West Virginia GIS Technical Center
West Virginia University
Department of Geology and Geography Eberly College of Arts and Sciences

April 10, 2025

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SUBJECT: Invoice for COMS Task E; FY23 CTP Community Outreach and Mitigation Strategies (COMS)

Dear Kevin,

In accordance with the FY23 CTP Service Agreement dated October 2023, this invoice in the amount of **$27,000.00** for COMS **Task E** (Building-Level Risk Assessment Update) in support of the WV Flood Tool (www.mapwv.gov/Flood) and WV Risk Explorer (wvfrf.org/WVRE). See the scope of work as outlined in the amended 2023-24 (FY23) CTP Statement of Work Plan dated August 2023, and authorized under a WV-48 service agreement between the WVEMD and WV GIS Technical Center, West Virginia University. Refer to the FY23 COMS Statement of Work documents for more details about the specific tasks.

Invoice #	Services Rendered	Amount
04102025 **Time Period** 10/1/2023 to 4/1/2025 **Task E**	**[Task E] Update the statewide Building-Level Risk Assessments (BLRA) on the WV Flood Tool's RiskMAP View from new data sources, (e.g., Flood Studies, Tax Assessment building characteristics as structure values, and USACE Section 202 Mitigated Structures).** Updated the building-level risk assessments for **23 counties or 58% (56,641 of 97,380 structures)** of all flood-prone structures in high-risk flood zones. All new building-level risk assessments were updated to the Risk MAP View of the WV Flood Tool. Performance period between 10/1/2023 and 4/10/2025. **Table COMS-E.1.** Counties in which inventoried floodplain buildings and risk assessments were conducted.	$18,000

County	PDC	BIE	BLRA	Building Count
Barbour County	7	2024	2023	813
Berkeley County	9	2025	2025	827
Boone County	3	2023	2024	3926
Braxton County	7	2025	2024	824
Brooke County	11	2022	2023	1101
Cabell County	2	2023	2024	3377
Calhoun County	5	2023	2023	623
Clay County	3	2025	2023	1041
Doddridge County	6	2023	2023	769
Fayette County	4	2023	2023	1798
Gilmer County	7	2025	2023	518
Grant County	8	2024	2023	319
Greenbrier County	4	2025	2025	1885

Hampshire County	8	2024	2023	1157
Hancock County	11	2022	2023	548
Hardy County	8	2023	2023	599
Harrison County	6	2024	2024	2117
Jackson County	5	2023	2023	1062
Jefferson County	9	2025	2025	776
Kanawha County	3	2025	2025	14608
Lewis County	7	2024	2023	1073
Lincoln County	2	2025	2023	2705
Logan County	2	2025	2023	5507
Marion County	6	2024	2023	1701
Marshall County	10	2025	2023	1648
Mason County	2	2023	2023	1573
McDowell County	1	2025	2025	3602
Mercer County	1	2023	2023	2553
Mineral County	8	2024	2023	1167
Mingo County	2	2025	2025	3629
Monongalia County	6	2023	2023	1197
Monroe County	1	2023	2023	348
Morgan County	9	2025	2025	645
Nicholas County	4	2025	2023	1000
Ohio County	10	2025	2023	3391
Pendleton County	8	2024	2023	472
Pleasants County	5	2023	2023	448
Pocahontas County	4	2025	2023	984
Preston County	6	2022	2023	756
Putnam County	3	2023	2024	2690
Raleigh County	1	2025	2023	2466
Randolph County	7	2024	2024	1954
Ritchie County	5	2023	2023	522
Roane County	5	2023	2024	1077
Summers County	1	2025	2024	853
Taylor County	6	2022	2023	427
Tucker County	7	2024	2023	625
Tyler County	5	2024	2023	839
Upshur County	7	2023	2023	1432
Wayne County	2	2025	2025	2625
Webster County	4	2025	2023	1124
Wetzel County	10	2024	2024	2129
Wirt County	5	2023	2024	522
Wood County	5	2023	2023	2283
Wyoming County	1	2023	2023	2725
		33	23	97,380

