-	-	150 pCi/L	A
Uranium	7440-61-1	F	zero	0.03	-	-	-	0.0006 ⁵	0.02	-	-	A

¹ These values are calculated for a 4-kg infant and are protective for all age groups

² Subchronic value for pregnant women

³ Based on a cosmetic effect

⁴ AMCL = Alternative Maximum Contaminant Level

⁵ Soluble uranium salts Radionuclide Rule

226-228 - ZERO Limit

A - Group Cancer

F - Status - FINAL

Cover

Drinking Water Standards and Health Advisories

March 2018

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Secondary Drinking Water Regulations

Chemicals	CAS Number	Status	SDWR
Aluminum	7429-90-5	F	0.05 to 0.2 mg/L
Chloride	7647-14-5	F	250 mg/L
Color	NA	F	15 color units
Copper	7440-50-8	F	1.0 mg/L
Corrosivity	NA	F	non-corrosive
Fluoride	7681-49-4	F	2.0 mg/L
Foaming agents	NA	F	0.5 mg/L
Iron	7439-89-6	F	0.3 mg/L
Manganese	7439-96-5	F	0.05 mg/L
Odor	NA	F	3 threshold odor numbers
pH	NA	F	6.5 – 8.5
Silver	7440-22-4	F	0.1 mg/L
Sulfate	7757-82-6	F	250 mg/L
Total dissolved solids (TDS)	NA	F	500 mg/L
Zinc	7440-66-6	F	5 mg/L

2044 MEADOWBROOK ROAD
POST OFFICE BOX 4657
BRIDGEPORT, WV 26330
TEL: (304) 842-5285 • FAX (304) 842-5351
E-MAIL reliancelabs@wvdsi.net
INTERNET www.RelianceLabs.net

SHEET NO. 4 OF 4

***PROJECT/REMARKS**

Bypass-Software
Beitrag

REMARKS:

#PWS#

*RELINQUISHED BY: PRINT: Don J. [Signature] SIGN: [Signature]	DATE: 3-20-19 TIME: 1010 1300	*DATE/TIME	PRINT: [Signature] SIGN: [Signature]	*RECEIVED BY:
*RELINQUISHED BY:	DATE: TIME:	*DATE/TIME	PRINT: SIGN:	*RECEIVED BY:
*RELINQUISHED BY:	DATE: TIME:	*DATE/TIME	PRINT: SIGN:	*RECEIVED BY:
*COURIER: TRACKING #:	DATE: TIME:	*DATE/TIME	PRINT: SIGN:	*RECEIVED BY:

WEATHER/TEMPERATURE:

☐ **RUSH STATUS** (INITIAL ACCEPTANCE _____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IS NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME. HOWEVER, ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

*** TO BE COMPLETED BY CLIENT**

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT



Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

April 08, 2019

Ms. Tenley Miller
Reliance Laboratories, Inc.
2044 Meadowbrook Road
P.O. Box 4657
Bridgeport, WV 26330

RE: Project: 302487/302493
Pace Project No.: 30285346

Dear Ms. Miller:

Enclosed are the analytical results for sample(s) received by the laboratory on March 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Laura M. Pirilla
laura.pirilla@pacelabs.com
(724)850-5616
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CERTIFICATIONS

Project: 302487/302493
Pace Project No.: 30285346

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 302487/302493
Pace Project No.: 30285346

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30285346001	302487-2019-DW	Drinking Water	03/20/19 09:10	03/21/19 09:40
30285346002	302491-2019-DW	Drinking Water	03/20/19 09:30	03/21/19 09:40
30285346003	302492-2019-DW	Drinking Water	03/20/19 09:50	03/21/19 09:40
30285346004	302493-2019-DW	Drinking Water	03/20/19 10:10	03/21/19 09:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 302487/302493
Pace Project No.: 30285346

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30285346001	302487-2019-DW	EPA 903.1	MK1	1
		EPA 904.0	JLW	1
30285346002	302491-2019-DW	EPA 903.1	MK1	1
		EPA 904.0	JLW	1
30285346003	302492-2019-DW	EPA 903.1	MK1	1
		EPA 904.0	JLW	1
30285346004	302493-2019-DW	EPA 903.1	MK1	1
		EPA 904.0	JLW	1

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 302487/302493
Pace Project No.: 30285346

Method: EPA 903.1
Description: 903.1 Radium 226
Client: Reliance Laboratories, Inc.
Date: April 08, 2019

General Information:

4 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 302487/302493
Pace Project No.: 30285346

Method: EPA 904.0
Description: 904.0 Radium 228
Client: Reliance Laboratories, Inc.
Date: April 08, 2019

General Information:

4 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 302487/302493
Pace Project No.: 30285346

Sample: 302487-2019-DW Lab ID: 30285346001 Site ID: 03/20/19 09:10 Received: 03/21/19 09:40 Matrix: Drinking Water
PWS: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Sampler's signature not present on the subcontracted COC from Reliance.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.793 ± 0.549 (0.711)	pCi/L	04/02/19 21:35	13982-63-3	
Radium-228	EPA 904.0	C:NA T:95% 0.588 ± 0.282 (0.508) C:79% T:91%	pCi/L	04/05/19 12:27	15262-20-1	

Sample: 302491-2019-DW Lab ID: 30285346002 Site ID: 03/20/19 09:30 Received: 03/21/19 09:40 Matrix: Drinking Water
PWS: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Sampler's signature not present on the subcontracted COC from Reliance.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.207 ± 0.302 (0.508)	pCi/L	04/02/19 21:35	13982-63-3	
Radium-228	EPA 904.0	C:NA T:91% 0.506 ± 0.300 (0.576) C:77% T:88%	pCi/L	04/05/19 12:27	15262-20-1	

Sample: 302492-2019-DW Lab ID: 30285346003 Site ID: 03/20/19 09:50 Received: 03/21/19 09:40 Matrix: Drinking Water
PWS: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Sampler's signature not present on the subcontracted COC from Reliance.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.388 ± 0.400 (0.600)	pCi/L	04/02/19 21:35	13982-63-3	
Radium-228	EPA 904.0	C:NA T:91% 0.336 ± 0.336 (0.706) C:79% T:85%	pCi/L	04/05/19 12:27	15262-20-1	

Sample: 302493-2019-DW Lab ID: 30285346004 Site ID: 03/20/19 10:10 Received: 03/21/19 09:40 Matrix: Drinking Water
PWS: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Sampler's signature not present on the subcontracted COC from Reliance.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0671 ± 0.132 (0.182)	pCi/L	04/02/19 21:35	13982-63-3	
Radium-228	EPA 904.0	C:NA T:97% 0.341 ± 0.350 (0.738) C:78% T:86%	pCi/L	04/05/19 12:28	15262-20-1	

EPA - combined 226 + 228 limit of 5 pCi/L

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 302487/302493
Pace Project No.: 30285346

QC Batch:	334940	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30285346001, 30285346002, 30285346003, 30285346004		
METHOD BLANK: 1629907 Matrix: Water			
Associated Lab Samples:	30285346001, 30285346002, 30285346003, 30285346004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.922 ± 0.385 (0.611) C:78% T:88%	pCi/L	04/05/19 12:25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 302487/302493
Pace Project No.: 30285346

QC Batch: 335112 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30285346001, 30285346002, 30285346003, 30285346004

METHOD BLANK: 1630779 Matrix: Water
Associated Lab Samples: 30285346001, 30285346002, 30285346003, 30285346004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.383 (0.829) C:NA T:95%	pCi/L	04/02/19 21:22	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 302487/302493
Pace Project No.: 30285346

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.
Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAP Institute.

