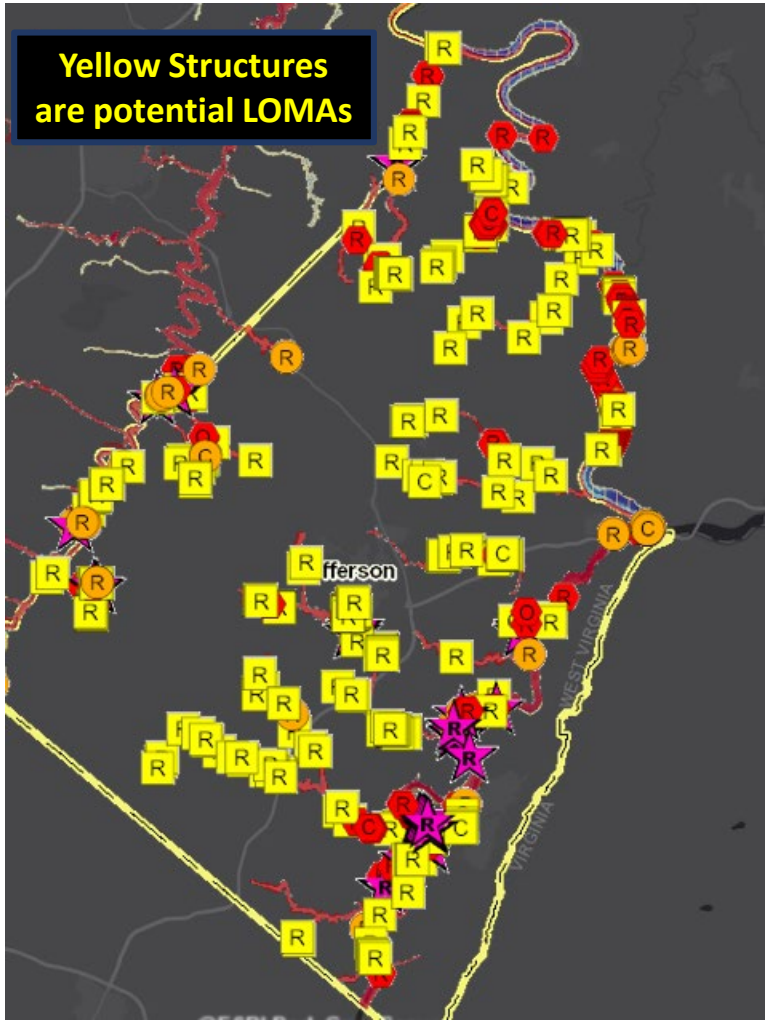
LiDAR for Map Amendments

11/29/2020



Jefferson County Flood Risk Study – Future SFHA Map Conditions for Buildings

LiDAR for Letter of Map Amendment (LOMA)

LiDAR data can replace the requirement to submit elevation information certified by a licensed land surveyor or professional engineer, which can create a cost savings for property owners.

The WV Flood Tool (www.mapwv.gov/flood) can be used for the map requirement of LOMAs for properties located in A or AE Flood Zones.

Countywide Flood Risk Studies identify potential structures that could be removed from the SFHA

LiDAR for Map Amendments

HOW DO I CHANGE MY FLOOD ZONE DESIGNATION?

Letters of Map Amendment (LOMAs) enable property owners to request changes or updates to their property's flood risk status to FEMA. Learn more about how to request a change to your flood zone designation at FEMA's website. Typically, this flood zone change request using the WV Flood Tool applies to property owners at the floodplain boundary fringe (not in the floodway) of high-risk AE or Approximate A Flood Zones, for **existing** buildings or lots not elevated on fill (natural grade), and where there is more than two feet difference between the Base Flood Elevation (BFE) and Lowest Adjacent Grade (LAG).

LiDAR FOR MAP AMENDMENTS

LiDAR data can replace the requirement to submit elevation information certified by a licensed land surveyor or professional engineer, which can create a cost savings for property owners. However, when the LAG is close to the BFE, LiDAR data may not be accurate enough and require certified elevations to capture the full risk of the building. The WV Flood Tool can be used to submit LOMAs where accurate LIDAR-derived elevation contours and point data are available. Generally, if there is **two feet** or more difference between the BFE and LAG, then the homeowner or community should investigate using the WV Flood Tool's Print LOMA Map function to generate a LOMA for submission to FEMA at **no charge**.

DOES MY COMMUNITY HAVE LIDAR?

Not all communities have LiDAR data available. Talk to your floodplain administrator to find out if your community has LiDAR data. To be used in a LOMA request, LiDAR data must meet or exceed the U.S. Geological Survey (USGS) Quality Level 3 accuracy requirement. To learn more about this requirement, view the WV LiDAR Quality Level Map and Elevation Source Metadata for the WV Flood Tool.

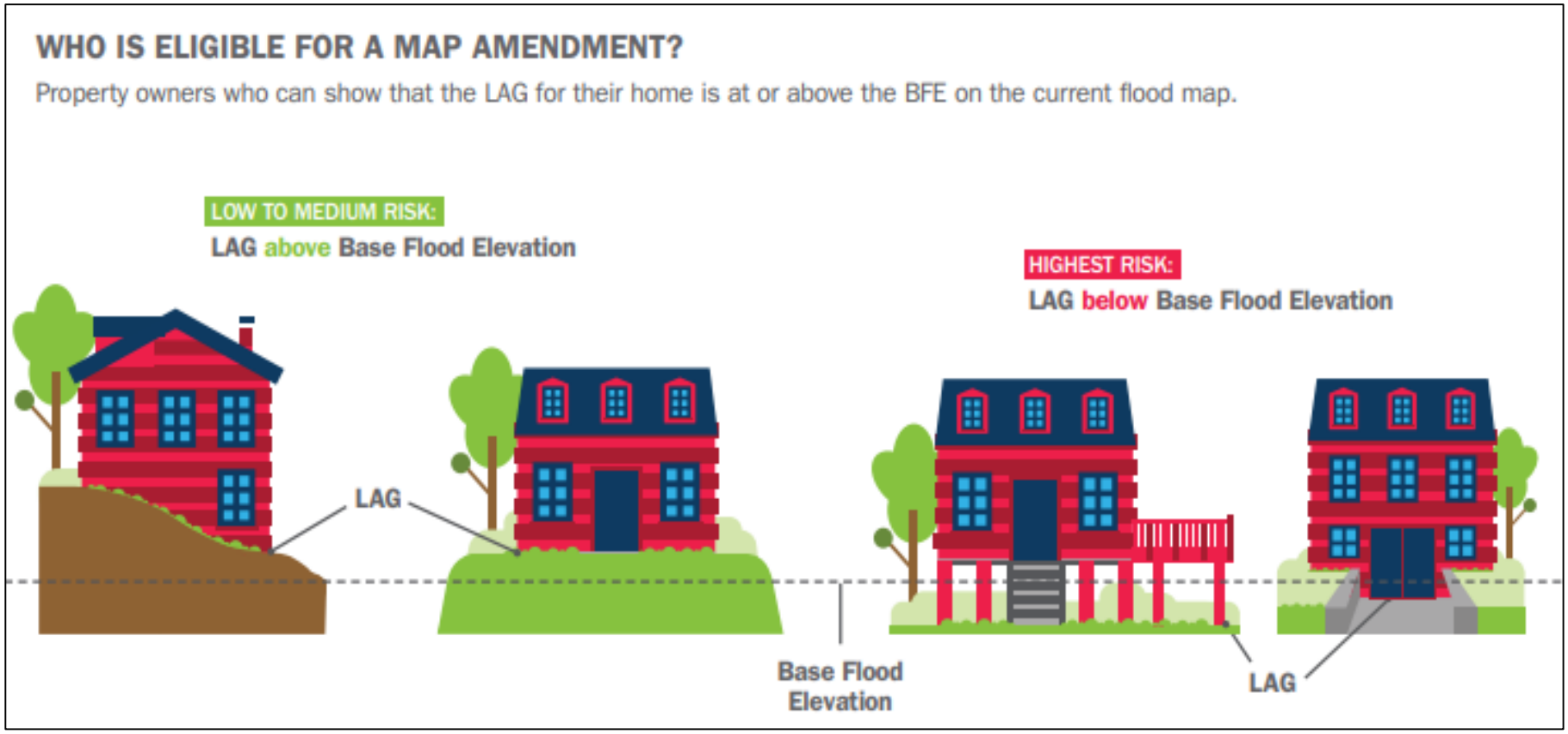
ONLINE LOMC

The Online LOMC web application allows homeowners or their designated representatives to easily request a Letter of Map Change (LOMC). Use this site if your property was inadvertently included in a flood zone, or if the addition of fill elevated your property so that it is above the flood zone. The Online LOMC tool is an alternative to the MT-1 and MT-2 paper forms and/or MT-EZ paper form. Anyone, including communities, home or property owners, their representatives, and professional surveyors and engineers, may submit a LiDAR LOMA request using the Online LOMC if the application meets the LOMA submission requirements listed in the next section.

LiDAR for Map Amendments

HOW DO I CHANGE MY FLOOD ZONE DESIGNATION?

Occasionally, a small area is inadvertently shown to be within the SFHA on a FIRM, even though the ground is at or above the BFE. If this occurs, an individual property owner may submit survey information to FEMA and request that FEMA issue a document that officially removes a property from the SFHA, called a Letter of Map Amendment (LOMA). Importantly, the LOMA enables property owners to request changes or updates to their property's flood risk status to FEMA. Learn more about how to request a change to your flood zone designation at FEMA's website.



Source: How to Request a Map Amendment (Nov. 2018)

When LiDAR Cannot Be Used

⛔ WHEN LIDAR CANNOT BE USED ⛔

There are situations when LiDAR cannot be used in a LOMA request. These include applications involving the following:

- Buildings or lots elevated using fill
- Buildings or lots in the regulatory floodway or Zone AO.
  - FEMA is only concerned that the subject of review is outside the floodway
  - The location of the closest lower contour can be within the floodway
- Buildings under construction. LiDAR would need to show that the lot or portion of the lot on which building will be located is above the Base Flood Elevation (BFE)
- Conditional determinations
- Electronic LOMAs (eLOMAs)
- Potential violations identified through the LOMA process
- Physical changes to the flooding source/Special Flood Hazard Area that require revisions to the Flood Insurance Rate Map
- Requests to supersede previously issued LOMAs based on certified elevation data

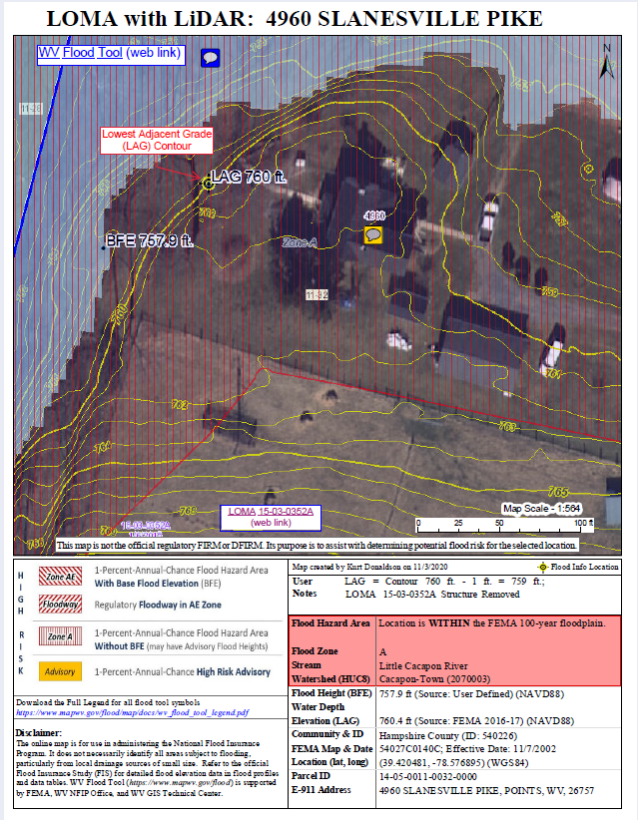
LiDAR LOMA Submission – 4 Steps

1) Determine if your community has QL2 or QL3 LiDAR

2) Print **LOMA Map** using **WV Flood Tool**

Supporting document for Online LOMC application

- Identify published building-level risk assessments for potential Mapped Out structures
- Determine LOMA Type: Existing Structure or Lot
- Determine BFE
- Determine LAG/LLE
- Add Annotation
- Print and Download LOMA Map
- Save to PDF File



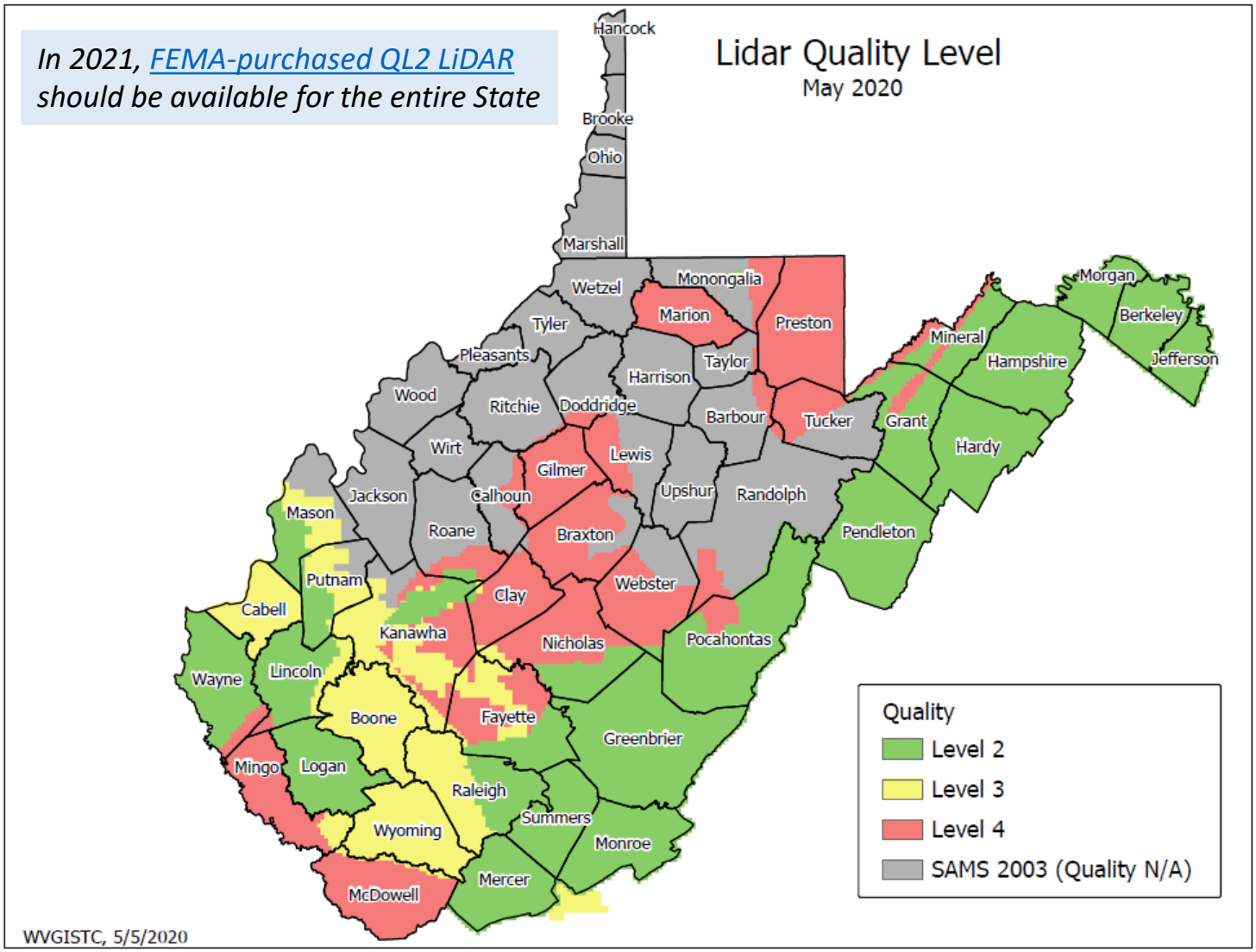
3) Further Edit/Annotate Print LOMA (optional)

4) Submit LiDAR LOMA Map Exhibit using FEMA's **Online LOMC** Portal (no fee charged)

Click here for more detailed instructions

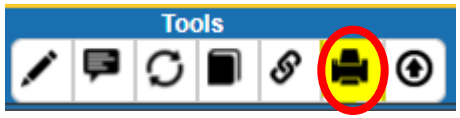
Step 1: Does My Community Have LiDAR?

