Flood Risk Report

Upper Monongahela Watershed, 05020003

Community Names: Marion County Unincorporated Areas, Monongalia County Unincorporated Areas*, Preston County Unincorporated Areas*, Taylor County Unincorporated Areas**

(continued on next page)

State: West Virginia & Pennsylvania

**Spans more than one watershed. This report only covers the area within the studied watershed.*

Report Number 01

10/4/2016

Final

FEMA

RiskMAP

Increasing Resilience Together

Community Name
Town of Barrackville
Township Of Dunkard*
City of Fairmont*
Town of Fairview
Town of Farmington
Town of Grant Town
Town of Granville
City of Mannington
Town of Masontown
City of Morgantown
City of Pleasant Valley*
Borough of Point Marion*
Town of Reedsville
Town of Rivesville
Township of Springhill*
Town of Star City
City of Westover

*Spans more than one watershed. This report only covers area within the studied watershed.

Preface

The Department of Homeland Security (DHS), Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides states, tribes, and local communities with flood risk information and tools that they can use to increase their resilience to flooding and better protect their citizens. By pairing accurate floodplain maps with risk assessment tools and planning and outreach support, Risk MAP has transformed traditional flood mapping efforts into an integrated process of identifying, assessing, communicating, planning for, and mitigating flood-related risks.

This Flood Risk Report (FRR) provides non-regulatory information to help local or tribal officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to their citizens and local businesses.

Because flood risk often extends beyond community limits, the FRR provides flood risk data for the entire Flood Risk Project as well as for each individual community. This also emphasizes that flood risk reduction activities may impact areas beyond jurisdictional boundaries.

Flood risk is always changing, and there may be other studies, reports, or sources of information available that provide more comprehensive information. The FRR is not intended to be regulatory or the final authoritative source of all flood risk data in the project area. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the project area.

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FLOOD RISK REPORT

1 Introduction

1.1 About Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry areas. Floods become hazardous to people and property when they inundate an area where development has occurred, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the generation of unwanted debris. Severe flooding can destroy buildings, ruin crops, and cause critical injuries or death.

Flooding is a natural part of our world and our communities. Flooding becomes a significant hazard, however, when it intersects with the built environment.

1.1.1 Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Just because one knows where a flood occurs does not mean they know the **risk** of flooding. The most common method for determining flood risk, also referred to as vulnerability, is to identify the probability of flooding and the consequences of flooding. In other words:

- **Flood Risk = Probability x Consequences**; where
- **Probability** = the likelihood of occurrence
- **Consequences** = the estimated impacts associated with the occurrence

The probability of a flood is the likelihood that a flood will occur. The probability of flooding can change based on physical, environmental, and/or contributing engineering factors. Factors affecting the probability that a flood will impact an area range from changing weather patterns to the existence of mitigation projects. The ability to assess the probability of a flood and the level of accuracy for that assessment are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the water body in question.

The consequences of a flood are the estimated impacts associated with the flood occurrence. Consequences relate to humans' activities within an area and how a flood impacts the natural and built environments.

Which picture below shows more flood risk?

Even if you assume that the flood in both pictures was the same probability—let's say a 10-percent-annual-chance flood—the consequences in terms of property damage and potential injury as a result of the flood in the bottom picture are much more severe. Therefore, the flood risk in the area shown in the bottom picture is higher.

1.1.2 Flood Risk Products

Through Risk MAP, FEMA provides communities with updated Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) Reports that focus on the probability of floods and that show where flooding may occur as well as the calculated 1-percent-annual-chance flood elevation. The 1-percent-annual-chance flood, also known as the base flood, has a 1% chance of being equaled or exceeded in any given year. FEMA understands that flood risk is dynamic—that flooding does not stop at a line on a map—and as such, provides the following flood risk products:

Whether or not an area might flood is one consideration. The extent to which it might flood adds a necessary dimension to that understanding.

- **Flood Risk Report (FRR)**: The FRR presents key risk analysis data for the Flood Risk Project.
- **Flood Risk Map (FRM)**: Like the example found in Section 3.1 of this document, the FRM shows a variety of flood risk information in the project area. More information about the data shown on the FRM may be found in Section 2 of this report.
- **Flood Risk Database (FRD)**: The FRD is in Geographic Information System (GIS) format and houses the flood risk data developed during the course of the flood risk analysis that can be used and updated by the community. After the Flood Risk Project is complete, this data can be used in many ways to visualize and communicate flood risk within the Flood Risk Project.

These Flood Risk Products provide flood risk information at both the Flood Risk Project level and community level (for those portions of each community within the Flood Risk Project). They demonstrate how decisions made within a Flood Risk Project can impact properties downstream, upstream, or both. Community-level information is particularly useful for mitigation planning and emergency management activities, which often occur at a local jurisdiction level.

1.2 Uses of this Report

The goal of this report is to help inform and enable communities and tribes to take action to reduce flood risk. Possible users of this report include:

Vulnerability of infrastructure is another important consideration.

- Local elected officials
- Floodplain managers
- Community planners
- Emergency managers
- Public works officials
- Other special interests (e.g., watershed conservation groups, environmental awareness organizations, etc.)

State, local, and tribal officials can use the summary information provided in this report, in conjunction with the data in the FRD, to:

- **Update local hazard mitigation plans.** As required by the 2000 Federal Stafford Act, local hazard mitigation plans must be updated at least every five (5) years. Summary information presented in Section 3 of this report and the FRM can be used to identify areas that may need additional focus when updating the risk assessment section of a local hazard mitigation plan. Information found in Section 4 pertains to the different mitigation techniques and programs and can be used to inform decisions related to the mitigation strategy of local plans.
- **Update community comprehensive plans.** Planners can use flood risk information in the development and/or update of comprehensive plans, future land use maps, and zoning regulations. For example, zoning codes may be changed to better provide for appropriate land uses in high-hazard areas.
- **Update emergency operations and response plans.** Emergency managers can identify low-risk areas for potential evacuation and sheltering and can help first responders avoid areas of high-depth flood water. Risk assessment results may reveal vulnerable areas, facilities, and infrastructure for which planning for continuity of operations plans (COOP), continuity of government (COG) plans, and emergency operations plans (EOP) would be essential.

Flooding along the Wabash River in Clark County, Illinois, contributed to a federal disaster declaration on June 24, 2008.

- **Develop hazard mitigation projects.** Local officials (e.g., planners and public works officials) can use flood risk information to re-evaluate and prioritize mitigation actions in local hazard mitigation plans.
- **Communicate flood risk.** Local officials can use the information in this report to communicate with property owners, business owners, and other citizens about flood risks, changes since the last FIRM, and areas of mitigation interest. The report layout allows community information to be extracted in a fact sheet format.
- **Inform the modification of development standards.** Floodplain managers, planners, and public works officials can use information in this report to support the adjustment of development standards for certain locations. For example, heavily developed areas tend to increase floodwater runoff because paved surfaces cannot absorb water, indicating a need to adopt or revise standards that provide for appropriate stormwater retention.

The Flood Risk Database, Flood Risk Map, and Flood Risk Report are “non-regulatory” products. They are available and intended for community use but are neither mandatory nor tied to the regulatory development and insurance requirements of the National Flood Insurance Program (NFIP). They may be used as regulatory products by communities if authorized by state and local enabling authorities.

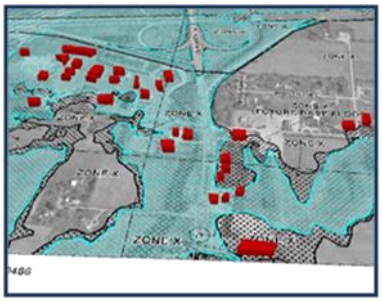
1.3 Sources of Flood Risk Assessment Data Used

To assess potential community losses, or the consequences portion of the "risk" equation, the following data is typically collected for analysis and inclusion in a Flood Risk Project:

- Information about local assets or resources at risk of flooding
- Information about the physical features and human activities that contribute to that risk
- Information about where the risk is most severe

For most Flood Risk Projects, FEMA uses the following sources of flood risk information to develop this report:

- Hazus-estimated flood loss information
- Total Exposure in Floodplain (TEIF)
- New engineering analyses (e.g., coastal, hydrologic, and/or hydraulic modeling) to develop new flood boundaries
- Locally supplied data (see Section 7 for a description)
- Sources identified during the Discovery process



FEMA data can be leveraged to identify and measure vulnerability by including local building information (i.e. building type). The examples above show various ways to display flooding intersecting with buildings.

1.4 Related Resources

For a more comprehensive picture of flood risk, FEMA recommends that state and local officials use the information provided in this report in conjunction with other sources of flood risk data, such as those listed below.

- **FIRMs and FIS Reports.** This information indicates areas with specific flood hazards by identifying the limit and extent of the 1-percent-annual-chance floodplain and the 0.2-percent-annual-chance floodplain. FIRMs and FIS Reports do not identify all floodplains in a Flood Risk Project. The FIS Report includes summary information regarding other frequencies of flooding, as well as flood profiles for riverine sources of flooding. In rural areas and areas for which flood hazard data are not available, the 1-percent-annual-chance floodplain may not be identified. In addition, the 1-percent-annual-chance floodplain may not be identified for flooding sources with very small drainage areas (less than 1 square mile).
- **Total Exposure in Floodplain (TEIF) Loss Estimation Database.** This tool ranks each community in the project area by its total potential economic losses in the special flood hazard area, and geospatially associates those losses, aggregated to each Census block. The economic losses are estimates, derived from national level datasets – 2010

Census and Americal Community Survey (ACS) data applying 2012 RS Means valuations -- and should be used for relative comparison of potential losses and risk. The National Flood Hazard Layer that was used to develop TEIF was extracted in May 2013. This tool can help to identify areas and populations of highest risk, prioritize hazard mitigation projects and inform resource allocation for pre-disaster planning (FEMA, 2013).

- **Hazus Flood Loss Estimation Reports.** Hazus can be used to generate reports, maps and tables on potential flood damage that can occur based on new/proposed mitigation projects or future development patterns and practices. Hazus can also run specialized risk assessments, such as what happens when a dam or levee fails. Flood risk assessment tools are available through other agencies as well, including the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE). Other existing watershed reports may have a different focus, such as water quality, but may also contain flood risk and risk assessment information. See Section 6 for additional resources.
- **Flood or multi-hazard mitigation plans.** Local hazard mitigation plans include risk assessments that contain flood risk information and mitigation strategies that identify community priorities and actions to reduce flood risk. This report was informed by any existing mitigation plans in the Flood Risk Project.
- **FEMA Map Service Center (MSC).** The MSC has useful information, including fly sheets, phone numbers, data, etc. Letters of Map Change are also available through the MSC. The user can view FIRM databases and the National Flood Hazard Layer (NFHL) Database.

2 Flood Risk Analysis

2.1 Overview

Flood hazard identification uses FIRMs, and FIS Reports identify where flooding can occur along with the probability and depth of that flooding. Flood risk assessment is the systematic approach to identifying how flooding impacts the environment. In hazard mitigation planning, flood risk assessments serve as the basis for mitigation strategies and actions by defining the hazard and enabling informed decision making. Fully assessing flood risk requires the following:

- Identifying the flooding source and determining the flood hazard occurrence probability
- Developing a complete profile of the flood hazard including historical occurrence and previous impacts
- Inventorying assets located in the identified flood hazard area
- Estimating potential future flood losses caused by exposure to the flood hazard area

Flooding impacts non-populated areas too, such as agricultural lands and wildlife habitats.

Flood risk analyses are different methods used in flood risk assessment to help quantify and communicate flood risk. Flood risk analysis can be performed on a large scale (state, community) level and on a very small scale (parcel, census block). Advantages of large-scale flood risk analysis, especially at the watershed level, include identifying how actions and development in one community can affect areas up- and downstream. On the parcel or census block level, flood risk analysis can provide actionable data to individual property owners so they can take appropriate mitigation steps.

2.2 Analysis of Risk

The FRR, FRM, and FRD contain a variety of flood risk analysis information and data to help describe and visualize flood risk within the project area. Depending on the scope of the Flood Risk Project for this project area, this information may include some or all of the following elements:

- Changes Since Last FIRM
- Flood Depth and Analysis Grids
- Flood Risk Assessments

State and Local Hazard Mitigation Plans are required to have a comprehensive all-hazard risk assessment. The flood risk analyses in the FRR, FRM, and FRD can inform the flood hazard portion of a community's or state's risk assessment. Further, data in the FRD can be used to develop information that meets the requirements for risk assessments as it relates to the hazard of flood in hazard mitigation plans.

- Areas of Mitigation Interest

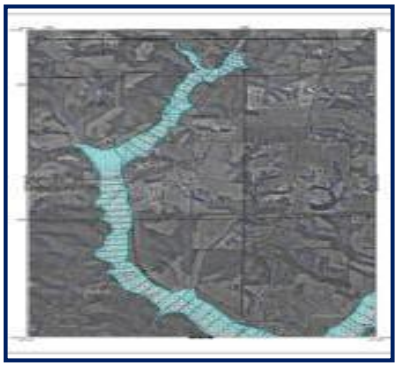
2.2.1 Changes Since Last FIRM

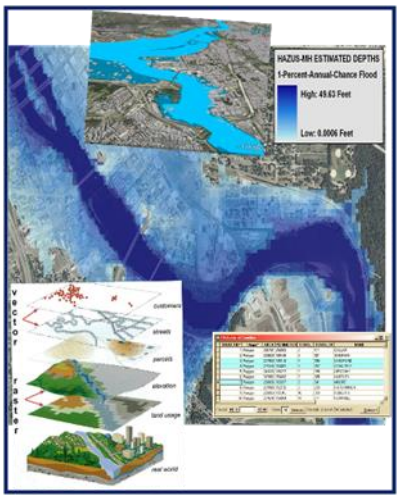
The Changes Since Last FIRM (CSLF) dataset, stored in the FRD and shown in Section 3 of this report, illustrates where changes to flood risk may have occurred since the last FIRM was published for the subject area. Communities can use this information to update their mitigation plans, specifically quantifying "what is at risk" and identifying possible mitigation activities.