REPORT OF LABORATORY ANALYSIS

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Date: 04/08/2019 12:24 PM

Page 10 of 13



☐ RIDGEFIELD BUSINESS CENTER
25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

*SAMPLER (S) D. Judy E-MAIL _____

SHEET NO. _____ OF _____

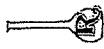
*PROJECT/REMARKS



30285346

PWS# _____

WHITE - LABORATORY YELLOW - CLIENT



RELiance LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV www.Reliancelabs.net MARTINSBURG, WV

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 156, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

Wednesday, March 20, 2019

Pace Analytical Services
1638 Roseytown Road
Suites 2,3,4
Greensburg, PA 15601

30285346

Please analyze the following sample for: **Radium 226-228**

Please identify as:

302487-2019-DW	Date/Time Sampled: 3/20/2019 9:10
302491-2019-DW	Date/Time Sampled: 3/20/2019 9:30
302492-2019-DW	Date/Time Sampled: 3/20/2019 9:50
302493-2019-DW	Date/Time Sampled: 3/20/2019 10:10

Sampled by: D.Judy

PLEASE SEND RESULTS & INVOICE TO:

RELiance LABORATORIES, INC.
ATTN: TENLEY MILLER
P.O. BOX 4657
BRIDGEPORT, WV 26330
tmiller@wvdsi.net

Thank You

Pittsburgh Lab Sample Condition Upon Receipt

Project # **30285346**

Client Name: **Reliance Labs**

Label	ET
LIMS Login	ET

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: **77475442917**

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No

Thermometer Used: **11** Type of Ice: ☒ Wet ☐ Blue ☐ None

Cooler Temperature: **2.0** °C Correction Factor: **0.0** °C Final Temp: **2.0** °C

Temp should be above freezing to 6°C

Comments:	Yes	No	pH paper Lot#	Date and initials of person examining contents:
Chain of Custody Present:		N/A	10D3581	ET 3-21-19
Chain of Custody Filled Out:				
Chain of Custody Relinquished:				
Sampler Name & Signature on COC:				
Sample Labels match COC:				
-Includes date/time/ID				
Matrix:				
Samples Arrived within Hold Time:				
Short Hold Time Analysis (<72hr remaining):				
Rush Turn Around Time Requested:				
Sufficient Volume:				
Correct Containers Used:				
-Pace Containers Used:				
Containers Intact:				
Orthophosphate field filtered				
Hex Cr Aqueous Compliance/NPDES sample field filtered				
Organic Samples checked for dechlorination:				
Filtered volume received for Dissolved tests				
All containers have been checked for preservation.				
All containers needing preservation are found to be in compliance with EPA recommendation.				
exceptions: VOA, coliform, TOC, O&G, Phenolics				
Initial when completed			ET	Date/time of preservation
Lot # of added preservation				
Headspace in VOA Vials (>8mm):				
Trip Blank Present:				
Trip Blank Custody Seals Present				
Rad Samples Screened < 0.5 mrem/hr				
Initial when completed			ET	Date: 3-21-19

Client Notification/ Resolution:

Person Contacted:

Date/Time:

Contacted By:

Comments/ Resolution:

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservation, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

For uranium mill tailing sites with radium contamination, EPA has established a radium level of 5 picoCuries per gram (pCi/g) above background as a protective health-based level for cleanup of soil in the top 15 centimeters. These regulations under 40 Code of Federal Regulations (CFR) Part 192.12 are often Applicable or Relevant and Appropriate Requirements (ARARs) at Superfund sites. The EPA document "Use of Soil Cleanup Criteria in 40 CFR Part 192 as Remediation Goals for CERCLA Sites" provides guidance to EPA staff regarding when the use of 5 picoCuries per gram (pCi/g) is an ARAR or otherwise recommended cleanup level for any 15 centimeters of subsurface radium-contaminated soil other than the first 15 centimeters. This document is available online at:

<http://www.epa.gov/superfund/health/contaminants/radiation/pdfs/umtrcagu.pdf>.

If regulations under 40 CFR Part 192.12 are an ARAR for radium in soil at a Superfund site, then Nuclear Regulatory Commission regulations for uranium mill tailing sites under 10 CFR Part 40 Appendix A, I, Criterion 6(6), may be an ARAR at the same site. Criterion 6(6) requires that the level of radiation, called a "benchmark dose," that an individual would receive be estimated after that site was cleaned up to the radium soil regulations under 40 CFR Part 192.12. This benchmark dose then becomes the maximum level of radiation that an individual may be exposed to from all radionuclides, except radon, in both the soil and buildings at the site. The EPA document "Remediation Goals for Radioactively Contaminated CERCLA Sites Using the Benchmark Dose Cleanup Criterion 10 CFR Part 40 Appendix A, I, Criterion 6(6)" provides

guidance to EPA staff regarding how Criterion 6(6) should be implemented as an ARAR at Superfund sites, including using a radium soil cleanup level of 5 pCi/g in both the surface and subsurface in estimating a benchmark dose. This document is available online at:

<http://www.epa.gov/superfund/health/contaminants/radiation/pdfs/part40.pdf>.

EPA has established a Maximum Contaminant Level (MCL) of 5 picoCuries per liter (pCi/L) for any combination of radium-226 and radium-228 in drinking water. EPA has also established a MCL of 15 pCi/L for alpha particle activity, excluding radon and uranium, in drinking water. Radium-226 is covered under this MCL.

For more information about how EPA addresses radium at Superfund sites

Contact Stuart Walker of EPA:

(703) 603-8748 or walker.stuart@epa.gov,

or visit EPA's Superfund Radiation Webpage:

<http://www.epa.gov/superfund/resources/radiation/>

**Reliance Laboratories, Inc.**

2044 Meadowbrook Road | P.O. Box 4657
Bridgeport, WV 26330
Phone: 304.842.5285 | Fax: 304.842.5351

Martinsburg Laboratory

Ridgefield Business Center | 25 Crimson Circle
Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

LABORATORY REPORT SUMMARY

Client: C0010D

Thursday, November 15, 2018

Mill Creek Ruritan Club
408 West Ridge Loop Rd.
Romney

WV 26757

Total Number of Pages: 9
(Not Including C.O.C.)
Page 1 of 9

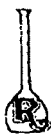
Lab ID	Sample ID	Sample ID 2	Sample Date
296157-2018-DW	Mill Creek #1	Mill Creek Ruritan Club	10/29/2018
296158-2018-DW	Faggili #2	Mill Creek Ruritan Club	10/29/2018
296159-2018-DW	High #3	Mill Creek Ruritan Club	10/29/2018
296160-2018-DW	White Pine #4	Mill Creek Ruritan Club	10/29/2018

Handwritten notes:
 2 miles south of Huffman Rd on US 220
 Faggili #2 - 0.7 mile west of 220 m Huffman
 old Mantum Rd (1/4 mile south of Huffman Rd turn off on Rt 220 - out 1/2 mile on Old Mt Rd. (near uranium)
 in between Huffman & Old Mt Rd on 220 (2.5 miles south of test #1)

The enclosed results have been analyzed according to the referenced method and SOP. Any deviations to the method have been noted on the report. Unless otherwise noted, all results have been verified to meet quality control requirements of the method. All analysis performed by Reliance Laboratories, Bridgeport, WV or Reliance Laboratories, Martinsburg, WV, as noted on laboratory report. This report may not be reproduced, except in full, without written approval of Reliance Laboratories, Inc.

Report Reviewed By

Digitally signed
by Tenley Miller
Date: 2018.11.16
10:06:58 -05'00'



RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV

www.RelianceLabs.net

MARTINSBURG, WV

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

PURGEABLE ORGANICS – CHAIN OF CUSTODY & SAMPLE COLLECTION PROCEDURE

1. Samples should be grab samples and should be taken from a cold water tap where drinking water or water for human consumption is normally obtained.
2. Sample bottles should be handled aseptically to prevent contamination of samples. Do not touch the inside of the bottles or caps. Do not allow either to touch the faucet. Do not remove any preservatives present.
3. Open the cold water tap and allow water to run evenly for three to five minutes in order to equilibrate system. Generally, the water temperature will stabilize indicating complete equilibration.
4. Collect grab samples in 40 ml glass vials. Slowly fill each container to overflowing, place the Teflon lined cap on the vial and seal. Invert the sample to check for air bubbles, if bubbles are present remove cap and continue filling vial. Fill all empty vials.
5. Return trip blank unaltered to the laboratory with sample vials.
6. Carefully pack all sample containers in ice to maintain 4 degrees Celsius.
7. Complete all information below and return with sample and trip blank to the laboratory.