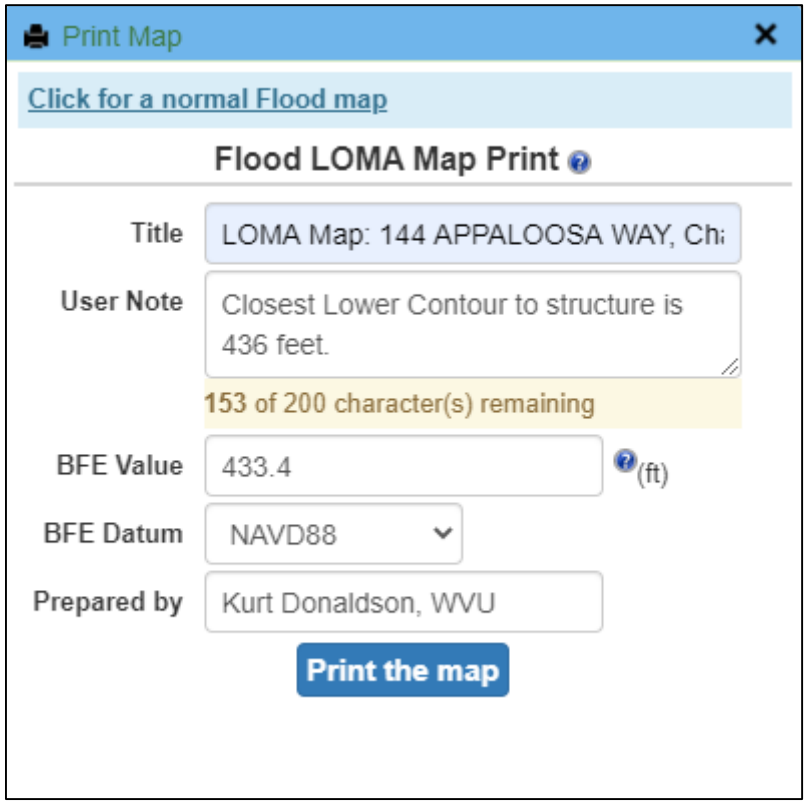
In 2021, FEMA-purchased QL2 LiDAR should be available for the entire State



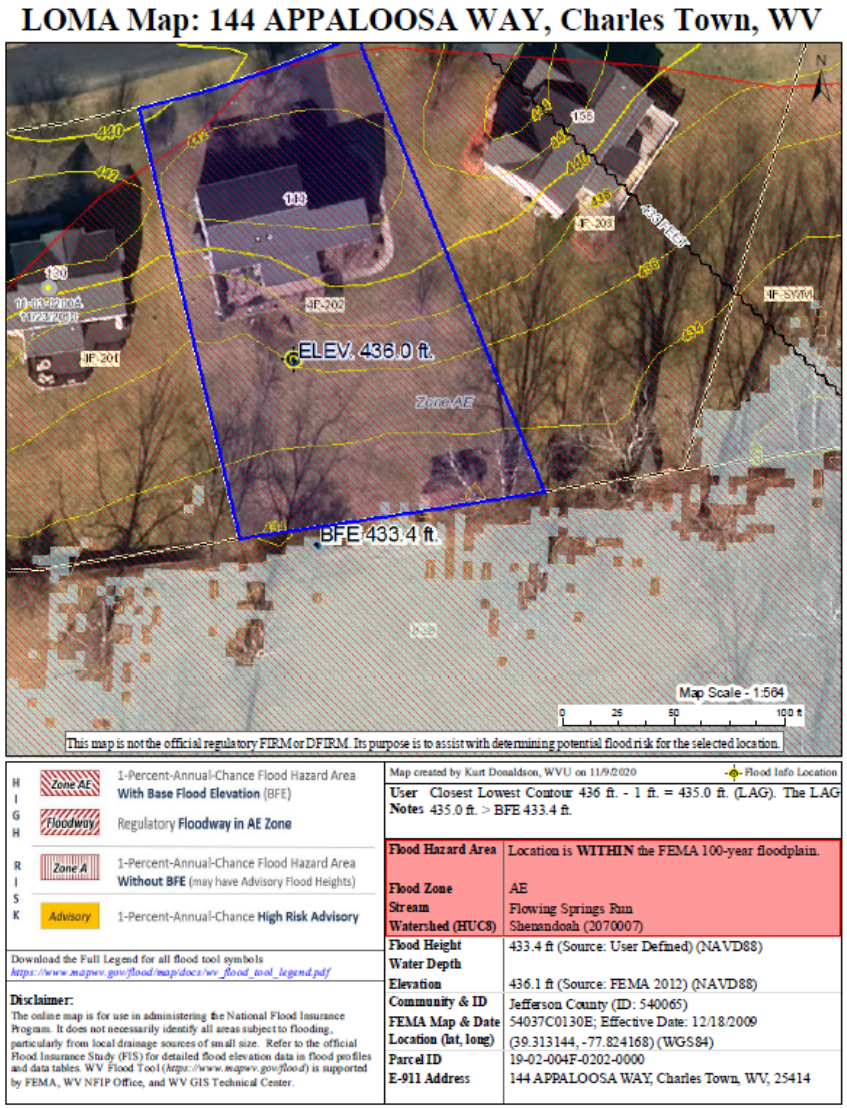
Presently not all communities have LiDAR data available. To be used in a LOMA request, LiDAR data must meet or exceed the U.S. Geological Survey (USGS) **Quality Level 3** accuracy requirement. To learn more about this requirement, view the elevation source metadata for the WV Flood Tool.

Step 2: Print LOMA Map with WV Flood Tool





Use the WV Flood Tool's **Print Tool** (**LOMA Option**) to generate LOMA Maps



What needs to be submitted on Map?

WHAT NEEDS TO BE SUBMITTED WITH MY APPLICATION?

When requesting a LOMA using LiDAR data, you must submit a paper map or digital PDF that displays:

(1) an overlay of the LiDAR contours (lines of equal elevation), or

(2) an overlay of the LiDAR points (points with specific elevations).

Either overlay must include an aerial image of the building or lot with at least one street intersection shown on the map.

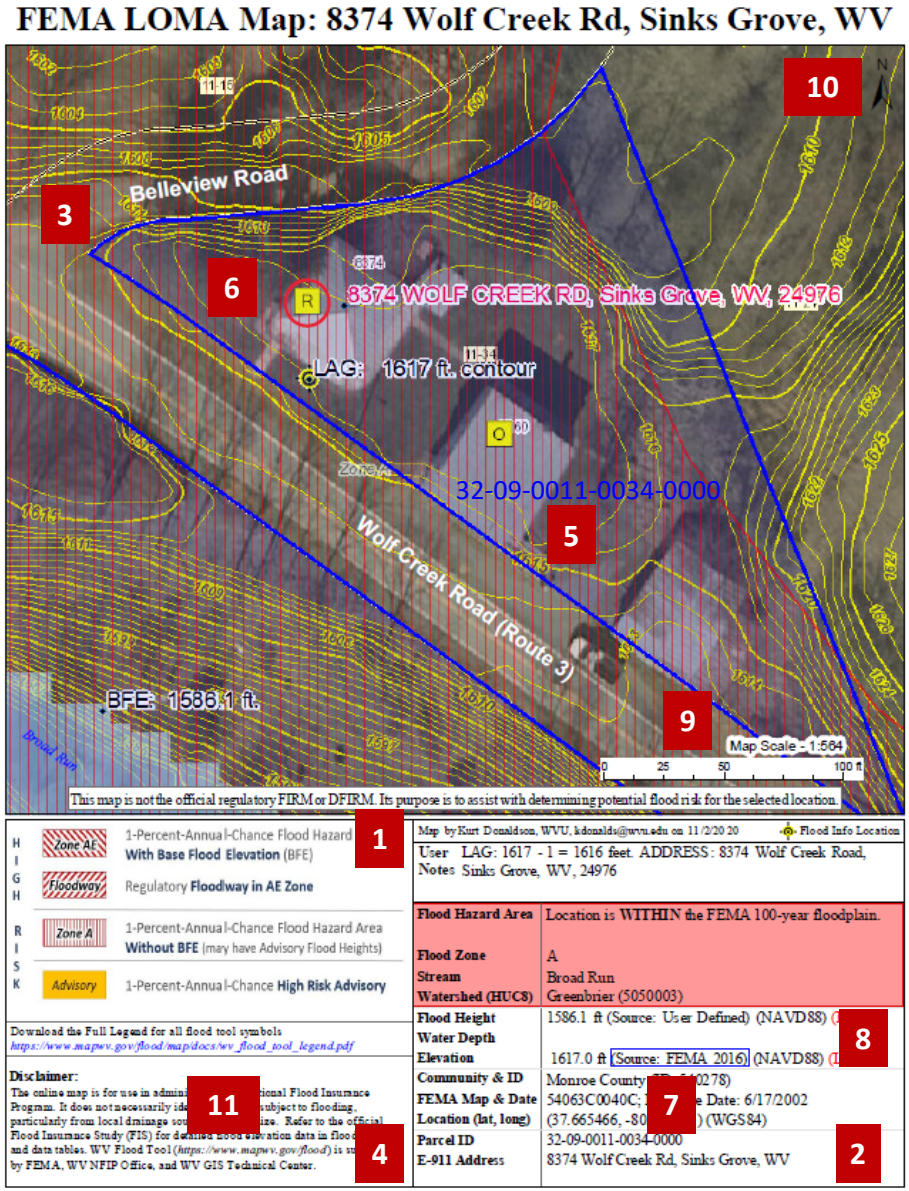
The map must also have:

- Scale and North arrow
- Address or Assessor's Parcel Number (APN) for the building/lot
- Clearly identified building and/or lot boundaries
- Name, organization, and contact information for the map overlay creator
- Aerial imagery that correctly represents the footprint of the building
- Date the LiDAR was collected
- Source of the LiDAR, including public website address. LiDAR must be provided by a Federal, State, or local government agency.
- LiDAR accuracy information (Does it meet Quality Level 3 standards?)
- Vertical Datum of elevation data (e.g., NAVD 88)
- Location of the data archive or metadata file (must be available for independent verification through a publicly available website or metadata)

Your floodplain administrator or a mapping professional can help you develop the map for your application. For other requirements, please use the How to Request a Map Amendment Guide.

Source: FEMA Region V Fact Sheet
https://greatlakescoast.org/pubs/factSheets/Region_V_LiDAR_LOMA_FS_v3_012219_FINAL.pdf

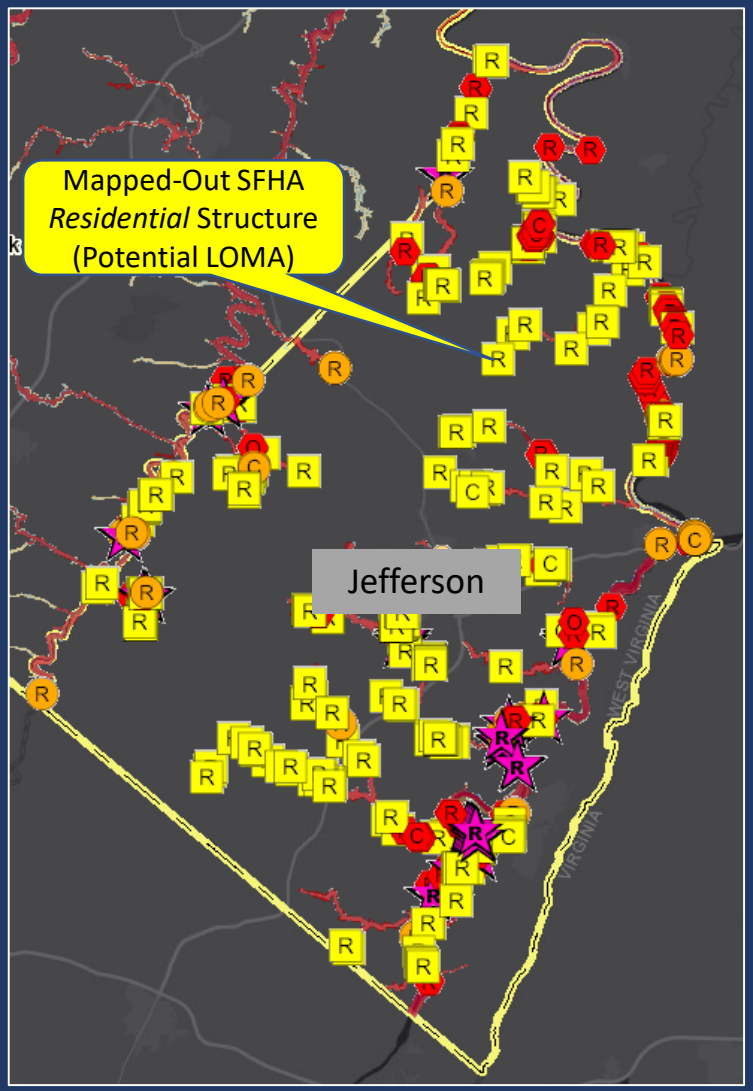
What needs to be submitted?

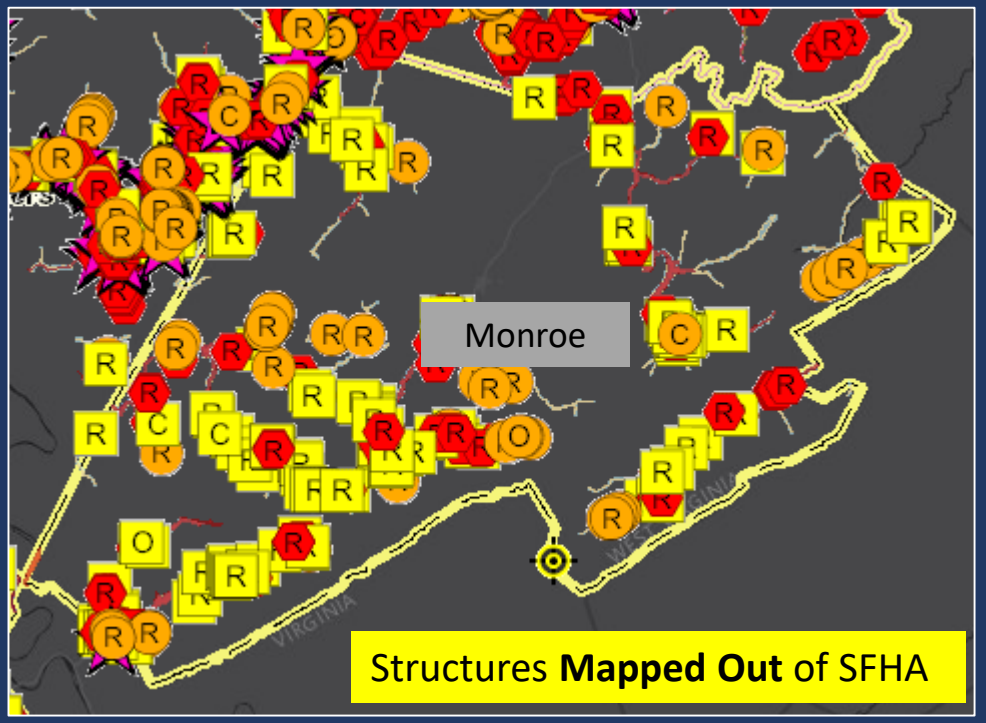


#	Map Elements Required
1	Name, organization, and contact information for the map creator
2	E-911 Address of property
3	Road or street intersection reference
4	Assessor's full Parcel ID Number (APN) for the building/lot
5	Clearly identified building and/or lot boundaries
6	Aerial imagery that shows building footprint
7	Date, Source, and Accuracy of the LiDAR collected (must meet Quality Level 3 standards)
8	Vertical Datum of elevation data (e.g., NAVD 88, NGVD 29)
9	Scale Bar
10	North Arrow
11	WV Flood Tool Location web link

More than one map can be made to present all elements

Identify LOMA Structures (Risk MAP View)





Search on Building Risk "Mapped Out" SFHA structures (yellow square symbol) in **Risk MAP View** for potential LOMAs. It is estimated that Jefferson County, for example, has 250 structures that could be considered for LOMA Removal Status from the Special Flood Hazard Area (SFHA).