- First step of BLRA Cycle: Building Inventory Enhanced (BIE) completed (blue shade) for 33 counties.
- Second and third steps of BLRA Cycle: Building-Level Risk Assessments completed for 56,641 floodplain structures, or 58% of inventory, completed (yellow shade) for 23 counties. See BLRA Cycle diagram below.
- Status of Building Inventory Updates & Available Model-Backed Depth Grids
- Statewide graphic of BLRA Updates

Figure COMS-E.2. Building-Level Flood Risk Assessment Update Graphic

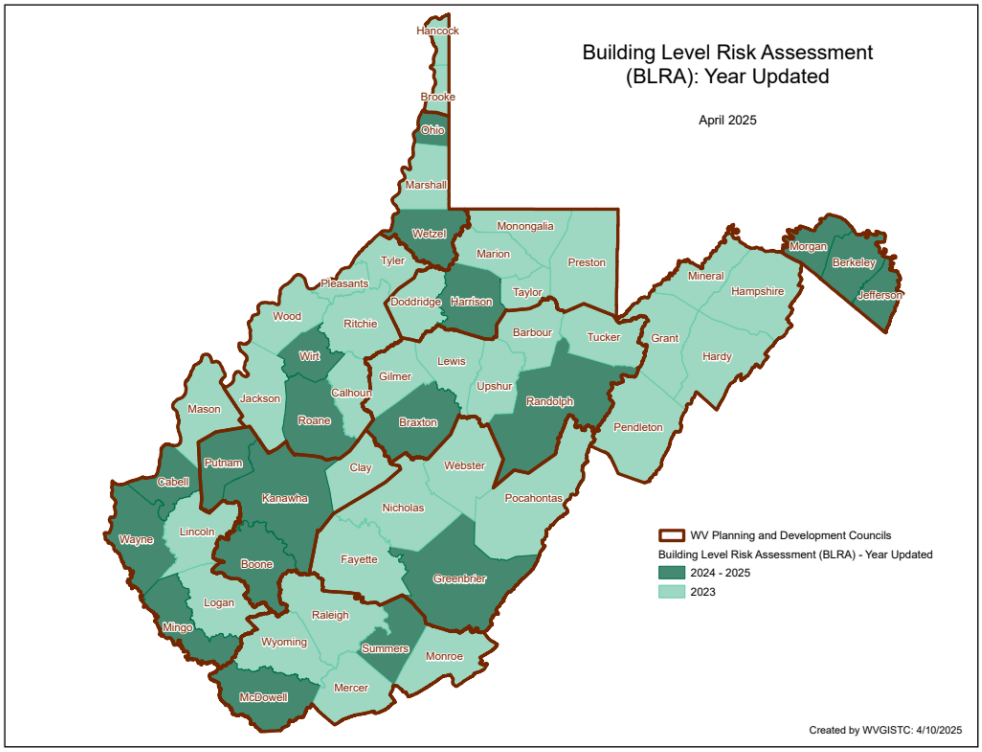
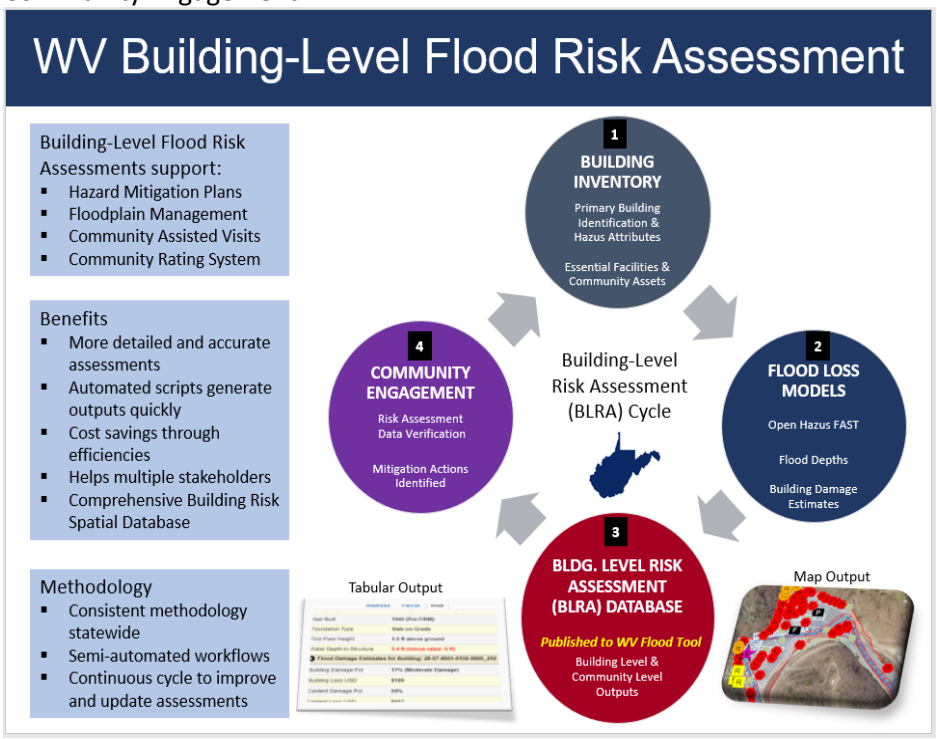