The CSLF dataset identifies changes in the Special Flood Hazard Area (SFHA) and floodway boundary changes since the previous FIRM was developed. These datasets quantify land area increases and decreases to the SFHA and floodway, as well as areas where the flood zone designation has changed (e.g., Zone A to AE, AE to VE, shaded Zone X protected by levee to Zone AE for de-accredited levees).

The CSLF dataset is created in areas that were previously mapped using digital FIRMs. The CSLF dataset for this project area includes:

- **Floodplain and/or Floodway Boundary Changes**: Any changes to the existing floodplain or floodway boundaries are depicted in this dataset
- **Floodplain Designation Changes**: This includes changed floodplain designations (e.g., Zone A to Zone AE).





Floodplain maps have evolved considerably from the older paper-based FIRMs to the latest digital products and datasets.

CSLF data can be used to communicate changes in the physical flood hazard area (size, location) as part of the release of new FIRMs. It can also be used in the development or update of hazard mitigation plans to describe changes in hazard as part of the hazard profile.

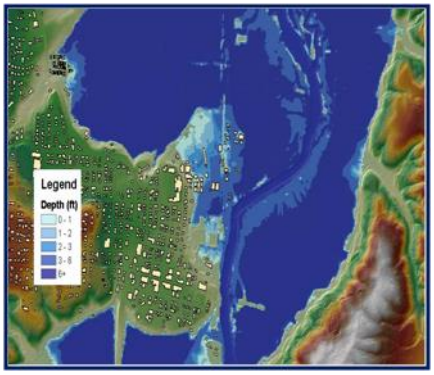
CSLF data is shown in the FRR, and underlying data is stored in the FRD.

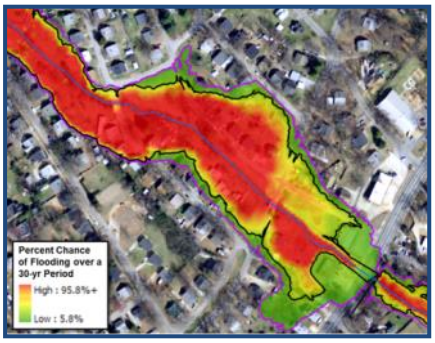
2.2.2 Flood Depth and Analysis Grids

Grids are FEMA datasets provided in the FRD to better describe the risk of the flood hazard. Much like the pixels in a photo or graphic, a grid is made up of square cells, where each grid cell stores a value representing a particular flood characteristic (elevation, depth, velocity, etc.) While the FIRM and FIS Report describe "what" is at risk by identifying the hazard areas, water surface, flood depth, and other analysis grids can help define "how bad" the risk is within those identified areas. These grids are intended to be used by communities for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The Flood Depth and Analysis Grids provide an alternative way to visualize how a particular flood characteristic (depth, velocity, etc.) vary within the floodplain. Since they are derived from the engineering modeling results, they are typically associated with a particular frequency-based flooding event (e.g., 1-percent-annual-chance event). Grids provided in the FRD for this project area include the following:

- **Water Surface Elevation Grids (for the calculated flood frequencies included in the FIS Report):** This dataset represents the flood elevations calculated for each modeled flood frequency.
- **Flood Depth Grids (for the calculated flood frequencies included in the FIS Report):** Flood Depth Grids are created for each flood frequency calculated during the course of a Flood Risk Project. These grids communicate flood depth as a function of the difference between the calculated water surface elevation and the ground. Five grids will normally be delivered for riverine areas for the standard flood frequencies (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance).

  Coastal flood depth grids are created for areas where the dominant wave hazard is overland wave propagation. The grid depicts the difference in elevation between the wave crest elevation, or BFE, and the ground. Coastal areas will typically only receive a depth grid for the 1-percent-annual-chance (base) flood for which overland wave propagation results are produced as a part of the FIS; however, approximate methods may be used to estimate wave crest elevations for other flood frequencies, if desired.





Grid data can make flood mapping more informative. The top image is a flood depth grid showing relative depths of water in a scenario flood event. The bottom image is a percent annual chance of flooding grid, which shows inundation areas of various frequency floods.

Grid data can be used to communicate the variability of floodplains, such as where floodplains are particularly deep or hazardous, where residual risks lie behind levees, and where losses may be great after a flood event. For mitigation planning, grid data can inform the hazard profile and vulnerability analysis (what is at risk for different frequencies) and can be used for preliminary benefit-cost analysis screening. For floodplain management, higher regulatory standards can be developed in higher hazard flood prone areas (i.e., 10-percent-annual-chance floodplains or deep floodplains).

- **Percent Annual Chance of Flooding Grid:**
  This is a grid dataset that represents the percent annual chance of flooding for locations along a flooding source. This grid uses the five standard flood frequencies.

- **Percent 30-Year Chance of Flooding Grid:** This is a grid dataset that represents the estimated likelihood of flooding at least once within a 30-year period, which is the average lifespan for a home mortgage, for all locations within the extent of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplain.

2.2.3 Flood Risk Assessments

Flood risk assessment results reported in the FRR were developed using Total Exposure in Floodplain (TEIF), a loss estimation tool that was developed at FEMA Region III using ArcGIS and Microsoft Excel. TEIF provides an approximate value of total exposure -- total potential economic losses -- in the Special Flood Hazard Areas (SFHAs). The economic losses are estimates, derived from national level datasets -- 2010 Census and ACS data applying 2012 RS Means valuations -- and should be used for relative comparison of potential losses and risk. The National Flood Hazard Layer that was used to develop TEIF was extracted in May 2013. TEIF allows the user to develop a relative comparison of potential flood loss among all levels of the census geographies.)

Hazus (www.fema.gov/hazus) is a nationally-applicable and standardized risk assessment tool that estimates potential losses from earthquakes, floods, and hurricanes. It uses GIS technology to estimate physical, economic, and social impacts of disasters. Files from the FRD can be imported into Hazus to develop other risk assessment information including:

Hazus is a loss estimation methodology developed by FEMA for flood, wind, and earthquake hazards. The methodology and data established by Hazus can also be used to study other hazards.

- Debris generated after a flood event
- Dollar loss of the agricultural products in a study region
- Utility system damages in the region
- Vehicle loss in the study region
- Damages and functionality of lifelines such as highway and rail bridges, potable water, and wastewater facilities

Some benefits of using TEIF or Hazus include the following:

- Help individuals and communities graphically visualize the areas where flood risk is highest.

- Outputs that can enhance state and local mitigation plans and help screen for cost-effectiveness in FEMA mitigation grant programs

- Analysis refinement through updating inventory data and integrating data produced using other flood models
- Widely available support documents and networks (Hazus Users Groups)

HAZUS Flood Loss Estimates:

HAZUS loss estimates should be used to understand relative risk from flood and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics, or economic parameters). Flood loss estimates can include the following:

- **Residential Asset Loss**: These include direct building losses (estimated costs to repair or replace the damage caused to the building) for all classes of residential structures including single family, multi-family, manufactured housing, group housing, and nursing homes. This value also includes content losses.
- **Commercial Asset Loss**: These include direct building losses for all classes of commercial buildings including retail, wholesale, repair, professional services, banks, hospitals, entertainment, and parking facilities. This value also includes content and inventory losses.
- **Other Asset Loss**: This includes losses for facilities categorized as industrial, agricultural, religious, government, and educational. This value also includes content and inventory losses.
- **Business Disruption**: This includes the losses associated with the inability to operate a business due to the damage sustained during the flood. Losses include inventory, income, rental income, wage, and direct output losses, as well as relocation costs.
- **Annualized Losses**: Annualized losses are calculated using Hazus by taking losses from multiple events over different frequencies and expressing the long-term average by year. This factors in historic patterns of frequent smaller floods with infrequent but larger events to provide a balanced presentation of flood damage.
- **Loss Ratio:** The loss ratio expresses the scenario losses divided by the total building value for a local jurisdiction and can be a gage to determine overall community resilience as a result of a scenario event. For example, a loss ratio of 5 percent for a given scenario would indicate that a local jurisdiction would be more resilient and recover more easily from a given event, versus a loss ratio of 75 percent which would indicate widespread losses. An annualized loss ratio uses the annualized loss data as a basis for computing the ratio. Loss ratios are not computed for business disruption.

2.2.4 Dam Inundation Areas

Dam inundation areas for failed dams within the watershed were obtained from the National Resource Conservation Service, West Virginia Office. This included inundation areas affected by the 12 dams listed in the table below. These inundation areas were overlaid on existing topography to estimate

water surface elevations. A separate individual level inundation maps were developed for each of the 12 dams. Depth grids for the inundation areas were generated based on these elevations.

Dam Name	NIDID	Flooding Source	Latitude	Longitude
Upper Buffalo #2	WV04910	Buffalo Creek	39.5177	-80.4096
Upper Buffalo #4	WV04927	Owen Davy Fork	39.5160	-80.4536
Upper Buffalo #16	WV04928	Dents Run	39.5453	-80.3886
Upper Buffalo #22	WV04919	Big Run	39.6022	-80.3838
Upper Buffalo #33A	WV04934	Flat run	39.5946	-80.3331
Upper Buffalo #37A	WV04931	Whetstone Run	39.5162	-80.3708
Upper Buffalo #39	WV04911	Llewellyn Run	39.5691	-80.3247
Upper Deckers Creek #1	WV07706	Deckers Creek	39.5025	-79.8400
Upper Deckers Creek #2	WV07707	Laurel Run	39.5292	-79.8251
Upper Deckers Creek #4	WV07709	Billan Creek	39.5295	-79.7785
Upper Deckers Creek #5	WV07710	Kanes Creek	39.5004	-79.7772
Upper Deckers Creek #6	WV07711	Deckers Creek	39.4987	-79.8088

2.2.5 Flood Stage Mapping at USGS Gages

Mapping was developed at the 11 USGS gages listed in the table below for use in the USGS Flood Inundation Mapping Program. Inundation areas were mapped at one foot intervals up to the highest flood on record at each gage. The highest flood of record for some of the gages is relatively low due to a short period of record. Therefore, mapping was complete up to the 100yr flood elevation for some of the gages. The mapping covered from 0.5 miles downstream to 0.5 miles upstream of each gage with the exception of gages that are located just upstream and or downstream of lock and dams. The mapping covered only either upstream or downstream 0.5 miles depending on which side of the lock and dam the gage was located.

Station Name	USGS Station ID	Latitude	Longitude
WHETSTONE RUN NEAR MANNINGTON, WV	03061430	39.5175	-80.371389
BUFFALO CREEK AT BARRACKVILLE, WV	03061500	39.503889	-80.172222
MONONGAHELA R AT OPEKISKA LOCK & DAM (UPPER), WV	03062224	39.563889	-80.051389
MONONGAHELA R AT OPEKISKA LOCK & DAM (LOWER), WV	03062225	39.564444	-80.050833
MONONGAHELA R AT HILDEBRAND LOCK & DAM (UPPER), WV	03062245	39.581667	-80.009722
MONONGAHELA R AT HILDEBRAND LOCK & DAM (LOWER), WV	03062250	39.582778	-80.010278
MONONGAHELA R AT MORGANTOWN LOCK & DAM (UPPER), WV	03062445	39.619722	-79.969722
MONONGAHELA R AT MORGANTOWN LOCK & DAM (LOWER), WV	03062450	39.62	-79.969167
DECKERS CREEK AT MORGANTOWN, WV	03062500	39.629167	-79.952778
MONONGAHELA RIVER AT LOCK & DAM 8(UPPER POOL), AT POINT MARION, PA	03062998	39.728333	-79.911111
MONONGAHELA RIVER AT LOCK & DAM 8(LOWER POOL), AT POINT MARION, PA	03063000	39.726944	-79.911667

2.2.6 Areas of Mitigation Interest

Areas of Mitigation Interest are not provided in this project.

3 Flood Risk Analysis Results

The following pages provide summary flood risk results for the Flood Risk Project as follows:

The FRM provides a graphical overview of the Flood Risk Project which highlights areas of risk that should be noted, based on potential losses, exposed facilities, etc., based on data found in the FRD. Refer to the data in the FRD to conduct additional analyses.