Please provide all necessary information.

SAMPLING INFORMATION – COMPLETE THIS DOCUMENT IN INDELIBLE INK

Firm: _____ Contact: Donald Judy
 Address: 408 West Ridge Loop Road Romney WV 26757
 Telephone: 304-822-7842 Fax: _____
 Public Water System (PWS) I.D.: _____
 Describe Sample Location: 4651 Purgitsville Pike Purgitsville WV 26852
 Sample Date: 10-29-18 Sample Time: 9:15 AM Collected By: Donald Judy
 Sample Witnessed By: Tom High Date Received at Laboratory: _____
 Preserved at Lab (Y/N): _____ Proper Preservatives: _____ Proper Containers Used: _____
 Holding Times Observed: _____ Disinfectant Residual: _____
 Sample Temperature Upon Receipt: _____ Received By: _____
 Shipper/Tracking #: _____
 Results Authorized By: _____ Date: _____

**Reliance Laboratories, Inc.**

2044 Meadowbrook Road | P.O. Box 4657
Bridgeport, WV 26330
Phone: 304.842.5285 | Fax: 304.842.5351

Martinsburg Laboratory

Ridgefield Business Center | 25 Crimson Circle
Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

Mill Creek Ruritan Club
408 West Ridge Loop Rd.

Thursday, November 15, 2018

Page 2 of 9

Romney, WV 26757

Lab Number: 296157-2018-DW Sample ID: Mill Creek #1
Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Inorganics							
Total Lead	J 0.00080	mg/l	EPA 200.8 R5.4	11/1/2018	12:58 TH	0.0005	0.001
Total Iron	✓ 0.027	mg/l	EPA 200.8 R5.4	11/1/2018	12:58 TH	0.004	0.01
Total Arsenic	0.0094	mg/l	EPA 200.8 R5.4	11/1/2018	12:58 TH	0.001	0.005

Iron - secondary recommended limit = 0.30 mg/L
 Arsenic ~~limit~~ 0.01 mg/L.
 Lead - 15 µg/L
 limit

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 9:10

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)



Reliance Laboratories, Inc.
 2044 Meadowbrook Road | P.O. Box 4657
 Bridgeport, WV 26330
 Phone: 304.842.5285 | Fax: 304.842.5351

Martinsburg Laboratory
 Ridgefield Business Center | 25 Crimson Circle
 Martinsburg, WV 25403
 Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
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Mill Creek Ruritan Club
 408 West Ridge Loop Rd.

Thursday, November 15, 2018

Page 3 of 9

Romney, WV 26757

Lab Number: 296157-2018-DW Sample ID: Mill Creek #1
 Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Total Petroleum Hydrocarbons							
TPH - GRO	ND	mg/l	SW8015B/5030B	11/5/2018	15:59 TM	0.04	0.5
4-Bromochlorobenzene (Surrogate)	99.1	%	SW8015B	11/5/2018	15:59 TM		
TPH - DRO	ND	mg/l	SW8015B/3535A	11/6/2018	9:27 TM	0.68	1
TPH - ORO	ND	mg/l	SW8015B/3535A	11/6/2018	9:27 TM	0.54	1
o-Terphenyl (Surrogate)	83.1	%	SW8015B	11/6/2018	9:27 TM		

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 9:10

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)

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Martinsburg Laboratory

Ridgefield Business Center | 25 Crimson Circle
Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

Mill Creek Ruritan Club
408 West Ridge Loop Rd.

Thursday, November 15, 2018

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Romney, WV 26757

Lab Number: 296158-2018-DW Sample ID: Faggili #2
Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Inorganics</u>							
Total Lead	ND	mg/l	EPA 200.8 R5.4	11/1/2018	13:03 TH	0.0005	0.001
Total Iron	0.530	mg/l	EPA 200.8 R5.4	11/1/2018	13:03 TH	0.004	0.01
Total Arsenic	ND	mg/l	EPA 200.8 R5.4	11/1/2018	13:03 TH	0.001	0.005

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 10:50

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

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Mill Creek Ruritan Club
408 West Ridge Loop Rd.

Thursday, November 15, 2018

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Romney, WV 26757

Lab Number: 296158-2018-DW Sample ID: Faggili #2
Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Total Petroleum Hydrocarbons							
TPH - GRO	ND	mg/l	SW8015B/5030B	11/6/2018 9:22	TH	0.04	0.5
4-Bromochlorobenzene (Surrogate)	91.2	%	SW8015B	11/6/2018 9:22	TM		
TPH - DRO	ND	mg/l	SW8015B/3535A	11/6/2018 10:08	TM	0.68	1
TPH - ORO	ND	mg/l	SW8015B/3535A	11/6/2018 10:08	TM	0.54	1
o-Terphenyl (Surrogate)	110	%	SW8015B	11/6/2018 10:08	TM		

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 10:50

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

MDL - Minimum Detectable Limit

MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL

MRL - Minimum Reporting Limit

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)



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Mill Creek Ruritan Club
 408 West Ridge Loop Rd.

Thursday, November 15, 2018

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Romney, WV 26757

Lab Number: 296159-2018-DW **Sample ID:** High #3
 Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Inorganics							
Total Lead	ND	mg/l	EPA 200.8 R5.4	11/1/2018	13:08 TH	0.0005	0.001
Total Iron	X 1.28	mg/l	EPA 200.8 R5.4	11/1/2018	13:08 TH	0.004	0.01
Total Arsenic	ND	mg/l	EPA 200.8 R5.4	11/1/2018	13:08 TH	0.001	0.005

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 10:30

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)

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Mill Creek Ruritan Club
 408 West Ridge Loop Rd.

Thursday, November 15, 2018

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Romney, WV 26757

Lab Number: 296159-2018-DW Sample ID: High #3
 Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Total Petroleum Hydrocarbons							
TPH - GRO	ND	mg/l	SW8015B/5030B	11/6/2018 9:53	TM	0.04	0.5
4-Bromochlorobenzene (Surrogate)	102	%	SW8015B	11/6/2018 9:53	TM		
TPH - DRO	ND	mg/l	SW8015B/3535A	11/6/2018 10:49	TM	0.68	1
TPH - ORO	ND	mg/l	SW8015B/3535A	11/6/2018 10:49	TM	0.54	1
o-Terphenyl (Surrogate)	113	%	SW8015B	11/6/2018 10:49	TM		

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 10:30

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)

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Mill Creek Ruritan Club
408 West Ridge Loop Rd.

Thursday, November 15, 2018

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Romney, WV 26757

Lab Number: 296160-2018-DW Sample ID: White Pine #4
Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Inorganics							
Total Lead	ND	mg/l	EPA 200.8 R5.4	11/1/2018	13:12 TH	0.0005	0.001
Total Iron	0.219	mg/l	EPA 200.8 R5.4	11/1/2018	13:12 TH	0.004	0.01
Total Arsenic	ND	mg/l	EPA 200.8 R5.4	11/1/2018	13:12 TH	0.001	0.005

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 10:50

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

*Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.

NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)



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Mill Creek Ruritan Club
 408 West Ridge Loop Rd.