Figure COMS-E.3. Building-Level Flood Risk Assessment Cycle (BLRA). Major processing steps: (1) Building Inventory, (2) Flood Loss Models, (3) Building-Level Risk Assessment outputs published to WV Flood Tool, and (4) Community Engagement.



BUILDING LEVEL RISK METHODLOGY. [WV Flood Risk Assessment Methodology Report] in support of hazard mitigation plans

BUILDING LEVEL RISK CYCLE. Refer to this [directory] for detailed documentation about how the building level risk assessment cycle (BLRA) which continuously creates the building-level risk assessments. [BLRA Cycle Report] | [BLRA Cycle Diagram] | [Building Inventory Workflow Diagram]

Figure COMS-E.4. Example RiskMAP View of WV Flood Tool showing primary buildings inventoried in the PRELIMINARY 1%-annual-chance floodplain. Below is a building-level flood loss estimate for residential structure **38-08-0002-0092-0000_825** for a riverine 1%-annual-chance flood event. View [map link] on WV Flood Tool.

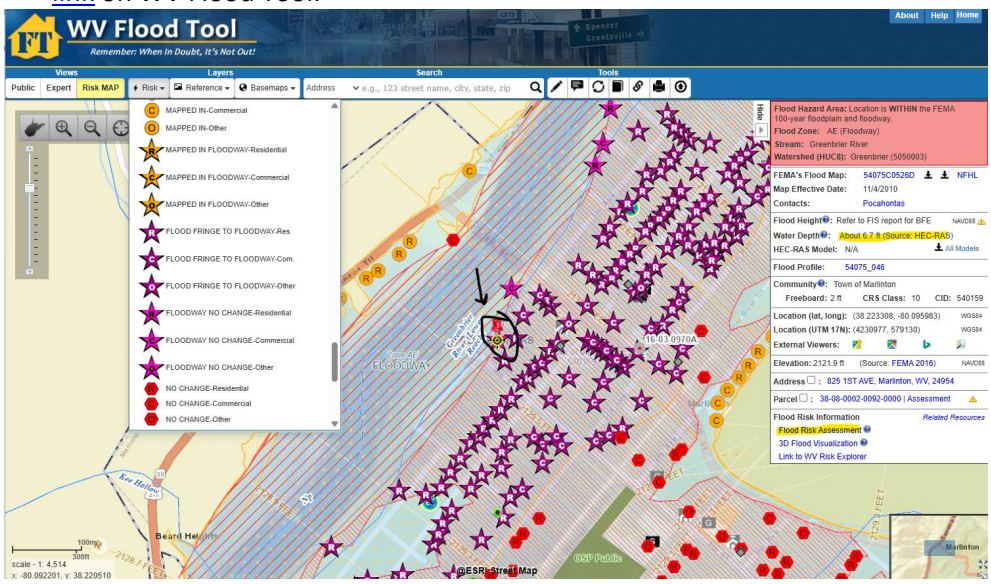


Figure COMS-E.5. Hazus Loss Estimates and 3D Flood Visualization for Building ID **38-08-0002-0092-0000_825.**