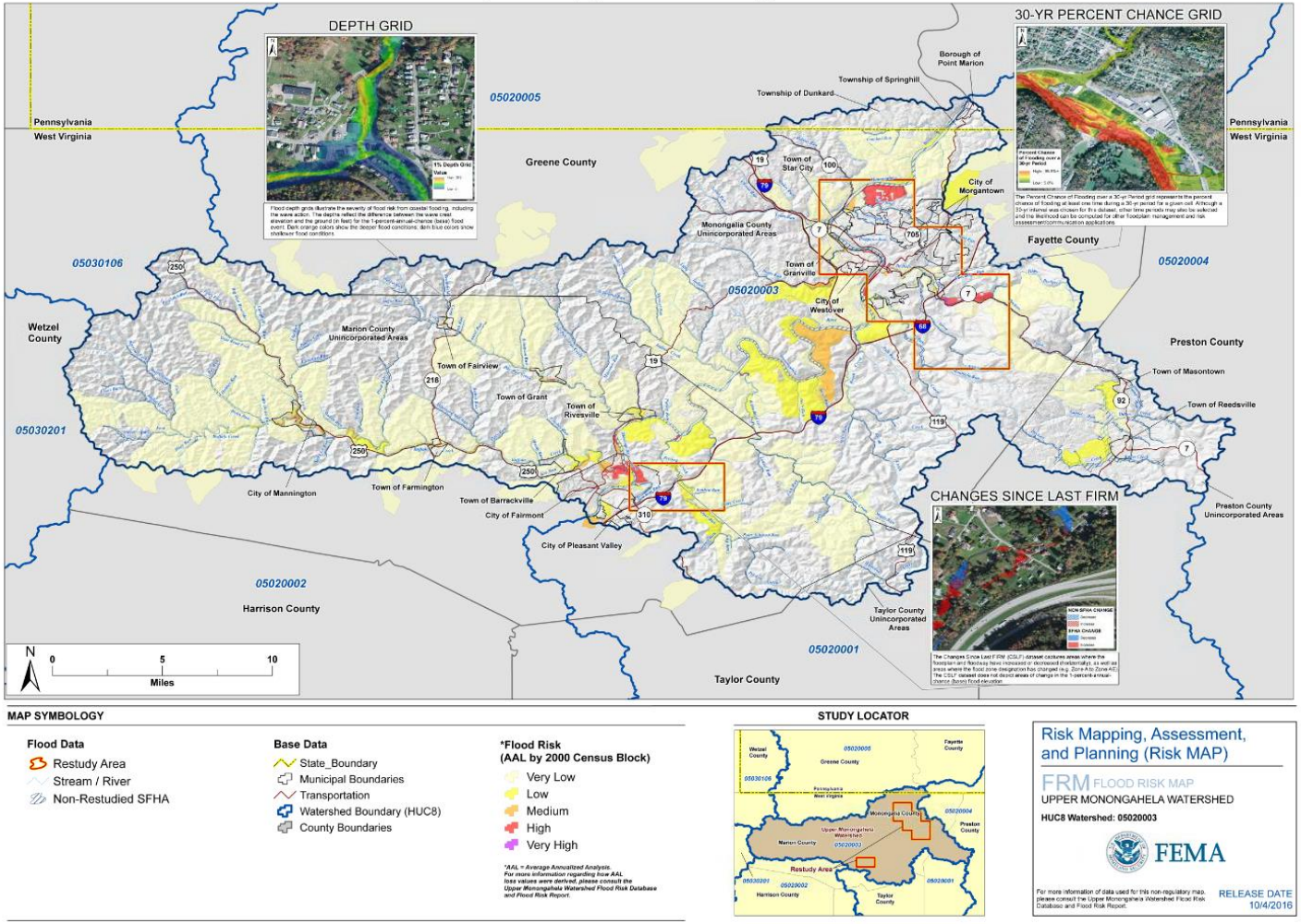
- **Flood Risk Map.** Within the Flood Risk Project the FRM displays base data reflecting community boundaries, major roads, and stream lines; potential losses that include the Total Exposure in Floodplain (TEIF) flood risk identification. This map promotes access and usage of additional data available through the FRD, FIRM, the National Flood Hazard Layer and viewers (desktop or FEMA website, etc.). This information can be used to assist in Flood Risk Project-level planning as well as for developing mitigation actions within each jurisdiction located within the Flood Risk Project.

- **Flood Risk Project Summary.** Within the Flood Risk Project area, summary data for some or all of the following datasets are provided for the entire project area and also on a jurisdiction by jurisdiction basis:
    - **Changes Since Last FIRM.** This is a summary of where the floodplain and flood zones have increased or decreased (only analyzed for areas that were previously mapped using digital FIRMs).
    - **Flood Depth and Analysis Grids.** A general discussion of the data provided in the FRD, including analysis grids if furnished as part of the project.
    - **Flood Risk Assessments.** A loss estimation of potential flood damages using different flood scenarios.
        - TEIF 1.0: An analysis of the total potential economic losses in the special flood hazard area.
        - FEMA Average Annualized Loss (AAL) Study: A national level flood analysis to compare losses from the regulatory 1% annual chance flood event at the State and Local level, published in 2010. The AAL grossly underestimates flood losses due to the low resolution of the inputs; therefore, this analysis is not sufficient for the comparison of losses below the municipal level.

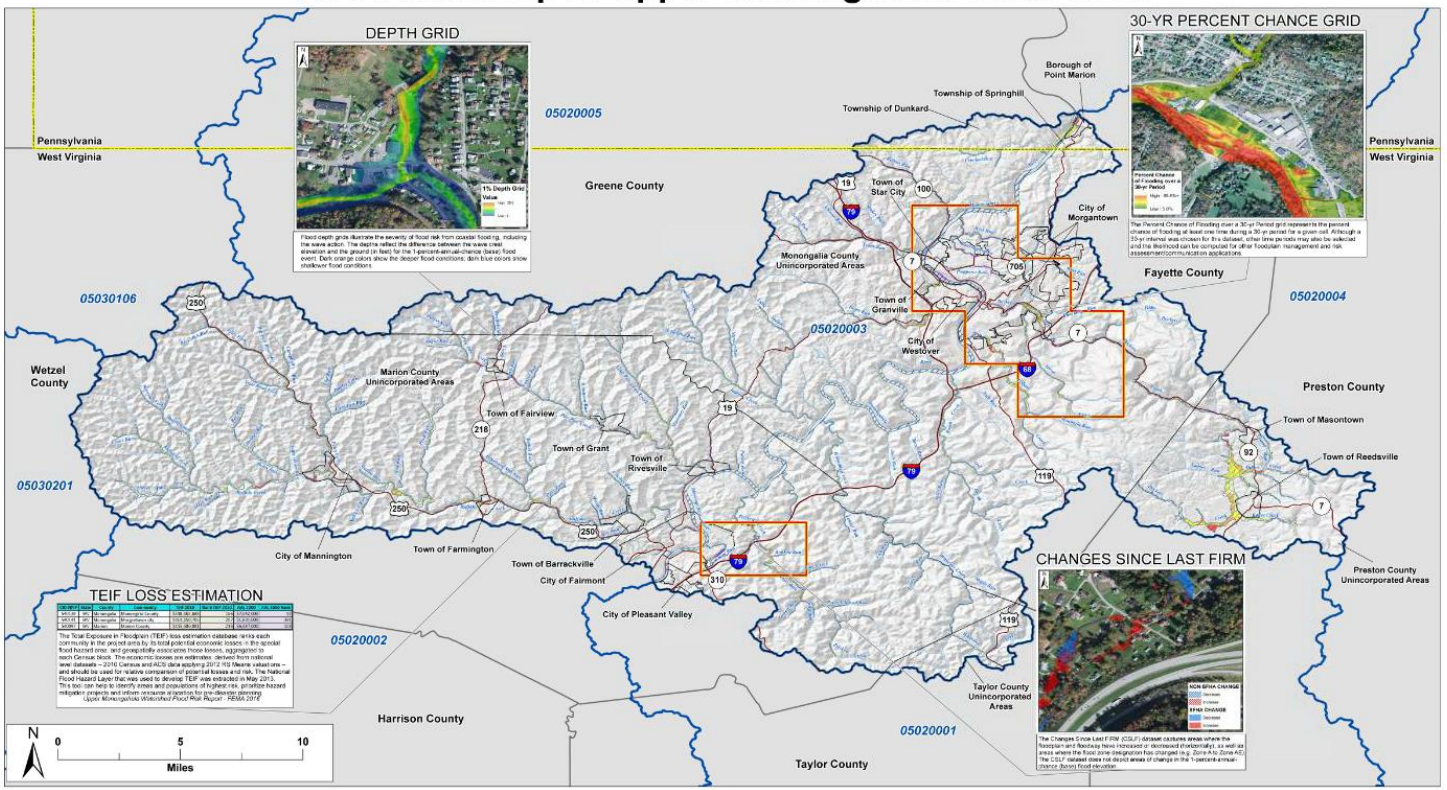
3.1 Flood Risk Map

The Flood Risk Map for this Flood Risk Project is shown below. In addition to this reduced version of the map, a full size version is available within the FRD. Map 1 displays AAL data, Map 2 displays TEIF data and Map 3 displays Refined loss data.

Flood Risk Map 1: Upper Monongahela Watershed



Flood Risk Map 2: Upper Monongahela Watershed



MAP SYMBOLOGY

Flood Data
- Restudy Area
- Stream / River
- Non-Restudied SFHA

[1]Base Data
- State_Boundary
- Municipal Boundaries
- Transportation
- Watershed Boundary (HUC8)
- County Boundaries

[2]Flood Risk (TEIF by Census Block)
- Very Low
- Low
- Medium
- High
- Very High

[1] *Please note that the TEIF flood risk results are displayed for all flood hazard areas within Upper Monongahela Watershed. However, new flood hazard areas were developed only for areas influenced by coastal surge.*

[2] *TEIF = Total Exposure in Floodplain. For more information regarding how TEIF loss values were derived, please consult the Upper Monongahela Watershed Flood Risk Database and Flood Risk Report.*

STUDY LOCATOR

Risk Mapping, Assessment, and Planning (Risk MAP)

FRM FLOOD RISK MAP

UPPER MONONGAHELA WATERSHED

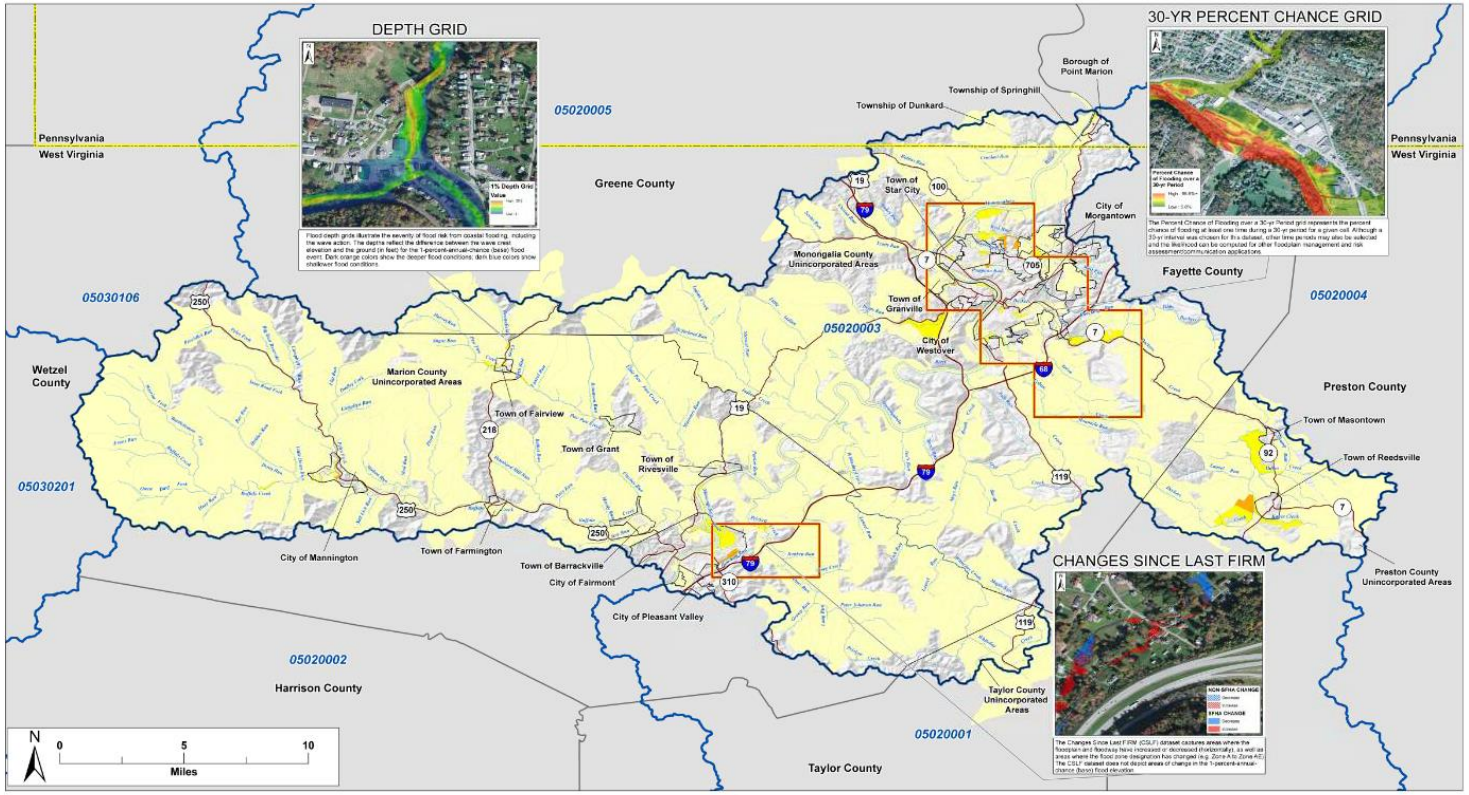
HUC8 Watershed: 05020003

FEMA

For more information of data used for this non-regulatory map, please consult the Upper Monongahela Watershed Flood Risk Database and Flood Risk Report.

RELEASE DATE 10/4/2016

Flood Risk Map 3: Upper Monongahela Watershed



MAP SYMBOLOGY

Flood Data
- Restudy Area
- Stream / River
- Non-Restudied SFHA

Base Data
- State_Boundary
- Municipal Boundaries
- Transportation
- Watershed Boundary (HUC8)

***Flood Risk (Hazus Loss by Census Block)**
- Very Low
- Low
- Medium
- High
- Very High

*For more information regarding how Hazus loss values were derived, please consult the Upper Monongahela Watershed Flood Risk Database and Flood Risk Report.