Thursday, November 15, 2018
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Romney, WV 26757

Lab Number: 296160-2018-DW Sample ID: White Pine #4
 Mill Creek Ruritan Club

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: Total Petroleum Hydrocarbons							
TPH - GRO	ND	mg/l	SW8015B/5030B	11/6/2018	10:52 TM	0.04	0.5
4-Bromochlorobenzene (Surrogate)	76.7	%	SW8015B	11/6/2018	10:52 TM		
TPH - DRO	ND	mg/l	SW8015B/3535A	11/6/2018	11:30 TM	0.68	1
TPH - ORO	ND	mg/l	SW8015B/3535A	11/6/2018	11:30 TM	0.54	1
o-Terphenyl (Surrogate)	84.3	%	SW8015B	11/6/2018	11:30 TM		

Remarks:

Analysis performed by Reliance Laboratories Bridgeport, WV

Date Sample Collected: 10/29/2018 10:50

Sample Submitted By: D. JUDY

Date Sample Received: 10/29/2018 13:53

Sample temp. upon receipt: 4.2 Deg C

ND = Not Detected at the MDL or MRL

MDL - Minimum Detectable Limit

MRL - Minimum Reporting Limit

MCL - Maximum Contaminant Level, USEPA Regulated

J = Reported value is an estimate because concentration is less than the MRL

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NOTE: ND or Not Detected indicates that the analytical value obtained is below the minimum detectable limit (MDL)



RELiance LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV

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MARTINSBURG, WV

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

WATER SUPPLY SAMPLING – CHAIN OF CUSTODY & SAMPLE COLLECTION PROCEDURE

1. Samples should be grab samples and should be taken from a cold water tap where drinking water or water for human consumption is normally obtained.
2. Sample bottles should be handled aseptically to prevent contamination of samples. Do not touch the inside of the bottles or caps. Do not allow either to touch the faucet.
3. Open the cold water tap and allow water to run evenly for three to five minutes in order to equilibrate system. Generally, the water temperature will stabilize indicating complete equilibration.
4. Fill all containers completely allowing no air space to remain.

MICROBIOLOGICAL/BACTERIOLOGICAL SAMPLES ONLY

Collect at least 100 ml of sample (fill to the mark on the sample container). Allow one (1) inch of airspace in the sample container. Water taps selected for sampling must be free of aerators, strainers, hose attachments, mixing devices and purification devices. **THE SAMPLE CONTAINER IS STERILE. The pill included in the container removes chlorine residual.** Samples should be analyzed within 30 hours of collection (HPC 8 hours). Samples should remain ≤ 10 degrees C during shipment.

5. Close bottles tightly. Write name, date, time of sampling, and area where sample was taken on the bottle and on the Chain-of-Custody form.
6. Carefully pack all sample containers when shipping to the laboratory.
7. Ship/deliver to the address above.

CAUTION: Some sample bottles contain stabilizing reagents which are corrosive and should be handled carefully. If reagents come in contact with skin, flush with water.

SAMPLING INFORMATION – COMPLETE THIS DOCUMENT IN INDELIBLE INK

Firm: _____ Contact: Donald Judy
 Address: 408 West Ridge Loop Road Romney WV 26757
 Telephone: 304-822-7842 Fax: _____ Public Water System (PWS) I.D.: _____
 Describe Sample Location: 4651 Burgerville Pike Burgerville WV 26852
 Sample Date: 12-29-18 Sample Time: 9:15 AM Collected By: Donald Judy
 Sample Witnessed By: Tom High Date Received at Laboratory: _____
 Preserved at Lab (Y/N): _____ Proper Preservatives: _____ Proper Containers Used: _____
 Holding Times Observed: _____ Disinfectant Residual: _____ Received By: _____
 Sample Temperature Upon Receipt: _____ Shipper/Tracking #: _____
 Results Authorized By: _____ Date: _____

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-162266-1
Client Project/Site: RSK / 296157, 296158, 296159, 296160

For:
Reliance Laboratories Inc
PO BOX 4657
Bridgeport, West Virginia 26330

Attn: Tenley Miller

Jennifer Gambill

Authorized for release by:
11/8/2018 5:30:24 PM

Jennifer Gambill, Project Manager I
(615)301-5044
jennifer.gambill@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Reliance Laboratories Inc
Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

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Sample Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-162266-1	296157-2018-DW	Water	10/29/18 09:10	10/31/18 10:00
490-162266-2	296158-2018-DW	Water	10/29/18 10:50	10/31/18 10:00
490-162266-3	296159-2018-DW	Water	10/29/18 10:30	10/31/18 10:00
490-162266-4	296160-2018-DW	Water	10/29/18 10:50	10/31/18 10:00

Case Narrative

Client: Reliance Laboratories Inc

TestAmerica Job ID: 490-162266-1

Project/Site: RSK / 296157, 296158, 296159, 296160

Job ID: 490-162266-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative

490-162266-1

Comments

No additional comments.

Receipt

The samples were received on 10/31/2018 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

GC Semi VOA

Method(s) RSK-175: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-555810.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Reliance Laboratories Inc

TestAmerica Job ID: 490-162266-1

Project/Site: RSK / 296157, 296158, 296159, 296160

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
π	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

5

Client Sample Results

Client: Reliance Laboratories Inc

Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

Client Sample ID: 296157-2018-DW

Date Collected: 10/29/18 09:10

Lab Sample ID: 490-162266-1

Date Received: 10/31/18 10:00

Matrix: Water

Method: RSK-175 - Dissolved Gases in Water									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			11/08/18 11:53	1
Ethane	22.2		5.00	2.70	ug/L			11/08/18 11:53	1
Methane	37800	37.8 mg/L	400	136	ug/L			11/08/18 13:15	80
Propane	ND		5.00	3.30	ug/L			11/08/18 11:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Acetylene (Surr)	83		70 - 130					11/08/18 11:53	1

> 20 mg/L yields explosive conditions
 10-20 mg/L - monitoring advisable
 < 10 mg/L - safe.

Client Sample Results

Client: Reliance Laboratories Inc

TestAmerica Job ID: 490-162266-1

Project/Site: RSK / 296157, 296158, 296159, 296160

Client Sample ID: 296158-2018-DW

Lab Sample ID: 490-162266-2

Date Collected: 10/29/18 10:50

Matrix: Water

Date Received: 10/31/18 10:00

Method: RSK-175 - Dissolved Gases in Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			11/08/18 12:00	1
Ethane	9.89		5.00	2.70	ug/L			11/08/18 12:00	1
Methane	13900	13.9 mg/L.	200	68.0	ug/L			11/08/18 12:52	40
Propane	ND		5.00	3.30	ug/L			11/08/18 12:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	87		70 - 130		11/08/18 12:00	1

Client Sample Results

Client: Reliance Laboratories Inc
Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

Client Sample ID: 296159-2018-DW

Lab Sample ID: 490-162266-3

Date Collected: 10/29/18 10:30

Matrix: Water

Date Received: 10/31/18 10:00

Method: RSK-175 - Dissolved Gases in Water									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			11/08/18 12:04	1
Ethane	ND		5.00	2.70	ug/L			11/08/18 12:04	1
Methane	7.90		5.00	1.70	ug/L			11/08/18 12:04	1
Propane	ND		5.00	3.30	ug/L			11/08/18 12:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Acetylene (Surr)	86		70 - 130					11/08/18 12:04	1

TestAmerica Nashville

Client Sample Results

Client: Reliance Laboratories Inc

TestAmerica Job ID: 490-162266-1

Project/Site: RSK / 296157, 296158, 296159, 296160

Client Sample ID: 296160-2018-DW

Lab Sample ID: 490-162266-4

Date Collected: 10/29/18 10:50

Matrix: Water

Date Received: 10/31/18 10:00

Method: RSK-175 - Dissolved Gases in Water									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			11/08/18 12:33	1
Ethane	13.3		5.00	2.70	ug/L			11/08/18 12:33	1
Methane	6510	6.51 mg/L	100	34.0	ug/L			11/08/18 12:58	20
Propane	ND		5.00	3.30	ug/L			11/08/18 12:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Acetylene (Surr)	85		70 - 130					11/08/18 12:33	1