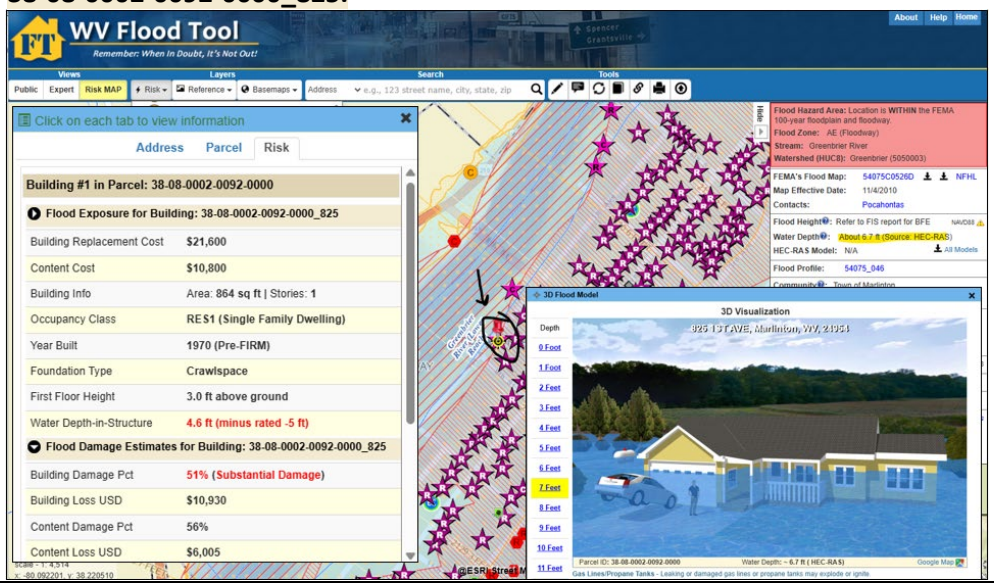


Figure COMS-E.6. Zoomed-in view of Flood Exposure and Damage Estimates generated using FEMA's Open Hazus for Building ID **38-08-0002-0092-0000_825.** View map link on WV Flood Tool.

Click on each tab to view information

Address | Parcel | Risk

Building #1 in Parcel: 38-08-0002-0092-0000

Flood Exposure for Building: 38-08-0002-0092-0000_825

Building Replacement Cost	$21,600
Content Cost	$10,800
Building Info	Area: 864 sq ft | Stories: 1
Occupancy Class	RES1 (Single Family Dwelling)
Year Built	1970 (Pre-FIRM)
Foundation Type	Crawlspace
First Floor Height	3.0 ft above ground
Water Depth-in-Structure	4.6 ft (minus rated -5 ft)

Flood Damage Estimates for Building: 38-08-0002-0092-0000_825

Building Damage Pct	51% (Substantial Damage)
Building Loss USD	$10,930
Content Damage Pct	56%
Content Loss USD	$6,005
Inventory Damage Pct	0%
Inventory Loss USD	$0
Debris Removal Total	6 tons
Max. Restoration Time	450 days
Population Displacement	3.6 persons
Model Assessment Date	03/19/2025
Model Use & Limitations	Link