STUDY LOCATOR

Risk Mapping, Assessment, and Planning (Risk MAP)

FRM FLOOD RISK MAP

UPPER MONONGAHELA WATERSHED

HUC8 Watershed: 05020003

FEMA

For more information of data used for this non-regulatory map, please consult the Upper Monongahela Watershed Flood Risk Database and Flood Risk Report.

RELEASE DATE 10/04/2016

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3.2 Upper Monongahela Watershed, WV Flood Risk Project Area Summary

The Upper Monongahela Watershed covers an area of 7,340 square miles, including portions of southwest Pennsylvania and northern West Virginia. The Watershed flows through the coalfields and mountains in Marion, Monongalia, Preston, Taylor, and Wetzel Counties in West Virginia and into Fayette and Greene Counties of western Pennsylvania. The Monongahela River is a 130-mile-long river on the Allegheny Plateau. It is formed by the confluence of the West Fork River and its "East Fork"— the Tygart Valley River—at Fairmont, WV, and then flows north and joins the Allegheny River to form the Ohio River in Pittsburgh, PA.
The other major river in the watershed is the Cheat River, the largest tributary of the Upper Monongahela River. The Cheat is formed at Parsons, WV, by the confluence of Shavers Fork and Black Fork. The Cheat River flows generally northward through Tucker and Preston Counties, before joining the Monongahela River at Point Marion, PA.

3.2.1 Overview

Upper Monongahela Watershed, WV, located in Pennsylvania, West Virginia, includes the following communities:

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Barrackville	540098	1,302	41	0.7	100	Y	10	Y
Township Of Dunkard	422431	2,372	2	32.1	19	Y	10	Y
City of Fairmont	540099	18,704	9	7.9	74	Y	10	Y
Town of Fairview	540100	408	49	0.3	100	Y	10	Y
Town of Farmington	540101	375	33	0.3	100	Y	10	Y
Town of Grant Town	540102	613	34	0.5	100	Y	10	Y
Town of Granville	540272	781	72	1.3	100	Y	10	Y
City of Mannington	540103	2,063	54	1.1	100	Y	10	Y
Town of Masontown	540270	546	4	0.3	100	Y	10	Y
City of Morgantown	540141	29,660	12	10.1	100	Y	10	Y

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
City of Pleasant Valley	540292	3,149	8	3.6	20	Y	10	Y
Borough of Point Marion	421617	1,159	26	0.4	79	Y	10	Y
Town of Reedsville	540269	593	16	0.6	100	Y	10	Y
Town of Rivesville	540105	934	22	0.5	100	Y	10	Y
Township of Springhill	421639	2,907	<1	31.7	3	Y	10	Y
Town of Star City	540273	1,825	10	0.5	100	Y	10	Y
City of Westover	540274	3,983	6	1.3	100	Y	10	Y
Marion County Unincorporated Areas	540097	56,925	19	294.6	71	Y	10	Y
Monongalia County Unincorporated Areas	540139	96,189	18	339.6	55	Y	10	Y
Preston County Unincorporated Areas	540160	33,520	9	643.6	4	Y	10	Y
Taylor County Unincorporated Areas	540188	16,895	2	338.6	2	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

Community-specific results are provided on subsequent pages. Data provided below and on subsequent pages only includes areas located within the Upper Monongahela Watershed, WV Flood Risk Project and do not necessarily represent community-wide totals.

- Participating in the Richmond-Crater Multi-Regional Hazard Mitigation Plan dated November 2011.

- Past Federal Disaster Declarations for flooding = 2
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 103 policies totaling approximately $25,928,300
- NFIP-recognized repetitive loss properties = 3
- NFIP-recognized severe repetitive loss properties = 1

Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.2.2. Flood Risk Datasets

As a part of this Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for this Flood Risk Project below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for Upper Monongahela Watershed, WV is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the watershed.

Area of Interest	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Area within SFHA*	9.5	0.3	-0.9	1.1
Area within Floodway*	4.7	0.3	-11.2	11.0

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Upper Monongahela Watershed, WV, the figures in this table only represent information within the area of updated engineering analysis that is within the Upper Monongahela Watershed, WV.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

  - Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. Specific areas within each jurisdiction are detailed within the individual community summaries.

- **Flood Depth Grids**
  - The FRD contains datasets in the form of depth grids for the entire Flood Risk Project that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and

implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation. Section 2 of the FRR provides general information regarding the development of and potential uses for this data.

- **Flood Risk Results**
  - The Upper Monongahela Watershed flood risk analysis incorporates results from the Total Exposure in Floodplain (TEIF) loss estimation tool shown in the table below. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Upper Monongahela Watershed risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted.
- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Upper Monongahela Watershed*:* Comparison of Estimated Potential Losses for Structures in the SFHA.

The table below compares the potential economic losses for TEIF and the AAL for the Upper Monongahela Watershed.

	Project Area Information			Total	TEIF			AAL*	
CID-NFIP	State	County	Community	Estimated Value[1,2]	Dollar Losses[1]	TEIF Rank[4]	Loss Ratio[3]	Dollar Losses[1]	AAL Rank[5]
540098	WV	Marion County	Town of Barrackville	$64,880,000	$8,170,000	180	13%	$90,000	213
422431	PA	Greene County	Township of Dunkard	$67,410,000	$11,510,000	1305	17%	$260,000	825
540099	WV	Marion County	City of Fairmont	$308,250,000	$40,990,000	95	13%	$2,920,000	73
540100	WV	Marion County	Town of Fairview	$19,980,000	$5,070,000	204	25%	$380,000	168
540101	WV	Marion County	Town of Farmington	$17,070,000	6,690,000	192	39%	$360,000	170
540102	WV	Marion County	Town of Grant Town	$23,520,000	$8,150,000	181	35%	$560,000	155
540272	WV	Monongalia County	Town of Granville	$50,390,000	$7,810,000	184	15%	$280,000	179
540103	WV	Marion County	City of Mannington	$113,170,000	$39,010,000	97	34%	$4490,000	54
540097	WV	Marion County	Marion County Unincorporated Areas	$1,755,390,000	$155,580,000	36	9%	$6,690,000	33
540270	WV	Preston County	Town of Masontown	$1,530,000	$30,000	274	2%	$0	243
540139	WV	Monongalia County	Monongalia County Unincorporated Areas	$2,439,050,000	$198,100,000	26	8%	$7,040,000	29

540141	WV	Monongalia County	City of Morgantown	$772,030,000	$161,150,000	32	20%	$1830,000	106
540292	WV	Marion County	City of Pleasant Valley	$ 139,760,000	$8,750,000	173	6%	$1460,000	119
421617	PA	Fayette County	Borough of Point Marion	$ 34,450,000	$16,060,000	1045	47%	$260,000	817
540160	WV	Preston County	Preston County Unincorporated Areas	$ 1,028,850,000	$103,380,000	51	10%	$2,490,000	80
540269	WV	Preston County	Town of Reedsville	$ 9,330,000	$770,000	267	8%	$0	243
540105	WV	Marion County	Town of Rivesville	$ 19,600,000	$3,980,000	220	20%	$860,000	142
421639	PA	Fayette County	Township of Springhill	$ 73,680,000	$8,760,000	1511	12%	$80,000	1348
540273	WV	Monongalia County	Town of Star City	$ 26,750,000	$3,920,000	222	15%	$10,000	237
540188	WV	Taylor County	Taylor County Unincorporated Areas	$ 505,520,000	$43,600,000	94	9%	$1,410,000	120
540274	WV	Monongalia County	City of Westover	$ 45,610,000	$10,600,000	161	23%	$420,000	162

Source: TEIF and AAL results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000.
[2]Estimated Value = Asset Replacement Value of all buildings for the community within the extent of the countywide floodplains.
[3]Loss ratio = Dollar Losses / Estimated Value. Loss Ratios reflect community TEIF values and are rounded to the nearest integer percent.
[4]TEIF Rank = TEIF Rank within state of West Virginia or Pennsylvania as compared to other communities.
[5]AAL Rank = AAL Rank within state of West Virginia or Pennsylvania as compared to other communities.

**The AAL indicates the estimated economic loss value to property in any single year. It is generated by calculating losses for the 0.2%, 1%, 2%, 5% and 10% annual chance flood events and creating an average of those values. However, in many communities, the AAL inaccurately reports economic losses, and therefore should be used only to compare potential losses between states and counties. TEIF aims to address these inaccuracies by providing a total potential economic loss value to property, for all communities with development within the special flood hazard area. The total economic loss value can be used to understand the degree of risk in each community relative to others.*

Upper Monongahela Watershed: Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$14,699,000,000	69%	$80,820,000	1%	$96,730,000	1%	$105,230,000	1%	$125,100,000	1%	$8,890,000	<1%
Commercial Building/Contents	$4,364,000,000	21%	$35,230,000	1%	$41,560,000	1%	$47,280,000	1%	$56,790,000	1%	$3,990,000	<1%
Other Building/Contents	$2,114,300,000	10%	$29,770,000	1%	$35,680,000	1%	$38,110,000	2%	$45,340,000	2%	$3,300,000	<1%
Total Building/Contents[3]	$21,177,300,000	100%	$145,200,000	1%	$173,900,000	1%	$190,200,000	1%	$227,300,000	1%	$16,400,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A	$5,400,000	N/A	$6,000,000	N/A	$6,400,000	N/A	$200,000	N/A
TOTAL[5]	$21,177,300,000	N/A	$149,800,000	1%	$179,300,000	1%	$196,200,000	1%	$233,700,000	1%	$16,600,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		*1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$14,699,000,000	69%	$86,460,000	<1%
Commercial Building/Contents	$4,364,000,000	21%	$65,040,000	1%
Other Building/Contents	$2,114,300,000	10%	$56,740,000	3%
Total Building/Contents[3]	**$21,177,300,000**	**100%**	$208,170,000	<1%
Business Disruption[4]	N/A	N/A	$6,400,000	N/A
TOTAL[5]	**$ 21,177,300,000**	**N/A**	$214,570,000	1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3 Communities

The following sections provide an overview of the community's floodplain management program as of the date of this publication, as well as summarize the flood risk analysis performed for each project area in Upper Monongahela Watershed, WV.

3.3.1 Town of Barrackville Summary (CID 540098)

The following pages include Flood Risk data for the Town of Barrackville.

3.3.1.1. *Overview*

Barrackville is a town in Marion County, West Virginia, United States. The population was 1,302 at the 2010 census.

The information below provides an overview of the Town of Barrackville as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Barrackville	540098	1,302	41	0.7	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 8 policies totaling approximately $684,000

Data provided below only includes areas within the Town of Barrackville, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.1.2. *Community Analyses and Results*

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
    - Changes Since Last FIRM was not performed within the boundaries of the Town of Barrackville because the community falls outside the area of updated engineering analysis.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
- **Flood Risk Results**
  - Town of Barrackville flood risk analysis uses the TEIF flood loss estimation tool***.*** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Barrackville risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Barrackville (540098): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$167,500,000	89%	$800,000	1%	$1,100,000	1%	$1,300,000	1%	$1,400,000	1%	$0	<1%
Commercial Building/Contents	$3,900,000	2%	$30,000	1%	$30,000	1%	$40,000	1%	$60,000	1%	$0	N/A
Other Building/Contents	$16,300,000	9%	$30,000	<1%	$30,000	<1%	$60,000	<1%	$50,000	<1%	$0	N/A
Total Building/Contents[3]	$187,600,000	100%	$800,000	<1%	$1,100,000	1%	$1,400,000	1%	$1,500,000	1%	$90,000	<1%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$187,600,000	N/A	$800,000	<1%	$1,100,000	1%	$1,400,000	1%	$1,500,000	1%	$90,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$167,500,000	89%	$700,000	<1%
Commercial Building/Contents	$3,900,000	2%	$40,000	1%
Other Building/Contents	$16,300,000	9%	$10,000	<1%
Total Building/Contents[3]	$187,600,000	100%	$700,000	<1%
Business Disruption[4]	N/A	N/A	$0	N/A
TOTAL[5]	$187,600,000	N/A	$700,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.2 Township Of Dunkard Summary (CID 422431)

The following pages include Flood Risk data for the Township Of Dunkard.

3.3.2.1. Overview

Dunkard Township is a township in Greene County, Pennsylvania. The township has a total area of 32.1 square miles, of which, 31.7 square miles of it is land and 0.4 square miles of it is water.

The information below provides an overview of the Township of Dunkard as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Township Of Dunkard	422431	2,372	2	32.1	19	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Fayette County Hazard Mitigation Plan , which expires on 7/1/2016.
- Past Federal Disaster Declarations for flooding = 4
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 17 policies totaling approximately $3,786,400

Data provided below only includes areas within the Township Of Dunkard, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.2.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
    - Changes Since Last FIRM was not performed within the boundaries of the Township of Dunkard because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
    - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
        - Water surface elevation grid for the 1-percent-annual-chance flood event

- Flood depth grids for the 1-percent-annual-chance flood event

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Township of Dunkard flood risk analysis uses the TEIF flood loss estimation tool. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

  - The Town of Dunkard risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Dunkard (422431): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$20,500,000	95%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Commercial Building/Contents	$800,000	4%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Other Building/Contents	$400,000	2%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	$21,700,000	100%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$21,700,000	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$20,500,000	94%	$80,000	<1%
Commercial Building/Contents	$800,000	4%	$0	<1%
Other Building/Contents	$400,000	2%	$0	<1%
Total Building/Contents[3]	$21,700,000	100%	$80,000	<1%
Business Disruption[4]	N/A	N/A	$0	N/A
TOTAL[5]	$21,700,000	N/A	$80,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.3 City of Fairmont Summary (CID 540099)

The following pages include Flood Risk data for the City of Fairmont.