R **R**esidential C **C**ommercial O **O**ther

Jefferson County – Potential LOMAs

(1) Future Map Conditions: Floodway (32), No Change SFHA (339), Mapped In SFHA (85), Mapped Out SFHA (279)

Flood Zones	Jefferson County Uninc.	Town Of Bolivar	City Of Charles Town	Town Of Harpers Ferry	City Of Ranson	Town Of Shepherdstown	County Total
• Regulatory Floodway	**32**	**0**	**0**	**0**	**0**	**0**	**32**
• No Change SFHA	**220**	**0**	**12**	**1**	**45**	**61**	**339**
• Structures **Mapped In** SFHA (potential high flood risk structure)	**45**	**3**	**4**	**30**	**2**	**1**	**85**
o Preliminary NFHL	0	0	0	0	0	0	0
o Advisory A	21	3	0	30	0	1	55
o Updated AE	24	0	4	0	2	0	30
• Structures **Mapped Out** SFHA (structure may qualify for LOMA) - 43% of regulatory structures may qualify for LOMA	**233**	**0**	**10**	**0**	**32**	**4**	**279**
o Advisory A	175	0	2	0	30	0	207
o Updated AE	58	0	8	0	2	4	72

Higher Risk

Lower Risk

Advisory flood zone mapping indicates about 40% of Structures may quality for LOMAs

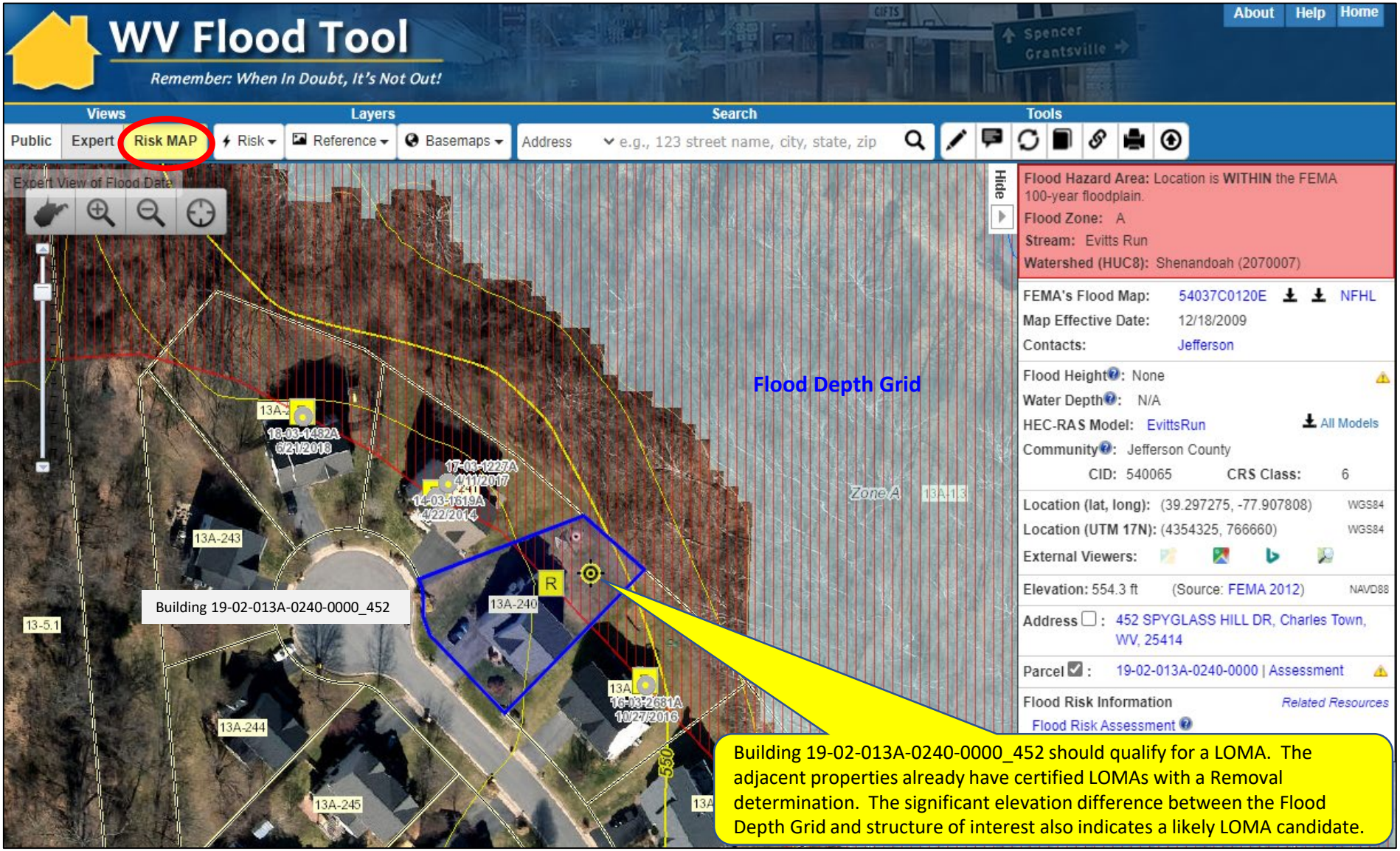
(2) Building Counts (bSF)

Flood Zones	Building Counts
Buildings in High-Risk Effective Zones - SFHA (bSF)	**650**
Buildings in High-Risk Advisory Zones (Mapped in SFHA)	85
Total Buildings in High-Risk Zones (Effective and Advisory)	**735**

(3) LOMAs Positional Accuracy Verified

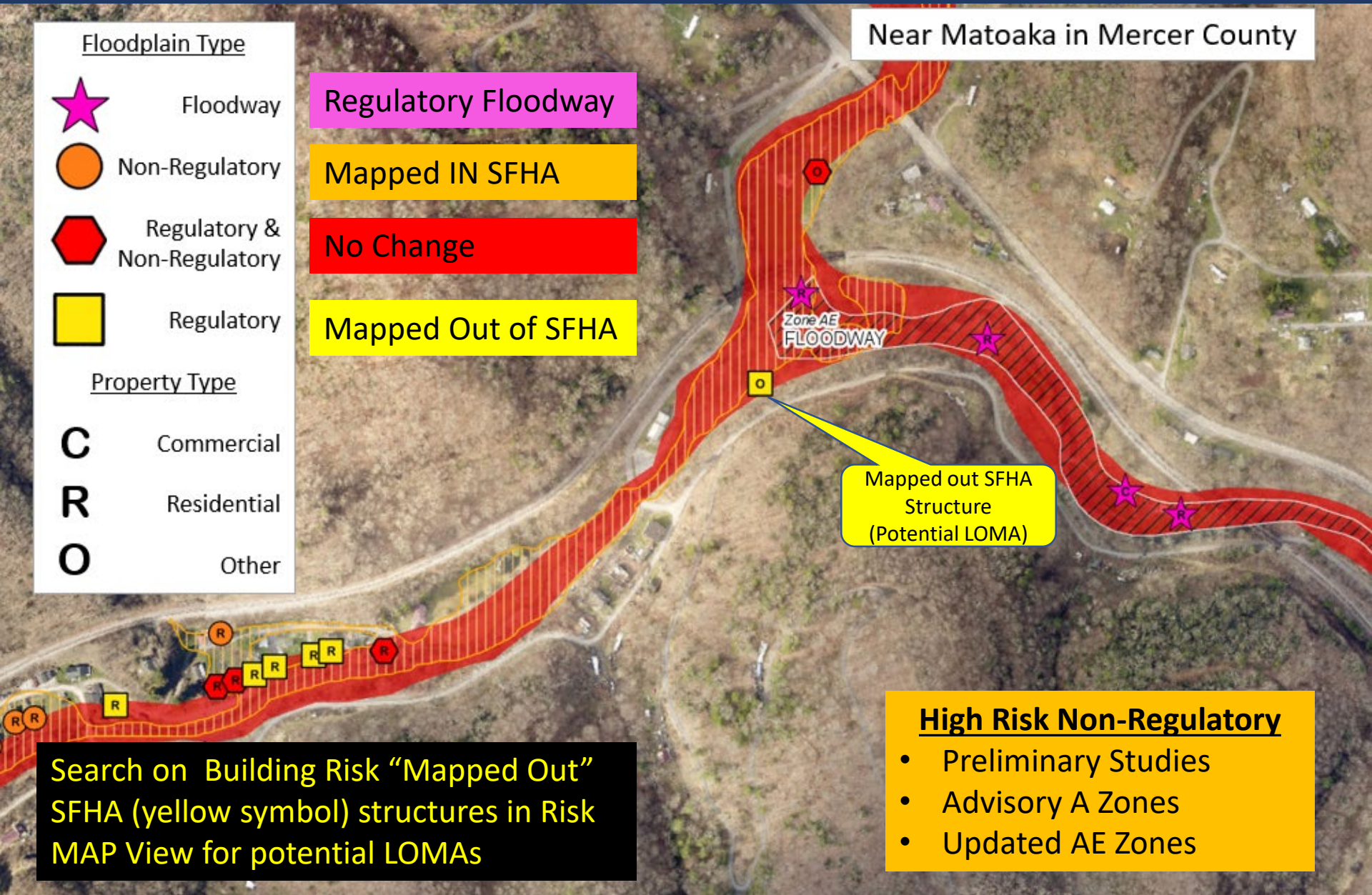
LOMA Determination	Count	Positional Accuracy Correct	**Positional Accuracy FIXED** (State Flood Risk Assessment)
Non-Removal	9	2	7
Removal	85	53	32
Out as Shown	13	4	9
Total	**107**	59	48
		55%	45%

Identify Potential LOMAs (Risk MAP View)

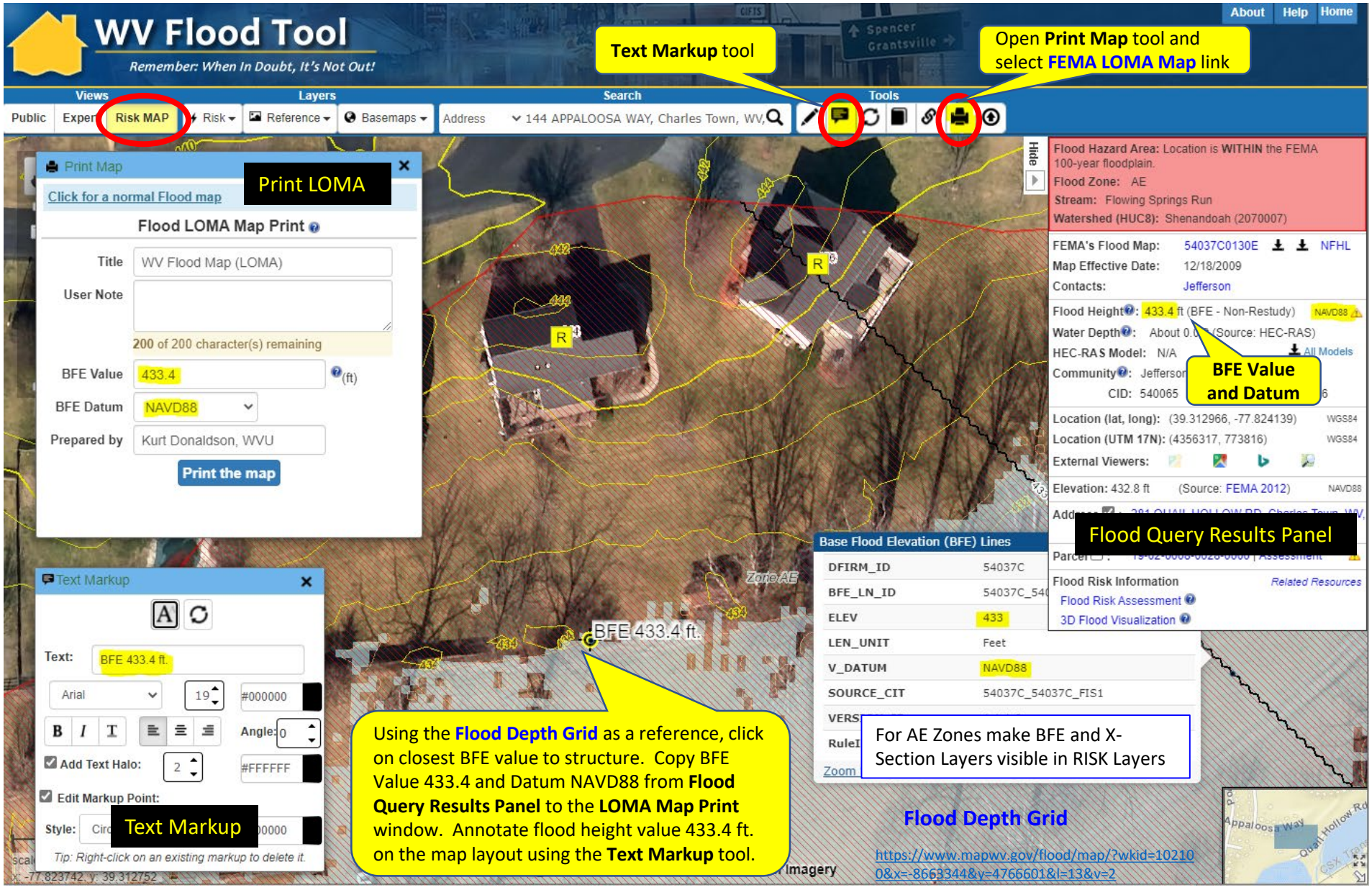


https://www.mapwv.gov/flood/map/?wkid=102100&x=-8672657&y=4764344&l=12&v=2

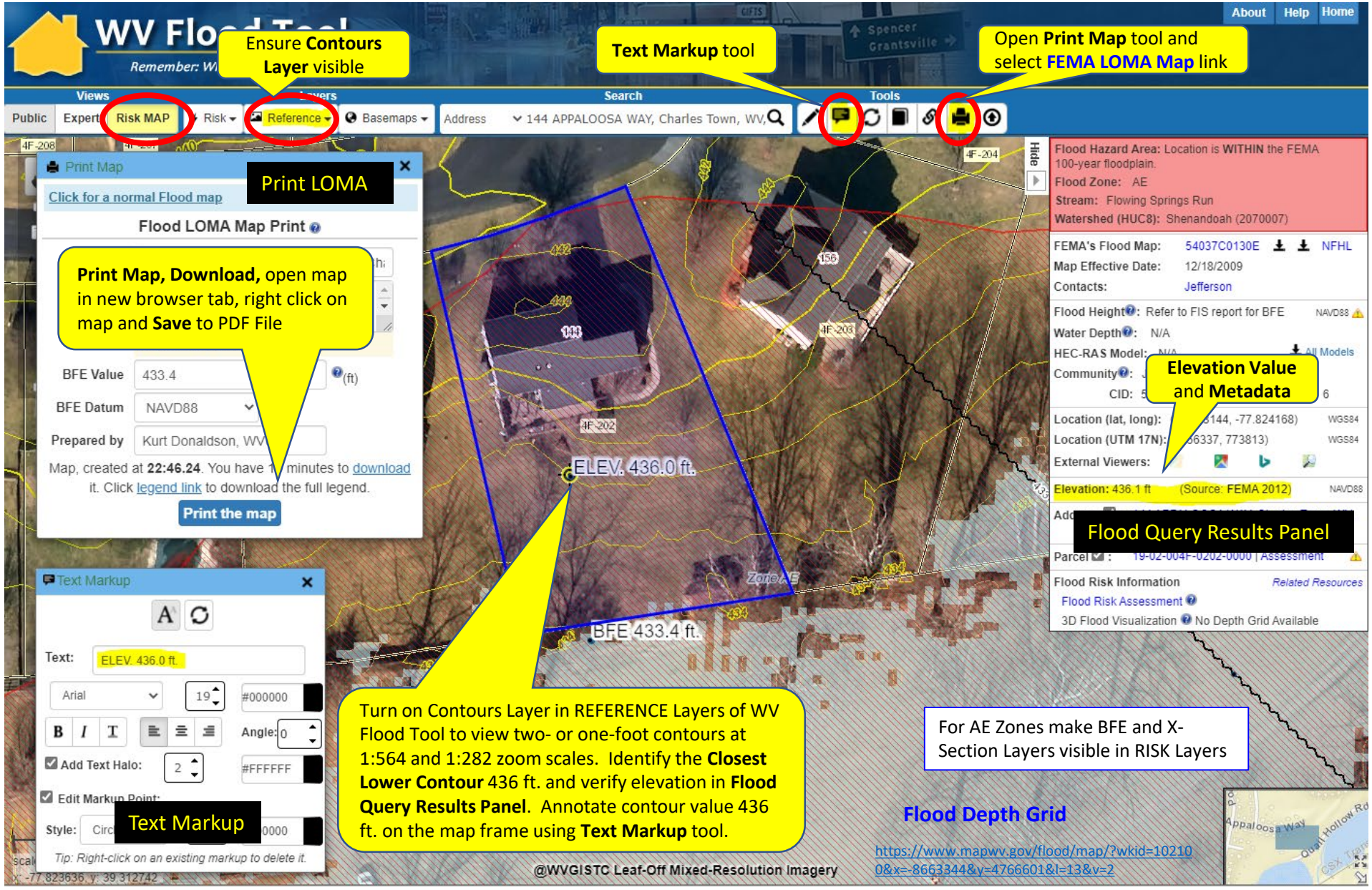
Future Map Conditions (Potential LOMAs) C R O