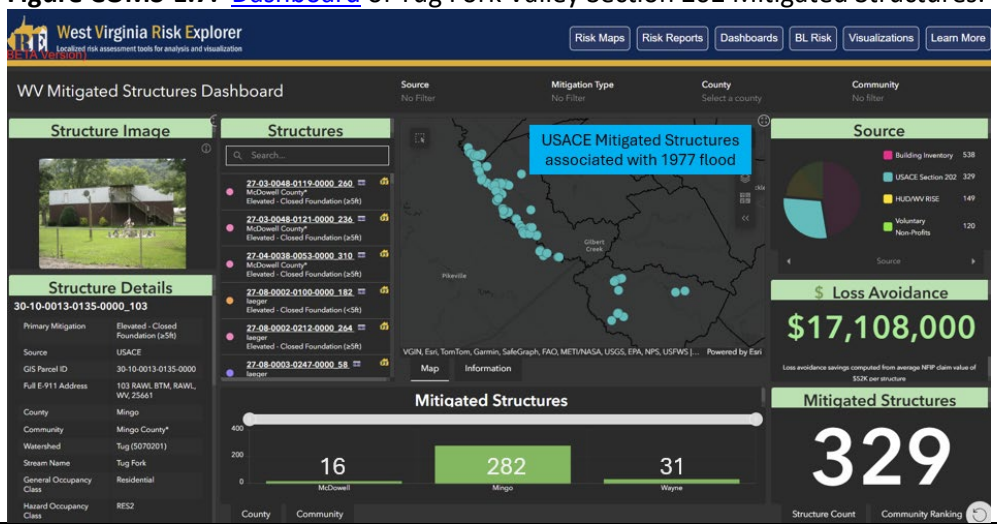
Task E	**[Task E Continued]. Mapped 329 nonstructural mitigated structures to the WV Flood Tool from the best available USACE Tug Fork Valley Section 202 nonstructural projects for McDowell, Mingo, and Wayne Counties.** Some of the Section 202 mitigated structures have been torn down and no longer exist. Various flood risk adaptive mitigation measures were mapped for these three counties. Additionally, besides mitigated structures in the high-risk floodplains, the relocation communities of Valley View (Williamson) and Mate Creek (Matewan) outside the Special Flood Hazard Area were mapped to the RiskMAP View of the WV Flood Tool. Background Information: The McDowell-Mingo-Wayne Counties Non-structural Flood Damage Reduction Projects, initiated in response to the April 1977 flooding in the Tug and Levisa Fork basins, focuses on reducing flood damage through methods like voluntary floodproofing, relocation of structures, floodplain acquisition, and demolition of structures. This flood mitigation program was authorized under Section 202 of the Energy and Water Development Appropriation Act of 1981. As of 2025, only McDowell County is an active project area. More than $284 million was obligated by the federal government for structural and nonstructural mitigation projects associated with the April 1977 Disaster (DR 531), indicating significant financial assistance for this project. Recently the severe flooding in February 2025 in the Tug Fork watershed would have been more costly if not for the prior flood reduction efforts. • ACQUIRED PARCELS: A total of 271 parcels acquired through the Section 202 Mitigation Program were mapped to the WV Flood Tool: McDowell (153), Mingo (100), and Wayne (18). • FLOODPROOFED STRUCTURES: A total of 329 nonstructural mitigated structures were mapped to the WV Flood Tool from the best available Section 202 sources you provided for McDowell, Mingo, and Wayne Counties. Some of the Section 202 mitigated structures have been torn down and no longer exist. Additionally, the relocation communities of Valley View (Williamson) and Mate Creek (Matewan) were mapped. **Figure COMS-E.7.** Dashboard of Tug Fork Valley Section 202 Mitigated Structures. 	**$8,000**

Figure COMS-E.8. Map View of Mate Creek Relocation Community on WV Flood Tool.