TestAmerica Nashville

QC Sample Results

Client: Reliance Laboratories Inc
Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

Method: RSK-175 - Dissolved Gases in Water

Lab Sample ID: MB 490-555810/6

Matrix: Water

Analysis Batch: 555810

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			11/08/18 11:19	1
Ethane	ND		5.00	2.70	ug/L			11/08/18 11:19	1
Methane	ND		5.00	1.70	ug/L			11/08/18 11:19	1
Propane	ND		5.00	3.30	ug/L			11/08/18 11:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	96		70 - 130		11/08/18 11:19	1

Lab Sample ID: LCS 490-555810/7

Matrix: Water

Analysis Batch: 555810

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Butane	1020	907.9		ug/L		89	85 - 115
Ethane	527	494.1		ug/L		94	85 - 115
Methane	287	267.5		ug/L		93	85 - 115
Propane	771	707.3		ug/L		92	85 - 115

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Acetylene (Surr)	96		70 - 130

Lab Sample ID: LCSD 490-555810/8

Matrix: Water

Analysis Batch: 555810

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Butane	1020	895.6		ug/L		88	85 - 115	1	30
Ethane	527	489.1		ug/L		93	85 - 115	1	30
Methane	287	259.6		ug/L		91	85 - 115	3	30
Propane	771	691.2		ug/L		90	85 - 115	2	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Acetylene (Surr)	92		70 - 130

TestAmerica Nashville

QC Association Summary

Client: Reliance Laboratories Inc

TestAmerica Job ID: 490-162266-1

Project/Site: RSK / 296157, 296158, 296159, 296160

GC VOA**Analysis Batch: 555810**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-162266-1	296157-2018-DW	Total/NA	Water	RSK-175	
490-162266-1	296157-2018-DW	Total/NA	Water	RSK-175	
490-162266-2	296158-2018-DW	Total/NA	Water	RSK-175	
490-162266-2	296158-2018-DW	Total/NA	Water	RSK-175	
490-162266-3	296159-2018-DW	Total/NA	Water	RSK-175	
490-162266-4	296160-2018-DW	Total/NA	Water	RSK-175	
490-162266-4	296160-2018-DW	Total/NA	Water	RSK-175	
MB 490-555810/6	Method Blank	Total/NA	Water	RSK-175	
LCS 490-555810/7	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 490-555810/8	Lab Control Sample Dup	Total/NA	Water	RSK-175	

Lab Chronicle

Client: Reliance Laboratories Inc
Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

Client Sample ID: 296157-2018-DW

Lab Sample ID: 490-162266-1

Date Collected: 10/29/18 09:10

Matrix: Water

Date Received: 10/31/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	555810	11/08/18 11:53	AAB	TAL NSH
Total/NA	Analysis	RSK-175		80	21 mL	21 mL	555810	11/08/18 13:15	AAB	TAL NSH

Client Sample ID: 296158-2018-DW

Lab Sample ID: 490-162266-2

Date Collected: 10/29/18 10:50

Matrix: Water

Date Received: 10/31/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	555810	11/08/18 12:00	AAB	TAL NSH
Total/NA	Analysis	RSK-175		40	21 mL	21 mL	555810	11/08/18 12:52	AAB	TAL NSH

Client Sample ID: 296159-2018-DW

Lab Sample ID: 490-162266-3

Date Collected: 10/29/18 10:30

Matrix: Water

Date Received: 10/31/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	555810	11/08/18 12:04	AAB	TAL NSH

Client Sample ID: 296160-2018-DW

Lab Sample ID: 490-162266-4

Date Collected: 10/29/18 10:50

Matrix: Water

Date Received: 10/31/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	555810	11/08/18 12:33	AAB	TAL NSH
Total/NA	Analysis	RSK-175		20	21 mL	21 mL	555810	11/08/18 12:58	AAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 296157, 296158, 296159, 296160

TestAmerica Job ID: 490-162266-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases in Water	RSK	TAL NSH

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175,
Rev. 0, 8/11/94, USEPA Research Lab

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Reliance Laboratories Inc

TestAmerica Job ID: 490-162266-1

Project/Site: RSK / 296157, 296158, 296159, 296160

Laboratory: TestAmerica Nashville

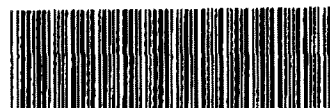
The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
West Virginia DEP	State Program	3	219	02-28-19

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM



490-162266 Chain of Custody

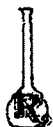
Cooler Received/Opened On 10-31-2018 @ 10:00Time Samples Removed From Cooler 12:14 Time Samples Placed In Storage 12:23 (2 Hour Window)

1. Tracking # 1451 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 14740456 pH Strip Lot _____ Chlorine Strip Lot _____

2. Temperature of rep. sample or temp blank when opened: 2.5 Degrees Celsius3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA4. Were custody seals on outside of cooler? YES NO NA

If yes, how many and where: _____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA6. Were custody papers inside cooler? YES...NO...NAI certify that I opened the cooler and answered questions 1-6 (Initial) AI7. Were custody seals on containers: YES NO and intact YES...NO...NAWere these signed and dated correctly? YES...NO...NA8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None9. Cooling process: Ice Ice-pack Ice (direct contact) Dry Ice Other None10. Did all containers arrive in good condition (unbroken)? YES...NO...NA11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA12. Did all container labels and tags agree with custody papers? YES...NO...NA13a. Were VOA vials received? YES...NO...NAb. Was there any observable headspace present in any VOA vial? YES NO NA14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # 2-8I certify that I unloaded the cooler and answered questions 7-14 (Initial) 2-815a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NAb. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA16. Was residual chlorine present? YES...NO...NAI certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (Initial) 2-817. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA18. Did you sign the custody papers in the appropriate place? YES...NO...NA19. Were correct containers used for the analysis requested? YES...NO...NA20. Was sufficient amount of sample sent in each container? YES...NO...NAI certify that I entered this project into LIMS and answered questions 17-20 (Initial) 2-8I certify that I attached a label with the unique LIMS number to each container (Initial) 2-821. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO...# _____



RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV

www.RelianceLabs.net

MARTINSBURG, WV

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181 |
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

Tuesday, October 30, 2018

490-162266

TestAmerica - Nashville
2960 Foster Creighton Drive
Nashville, TN 37204

Please analyze the following sample(s) for: **Dissolved Methane/Ethane/Butane/Propane**

Please identify as:

296157-2018-DW
296158-2018-DW
296159-2018-DW
296160-2018-DW

DATE/TIME SAMPLED: 10/29/2018 9:10
DATE/TIME SAMPLED: 10/29/2018 10:50
DATE/TIME SAMPLED: 10/29/2018 10:30
DATE/TIME SAMPLED: 10/29/2018 10:50

Sampled by: D.Judy

PLEASE SEND RESULTS & INVOICE TO:

RELIANCE LABORATORIES, INC.
ATTN: TENLEY MILLER
P.O. BOX 4657
BRIDGEPORT, WV 26330
tmiller@wvdsi.net

Thank You



Amo Oliverio
Biological and Environmental Technology Coordinator\Faculty
Eastern WV Community and Technical College

December 12, 2019

To whom it may concern,

A few months ago, Mr. Judy visited my students at Eastern WV Community and Technical College with an almost unbelievable story. He showed us a video of him igniting flowing tap water on fire, reviewed water analysis reports, and described disease incidences involving the citizens of the Purgitsville area. Impassioned by the story, my students and I began scouring the scientific literature to better understand the health risks associated with some of the contaminants found in the drinking water the families of Purgitsville have unknowingly been drinking.