LOMA Map – Identify BFE

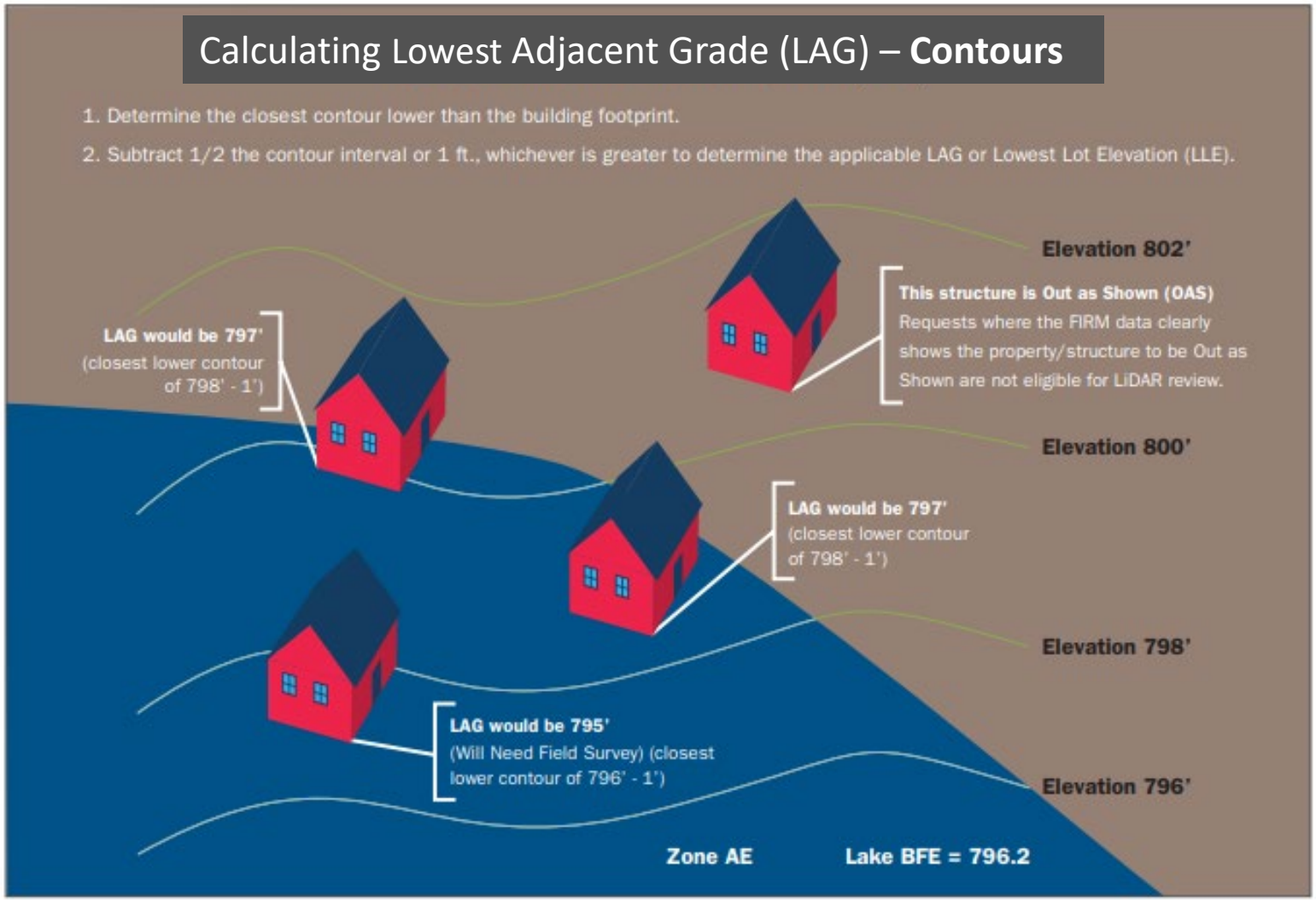


LOMA Map – Identify LAG



LiDAR Contour Method

Using LiDAR Contours: For LOMA submittals that include LiDAR data contours, FEMA will subtract half the contour interval or 1 foot, whichever is greater, from the lowest contour closest to (but not going through) the building (to determine the LAG) or the lot (to determine the LLE).



Calculating Elevations Using LiDAR

CALCULATING ELEVATIONS USING LIDAR

The lowest adjacent grade (LAG) for a building, or the lowest lot elevation (LLE) for a lot, will be compared to the Base Flood Elevation (BFE) to determine the flood zone. If LAG/LLE is at or above the BFE on the current flood map, FEMA can issue a removal determination. For buildings or lots that cannot be removed from the high-risk flood zone using LiDAR, certified elevation data will be required for a standard LOMA determination.

Using LiDAR Contours

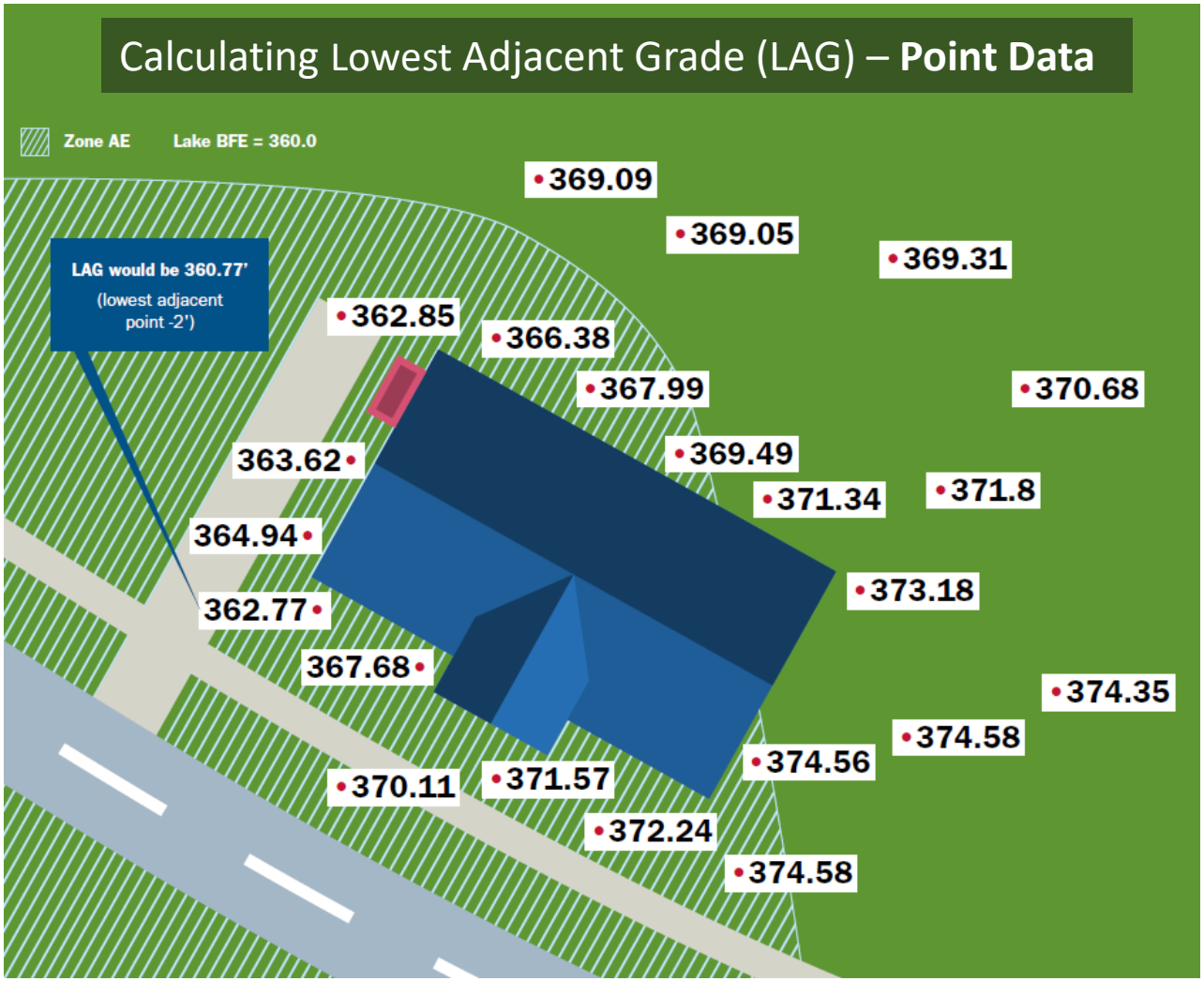
For LOMA submittals that include LiDAR data contours, FEMA will subtract half the contour interval or 1 foot, whichever is greater, from the lowest contour closest to (but not going through) the building (to determine the LAG) or the lot (to determine the LLE).

Using LiDAR Point Data

For submittals that include LiDAR point data, FEMA will subtract 2 feet from the lowest point closest to the building (to determine the LAG) or the lowest point on the lot (to determine the LLE). Multiple points must cover the building/lot for this method.

LiDAR Point Data Method

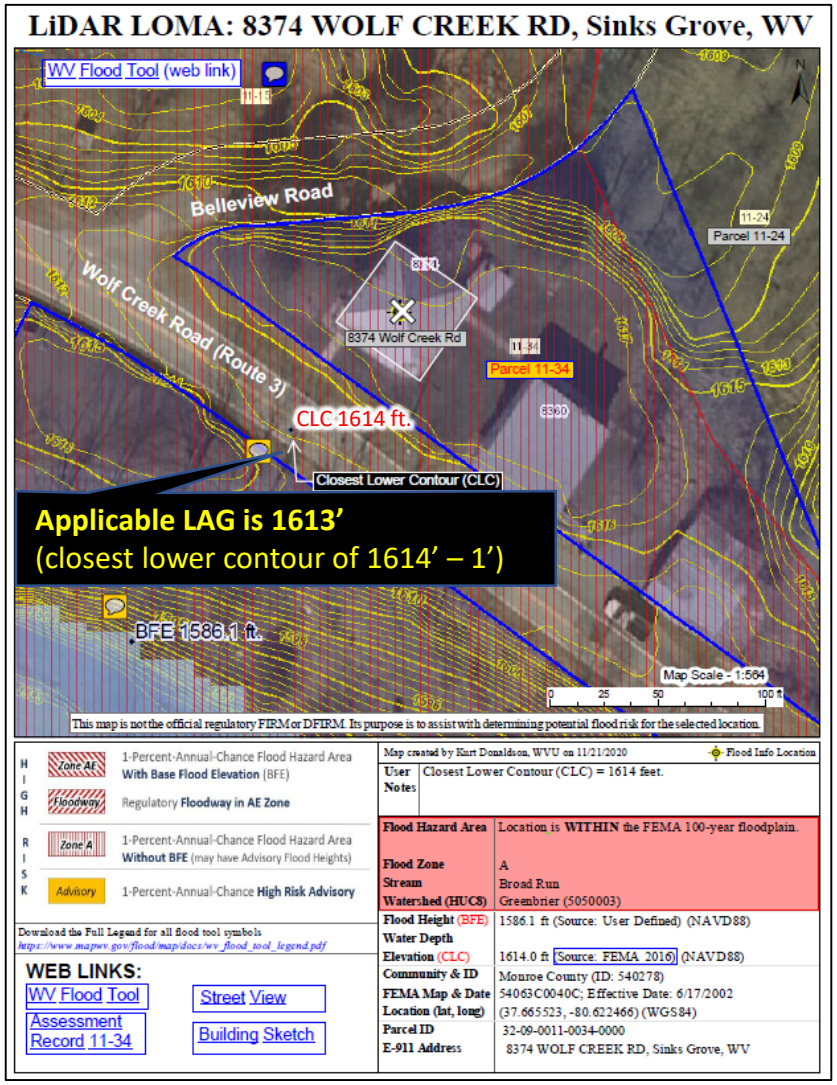
Using Point Data Method: For submittals that include LiDAR point data, FEMA will subtract 2 feet from the lowest point closest to the building (to determine the LAG) or the lowest point on the lot (to determine the LLE). Multiple points must cover the building/lot for this method.



WV Flood Tool (LAG Methods)

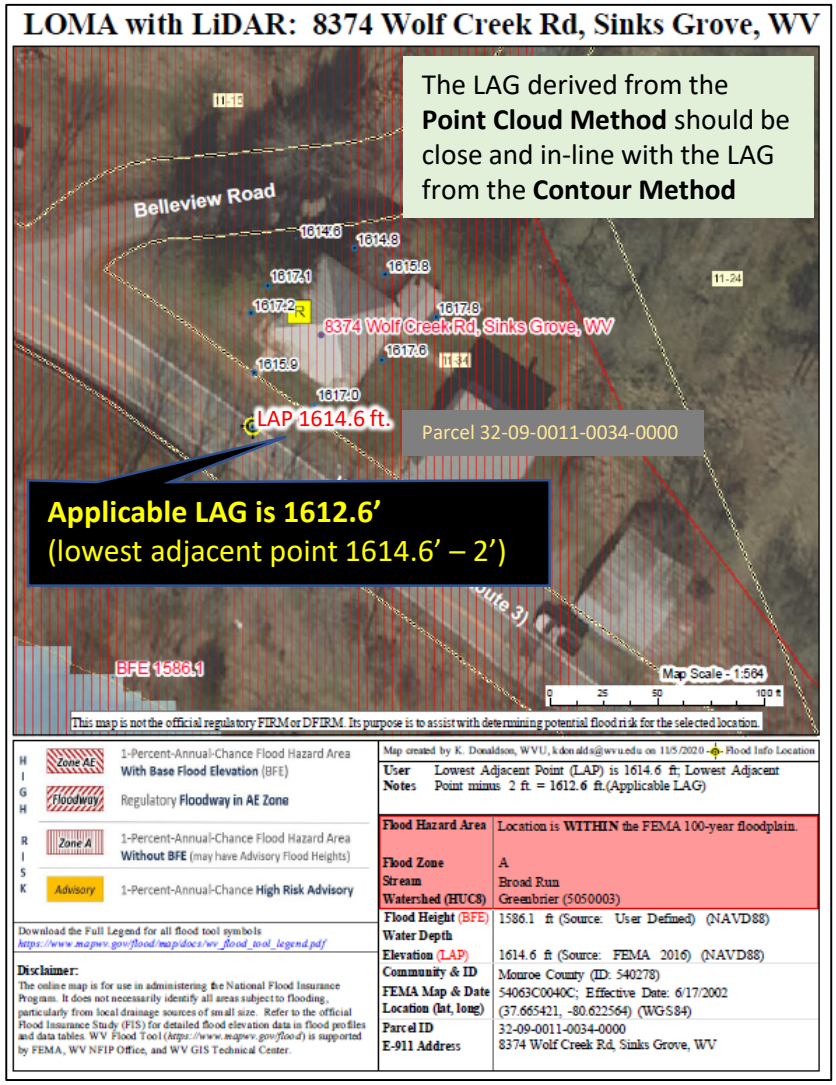
Contours

(Elevation Contours Reference Layer)