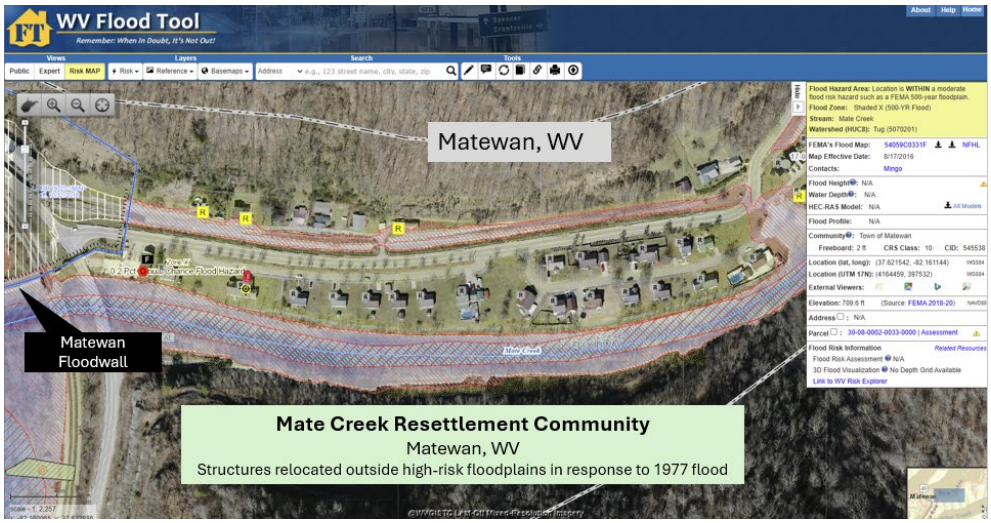
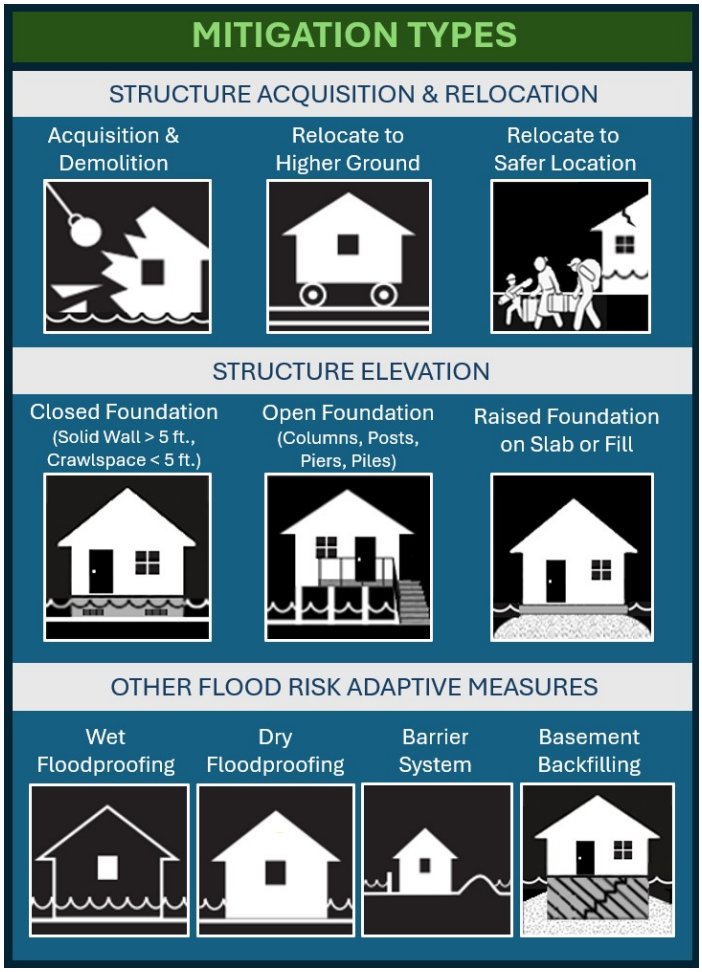