The flaming water is due to amounts of methane, ethane, and acetylene, which are all extremely flammable natural gases. Exposure to these gases can cause headaches, dizziness, nausea, vomiting, and loss of coordination, and possible suffocation. Many sources stated that these natural gases have not been tested for their ability to cause reproductive harm, which is a possibility and needs further study.

Some of the wells also tested positive for small amounts of arsenic. Arsenic is a heavy metal that can form compounds that may build up in tissues with high fat content until they become toxic. Arsenic increases the risk of cancer, especially in the lung, bladder, skin, kidney, and liver. A study in Chile discovered a higher mortality rate of liver cancer in a population whose drinking water contained small amounts of arsenic. The liver cancer rate was especially high in children.

On top of the list of the most concerning contaminants found were two known cancer-causing forms of the radioactive element, radium (radium 226 and radium 228). Radium is a radioactive element that occurs when uranium naturally decays deep in the Earth. Ingested radium is initially absorbed into the blood. What is not eliminated in the urine accumulates in the kidney, soft tissues, and especially in the bones of humans. As the radium bioaccumulates, or builds up in the body over time, the incidence and mortality risk of cancer greatly increases, especially breast, liver, stomach, and many types of bone cancer.

Just one of these contaminants in drinking water would be a major concern, let alone the combination all of these carcinogenic toxins in a family's drinking water. The medical community have yet to clearly define the health risks of these contaminants, especially when ingesting small amounts in various combinations over long periods of time and should be thoroughly explored in the future. In the meantime, the people of Purgitsville need to have access to clean and healthy drinking water for themselves and their future children.

Sincerely,

A handwritten signature in dark ink, appearing to read "Amo Oliverio". The signature is fluid and cursive, with a long horizontal stroke at the end.

Amo Oliverio

316 Eastern Drive
Moorefield, WV 26836
www.EasternWV.edu

phone: (304) 434-8000
fax: (304) 434-7000
toll free: (877) 982-2322

Work Cited

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From: dpcerrone@cerrone1.com
To: "Angie Curl"; "Terry Lively"
Cc: cmiller@cerrone1.com; "central hampshire"
Subject: Purgitsville Cancer Maps
Date: Monday, March 16, 2020 12:38:09 PM
Attachments: [image001.jpg](#)

Guys-

The maps returned from Don and associates from the PSD mark out about 68 households in the project area (out of 167 potential we believe) to have cancer. If that is just one case per household, that represents 68 people out of a population of 167 homes x 2.44 people per house 2010 county average. This represents about 17% of the local population there. According to the cancer.gov website, in 2016, 4.8% of the overall US population was living with cancer. Keep in mind that it is hard to confirm anything out of this given that the population here in Purgitsville probably significantly skews to being older, and it is impossible to compare it to the overall US average.

Nonetheless, we will stick with the language on this in the PER that we read Terry over the phone the other day. We will provide you a draft copy of this again prior to sealing the PER up and submitting it. Thanks

Dominick Paul Cerrone, PE

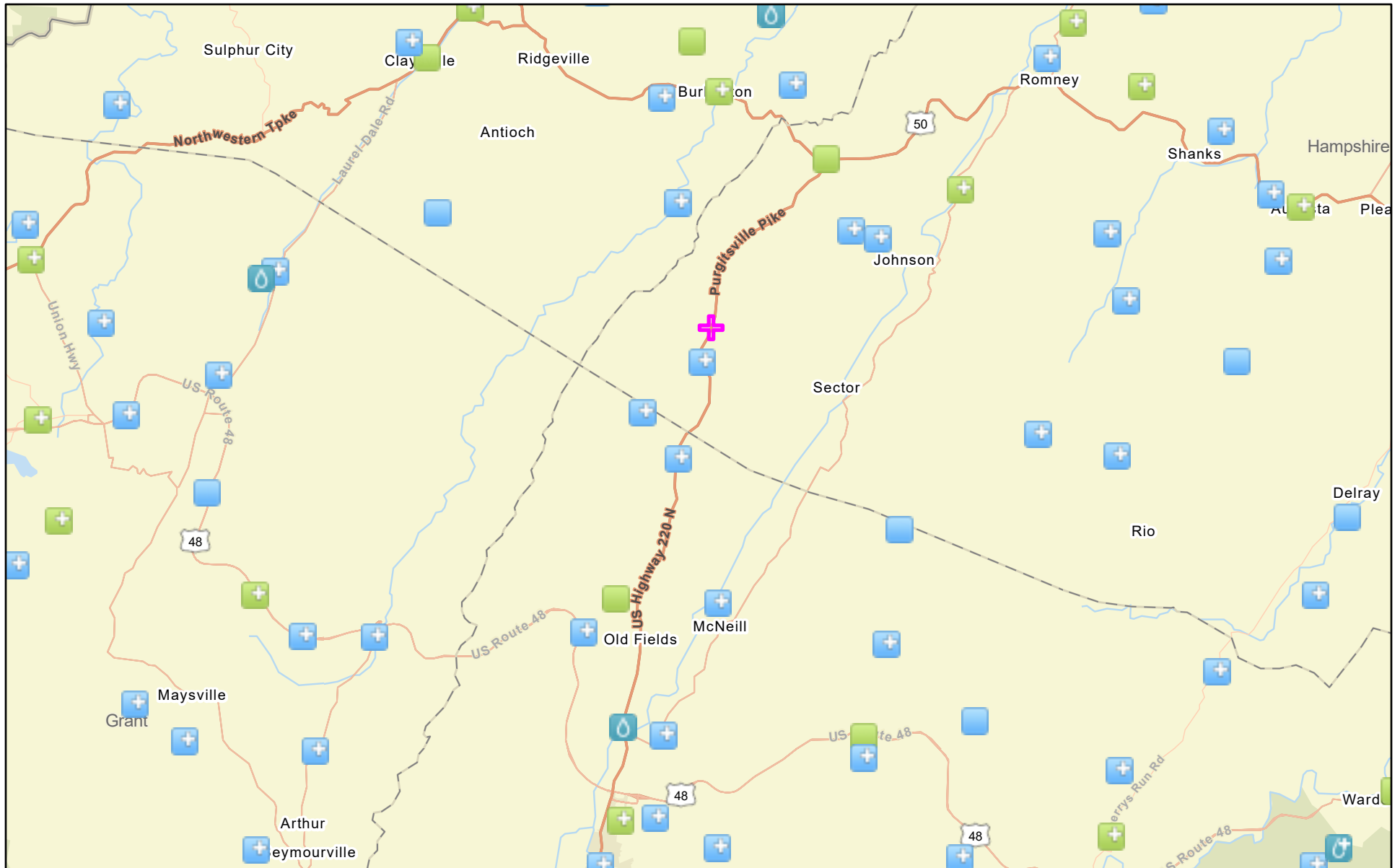
Director of Engineering










Cerrone Associates, Inc.
97-14th Street
Wheeling, WV 26003
www.cerrone1.com
dpcerrone@cerrone1.com
304-232-5550 x112
304-233-2512 (F)

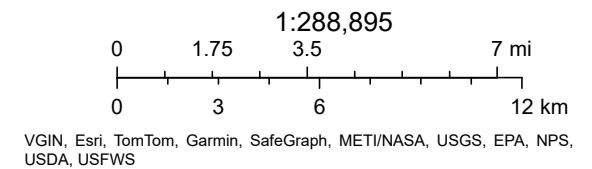
Attachment D
Environmental and
Historical Research
Information