Point Data

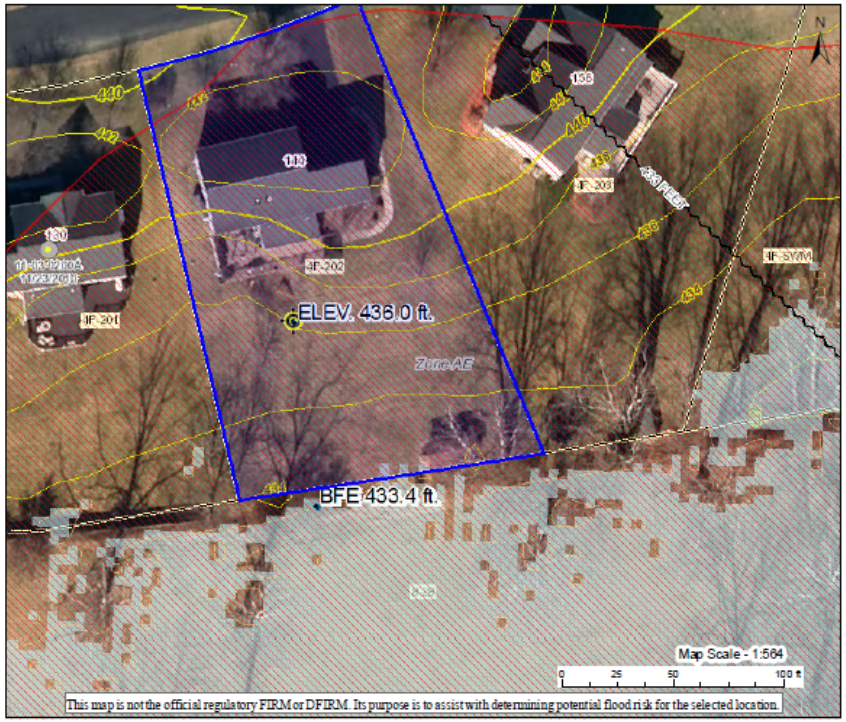
(Flood Query Results Panel)



Step 3: LOMA Map – More Annotation

PDF LOMA Exhibit

LOMA Map: 144 APPALOOSA WAY, Charles Town, WV



Zone AE	1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
Floodway	Regulatory **Floodway** in AE Zone
Zone A	1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
Advisory	1-Percent-Annual-Chance **High Risk Advisory**

Download the Full Legend for all flood tool symbols
https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf

Disclaimer:
The online map is for use in administering the National Flood Insurance Programs. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (*https://www.mapwv.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.

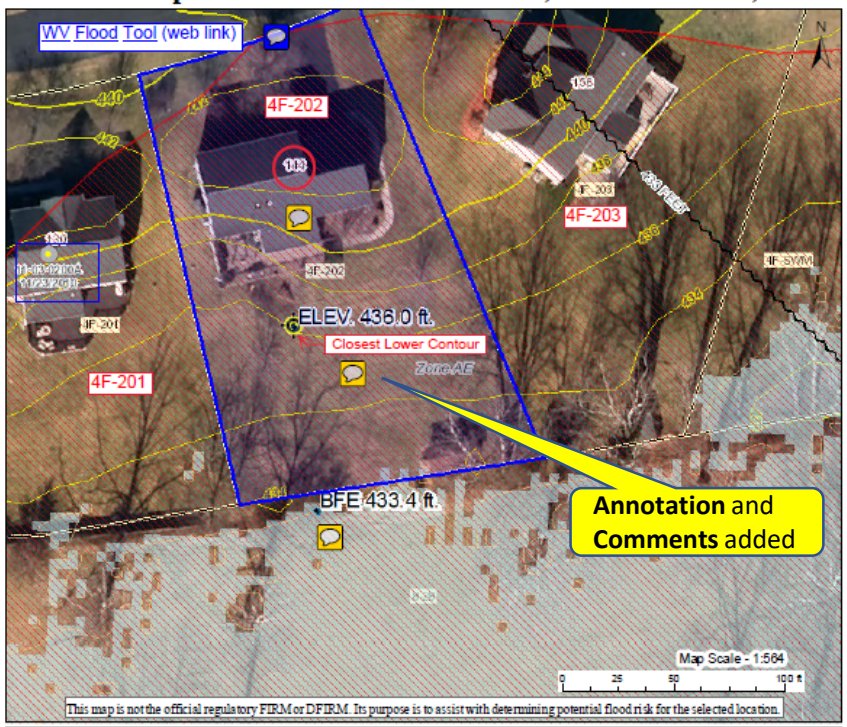
Map created by Kurt Donaldson, WVU on 11/9/2020 — Flood Info Location

User Notes Closest Lowest Contour 436 ft. - 1 ft. = 435.0 ft. (LAG). The LAG 435.0 ft. > BFE 433.4 ft.

Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	AE
Stream	Flowing Springs Run
Watershed (HUC8)	Shenandoah (2070007)
Flood Height	433.4 ft (Source: User Defined) (NAVD88)
Water Depth	
Elevation	436.1 ft (Source: FEMA 2012) (NAVD88)
Community & ID	Jefferson County (ID: 540065)
FEMA Map & Date	54037C0130E; Effective Date: 12/18/2009
Location (lat, long)	(39.313144, -77.824168) (WGS84)
Parcel ID	19-02-004F-0202-0000
E-911 Address	144 APPALOOSA WAY, Charles Town, WV, 25414

More Comments and Web Links added with Adobe Acrobat Software

LOMA Map: 144 APPALOOSA WAY, Charles Town, WV



Zone AE	1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
Floodway	Regulatory **Floodway** in AE Zone
Zone A	1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
Advisory	1-Percent-Annual-Chance **High Risk Advisory**

External **Web** links

WEB LINKS:

WV Flood Tool | LiDAR Metadata | Assessment Record 4F-202 | Building Sketch

Map created by Kurt Donaldson, WVU on 11/9/2020 — Flood Info Location

User Notes Closest Lowest Contour 436 ft. - 1 ft. = 435.0 ft. (LAG). The LAG 435.0 ft. > BFE 433.4 ft.

Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	AE
Stream	Flowing Springs Run
Watershed (HUC8)	Shenandoah (2070007)
Flood Height	433.4 ft (Source: User Defined) (NAVD88)
Water Depth	
Elevation	436.1 ft (Source: FEMA 2012) (NAVD88)
Community & ID	Jefferson County (ID: 540065)
FEMA Map & Date	54037C0130E; Effective Date: 12/18/2009
Location (lat, long)	(39.313144, -77.824168) (WGS84)
Parcel ID	19-02-004F-0202-0000
E-911 Address	144 APPALOOSA WAY, Charles Town, WV, 25414

Step 3: Edit / Annotate LOMA Print Map

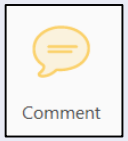
Use Adobe Acrobat Software to Edit Text, Add Comments and Web Links to Map Layout

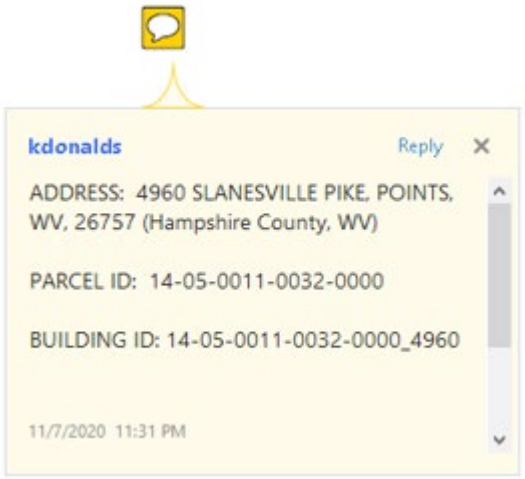
Edit PDF

- Edit
- Add Text
- Link

Comment (annotation)

- Add Sticky Note
- Add Text
- Drawing Tools
- Import Annotation



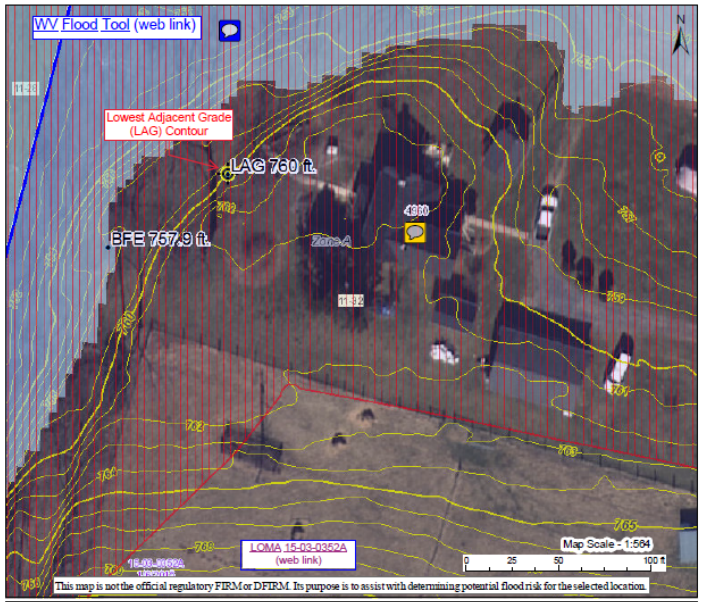


Lowest Adjacent Grade (LAG) Contour

LOMA 15-03-0352A (web link)

WV Flood Tool (web link)

LOMA with LiDAR: 4960 SLANESVILLE PIKE



Map created by Kurt Donaldson on 11/3/2020	Flood Info Location
User	LAG = Contour 760 ft. - 1 ft. = 759 ft.;
Notes	LOMA 15-03-0352A Structure Removed
Flood Hazard Area	Location is WITHIN the FEMA 100-year floodplain.
Flood Zone	A
Stream	Little Cacapon River
Watershed (HUC8)	Cacapon-Town (2070003)
Flood Height (BFE)	757.9 ft (Source: User Defined) (NAVD88)
Water Depth	
Elevation (LAG)	760.4 ft (Source: FEMA 2016-17) (NAVD88)
Community & ID	Hampshire County (ID: 540226)
FEMA Map & Date	54027C0140C; Effective Date: 11/7/2002
Location (lat, long)	(39.420481, -78.576895) (WGS84)
Parcel ID	14-05-0011-0032-0000
E-911 Address	4960 SLANESVILLE PIKE, POINTS, WV, 26757

HIGH RISK

Zone AE — 1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)

Floodway — Regulatory **Floodway in AE Zone**

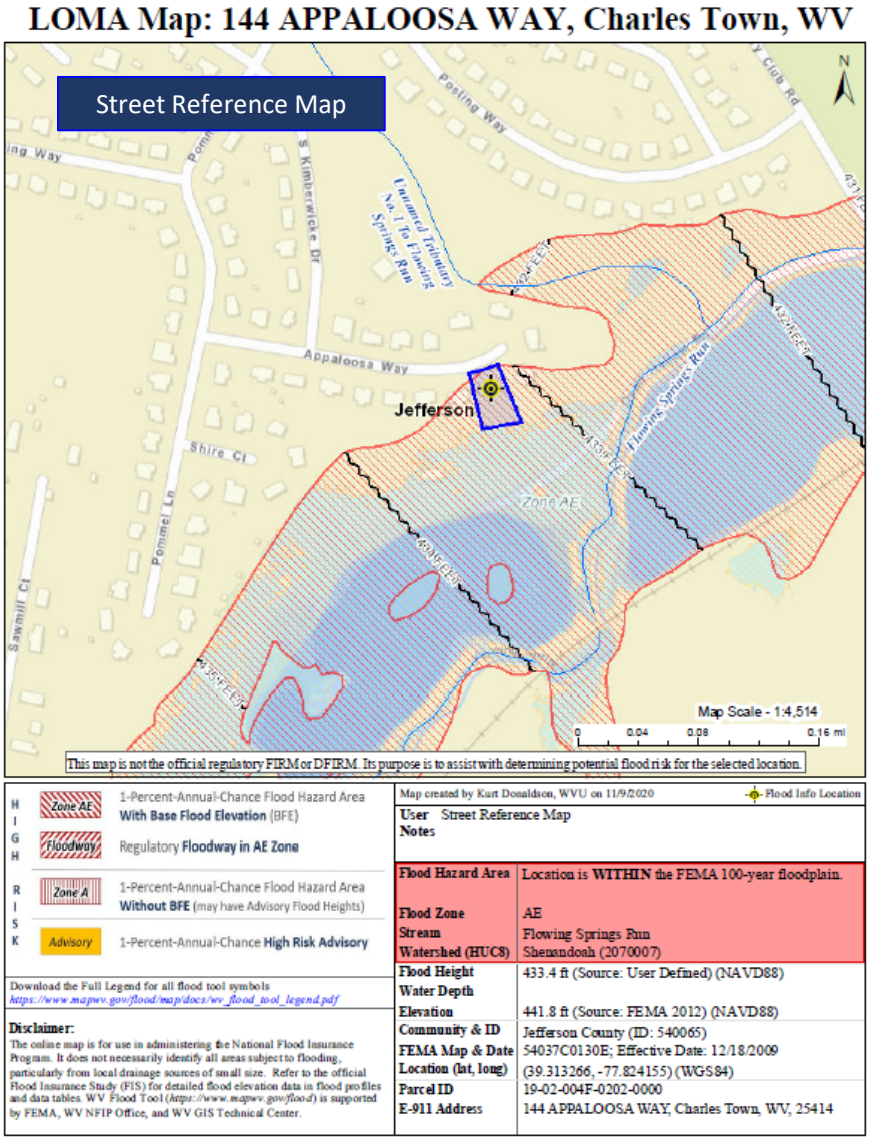
Zone A — 1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)

Advisory — 1-Percent-Annual-Chance **High Risk Advisory**

Download the Full Legend for all flood tool symbols
https://www.mapwv.gov/flood/mapdocs/wv_flood_tool_legend.pdf

Disclaimer:
The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (*https://www.mapwv.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.