3.3.3.1. Overview

Fairmont is a city in Marion County, West Virginia. The population was 18,704 at the 2010 census. It is the county seat of Marion County. The Tygart Valley River and the West Fork River join in Fairmont to form the Monongahela River. Buffalo Creek, a tributary of the Monongahela River, flows through the northern part of the city.

The information below provides an overview of the City of Fairmont as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
City of Fairmont	540099	18,704	9	7.9	74	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 14 policies totaling approximately $2,904,600

Data provided below only includes areas within the City of Fairmont, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.3.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for City of Fairmont is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.2	<0.1	<0.1	<0.1
Within Floodway	0.1	<0.1	-0.4	-0.4

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Fairmont, the figures in this table only represent information within the area of updated engineering analysis that is within the City of Fairmont.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Fairmont flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The City of Fairmont risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

City of Fairmont (540099): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$1,897,300,000	61%	$5,500,000	<1%	$6,100,000	<1%	$7,100,000	<1%	$7,700,000	<1%	$600,000	<1%
Commercial Building/Contents	$886,500,000	29%	$3,800,000	<1%	$4,000,000	1%	$7,300,000	1%	$6,600,000	1%	$400,000	<1%
Other Building/Contents	$314,700,000	10%	$4,300,000	1%	$4,700,000	2%	$5,500,000	2%	$5,600,000	2%	$500,000	<1%
Total Building/Contents[3]	$3,098,400,000	100%	$13,500,000	<1%	$14,900,000	1%	$19,900,000	1%	$19,900,000	1%	$1,500,000	<1%
Business Disruption[4]	N/A	N/A	$600,000	N/A	$600,000	N/A	$800,000	N/A	$800,000	N/A	$0	N/A
TOTAL[5]	$3,098,400,000	N/A	$14,100,000	1%	$15,500,000	1%	$20,700,000	1%	$20,700,000	1%	$1,500,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$1,897,300,000	61%	$4,700,000	<1%
Commercial Building/Contents	$886,500,000	29%	$4,700,000	1%
Other Building/Contents	$314,700,00	10%	$1,800,000	1%
Total Building/Contents[3]	$3,098,400,000	100%	$11,300,000	<1%
Business Disruption[4]	N/A	N/A	$200,000	N/A
TOTAL[5]	$3,098,400,000	N/A	$11,500,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.4 Town of Fairview Summary (CID 540100)

The following pages include Flood Risk data for the Town of Fairview.

3.3.4.1. Overview

Fairview is a town in Marion County, WV. The population was 408 at the 2010 census.

The information below provides an overview of the Town of Fairview as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Fairview	540100	408	49	0.3	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 7 policies totaling approximately $458,400

Data provided below only includes areas within the Town of Fairview, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.4.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM was not performed within the boundaries of the Town of Fairview because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes

data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
    - The Town of Fairview flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
    - The Town of Fairview risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
    - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Fairview (540100): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$46,700,000	74%	$1,800,000	4%	$2,300,000	5%	$2,300,000	5%	$2,800,000	6%	$200,000	<1%
Commercial Building/Contents	$9,700,000	15%	$700,000	7%	$900,000	9%	$900,000	9%	$900,000	9%	$80,000	1%
Other Building/Contents	$6,800,000	11%	$700,000	10%	$900,000	13%	$900,000	13%	$1,000,000	15%	$80,000	1%
Total Building/Contents[3]	$63,300,000	100%	$3,100,000	5%	$4,000,000	6%	$4,000,000	6%	$4,700,000	7%	$400,000	1%
Business Disruption[4]	N/A	N/A	$100,000	N/A	$200,000	N/A	$200,000	N/A	$100,000	N/A	$0	N/A
TOTAL[5]	$63,300,000	N/A	$3,200,000	5%	$4,200,000	6%	$4,200,000	7%	$4,800,000	8%	$400,000	1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$46,700,000	74%	$1,400,000	3%
Commercial Building/Contents	$9,700,000	15%	$600,000	6%
Other Building/Contents	$6,800,000	11%	$500,000	7%
Total Building/Contents[3]	$63,200,000	100%	$2,500,000	4%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$63,200,000	N/A	$2,500,000	4%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.5 Town of Farmington Summary (CID 540101)

The following pages include Flood Risk data for the Town of Farmington.

3.3.5.1. Overview

Farmington is a town in Marion County, WV. The population was 375 at the 2010 census.

The information below provides an overview of the Town of Farmington as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Farmington	540101	375	33	0.3	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 16 policies totaling approximately $3,113,000

Data provided below only includes areas within the Town of Farmington, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.5.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
    - Changes Since Last FIRM was not performed within the boundaries of the Town of Farmington because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
    - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
        - Water surface elevation grid for the 1-percent-annual-chance flood event
        - Flood depth grids for the 1-percent-annual-chance flood event
    - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes

data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Town of Farmington flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Farmington risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Farmington (540101): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$33,100,000	41%	$2,800,000	9%	$2,900,000	9%	$3,200,000	10%	$3,800,000	12%	$300,000	1%
Commercial Building/Contents	$24,800,000	30%	$0	N/A	$10,000	<1%	$10,000	<1%	$10,000	1%	$0	N/A
Other Building/Contents	$23,900,000	29%	$300,000	1%	$300,000	1%	$300,000	1%	$400,000	2%	$30,000	<1%
Total Building/Contents[3]	$81,800,000	100%	$3,000,000	4%	$3,200,000	4%	$3,500,000	4%	$4,300,000	5%	$300,000	<1%
Business Disruption[4]	N/A	N/A	$100,000	N/A	$100,000	N/A	$100,000	N/A	$100,000	N/A	N/A	N/A
TOTAL[5]	$81,800,000	N/A	$3,100,000	4%	$3,300,000	4%	$3,600,000	4%	$4,400,000	5%	$300,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$33,100,000	41%	$800,000	2%
Commercial Building/Contents	$24,700,000	30%	$90,000	<1%
Other Building/Contents	$23,900,000	29%	$60,000	<1%
Total Building/Contents[3]	$81,700,000	100%	$900,000	1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$81,700,000	N/A	$900,000	1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.6 Town of Grant Town Summary (CID 540102)

The following pages include Flood Risk data for the Town of Grant Town.

3.3.6.1. Overview

Town of Grant Town is located in Marion County, West Virginia, in the eastern United States. The population was 613 at the 2010 census.

The information below provides an overview of the Town of Grant Town as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Grant Town	540102	613	34	0.5	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 1 policies totaling approximately $36,700

Data provided below only includes areas within the Town of Grant Town, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.6.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM was not performed within the boundaries of the Town of Grant Town because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Town of Grant Town flood risk analysis uses the TEIF flood loss estimation tool. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

  - The Town of Grant Town risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Grant Town (540102): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$76,400,000	91%	$2,200,000	3%	$2,900,000	4%	$3,200,000	4%	$3,500,000	5%	$300,000	<1%
Commercial Building/Contents	$2,300,000	3%	$200,000	9%	$200,000	9%	$200,000	9%	$300,000	13%	$20,000	1%
Other Building/Contents	$5,200,000	6%	$800,000	15%	$1,100,000	21%	$1,000,000	19%	$1,100,000	21%	$90,000	2%
Total Building/Contents[3]	$83,800,000	100%	$3,100,000	4%	$4,200,000	5%	$4,500,000	5%	$4,900,000	6%	$400,000	1%
Business Disruption[4]	N/A	N/A	$100,000	N/A	$100,000	N/A	N/A	N/A	$0	N/A	$0	N/A
TOTAL[5]	$83,800,000	N/A	$3,200,000	4%	$4,300,000	5%	$4,500,000	5%	$4,900,000	6%	$400,000	1%

Flood Risk Project Refined Losses [7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$76,400,000	91%	$600,000	1%
Commercial Building/Contents	$2,300,000	3%	$60,000	3%
Other Building/Contents	$5,200,000	6%	$20,000	<1%
Total Building/Contents[3]	$83,800,000	100%	$700,000	1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$83,800,000	N/A	$700,000	1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.7 Town of Granville Summary (CID 540272)

The following pages include Flood Risk data for the Town of Granville.

3.3.7.1. Overview

Granville is a town in Monongalia County, West Virginia, United States. The population was 781 at the 2010 census. It is included in the Morgantown, West Virginia Metropolitan Statistical Area. Granville was originally called Grandville, after a nearby river island.

The information below provides an overview of the Town of Granville as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Granville	540272	781	72	1.3	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 3 policies totaling approximately $1,186,900

Data provided below only includes areas within the Town of Granville, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.7.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for Town of Granville is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.3	<0.1	<0.1	<0.1
Within Floodway	0.1	<0.1	<0.1	<0.1

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Town of Granville, the figures in this table only represent information within the area of updated engineering analysis that is within the Town of Granville.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Town of Granville flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Granville risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Granville (540272): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$67,800,000	72%	$2,700,000	4%	$2,900,000	4%	$3,000,000	4%	$4,100,000	6%	$300,000	<1%
Commercial Building/Contents	$22,500,000	24%	$20,000	<1%	$20,000	<1%	$30,000	<1%	$80,000	<1%	$0	N/A
Other Building/Contents	$3,500,000	4%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	$93,800,000	100%	$2,700,000	3%	$2,900,000	3%	$3,000,000	3%	$4,200,000	5%	$300,000	<1%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$93,800,000	N/A	$2,700,000	3%	$2,900,000	3%	$3,000,000	3%	$4,200,000	5%	$300,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$67,800,000	72%	$1,600,000	2%
Commercial Building/Contents	$22,500,000	24%	$50,000	<1%
Other Building/Contents	$3,500,000	4%	$30,000	1%
Total Building/Contents[3]	$93,800,000	100%	$1,700,000	2%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$93,800,000	N/A	$1,700,000	2%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.8 City of Mannington Summary (CID 540103)

The following pages include Flood Risk data for the City of Mannington.

3.3.8.1. Overview

Mannington is a city in Marion County, West Virginia, United States located in the hills of North-Central West Virginia. Known as Mannington since 1856, the town is rich with history and heritage – from Native American relics to frontiersmen and their settlements to Civil War legends. Perhaps what makes Mannington most unusual is the impact of the oil and gas boom in 1890 that literally changed the shape of the town. The population was 2,063 at the 2010 census.

The information below provides an overview of the City of Mannington as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
City of Mannington	540103	2,063	54	1.1	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 51 policies totaling approximately $4,955,100

Data provided below only includes areas within the City of Mannington, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.8.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for City of Mannington is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0	0	0	0
Within Floodway	0	0	-0.1	-0.1

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Mannington, the figures in this table only represent information within the area of updated engineering analysis that is within the City of Mannington.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The City of Mannington flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The City of Mannington risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

City of Mannington (540103): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$233,900,000	77%	$18,300,000	8%	$23,500,000	10%	$25,000,000	11%	$30,000,000	13%	$2,100,000	1%
Commercial Building/Contents	$31,600,000	10%	$7,900,000	25%	$9,700,000	31%	$10,500,000	33%	$13,700,000	43%	$900,000	3%
Other Building/Contents	$40,000,000	13%	$9,000,000	23%	$10,900,000	27%	$11,800,000	30%	$15,100,000	38%	$1,000,000	3%
Total Building/Contents[3]	$305,500,000	100%	$35,100,000	12%	$44,100,000	14%	$47,200,000	16%	$58,800,000	19%	$4,100,000	1%
Business Disruption[4]	N/A	N/A	$1,200,000	N/A	$1,400,000	N/A	$1,600,000	N/A	$1,900,000	N/A	$100,000	N/A
TOTAL[5]	$305,500,000	N/A	$36,300,000	12%	$45,500,000	15%	$48,800,000	16%	$60,700,000	20%	$4,200,000	1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$ 233,900,000	77%	$ 9,300,000	4%
Commercial Building/Contents	$ 31,600,000	10%	$ 2,900,000	9%
Other Building/Contents	$ 40,000,000	13%	$ 3,600,000	9%
Total Building/Contents[3]	$305,500,000	100%	$ 15,800,000	5%
Business Disruption[4]	N/A	N/A	300,000	N/A
TOTAL[5]	$ 305,500,000	N/A	$ 16,100,000	5%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.9 Town of Masontown Summary (CID 540270)

The following pages include Flood Risk data for the Town of Masontown.

3.3.9.1. Overview

Masontown is a town in Preston County, West Virginia, United States. The population was 546 at the 2010 census.

The information below provides an overview of the Town of Masontown as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Masontown	540270	546	4	0.3	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 5

Data provided below only includes areas within the Town of Masontown, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.9.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
    - Changes Since Last FIRM was not performed within the boundaries of the Town of Masontown because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
    - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
        - Water surface elevation grid for the 1-percent-annual-chance flood event
        - Flood depth grids for the 1-percent-annual-chance flood event
    - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties

located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Town of Masontown flood risk analysis uses the TEIF flood loss estimation tool. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Masontown risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Masontown (540270): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$61,700,000	98%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Commercial Building/Contents	$600,000	1%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Other Building/Contents	$200,000	1%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	$62,500,000	100%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$62,500,000	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A

Flood Risk Project Refined Losses [7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$61,700,000	98%	$0	N/A
Commercial Building/Contents	$600,000	1%	$0	N/A
Other Building/Contents	$200,000	1%	$0	N/A
Total Building/Contents[3]	$62,500,000	100%	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A
TOTAL[5]	$62,500,000	N/A	$0	N/A

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.10 City of Morgantown Summary (CID 540141)

The following pages include Flood Risk data for the City of Morgantown.

3.3.10.1. Overview

Morgantown is a city in and the county seat of Monongalia County, West Virginia. Situated along the banks of the Monongahela River, Morgantown is the largest city in North-Central West Virginia, and the base of the Morgantown, West Virginia Metropolitan Statistical Area. It has a permanent population of 29,660 per the 2010 census, with West Virginia University adding thousands of seasonal residents to the city and surrounding area from September through May.