EPA Points of Interest



March 4, 2024

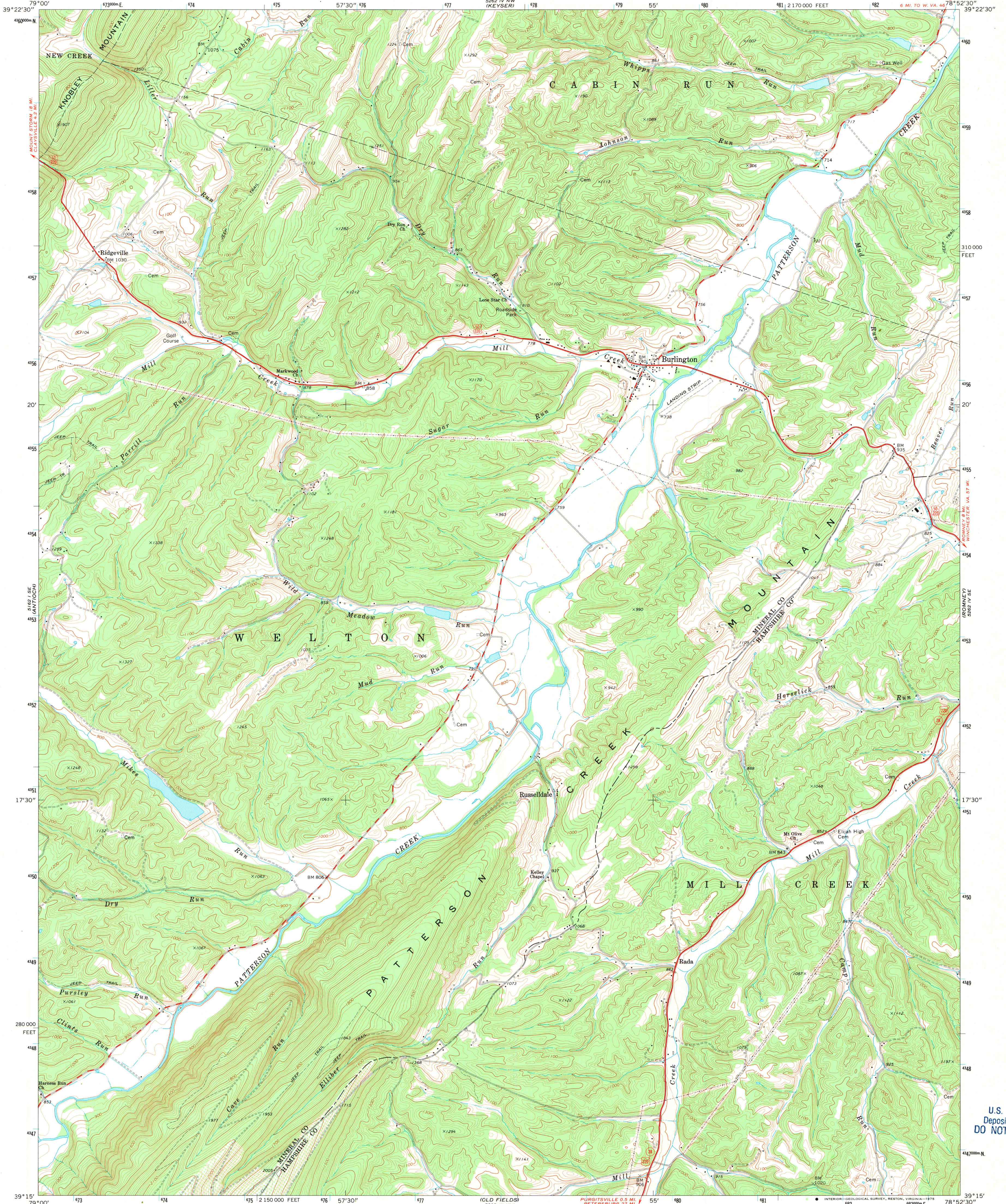
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|---|----------------------------|---|----------------------------|---|-----------------------|
|  | USGS Water Monitors (NWIS) |  | Water Dischargers (NPDES) |  | Search Result (point) |
|  | USGS Water Monitors (NWIS) |  | Hazardous Waste (RCRAInfo) | | |
|  | Water Dischargers (NPDES) |  | Hazardous Waste (RCRAInfo) | | |



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF WEST VIRGINIA
REPRESENTED BY THE
STATE OF WEST VIRGINIA GEOLOGICAL SURVEY
AND OTHER STATE AGENCIES

BURLINGTON QUADRANGLE
WEST VIRGINIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW 1/4 KEYSER 15' QUADRANGLE



Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1971. Field checked 1972

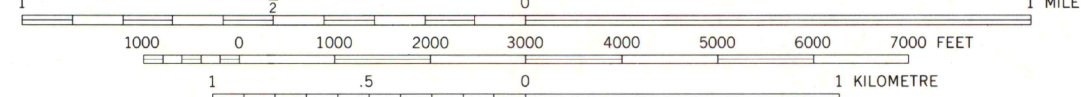
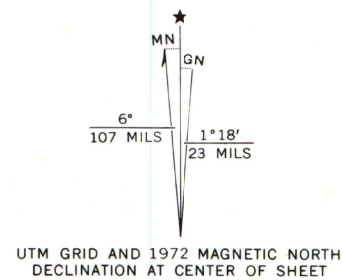
Projection and 10,000-foot grid ticks: West Virginia coordinate system, north zone (Lambert conformal conic)

1000-metre Universal Transverse Mercator grid ticks, zone 17, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Map photosinspected 1979

No major culture or drainage changes observed



CONTOUR INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY
DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION	
Primary highway, hard surface	Light-duty road, hard or improved surface
Secondary highway, hard surface	Unimproved road
Interstate Route	U. S. Route
	State Route

BURLINGTON, W. VA.

SW 1/4 KEYSER 15' QUADRANGLE

N3915—W7852.5/7.5

PHOTOINSPECTED 1979

AMS 5262 IV SW—SERIES V854

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A.H. ROBINSON
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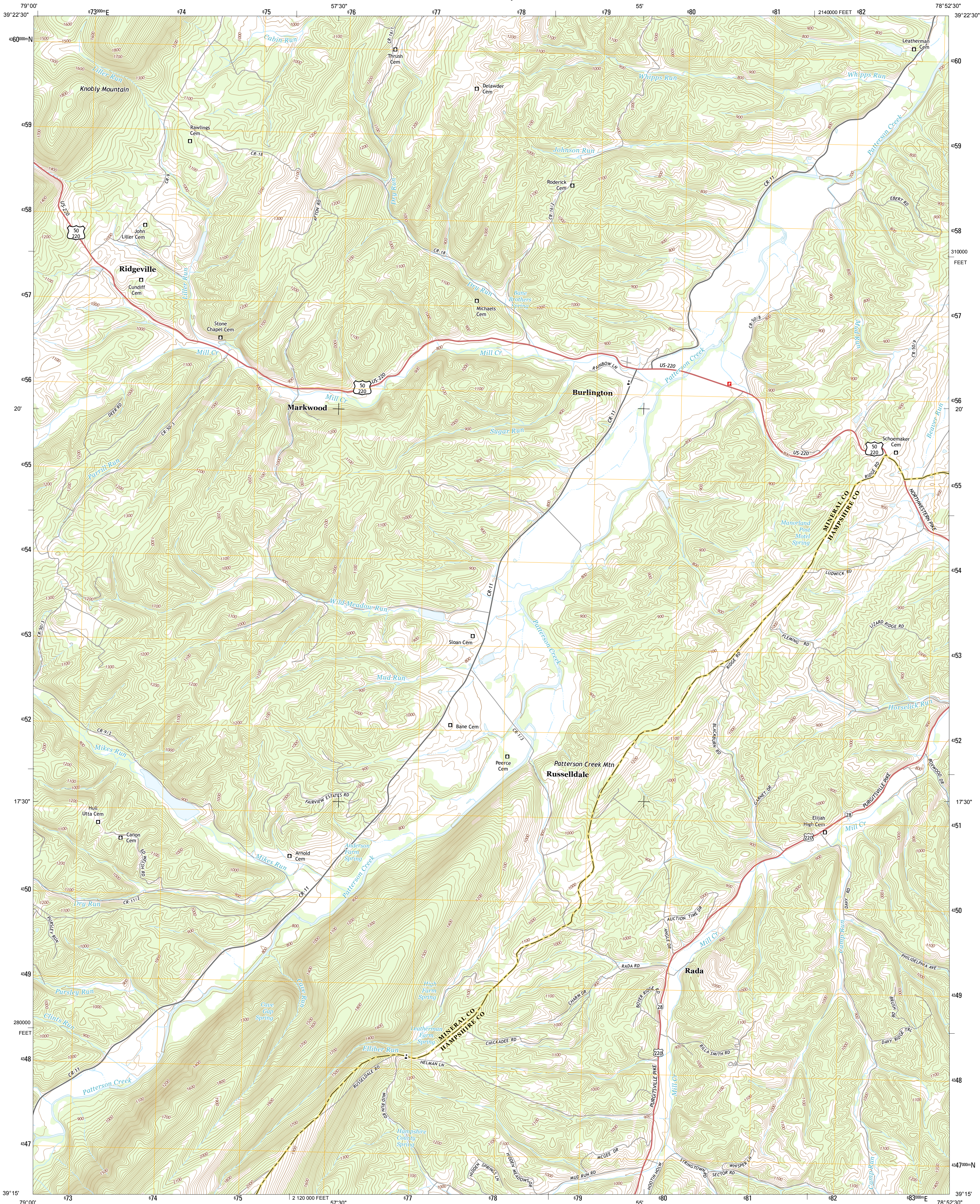
University of Wisconsin
Madison