LOMA Map – Location Reference



Zoom out and switch to street base map layer to show a street intersection. Generate and save a **Street Reference Map** to upload as supporting document for LOMA application

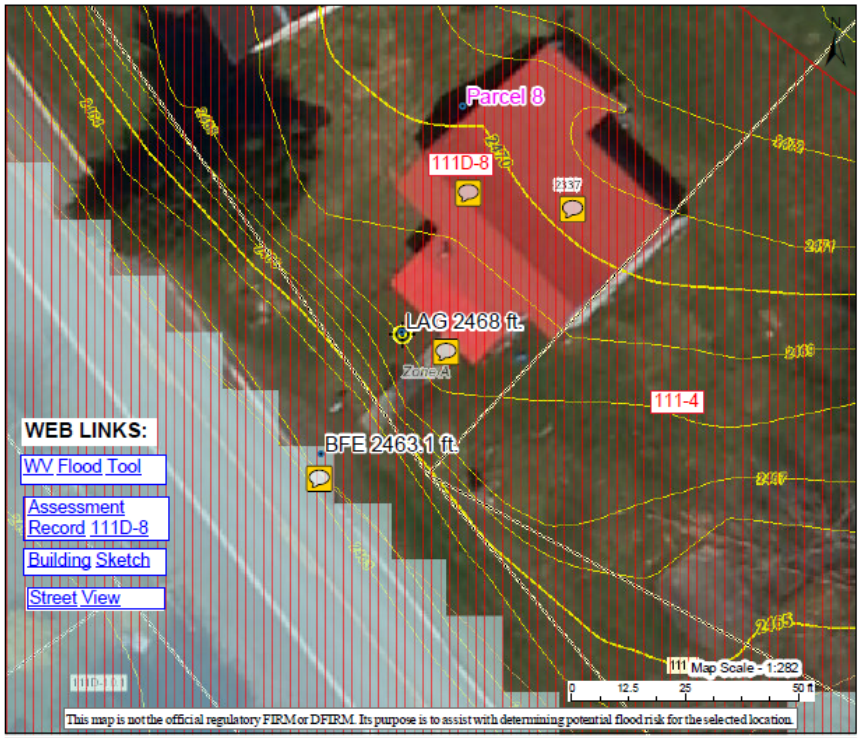
Step 4: Submit using Online LOMC Portal

1) Flood Determination Details (Single Structure, Single Lot, Multiple Structures, Multiple Lots; a survey is required for portions of lots)
2) Community Details
3) E-911 Street Address & Legal Description of Property
4) Fill Information (Choose *No*)
5) LOMC Type (Choose *LOMA*)
6) Processing Fee (Choose *No Fee Required*)
7) Applicant Name, Mailing Address, Contact Information
8) Upload Supporting Documents
    - **Copy of the Property Deed** (with recordation data & stamp of the Recorder's Office) OR a Copy of the **Subdivision Plat Map** for property (with recordation data and stamp of the Recorder's Office) as separate files.
    - Tax Assessor's Map or suitable map document (WV Flood Tool should suffice)
    - Additional Supporting Data (WV Flood Tool PDF maps)
        - **Print LOMA Map with BFE and LAG**
        - **Street Reference Map for property location**

https://hazards.fema.gov/femaportal/onlinelomc/signin

WV LOMA Examples

FEMA Floodplain LOMA Map



HIGH RISK

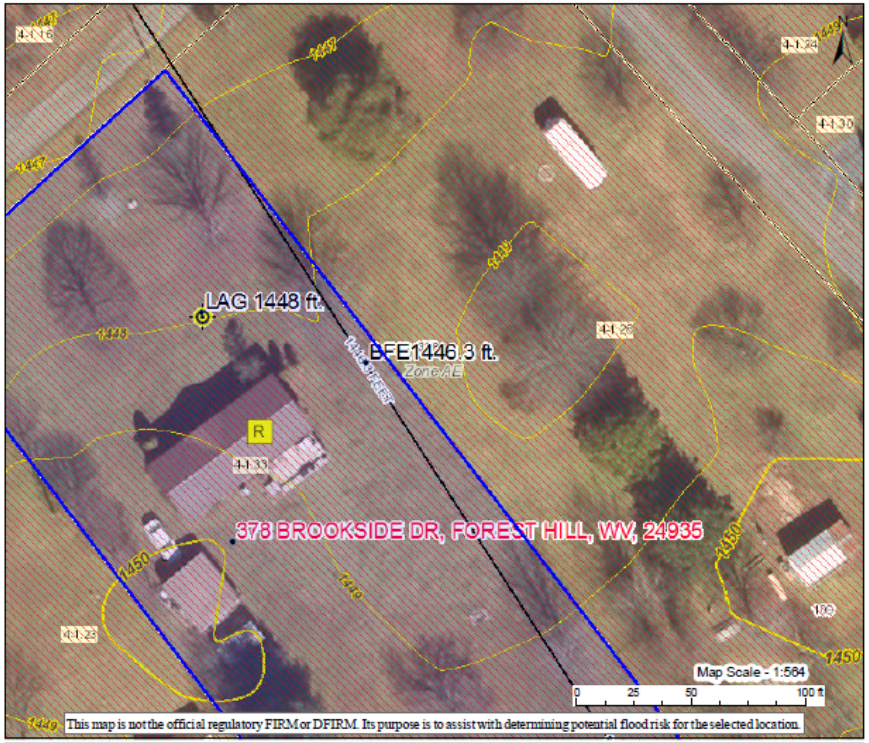
Zone AE	1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
Floodway	Regulatory **Floodway in AE Zone**
Zone A	1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
Advisory	1-Percent-Annual-Chance **High Risk Advisory**

Map created by Kurt Donaldson on 11/3/2020 — Flood Info Location

User Notes	ADDRESS: 2337 SEWELL CREEK RD, RAINELLE, WV, 25962. CORRECT PARCEL: 10-01-111D-0008-0000_2337. There is a parcel shift error on the mapping. LAG = 2468 -1 = 2467 feet.
Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	A
Stream	Sewell Creek
Watershed (HUC8)	Gauley (5050005)
Flood Height	2463.1 ft (Source: User Defined) (NAVD88)
Water Depth	
Elevation	2468.0 ft (Source: FEMA 2016) (NAVD88)
Community & ID	Fayette County (ID: 540026)
FEMA Map & Date	54019C0400D; Effective Date: 9/3/2010
Location (lat, long)	(37.920030, -80.828838) (WGS84)
Parcel ID	10-01-111D -0008-0000
E-911 Address	2337 SEWELL CREEK RD, RAINELLE, WV, 25962

Fayette County

FEMA Floodplain LOMA Map



HIGH RISK

Zone AE	1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
Floodway	Regulatory **Floodway in AE Zone**
Zone A	1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
Advisory	1-Percent-Annual-Chance **High Risk Advisory**

Map created by Kurt Donaldson on 11/2/2020 — Flood Info Location

User Notes	LAG = 1448 - 1 = 1447 ft.
Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	AE
Stream	Greenbrier River
Watershed (HUC8)	Greenbrier (5050003)
Flood Height	1446.3 ft (Source: User Defined) (NAVD88)
Water Depth	
Elevation	1448.1 ft (Source: FEMA 2016) (NAVD88)
Community & ID	Summers County (ID: 540186)
FEMA Map & Date	54089C0235C; Effective Date: 2/3/2010
Location (lat, long)	(37.611332, -80.778519) (WGS84)
Parcel ID	45-01-0004-0001-0033
E-911 Address	

Summers County

[Click here for WV LOMA Examples]

Contact for Help

FEMA: To speak with a Map Specialist about the amendment process, contact the FEMA Map Information eXchange (FMIX) at 877-FEMA-MAP (877-336-2627) or FEMAMapSpecialist@riskmapcds.com

WV Flood Tool (www.mapwv.gov/flood)
WVU GIS Technical Center, West Virginia University

Kurt Donaldson, GIS Manager
kurt.donaldson@mail.wvu.edu, phone: (304) 293-9467

Maneesh Sharma, GIS Analyst
Maneesh.Sharma@mail.wvu.edu, phone (304) 293-9466

Eric Hopkins, GIS Analyst
Eric.Hopkins@mail.wvu.edu, phone: (304) 293-9463

LIDAR LOMAs

Supplement

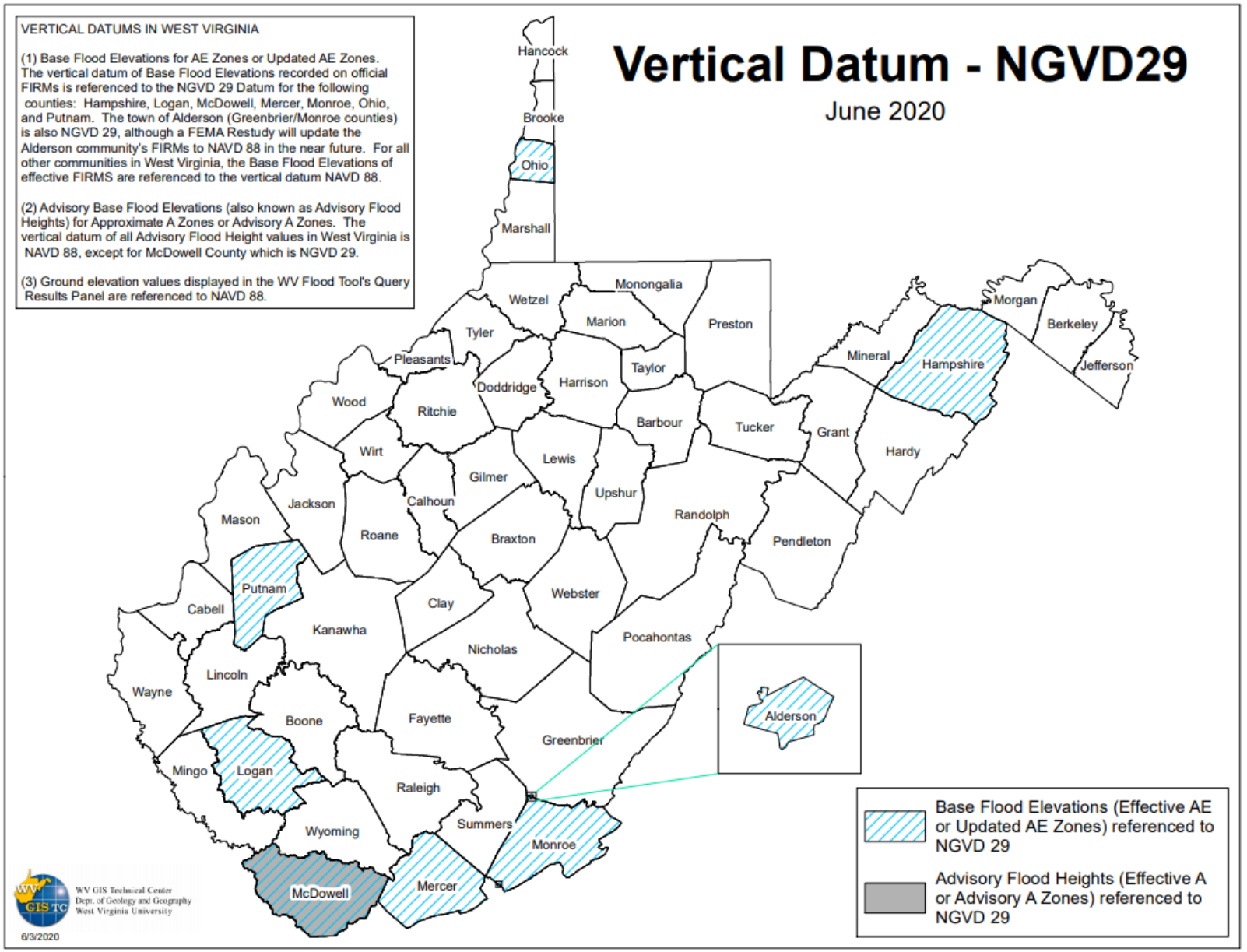
Special Feature: Datum Conversion

Vertical Datum Conversion

IMPORTANT: When submitting LOMA applications, the BFE and LAG Vertical Datums must be the same!

NGVD29 Base Flood Elevations: The LOMA Map Print Tool converts the Ground Elevation NAVD88 to NGVD29 so the BFE and LAG/LLE are the same vertical datum.

NGVD 29 Vertical Datum



NGVD 29 Vertical Datum

LOMA LIDAR: 41 Lymantary Hill Rd, Holden, WV

HIGH RISK
- Zone AE — 1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
- Floodway — Regulatory **Floodway in AE Zone**
- Zone A — 1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
- Advisory — 1-Percent-Annual-Chance **High Risk Advisory**

Download the Full Legend for all flood tool symbols
https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf

Disclaimer:
The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (*https://www.mapwv.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.

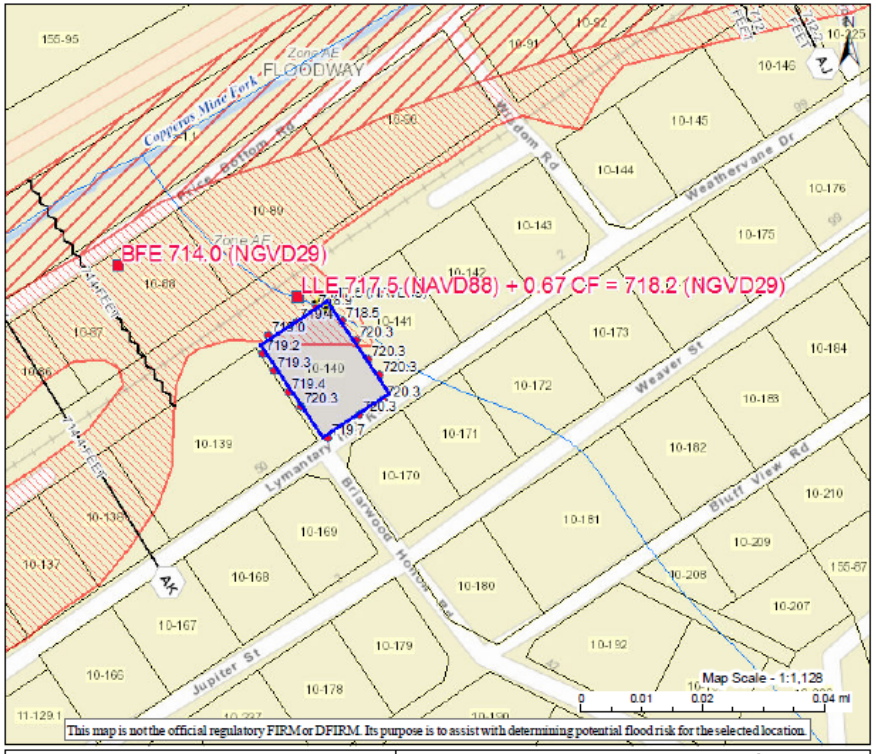
Map created by K. Donaldson, WVU, kdonalds@wvu.edu on 11/7/2020 — Flood Info Location

User Lowest Adjacent Point = 718.2' (NGVD29) - 2' = 716.2' (NGVD29)
Notes Lowest Lot Elevation

Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	AE
Stream	Copperas Mine Fork
Watershed (HUC8)	Upper Guyandotte (5070101)
Flood Height	714.0 ft (Source: User Defined) (NGVD29)
Water Depth	About 1.0 ft (Source: HAZUS)
Elevation	718.2 ft (Source: Logan 2018) (NGVD29) (0.67 CF)
Community & ID	Logan County (ID: 545536)
FEMA Map & Date	54045C0183E; Effective Date: 2/6/2008
Location (lat, long)	(37.828779, -82.045185) (WGS84)
Parcel ID	23-03-0010-0140-0000
E-911 Address	41 LYMANTARY HILL RD, HOLDEN, WV, 25601

Lowest Lot Elevation LOMA Map (Point Method)

LOMA LIDAR: 41 Lymantary Hill Rd, Holden, WV



HIGH RISK
- Zone AE — 1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
- Floodway — Regulatory **Floodway in AE Zone**
- Zone A — 1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
- Advisory — 1-Percent-Annual-Chance **High Risk Advisory**

Download the Full Legend for all flood tool symbols
https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf

Disclaimer:
The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (*https://www.mapwv.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.