The information below provides an overview of the City of Morgantown as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
City of Morgantown	540141	29,660	12	10.1	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 84 policies totaling approximately $20,968,900

Data provided below only includes areas within the City of Morgantown, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.10.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for City of Morgantown is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	3.0	0.2	-0.7	-0.5
Within Floodway	1.8	0.2	-0.4	-0.3

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Morgantown, the figures in this table only represent information within the area of updated engineering analysis that is within the City of Morgantown.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The City of Morgantown flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Morgantown risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

City of Morgantown (540141): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$3,604,900,000	61%	$6,100,000	<1%	$6,500,000	<1%	$7,100,000	<1%	$9,700,000	<1%	$600,000	<1%
Commercial Building/Contents	$1,562,000,000	26%	$7,000,000	<1%	$8,400,000	1%	$9,000,000	1%	$11,100,000	1%	$800,000	<1%
Other Building/Contents	$753,300,000	13%	$3,000,000	<1%	$3,700,000	1%	$4,000,000	1%	$4,400,000	1%	$300,000	<1%
Total Building/Contents[3]	$5,920,200,000	100%	$16,100,000	<1%	$18,700,000	<1%	$20,100,000	<1%	$25,100,000	<1%	$1,800,000	<1%
Business Disruption[4]	N/A	N/A	$600,000	N/A	$700,000	N/A	$800,000	N/A	$900,000	N/A	$0	N/A
TOTAL[5]	$5,920,200,000	N/A	$16,700,000	<1%	$19,400,000	<1%	$20,900,000	<1%	$26,000,000	<1%	$1,800,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$,3,604,900,000	61%	$7,600,000	<1%
Commercial Building/Contents	$1,562,000,000	26%	$12,900,000	1%
Other Building/Contents	$753,300,000	13%	$5,400,000	1%
Total Building/Contents[3]	$5,920,200,000	100%	$25,900,000	<1%
Business Disruption[4]	N/A	N/A	$500,000	N/A
TOTAL[5]	$5,920,200,000	N/A	$26,400,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.11 City of Pleasant Valley Summary (CID 540292)

The following pages include Flood Risk data for the City of Pleasant Valley.

3.3.11.1. Overview

Pleasant Valley is a city in Marion County, West Virginia, United States. The population was 3,149 at the 2010 census. It is immediately south of the larger city and county seat of Fairmont, West Virginia. The city is also adjacent to the Tygart Valley River.

The information below provides an overview of the City of Pleasant Valley as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
City of Pleasant Valley	540292	3,149	8	3.6	20	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 6 policies totaling approximately $870,500

Data provided below only includes areas within the City of Pleasant Valley, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.11.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for City of Pleasant Valley is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0	0	0	0
Within Floodway	0	0	-0.1	-0.1

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Pleasant Valley, the figures in this table only represent information within the City of Pleasant Valley.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Pleasant Valley flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The City of Pleasant Valley risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

City of Pleasant Valley (540292): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$86,000,000	85%	$1,000,000	1%	$1,000,000	1%	$1,100,000	1%	$1,200,000	1%	$100,000	<1%
Commercial Building/Contents	$7,200,000	7%	$200,000	3%	$200,000	3%	$200,000	3%	$300,000	4%	$20,000	<1%
Other Building/Contents	$8,400,000	8%	$40,000	1%	$50,000	1%	$50,000	1%	$50,000	1%	$0	N/A
Total Building/Contents[3]	$101,600,000	100%	$1,200,000	1%	$1,300,000	1%	$1,400,000	1%	$1,500,000	2%	$100,000	<1%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$101,600,000	N/A	$1,200,000	1%	$1,300,000	1%	$1,400,000	1%	$1,500,000	2%	$100,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$86,000,000	85%	$400,000	<1%
Commercial Building/Contents	$7,200,000	7%	$100,000	1%
Other Building/Contents	$8,400,000	8%	$10,000	<1%
Total Building/Contents[3]	$101,600,000	100%	$500,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$101,600,000	N/A	$500,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.12 Borough of Point Marion Summary (CID 421617)

The following pages include Flood Risk data for the Borough of Point Marion.

3.3.12.1. Overview

Point Marion is a borough in Fayette County, Pennsylvania, United States. Point Marion is located at the confluence of the Monongahela and Cheat Rivers.

The information below provides an overview of the Borough of Point Marion as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Borough of Point Marion	421617	1,159	26	0.4	79	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Greene County Hazard Mitigation Plan , which expires on 5/1/2018.
- Past Federal Disaster Declarations for flooding = 3
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 20 policies totaling approximately $1,491,500

Data provided below only includes areas within the Borough of Point Marion, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.12.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM was not performed within the boundaries of the Borough of Point Marion because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Borough of Point Marion flood risk analysis uses the TEIF flood loss estimation tool. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

  - The Borough of Point Marion risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Borough of Point Marion (421617): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$89,600,000	55%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Commercial Building/Contents	$23,900,000	15%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Other Building/Contents	$49,600,000	30%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	$163,100,000	100%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$163,100,000	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$89,600,000	55%	$3,600,000	4%
Commercial Building/Contents	$23,900,000	15%	$2,700,000	11%
Other Building/Contents	$49,600,000	30%	$14,000,000	28%
Total Building/Contents[3]	$163,000,000	100%	$20,300,000	12%
Business Disruption[4]	N/A	N/A	$1,700,000	N/A
TOTAL[5]	$163,000,000	N/A	$22,000,000	13%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.13 Town of Reedsville Summary (CID 540269)

The following pages include Flood Risk data for the Town of Reedsville.

3.3.13.1. Overview

Reedsville is a town in Preston County, West Virginia, in the United States. The population was 593 at the 2010 census.

The information below provides an overview of the Town of Reedsville as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Reedsville	540269	593	16	0.6	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 3 policies totaling approximately $230,000

Data provided below only includes areas within the Town of Reedsville, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.13.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
    - Changes Since Last FIRM was not performed within the boundaries of the Town of Reedsville because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
    - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
        - Water surface elevation grid for the 1-percent-annual-chance flood event
        - Flood depth grids for the 1-percent-annual-chance flood event

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Town of Reedsville flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

  - The Town of Reedsville risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Reedsville (540269): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$53,300,000	60%	$0	N/A	$0	N/A	$0	N/A	$60,000	<1%	$0	N/A
Commercial Building/Contents	$32,200,000	36%	$0	N/A	$0	N/A	$0	N/A	$40,000	<1%	$0	N/A
Other Building/Contents	$3,600,000	4%	$0	N/A	$0	N/A	$0	N/A	$40,000	<1%	$0	N/A
Total Building/Contents[3]	$89,000,000	100%	$0	N/A	$0	N/A	$0	N/A	$100,000	<1%	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	N/A	N/A
TOTAL[5]	$89,000,000	N/A	$0	N/A	$0	N/A	$0	N/A	$100,000	<1%	$0	N/A

Flood Risk Project Refined Losses [7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$53,300,000	60%	$200,000	<1%
Commercial Building/Contents	$32,200,000	36%	$100,000	<1%
Other Building/Contents	$3,600,000	4%	$100,000	3%
Total Building/Contents[3]	$89,000,000	100%	$400,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$89,000,000	N/A	$400,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.14 Town of Rivesville Summary (CID 540105)

The following pages include Flood Risk data for the Town of Rivesville.

3.3.14.1. Overview

Rivesville is a town and former coal town in Marion County, West Virginia, United States. The population was 934 at the 2010 census. Rivesville is in the heart of the Fairmont coal field on the north-west bank of the Monongahela River around its confluence with Paw Paw Creek.

The information below provides an overview of the Town of Rivesville as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Rivesville	540105	934	100	0.5	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 2 policies totaling approximately $270,400

Data provided below only includes areas within the Town of Rivesville, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.14.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for Town of Rivesville is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0	0	0	0
Within Floodway	0	0	-0.1	-0.1

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Town of Rivesville, the figures in this table only represent information within the area of updated engineering analysis that is within the Town of Rivesville.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Town of Rivesville flood risk analysis uses the TEIF flood loss estimation tool. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Rivesville risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Rivesville (540105): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$101,900,000	73%	$2,100,000	2%	$2,400,000	2%	$2,700,000	3%	$3,100,000	3%	$200,000	<1%
Commercial Building/Contents	$18,900,000	14%	$1,100,000	6%	$1,100,000	6%	$1,300,000	7%	$1,300,000	7%	$100,000	1%
Other Building/Contents	$18,400,000	13%	$700,000	4%	$1,000,000	5%	$1,100,000	6%	$1,200,000	7%	$80,000	<1%
Total Building/Contents[3]	$139,200,000	100%	$3,800,000	3%	$4,500,000	3%	$5,000,000	4%	$5,700,000	4%	$400,000	<1%
Business Disruption[4]	N/A	N/A	$100,000	N/A	$100,000	N/A	$200,000	N/A	$100,000	N/A	$0	N/A
TOTAL[5]	$139,200,000	N/A	$3,900,000	3%	$4,600,000	3%	$5,200,000	4%	$5,800,000	4%	$400,000	<1%

Flood Risk Project Refined Losses [7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$53,300,000	60%	$1,100,000	1%
Commercial Building/Contents	$32,200,000	36%	$1,900,000	10%
Other Building/Contents	$3,600,000	4%	$400,000	2%
Total Building/Contents[3]	$89,000,000	100%	$3,400,000	2%
Business Disruption[4]	N/A	N/A	$100,000	N/A
TOTAL[5]	$89,000,000	N/A	$ 3,500,000	3%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.15 Township of Springhill Summary (CID 421639)

The following pages include Flood Risk data for the Township of Springhill.

3.3.15.1. Overview

Springhill Township is a township in Fayette County, Pennsylvania, United States. The Albert Gallatin Area School District serves the region. Township villages include Friendship Heights, White House, McKinley Hill, Sprucetown, Nilan, and Gans.

The information below provides an overview of the Township of Springhill as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Township of Springhill	421639	2,907	<1%	31.7	3	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Greene County Hazard Mitigation Plan , which expires on 5/1/2018.
- Past Federal Disaster Declarations for flooding = 3
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 5 policies totaling approximately $808,500

Data provided below only includes areas within the Township of Springhill, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.15.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
    - Changes Since Last FIRM was not performed within the boundaries of the Township of Springhill because the community falls outside the area of updated engineering analysis.
- **Flood Depth and Analysis Grids**
    - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
        - Water surface elevation grid for the 1-percent-annual-chance flood event
        - Flood depth grids for the 1-percent-annual-chance flood event

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Township of Springhill flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

  - The Township of Springhill risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Township of Springhill (421639): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$8,400,000	93%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Commercial Building/Contents	$600,000	6%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Other Building/Contents	$100,000	1%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	$9,000,000	100%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$9,000,000	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$8,400,000	93%	$10,000	<1%
Commercial Building/Contents	$500,000	6%	$0	N/A
Other Building/Contents	$100,000	1%	$0	N/A
Total Building/Contents[3]	$9,000,000	100%	$20,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$9,000,000	N/A	$20,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.16 Town of Star City Summary (CID 540273)

The following pages include Flood Risk data for the Town of Star City.

3.3.16.1. Overview

Star City is a town in Monongalia County, West Virginia, United States. The population was 1,825 at the 2010 census. It is included in the Morgantown, West Virginia Metropolitan Statistical Area.

The information below provides an overview of the Town of Star City as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Town of Star City	540273	1,825	10	0.5	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 9 policies totaling approximately $3,063,500

Data provided below only includes areas within the Town of Star City, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.16.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for Town of Star City is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.5	<0.1	<0.1	<0.1
Within Floodway	0.5	<0.1	<0.1	<0.1

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Town of Star City, the figures in this table only represent information within the area of updated engineering analysis that is within the Town of Star City.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Town of Star City flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The Town of Star City risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Town of Star City (540273): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL) [6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$208,100,000	66%	$20,000	<1%	$30,000	<1%	$30,000	<1%	$40,000	<1%	$0	N/A
Commercial Building/Contents	$76,600,000	24%	$80,000	<1%	$100,000	<1%	$100,000	<1%	$100,000	<1%	$10,000	<1%
Other Building/Contents	$29,900,000	10%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	N/A	100%	$100,000	<1%	$100,000	<1%	$100,000	<1%	$200,000	<1%	$10,000	<1%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$314,500,000	N/A	$100,000	<1%	$100,000	<1%	$100,000	<1%	$200,000	<1%	$10,000	<1%

Flood Risk Project Refined Losses [7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$208,000,000	66%	$900,000	<1%
Commercial Building/Contents	$76,600,000	24%	$500,000	1%
Other Building/Contents	$29,900,000	10%	$10,000	<1%
Total Building/Contents[3]	$314,500,000	100%	$1,400,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$314,500,000	N/A	$1,400,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.17 City of Westover Summary (CID 540274)

The following pages include Flood Risk data for the City of Westover.

3.3.17.1. Overview

Westover is a city in Monongalia County, West Virginia, United States. The population was 3,983 at the 2010 census. It is included in the Morgantown, WV Metropolitan Statistical Area.