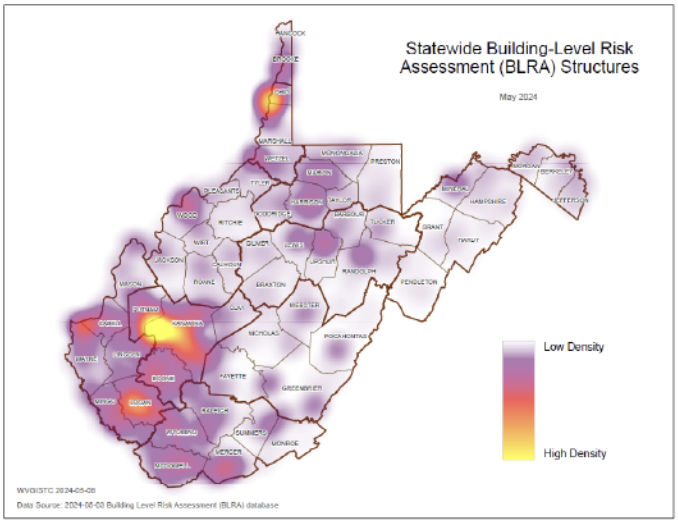
Figure COMS-E.9. Various nonstructural mitigation measure types for structure were mapped from USACE Section 202 Program mapped to the WV Flood Tool.



Task E	**[Task E Continued]. Detailed Analyses of Building Counts at 8 aggregate scales along with findings, description, rationale, recommendations, and data sources.** The Building Counts indicator is one of 27 risk factors identified by the statewide risk assessment. **Figure COMS-E.10.** Building count floodplain statistics at the statewide scale. View entire risk assessment report for buildings located in high-risk flood zones.	**$1,000**
Grand Total	***Total invoice amount:***	**$27,000**

BUILDING COUNT (STATEWIDE SCALE)

DESCRIPTION: A count of all primary insurable structures in the high-risk, 1%-annual-chance (100-yr) floodplain, or Special Flood Hazard Area (SFHA) on FEMA's Flood Insurance Rate Maps (FIRMs).



HIGH-RISK REGULATORY ZONES		
Buildings in Special Flood Hazard Area 1% Annual Chance (100-YR) Flood Zone		
Special Flood Hazard Area		84,490
• Detailed Zone AE	65%	55,112
• Approximate Zone A	35%	29,378
○ Zone AE Floodway	10%	8,572

HIGH-RISK ADVISORY FLOOD ZONES		
Includes Buildings in Non-Regulatory Zones Future Map 1% AEP (100-YR) Flood Zones		
High-Risk Flood Zones		97,936
• Mapped No Change	70%	69,093
• Mapped out SFHA	16%	-15,528
• Mapped in SFHA (non-regulatory) *	14%	13,315
• SFHA net change	-2%	-2,213
Structures est. in SFHA		82,408

* 54 counties have Advisory A / AE Flood Zones

OTHER FLOOD ZONES	
Buildings in Shaded X Zones Moderate or Reduced Flood Risk Areas	
High and Moderate Risk Zones	138,623
• 0.2% annual chance (500-YR) flood (moderate risk)	44,415
• Levee Protected Zones (reduced risk)	9,718

SFHA ZONE A STUDY TYPES
- 70% Approximate A Zones
- 30% Detailed AE Zones

WEB LINKS:	SFHA Building Density Graphic	High-Risk Regulatory Zones	High-Risk Advisory Zones	SFHA Zone A/AE Study Types	Web Report

Sources: WV BLRA (Building-Level-Risk Assessment) for High-Risk Effective/Advisory Zones; FEMA Flood Insurance Rate Maps (FIRMs) for SFHA. Report Date 20240429.

Please use the following information for paying electronically:

Payment Transfer Information:

OASIS: 4187 111 1463 1463 6909 H514

WVU Acct: 11. 110530213. 11303179. 4108501. 999. 99999999

If you have any questions, or need clarifications, please do not hesitate to call.

Sincerely,

Kurt Donaldson

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CC: WVU Revenue Services - RevenueServices@mail.wvu.edu