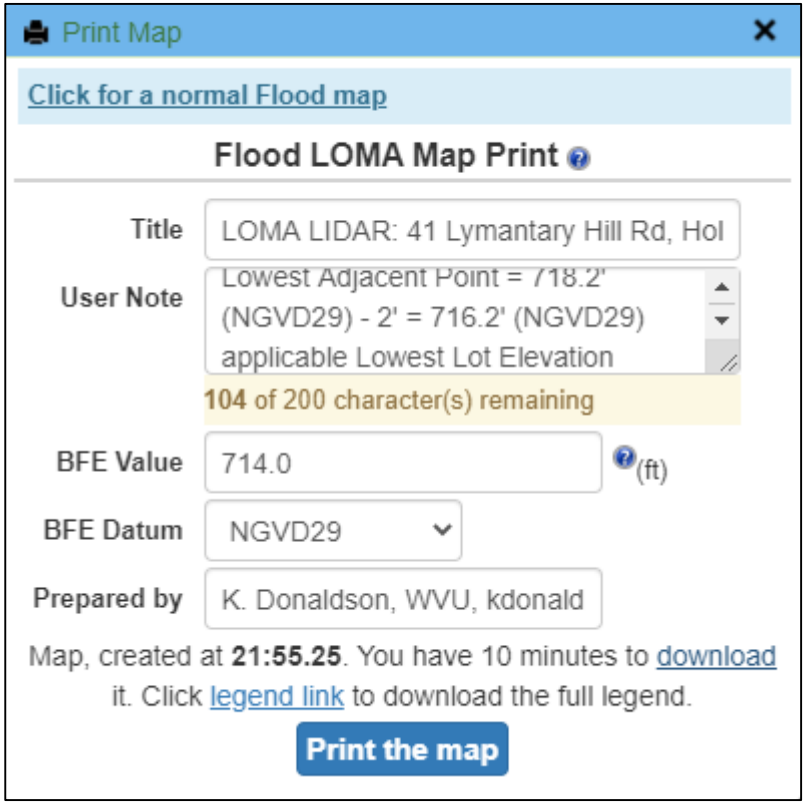
Map created by K. Donaldson, WVU, kdonalds@wvu.edu on 11/7/2020 — Flood Info Location

User Lowest Adjacent Point = 718.2' (NGVD29) - 2' = 716.2' (NGVD29)
Notes applicable Lowest Lot Elevation

Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	AE
Stream	Copperas Mine Fork
Watershed (HUC8)	Upper Guyandotte (5070101)
Flood Height	714.0 ft (Source: User Defined) (NGVD29)
Water Depth	About 1.0 ft (Source: HAZUS)
Elevation	718.2 ft (Source: Logan 2018) (NGVD29) (0.67 CF)
Community & ID	Logan County (ID: 545536)
FEMA Map & Date	54045C0183E; Effective Date: 2/6/2008
Location (lat, long)	(37.828778, -82.045184) (WGS84)
Parcel ID	23-03-0010-0140-0000
E-911 Address	41 LYMANTARY HILL RD, HOLDEN, WV, 25601

Reference Map

NGVD 29 Datum Conversion



Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	AE
Stream	Copperas Mine Fork
Watershed (HUC8)	Upper Guyandotte (5070101)
Flood Height	714.0 ft (Source: User Defined) (NGVD29)
Water Depth	About 1.0 ft (Source: HAZUS)
Elevation	718.2 ft (Source: Logan 2018) (NGVD29) (0.67 CF)
Community & ID	Loga
FEMA Map & Date	5404
Location (lat, long)	(37.8
Parcel ID	23-03-0010-0140-0000
E-911 Address	41 LYMANTARY HILL RD, HOLDEN, WV, 25601

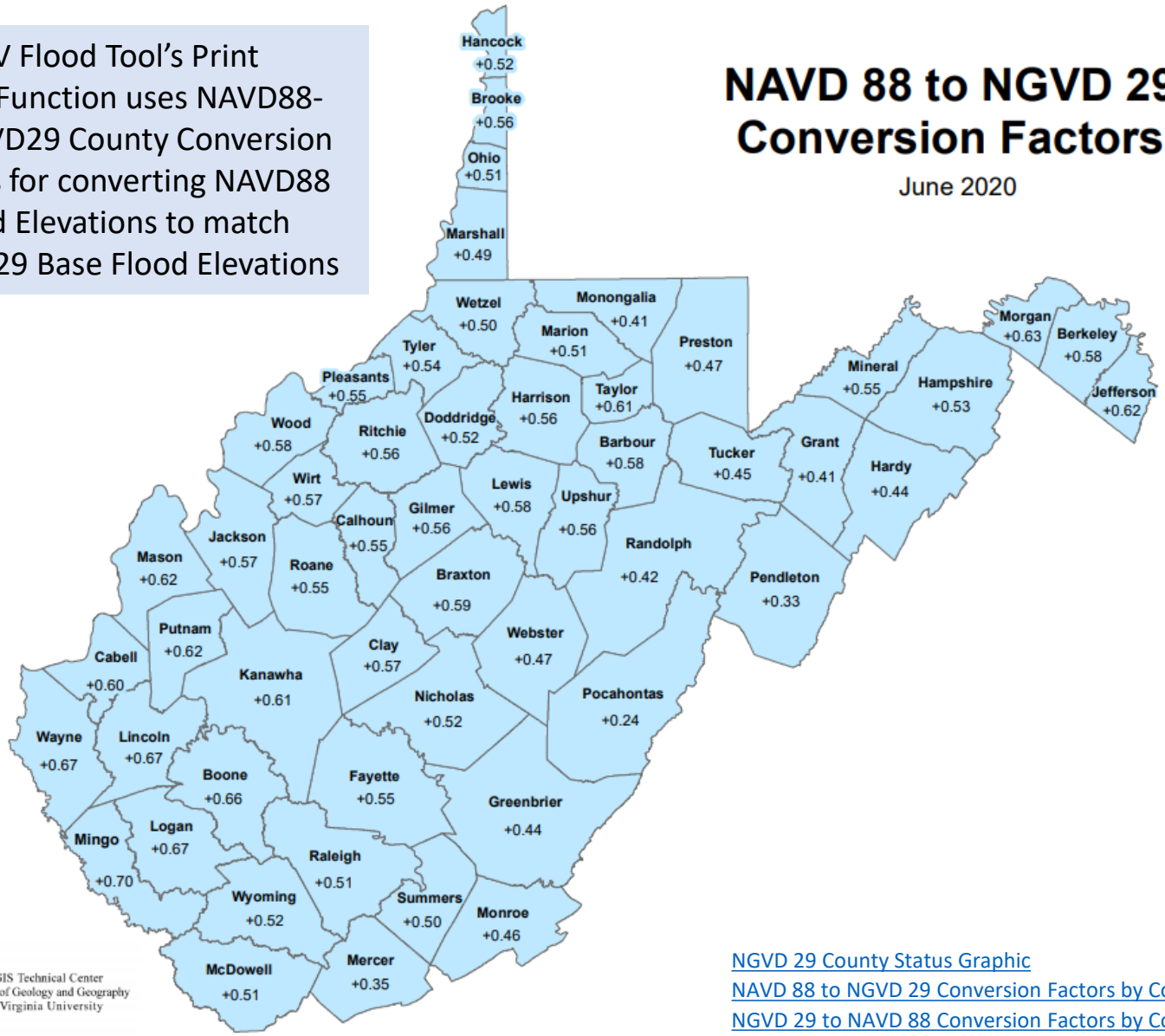
The Print LOMA function converts the Ground Elevation from NAVD88 to NGVD29 to match the BFE NGVD29 Vertical Datum

NGVD29 Base Flood Elevations: The LOMA Map Print Tool converts the Ground Elevation NAVD88 to NGVD29 so the BFE and LAG/LLE are the same vertical datum

Lowest Adjacent Point 717.5 ft (NAVD88) + 0.67 ft. Conversion Factor = 718.2 ft. (NGVD29)

NGVD 29 Datum Conversion

The WV Flood Tool's Print LOMA Function uses NAVD88-to-NGVD29 County Conversion Factors for converting NAVD88 Ground Elevations to match NGVD 29 Base Flood Elevations



WV GIS Technical Center
Dept. of Geology and Geography
West Virginia University

[NGVD 29 County Status Graphic]

[NAVD 88 to NGVD 29 Conversion Factors by County]

[NGVD 29 to NAVD 88 Conversion Factors by County]

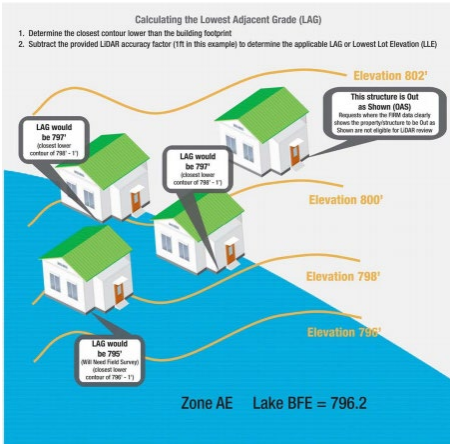
FEMA Processing Procedures

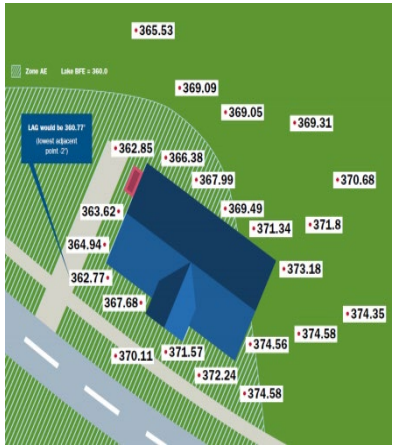
FEMA Processing Procedures of LiDAR LOMAs:

LIDAR-based submissions will be reviewed based on the following criteria:

- The LOMA analyst will review the submitted exhibit to determine the location of the structure/property in question and identify the elevation data to be assessed.
- *Contour submittals:* The analyst will identify the lowest contour immediately adjacent to the subject (but not going through it) and subtract one-half the contour interval or 1 foot, whichever is greater, from the lowest contour closest to the structure or property to determine the applicable LAG elevation or LLE. This elevation will be compared to the BFE.
- *LiDAR point submittals:* The analyst will identify the lowest point immediately adjacent to the structure or on the property and subtract 2 feet to determine the LAG or the LLE.
- If the comparison of the LAG or LLE to the BFE results in a *removal* and all other required data was submitted, a *determination* can be issued. The LAG/LLE, and possibly the BFE as well, will not be published with the determination. If additional data is required to process the request (i.e., submittal form, deed, plat), it will be requested to complete the determination.
- If the comparison of the LAG/LLE to the BFE results in a *non-removal*, certified elevations will be requested in addition to any other data needed for the request.

Guidance for Flood Risk Analysis and Mapping MT-1 Technical Guidance (November 2019), LiDAR LOMA, Section 5.3, page 47





Studied and Unstudied Zone A

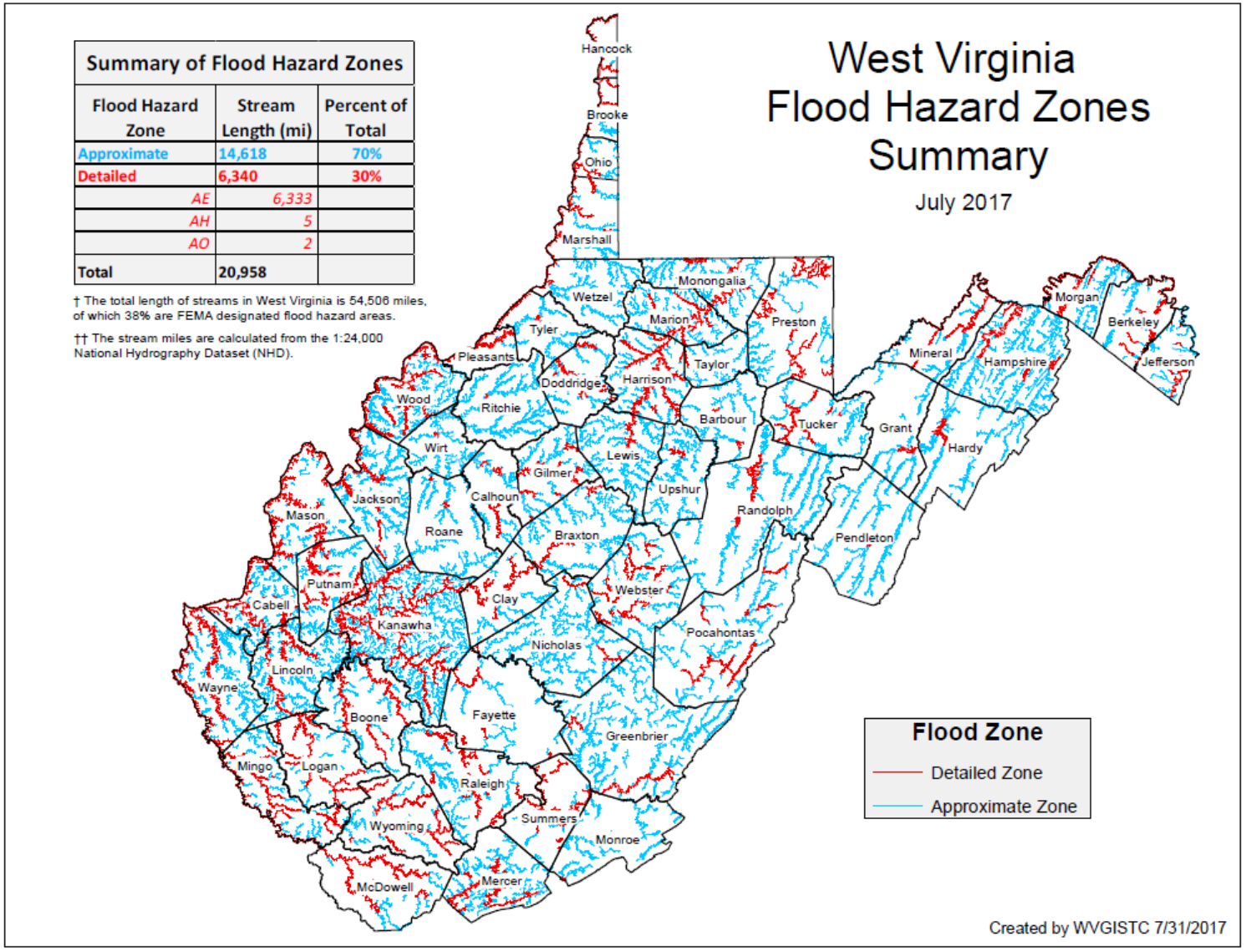
*70% of Flood Zones (measured in stream miles) in West Virginia are **Approximate A Zones***

Advisory BFEs (or Advisory Flood Heights) for Approximate A Zones do not exist for all counties or for small drainage areas (less than 1 square mile)

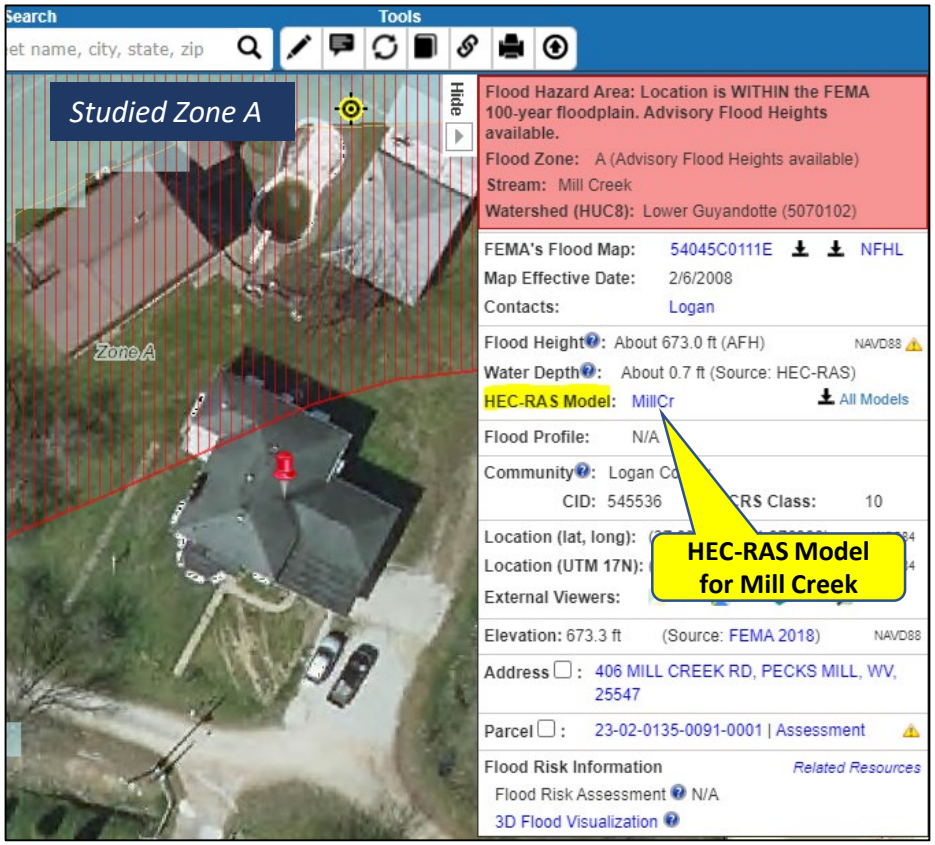
Summary of Flood Hazard Zones		
Flood Hazard Zone	Stream Length (mi)	Percent of Total
Approximate	14,618	70%
Detailed	6,340	30%
AE	*6,333*	
AH	*5*	
AO	*2*	
Total	20,958	

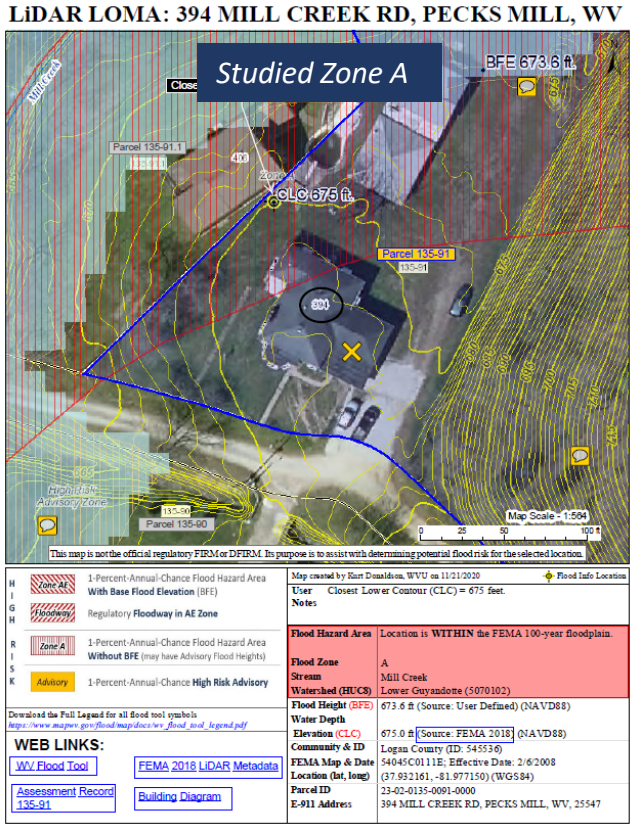
† The total length of streams in West Virginia is 54,506 miles, of which 38% are FEMA designated flood hazard areas.