The information below provides an overview of the City of Westover as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
City of Westover	540274	3,983	6	1.3	100	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 12 policies totaling approximately $3,351,600

Data provided below only includes areas within the City of Westover, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.17.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for City of Westover is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.3	<0.1	<0.1	<0.1
Within Floodway	0.2	<0.1	<0.1	<0.1

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Westover, the figures in this table only represent information within the area of updated engineering analysis that is within the City of Westover.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-,1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-,1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Westover flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - The City of Westover risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

City of Westover (540274): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$517,200,000	71%	$1,100,000	<1%	$1,700,000	<1%	$1,800,000	<1%	$1,900,000	<1%	$100,000	<1%
Commercial Building/Contents	$150,000,000	21%	$1,400,000	1%	$2,000,000	1%	$2,000,000	1%	$2,000,000	1%	$200,000	<1%
Other Building/Contents	$60,500,000	8%	$800,000	1%	$1,100,000	2%	$1,300,000	2%	$1,300,000	2%	$100,000	<1%
Total Building/Contents[3]	$727,600,000	100%	$3,400,000	1%	$4,700,000	1%	$5,000,000	1%	$5,200,000	1%	$400,000	<1%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$300,000	N/A	$300,000	N/A	$300,000	N/A	$0	N/A
TOTAL[5]	$727,600,000	N/A	$3,600,000	1%	$5,000,000	1%	$5,300,000	1%	$5,500,000	1%	$400,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$517,200,000	71%	$2,200,000	<1%
Commercial Building/Contents	$150,000,000	21%	$1,200,000	1%
Other Building/Contents	$60,500,000	8%	$1,600,000	3%
Total Building/Contents[3]	$727,600,000	100%	$5,000,000	1%
Business Disruption[4]	N/A	N/A	$100,000	N/A
TOTAL[5]	$727,600,000	N/A	$5,100,000	1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.18 Marion County Unincorporated Areas Summary (CID 540097)

The following pages include Flood Risk data for the Marion County Unincorporated Areas.

3.3.18.1. Overview

Marion County is located in northern West Virginia, with the City of Fairmont serving as the county seat. It is bordered by Monongalia County to the north and east, Taylor and Harrison Counties to the south, and Wetzel County to the west. The county's total land area is 309 square miles and the 2010 population of the county was 56,418, a decrease of 0.3% from the 2000 population (FEMA 2012).

The information below provides an overview of the Marion County Unincorporated Areas as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Marion County Unincorporated Areas	540097	56,925	19	294.6	71	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 192 policies totaling approximately $29,126,400

Data provided below only includes areas within the Marion County Unincorporated Areas, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.18.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for Marion County Unincorporated Areas is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.2	<0.1	<0.1	<0.1
Within Floodway	<0.1	<0.1	-1.3	-1.3

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Marion County Unincorporated Areas, the figures in this table only represent information within the area of updated engineering analysis that is within the Marion County Unincorporated Areas.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-,1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-,1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Marion County Unincorporated Areas' flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - Marion County Unincorporated Areas' risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
    - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Marion County Unincorporated Areas (540097): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$1,864,200,000	86%	$24,000,000	1%	$28,200,000	2%	$31,300,000	2%	$35,800,000	2%	$2,600,000	<1%
Commercial Building/Contents	$148,400,000	7%	$6,200,000	4%	$6,800,000	5%	$7,200,000	5%	$8,000,000	5%	$700,000	1%
Other Building/Contents	$161,400,000	7%	$6,300,000	4%	$7,700,000	5%	$8,000,000	5%	$9,700,000	6%	$700,000	<1%
Total Building/Contents[3]	$2,174,000,000	100%	$36,600,000	2%	$42,700,000	2%	$46,400,000	2%	$53,500,000	3%	$4,000,000	<1%
Business Disruption[4]	N/A	N/A	$900,000	N/A	$1,100,000	N/A	$1,200,000	N/A	$1,300,000	N/A	$100,000	N/A
TOTAL[5]	$2,174,000,000	N/A	$37,500,000	2%	$43,800,000	2%	$47,600,000	2%	$54,800,000	3%	$4,100,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$1,864,200,000	86%	$25,300,000	1%
Commercial Building/Contents	$148,400,000	7%	$21,300,000	14%
Other Building/Contents	$161,400,000	7%	$24,200,000	15%
Total Building/Contents[3]	$2,174,000,000	100%	$70,800,000	3%
Business Disruption[4]	N/A	N/A	$2,900,000	N/A
TOTAL[5]	$2,174,000,000	N/A	$73,700,000	3%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.19 Monongalia County Unincorporated Areas Summary (CID 540139)

The following pages include Flood Risk data for the Monongalia County Unincorporated Areas.

3.3.19.1. Overview

Monongalia County, located in the northern region of West Virginia, is bordered by Preston County to the east; Taylor County to the south; Marion County to the southwest; Wetzel County to the west; and Greene and Fayette Counties, Pennsylvania, to the north. The population for Monongalia County as determined by the 2000 Census was 81,866, and the 2006 estimated population was 84,752, an increase of 3.5% (FEMA 2010).

The information below provides an overview of the Monongalia County Unincorporated Areas as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Monongalia County Unincorporated Areas	540139	96,189	18	339.6	55	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 141 policies totaling approximately $25,988,700

Data provided below only includes areas within the Monongalia County Unincorporated Areas, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.19.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM for Monongalia County Unincorporated Areas is shown below.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	5.1	<0.1	-0.1	-0.1
Within Floodway	2.0	<0.1	-8.7	-8.7

**Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Monongalia County Unincorporated Areas, the figures in this table only represent information within the area of updated engineering analysis that is within the Monongalia County Unincorporated Areas.*

Section 2 of this report provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
    - Water surface elevation grids (10-, 4-, 2-, 1-, 1-plus- and 0.2-percent-annual-chance flood events)
    - Water surface elevation change grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Monongalia County Unincorporated Areas' flood risk analysis uses the TEIF flood loss estimation tool**.** Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - Monongalia County Unincorporated Areas' risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
    - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Monongalia County Unincorporated Areas (540097): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$5,163,900,000	73%	$11,400,000	<1%	$14,000,000	<1%	$14,800,000	<1%	$18,000,000	<1%	$1,300,000	<1%
Commercial Building/Contents	$1,308,500,000	19%	$6,100,000	1%	$7,500,000	1%	$7,800,000	1%	$11,000,000	1%	$700,000	<1%
Other Building/Contents	$588,000,000	8%	$3,600,000	1%	$3,900,000	1%	$3,800,000	1%	$4,900,000	1%	$400,000	<1%
Total Building/Contents[3]	$7,060,400,000	100%	$21,000,000	<1%	$25,400,000	<1%	$26,400,000	<1%	$33,900,000	1%	$2,400,000	<1%
Business Disruption[4]	N/A	N/A	$600,000	N/A	$700,000	N/A	$700,000	N/A	$800,000	N/A	$0	N/A
TOTAL[5]	$7,060,400,000	N/A	$21,600,000	<1%	$26,100,000	<1%	$27,100,000	<1%	$34,700,000	1%	$2,400,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$5,163,900,000	73%	$17,200,000	<1%
Commercial Building/Contents	$1,308,500,000	19%	$11,900,000	1%
Other Building/Contents	$588,000,000	8%	$3,000,000	1%
Total Building/Contents[3]	$7,060,400,000	100%	$32,100,000	<1%
Business Disruption[4]	N/A	N/A	$400,000	N/A
TOTAL[5]	$7,060,400,000	N/A	$32,500,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.20 Preston County Unincorporated Areas Summary (CID 540160)

The following pages include Flood Risk data for the Preston County Unincorporated Areas.

3.3.20.1. Overview

Preston County is located in the north central portion of West Virginia, approximately 8 miles east of the City of Morgantown, Monongalia County. Preston County is bordered by Fayette County, Pennsylvania to the north; Garrett County, Maryland to the east; Grant County to the southeast; Tucker County to the south; Barbour County to the 6 southwest; and Taylor and Monongalia Counties to the west. The county encompasses an area of 648 square miles which includes 3 square miles of water.

Preston County is located mostly within the Appalachian Plateau with a small southwestern portion of the county in the Hill Region of West Virginia. Soils in Preston County vary from a coarse, gritty soil that covers slopes of the mountains to sandy soils on the ridges to clayey soils in some areas (FEMA 2012).

The information below provides an overview of the Preston County Unincorporated Areas as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Preston County Unincorporated Areas	540160	33,520	9	643.6	4	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 64 policies totaling approximately $12,346,200

Data provided below only includes areas within the Preston County Unincorporated Areas, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.20.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM was not performed within the boundaries of the Preston County Unincorporated Area because the community falls outside the area of updated engineering analysis.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - Preston County Unincorporated Areas' flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - Preston County Unincorporated Areas' risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**

  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Preston County Unincorporated Areas (540160): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$371,800,000	82%	$1,000,000	<1%	$1,200,000	<1%	$1,300,000	<1%	$2,000,000	1%	$100,000	<1%
Commercial Building/Contents	$52,700,000	12%	$500,000	1%	$600,000	1%	$700,000	1%	$1,300,000	3%	$60,000	<1%
Other Building/Contents	$30,500,000	6%	$200,000	1%	$300,000	1%	$300,000	1%	$500,000	2%	$20,000	<1%
Total Building/Contents[3]	$454,900,000	100%	$1,700,000	<1%	$2,100,000	1%	$2,300,000	1%	$3,800,000	1%	$200,000	<1%
Business Disruption[4]	N/A	N/A	$100,000	N/A	$100,000	N/A	$100,000	N/A	$100,000	N/A	$0	N/A
TOTAL[5]	$454,900,000	N/A	$1,800,000	<1%	$2,200,000	1%	$2,400,000	1%	$3,900,000	1%	$200,000	<1%

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$371,800,000	82%	$8,700,000	2%
Commercial Building/Contents	$52,700,000	12%	$4,000,000	8%
Other Building/Contents	$30,500,000	6%	$2,000,000	7%
Total Building/Contents[3]	$454,900,000	100%	$14,600,000	3%
Business Disruption[4]	N/A	N/A	$200,000	N/A
TOTAL[5]	$454,900,000	N/A	$14,800,000	3%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

3.3.21 Taylor County Unincorporated Areas Summary (CID 540188)

The following pages include Flood Risk data for the Taylor County Unincorporated Areas.

3.3.21.1. Overview

Taylor County is located in northern West Virginia. It is bordered by the unincorporated areas of Marion County to the north, the unincorporated areas of Preston County to the east, the unincorporated areas of Barbour County to the south, and the unincorporated areas of Harrison County to the west. The total land area contained within the county is approximately 173 square miles. The population of Taylor County was 16,089 in 2000 (U.S. Census Bureau, 2000). The climate of Taylor County is temperate with a seasonal variation in temperature. Mean average rainfall is approximately 44 inches, with about 60 percent received from March through August. July is the wettest month, and September through November are the drier months (FEMA 2011).

The information below provides an overview of the Taylor County Unincorporated Areas as of the date of this publication.

Community Name	CID	Total Community Population[1]	Percent of Population in TEIF	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating[2]	Mitigation Plan
Taylor County Unincorporated Areas	540188	16,895	2	338.6	2	Y	10	Y

[1]Population data are from the 2010 Census
[2]A value of "10" indicates that the community does not participate in CRS

- Participating in Region VI PDC, which expires on 3/27/2017.
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/values) = 21 policies totaling approximately $2,887,900

Data provided below only includes areas within the Taylor County Unincorporated Areas, that area located within the Upper Monongahela Watershed, WV, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.21.2. Community Analyses and Results

Results for each of the Flood Risk Datasets developed for this Flood Risk Project are summarized below:

- **Changes Since Last FIRM**
  - Changes Since Last FIRM was not performed within the boundaries of the Taylor County Unincorporated Area because the community falls outside the area of updated engineering analysis.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grid for the 1-percent-annual-chance flood event
    - Flood depth grids for the 1-percent-annual-chance flood event
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Taylor County Unincorporated Areas' flood risk analysis uses the TEIF flood loss estimation tool*.* Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.
  - Taylor County Unincorporated Areas' risk analysis incorporates results from the FEMA's 2010 HAZUS Average Annualized Analysis (AAL) Study (FINAL April 13, 2010). This 2010 AAL Study covered most areas of the lower-48 States in which the HAZUS building inventory is based primarily on 2000 U.S. Census Data and other broad regional patterns. As a result, loss estimates are consistent with regional-based analyses and serve as a means to consider areas where more detailed damage and loss analyses may be warranted. The table below presents the flood risk analysis results within the area represented by this Flood Risk Project.

- **HAZUS Estimated Loss Information**
  - A new study was completed in 2016 on waterways within this community with improved topographical information. The current additional study remodeled some high risk areas and was rerun with Hazus 2.2 and 2010 census blocks. These results are listed separately in the table below, since the difference between the 2000 and 2010 census blocks was too great to integrate the results.

Taylor County Unincorporated Areas (540188): Estimated Potential Losses for Flood Event Scenarios

Flood Risk Project Average Annualized Losses (AAL)[6]

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$24,900,000	98%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Commercial Building/Contents	$500,000	2%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Other Building/Contents	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Total Building/Contents[3]	$25,400,000	100%	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	$25,400,000	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A

Flood Risk Project Refined Losses[7]

	Total Inventory		1% (100-yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]
Residential Building/Contents	$24,900,000	98%	$70,000	<1%
Commercial Building/Contents	$500,000	2%	$0	N/A
Other Building/Contents	$0	N/A	$0	N/A
Total Building/Contents[3]	$25,400,000	100%	$70,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A
TOTAL[5]	$25,400,000	N/A	$70,000	<1%

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption
[6]Flood Risk Project Average Annualized Losses calculated using Hazus 2.1 and 2000 Census data
[7]Flood Risk Project Refined Losses calculated using Hazus Version 2.2 and 2010 Census data

The figures in this table only represent information within the Upper Monongahela Watershed

4 Actions to Reduce Flood Risk

In order to fully leverage the Flood Risk Datasets and Products created for this Flood Risk Project, local stakeholders should consider many different flood risk mitigation tactics, including, but not limited the items shown in the sub-sections below.