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



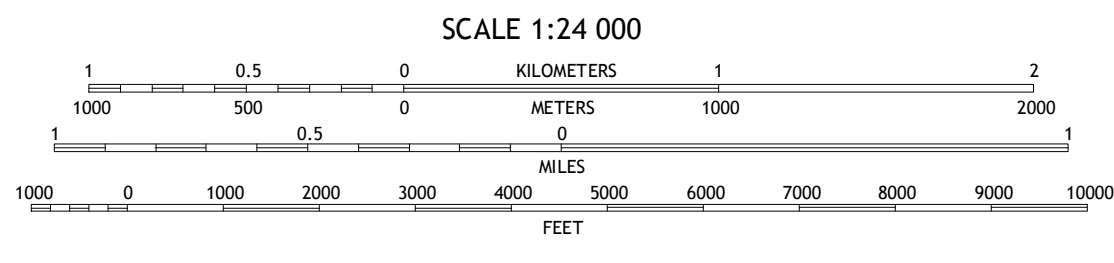
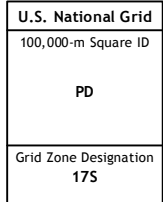
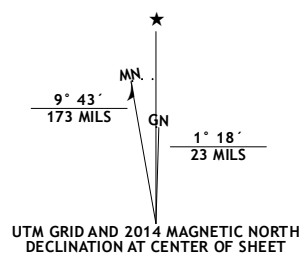
BURLINGTON QUADRANGLE
WEST VIRGINIA
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84) Projection and
1 000-meter grid; Universal Transverse Mercator, Zone 17S
10 000-foot ticks: West Virginia Coordinate System of 1983
(north zone)

This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NAIP, August 2011
Roads.....HERE, 2013
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2011
Contours.....National Elevation Dataset, 2006
Boundaries.....Multiple sources; see metadata file 1972 - 2013



CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16



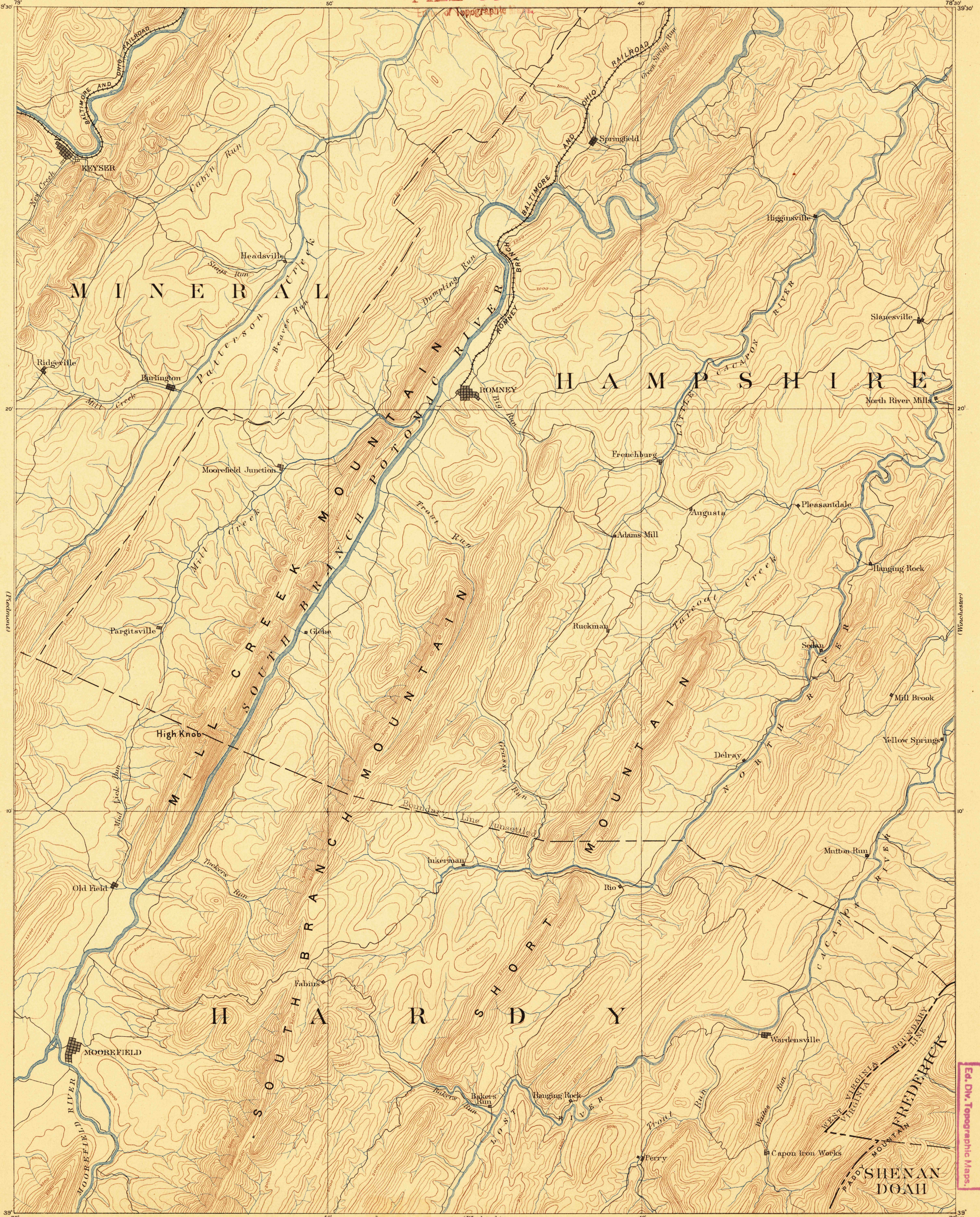
1	2	3
4	5	6
7	8	9

ADJOINING QUADRANGLES

ROAD CLASSIFICATION		
Expressway	Local Connector	
Secondary Hwy	Local Road	
Ramp	4WD	
Interstate Route	US Route	State Route

BURLINGTON, WV
2014





Henry Gannett, Chief Geographer.
Gilbert Thompson, Geographer in charge.
Triangulation and Topography by W.T. Griswold.
Surveyed in 1883-4-5.

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Contour Interval 100 feet

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581
Dec 30/97
Romney.