†† The stream miles are calculated from the 1:24,000 National Hydrography Dataset (NHD).



Studied Zone A (WV Flood Tool)

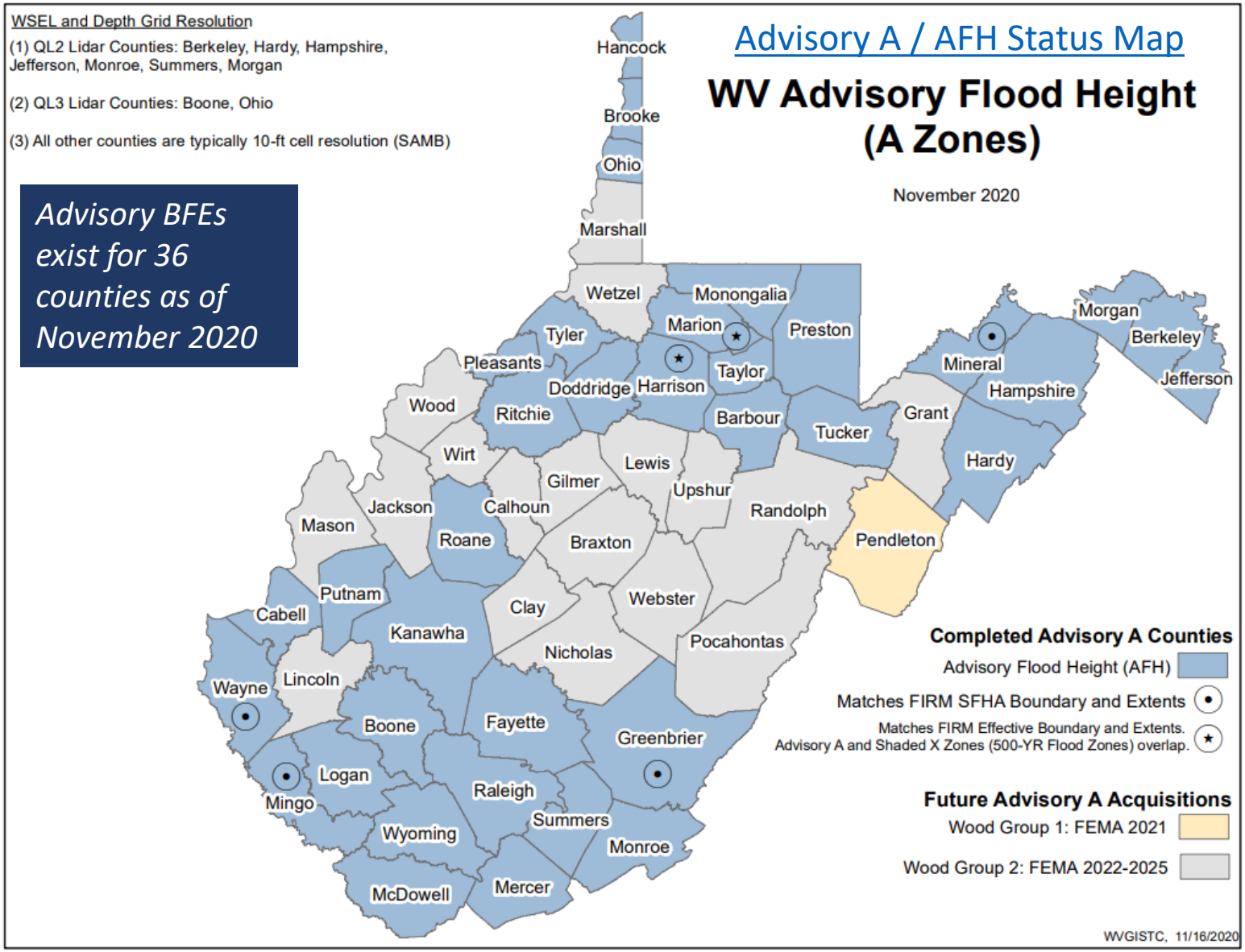




- FEMA's Zone A Team always refers to the WV Flood Tool as a first resource to validate a LiDAR LOMA submitted for a **Studied Zone A**. The only exception would be if a certified, site specific study, is submitted with the request. In that case, the local study based on ground survey would be considered the best available data.

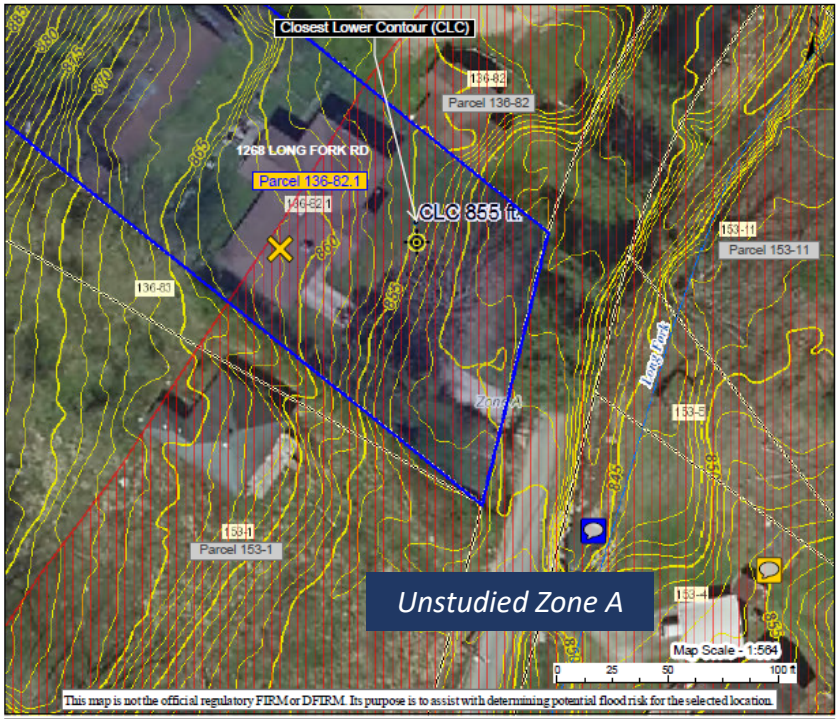
- For consistency and accuracy, FEMA's analysts always download the HEC-RAS model from the WV Flood tool in order to determine the appropriate BFE from the model profile plot to validate a Studied Zone A. FEMA will not rely solely on the LiDAR LOMA and BFE Exhibit generated from the WV Flood Tool.

Studied Zone A (WV Flood Tool)



Unstudied Zone A (WV Flood Tool)

LiDAR LOMA: 1268 LONG FORK RD, PECKS MILL, WV, 25547



HIGH RISK

- Zone AE — 1-Percent-Annual-Chance Flood Hazard Area **With Base Flood Elevation** (BFE)
- Floodway — Regulatory **Floodway** in AE Zone
- Zone A — 1-Percent-Annual-Chance Flood Hazard Area **Without BFE** (may have Advisory Flood Heights)
- Advisory — 1-Percent-Annual-Chance **High Risk Advisory**

Download the Full Legend for all flood tool symbols
https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf

WEB LINKS:

WV Flood Tool | FEMA 2018 LiDAR Metadata | Assessment Record 136-82.1 | Building Diagram

Map created by Kurt Donaldson, WVU on 11/21/2020 — Flood Info Location

User Notes: Unstudied Zone A. No BFE or HEC-RAS model available for Long Fork. Closest Lower Contour (CLC) = 855 ft.

Flood Hazard Area	Location is **WITHIN** the FEMA 100-year floodplain.
Flood Zone	A
Stream	Long Fork
Watershed (HUC8)	Lower Guyandotte (5070102)
Flood Height	No BFE Value for LOMA Determination
Water Depth	
Elevation (CLC)	855.0 ft Source: FEMA 2018 (NAVD88)
Community & ID	Logan County (ID: 545536)
FEMA Map & Date	54045C0125E; Effective Date: 2/6/2008
Location (lat, long)	(37.923978, -81.960436) (WGS84)
Parcel ID	23-02-0136-0082-0001
E-911 Address	1268 LONG FORK RD, PECKS MILL, WV, 25547

- To estimate a BFE to determine if a structure can be removed from an **Unstudied Zone A** through the LiDAR process, FEMA recommends a simple method like **Contour Interpolation**.
- Using the LiDAR-derived contours and LiDAR points of the WV Flood Tool, estimate the bank elevation and add a safety factor of at least **two feet** to be conservative. FEMA is always conservative in its BFE estimations. In cases where the LiDAR shows a property/structure above a computed BFE, then FEMA would issue the standard LiDAR removal determination.
- If FEMA deems the contour or point cloud data to suggest the LAG could be lower, FEMA will use that lower value in its review. If this review would alter the outcome to be a possible non-removal, FEMA proceeds with asking for certified elevation data. FEMA does not issue non-removals based on LiDAR exhibits.
- The requesters always have the option to provide any additional information and exhibits to assist with a BFE determination. However, until the drainage area and 1% discharge calculations are verified, FEMA cannot determine the BFE.

Unstudied Zone A

- FEMA will attempt to calculate the BFE when a LOMA application is submitted for properties of less than 50 lots or 5 acres.
- FEMA uses the best available topography to approximately model the BFEs. For areas where there is not a BFE tied to model backing that FEMA can download from the WV Flood Tool, FEMA will use whatever data is submitted or available to determine an applicable BFE for a request. FEMA will use the LiDAR available in the WV Flood Tool to capture the necessary extent to compute BFE determinations where there is no model backing. The availability of LiDAR provides FEMA with more confidence in the outcomes of these reviews and to complete a reasonable BFE determination.
- For riverine flooding, FEMA measure a cross section at the upstream limit of the structure and use FEMAs Quick 2 software to apply Manning's flow equation.
- Where available, FEMA uses gage data or regional regression equations to determine the discharge for the model.
- If the drainage area is too small for the parameter range FEMA may use the rational method.
- If the source is a lake or depressed area, FEMA would apply stage-storage calculations or rectangular weir flow pending the identification of outlet or not.
- FEMA follows the detailed methods of FEMA 256 *Managing Floodplain Development in Approximate Zone A Areas* that provides guidance for obtaining and developing base (100-Year) flood elevations.
- Once that BFE is determined in-house, FEMA will know if the LiDAR results in a removal or will send a data request letter asking for certified elevations.
- FEMA never discourages users from submitting a LiDAR LOMA because the BFE for an Unstudied Zone A is unknown. The LiDAR-derived ground elevation information submitted in the LiDAR LOMA Exhibit will be enough for FEMA to make an in-house determination.

LiDAR LOMA Disclaimer

LiDAR LOMA Disclaimer

All cases issued using LiDAR in lieu of certified elevations will include the following disclaimer:

This determination is based on LiDAR topographic data showing the elevation of the subject property. The elevation data that were used are not certified by a Licensed Land Surveyor or Professional Engineer, but they meet or exceed FEMA requirements. This determination is subject to change if more detailed data becomes available.

Guidance for Flood Risk Analysis and Mapping MT-1 Technical Guidance (November 2019), LiDAR LOMA, Section 5.5, page 49

Submit all Required Documents

Federal Emergency Management Agency
Washington, D.C. 20472

November 23, 2020

Mr. Kurt Donaldson
WV GIS Technical Center, WVU
98 Beechurst Avenue
Morgantown, WV 26505

IN REPLY REFER TO:
CASE NO: 21-03-0231A
COMMUNITY: MONROE COUNTY, WEST VIRGINIA (UNINCORPORATED AREAS)
COMMUNITY NO: 540278
216-AD

RE: (627) 8374 WOLF CREEK ROAD
Dear Mr. Donaldson:

This is in response to your request for a Letter of Map Amendment for the property referenced above.

The Federal Emergency Management Agency (FEMA) uses detailed application/certification forms for revision requests or amendments to the National Flood Insurance Program (NFIP) maps. The forms provide step-by-step instructions for requestors to follow, and are comprehensive, ensuring that the requestors' submissions are complete and more logically structured. Therefore, we can complete our review more quickly and at lower cost to the NFIP. While completing the forms may seem burdensome, the advantages to requestors outweigh any inconvenience.

The following forms or supporting data, which were omitted from your previous submittal, must be provided:

- Please submit a copy of the recorded plat for this subdivision lot that identifies the property noted in your request and that contains recording information from the county Recorder's Office. Recording information is necessary to generate a legally binding property description between the determination document and the property in question. If you choose, you may submit a copy of the deed with both recording information and the property's legal description from the Office of the Recorder in place of the recorded plat.

Please note that if all of the required items are not submitted within 90 days of the date of this letter, any subsequent request will be treated as an original submittal and will be subject to all submittal procedures.

When you write to us concerning your request, please include the case number referenced above in your letter. All required items for your request are to be either uploaded through the Online LOMC tool, for requests initiated online, or mailed to the Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426, for requests initiated through the mail.

Make sure to submit all require documents including recorded plat or deed for property

No Charge for LiDAR LOMAs

The current fee schedule for conditional and final map change requests submitted by MT-1 and MT-2 paper forms and the Online Letter of Map Change (LOMC) tool are provided below. By submitting requests online, fees are reduced since processing costs are lower.

Requests for Single-Lot, Single-Structure Map Change	Paper Form Fee	Online LOMC Fee
Single-Lot or Single-Structure LOMA	Free	Free
Single-Lot/Single-Structure CLOMA and CLOMR-F	$600	$500
Single-Lot/Single-Structure LOMR-F	$525	$425
Single-Lot/Single-Structure LOMR-F Based on As-Built Information (CLOMR-F previously issued by FEMA)	$425	$325

Requests for Multiple-Lot/Multiple-Structure Map Changes	Paper Form Fee	Online LOMC Fee
Multiple-Lot/Multiple-Structure LOMA	Free	Free
Multiple-Lot/Multiple-Structure CLOMA	$800	$700
Multiple-Lot/Multiple-Structure CLOMR-F and LOMR-F	$900	$800
Multiple-Lot/Multiple-Structure LOMR-F Based on As-Built Information (CLOMR-F previously issued by FEMA)	$800	$700

LOMA requests involving **one or more structures**: the LAG must be at or above the BFE.

LOMA requests involving **one or more lots**: the lowest point on each lot must be at or above the BFE.

RESOURCES

- West Virginia
  - WV Flood Tool LiDAR for LOMA Guide | Instructions
  - WV LiDAR for LOMA Examples

  - WV LiDAR Quality Level Map
  - WV Elevation Source Metadata
  - WV FEMA-Purchased LiDAR Status Map
  - WV Advisory A / AFH Status Map
  - WV Building and Property Identifiers
  - WV Vertical Datums

- FEMA
  - FEMA Online Letter of Map Change (LOMC) Website
  - Online Letter of Map Change Tutorial (2018)
  - How to Request a Map Amendment (Nov. 2018)
  - How to Request a LOMA or LOMA Based on Fill (LOMR-F)
  - Region V LiDAR LOMA Fact Sheet (2018)