4.1 Types of Mitigation Actions

Mitigation provides a critical foundation on which to reduce loss of life and property by avoiding or lessening the impact of hazard events. This creates safer communities and facilitates resiliency by enabling communities to return to normal function as quickly as possible after a hazard event. Once a community understands its flood risk, it is in a better position to identify potential mitigation actions that can reduce the risk to its people and property.

The mitigation plan requirements in 44 CFR Part 201 encourage communities to understand their vulnerability to hazards and take actions to minimize vulnerability and promote resilience. Flood mitigation actions generally fall into the following categories:

Before Mitigation and After Mitigation

Communities will need to prioritize projects as part of the planning process. FEMA can then help route federal mitigation dollars to fund these projects.

4.1.1 Preventative Measures

Preventative measures are intended to keep flood hazards from getting worse. They can reduce future vulnerability to flooding, especially in areas where development has not yet occurred or where capital improvements have not been substantial. Examples include:

- Comprehensive land use planning
- Zoning regulations
- Subdivision regulations
- Open space preservation
- Building codes
- Floodplain development regulations
- Stormwater management

NFIP's CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS: to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount. (A Class 10 is not participating in the CRS and receives no discount.)

- Purchase development rights or conservation easements
- Participation in the NFIP Community Rating System (CRS)

4.1.2 Property Protection Measures

Property protection measures protect existing buildings by modifying the building to withstand floods, erosion, and waves or by removing buildings from hazardous locations. Examples include:

- Building relocation
- Acquisition and clearance
- Building elevation
- Barrier installation
- Building retrofit

4.1.3 Natural Resource Protection Activities

Natural resource protection activities reduce the impact of floods by preserving or restoring natural areas such as floodplains, wetlands, and dunes and their natural functions. Examples include:

- Wetland protection
- Habitat protection
- Erosion and sedimentation control
- Best management practices (BMP)
- Prevention of stream dumping activities (anti-litter campaigns)
- Improved forestry practices such as reforesting or selective timbering (extraction)
- Beach Nourishment
- Dune Construction
- Dune protection measures such as walkovers, sand fencing, and vegetation

4.1.4 Structural Mitigation Projects

Structural mitigation projects lessen the impact of floods by modifying the environmental natural progression of the flooding event. Structural protection such as upgrading dams/levees for already existing development and critical facilities may be a realistic alternative. However, citizens should be made aware of their residual risk. Examples include:

- Reservoirs, retention, and detention basins

- Levees and floodwalls
- Channel modifications
- Channel maintenance
- Seawalls, reventments, and bulkheads
- Groins, offshore breakwaters, and jetties

4.1.5 Public Education and Awareness Activities

Public education and awareness activities advise residents, business owners, potential property buyers, and visitors about floods, hazardous areas, and mitigation techniques they can use to reduce the flood risk to themselves and their property. Examples include:

- Readily available and readable updated maps
- Outreach projects
- Libraries
- Technical assistance
- Real estate disclosure
- Environmental education
- Risk information via the nightly news

For more information regarding hazard mitigation techniques, best practices, and potential grant funding sources, visit www.fema.gov or contact your local floodplain manager, emergency manager, or State Hazard Mitigation Officer.

4.2 Identifying Specific Actions for Your Community

As many mitigation actions are possible to lessen the impact of floods, how can a community decide which ones are appropriate to implement? There are many ways to identify specific actions most appropriate for a community. Some factors to consider may include the following:

Refer to FEMA Mitigation Planning How To Guide #3 (FEMA 386-3) "Developing the Mitigation Plan - Identifying Mitigation Actions and Implementation Strategies" for more information on how to identify specific mitigation actions to address hazard risk in your community.

- **Site characteristics.** Does the site present unique challenges (e.g., significant slopes or erosion potential)?
- **Flood characteristics.** Are the flood waters affecting the site fast or slow moving? Are there wave hazards? Is there debris associated with the flow? How deep is the flooding?
- **Social acceptance.** Will the mitigation action be acceptable to the public? Does it cause social or cultural problems?
- **Technical feasibility.** Is the mitigation action technically feasible (e.g., making a building watertight to a reasonable depth)?
- **Administrative feasibility.** Is there administrative capability to implement the mitigation action?
- **Legal.** Does the mitigation action meet all applicable codes, regulations, and laws? Public officials may have a legal responsibility to act and inform citizens if a known hazard has been identified.
- **Economic.** Is the mitigation action affordable? Is it eligible under grant or other funding programs? Can it be completed within existing budgets?
- **Environmental.** Does the mitigation action cause adverse impacts on the environment or can they be mitigated? Is it the most appropriate action among the possible alternatives?

FEMA in collaboration with the American Planning Association has released the publication, "Integrating Hazard Mitigation into Local Planning." This guide explains how hazard mitigation can be incorporated into several different types of local planning programs. For more information, go to www.planning.org or http://www.fema.gov/library.

Your local Hazard Mitigation Plan is a valuable place to identify and prioritize possible mitigation actions. The plan includes a mitigation strategy with mitigation actions that were developed through a public and open process. You can then add to or modify those actions based on what is learned during the course of the Risk MAP project and the information provided within this FRR.

4.3 Mitigation Programs and Assistance

Not all mitigation activities require funding (e.g., local policy actions such as strengthening a flood damage prevention ordinance), and those that do are not limited to outside funding sources (e.g., inclusion in local capital improvements plan, etc.). For those mitigation actions

that require assistance through funding or technical expertise, several State and Federal agencies have flood hazard mitigation grant programs and offer technical assistance. These programs may be funded at different levels over time or may be activated under special circumstances such as after a presidential disaster declaration.

Communities can link hazard mitigation plans and actions to the right FEMA grant programs to fund flood risk reduction. More information about FEMA HMA programs can be found at http://www.fema.gov/government/grant/hma/index.shtm.

4.3.1 FEMA Mitigation Programs and Assistance

FEMA awards many mitigation grants each year to states and communities to undertake mitigation projects to prevent future loss of life and property resulting from hazard impacts, including flooding. The FEMA Hazard Mitigation Assistance (HMA) programs provide grants for mitigation through the programs listed in Table 4-1 below.

Table 4-1. FEMA Hazard Mitigation Assistance Programs

Mitigation Grant Program	Authorization	Purpose
Hazard Mitigation Grant Program (HMGP)	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Activated after a presidential disaster declaration; provides funds on a sliding scale formula based on a percentage of the total federal assistance for a disaster for long-term mitigation measures to reduce vulnerability to natural hazards
Flood Mitigation Assistance (FMA)	National Flood Insurance Reform Act	Reduce or eliminate claims against the NFIP
Pre-Disaster Mitigation (PDM)	Disaster Mitigation Act	National competitive program focused on mitigation project and planning activities that address multiple natural hazards
Repetitive Flood Claims (RFC)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce flood claims against the NFIP through flood mitigation; properties must be currently NFIP insured and have had at least one NFIP claim
Severe Repetitive Loss (SRL)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce or eliminate the long-term risk of flood damage to SRL residential structures currently insured under the NFIP

The HMGP and PDM programs offer funding for mitigation planning and project activities that address multiple natural hazard events. The FMA, RFC, and SRL programs focus funding efforts on reducing claims against the NFIP. Funding under the HMA programs is subject to availability of annual appropriations, and HMGP funding is also subject to the amount of FEMA disaster recovery assistance provided under a presidential major disaster declaration.

FEMA's HMA grants are awarded to eligible states, tribes, and territories (applicant) that, in turn, provide sub-grants to local governments and communities (sub-applicant). The applicant selects and prioritizes sub-applications developed and submitted to them by sub-applicants and submits them to FEMA for funding consideration. Prospective sub-applicants should consult the office designated as their applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers (SHMO) is available on the FEMA website (www.fema.gov).

4.3.2 Additional Mitigation Programs and Assistance

Several additional agencies including USACE, Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), NOAA, and others have specialists on staff and can offer further information on flood hazard mitigation. The State NFIP Coordinator and SHMO are state-level sources of information and assistance, which vary among different states.

The Silver Jackets program, active in several states, is a partnership of USACE, FEMA, and state agencies. The Silver Jackets program provides a state-based strategy for an interagency approach to planning and implementing measures for risk reduction.

5 Acronyms and Definitions

5.1 Acronyms

A

AAL	Average Annualized Loss
ALR	Annualized Loss Ratio
AoMI	Areas of Mitigation Interest

B

BCA	Benefit-Cost Analysis
BFE	Base Flood Elevation
BMP	Best Management Practices

C

CFR	Code of Federal Regulations
CID	Community Identification Number
COG	Continuity of Government Plan
COOP	Continuity of Operations Plan
CRS	Community Rating System
CSLF	Changes Since Last FIRM

D

DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000

E

EOP	Emergency Operations Plan

F

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FRD	Flood Risk Database
FRM	Flood Risk Map
FRR	Flood Risk Report
FY	Fiscal Year

G

GIS	Geographic Information System

H

HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program

I

IA	Individual Assistance

N

NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NRCS	Natural Resource Conservation Service

P

PA	Public Assistance
PDM	Pre-Disaster Mitigation

R

RFC	Repetitive Flood Claims
Risk MAP	Mapping, Assessment, and Planning

S

SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SRL	Severe Repetitive Loss

T

TEIF	Total Exposure in Floodplain

U

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

5.2 Definitions

0.2-percent-annual-chance flood – The flood elevation that has a 0.2-percent chance of being equaled or exceeded each year. Sometimes referred to as the 500-year flood.

1-percent-annual-chance flood – The flood elevation that has a 1-percent chance of being equaled or exceeded each year. Sometimes referred to as the 100-year flood.

Accredited Levee System – A levee system that FEMA has shown on a FIRM that is recognized as reducing the flood hazards posed by a 1-percent-annual-chance or greater flood. This determination is based on the submittal of data and documentation as required by 44CFR65.10 of the NFIP regulations. The area landward of an accredited levee system is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which are shown as Special Flood Hazard Area (SFHA).

Annualized Loss Ratio (ALR) – Expresses the annualized loss as a fraction of the value of the local inventory (total value/annualized loss).

Average Annualized Loss (AAL) – The estimated long-term weighted average value of losses to property in any single year in a specified geographic area.

Base Flood Elevation (BFE) – Elevation of the 1-percent-annual-chance flood. This elevation is the basis of the insurance and floodplain management requirements of the NFIP.

Berm – A small levee, typically built from earth.

Cfs – Cubic feet per second, the unit by which discharges are measured (a cubic foot of water is about 7.5 gallons).

Coastal High Hazard Area (CHHA) – Portion of the SFHA extending from offshore to the inland limit of a primary frontal dune along an open coast or any other area subject to high velocity wave action from storms or seismic sources.

Consequence (of flood) – The estimated damages associated with a given flood occurrence.

Crest – The peak stage or elevation reached or expected to be reached by the floodwaters of a specific flood at a given location.

Dam – An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water.

Design flood event – The greater of the following two flood events: (1) the base flood, affecting those areas identified as SFHAs on a community's FIRM; or (2) the flood corresponding to the area designated as a flood hazard area on a community's flood hazard map or otherwise legally designated.

Erosion – Process by which floodwaters lower the ground surface in an area by removing upper layers of soil.

Essential facilities – Facilities that, if damaged, would present an immediate threat to life, public health, and safety. As categorized in Hazus, essential facilities include hospitals, emergency operations centers, police stations, fire stations, and schools.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters or (2) the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Insurance Rate Map (FIRM) – An official map of a community, on which FEMA has delineated both the SFHAs and the risk premium zones applicable to the community. See also Digital Flood Insurance Rate Map.

Flood Insurance Study (FIS) Report – Contains an examination, evaluation, and determination of the flood hazards of a community, and if appropriate, the corresponding water-surface elevations.

Flood risk – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood vulnerability.

Flood vulnerability – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood risk.

Flood-borne debris impact – Floodwater moving at a moderate or high velocity can carry flood-borne debris that can impact buildings and damage walls and foundations.

Floodwall – A long, narrow concrete or masonry wall built to protect land from flooding.

Floodway (regulatory) – The channel of a river or other watercourse and that portion of the adjacent floodplain that must remain unobstructed to permit passage of the base flood without cumulatively increasing the water surface elevation more than a designated height (usually 1 foot).

Floodway fringe – The portion of the SFHA that is outside of the floodway.

Freeboard – A factor of safety usually expressed in feet above a flood level for purposes of flood plain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed (44CFR§59.1).

Hazus – A GIS-based risk assessment methodology and software application created by FEMA and the National Institute of Building Sciences for analyzing potential losses from floods, hurricane winds and storm surge, and earthquakes.

High velocity flow – Typically comprised of floodwaters moving faster than 5 feet per second.

Levee – A human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. (44CFR§59.1)

Loss ratio – Expresses loss as a fraction of the value of the local inventory (total value/loss).

Mudflow – Mudslide (i.e., mudflow) describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs. (44CFR§59.1)

Non-Accredited Levee System – A levee system that does not meet the requirements spelled out in the NFIP regulations at Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44CFR65.10), Mapping of Areas Protected by Levee Systems, and is not shown on a FIRM as reducing the flood hazard posed by a 1-percent-annual-chance flood.

Primary frontal dune (PFD) – A continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms.

The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

Probability (of flood) – The likelihood that a flood will occur in a given area.

Provisionally Accredited Levee (PAL) – A designation for a levee system that FEMA has previously accredited with reducing the flood hazards associated with a 1-percent-annual-chance or greater flood on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will demonstrate the levee system's compliance with the NFIP regulatory criteria cited at 44CFR65.10.

Risk MAP – Risk Mapping, Assessment, and Planning, a FEMA strategy to work collaboratively with state, local, and tribal entities to deliver quality flood data that increases public awareness and leads to action that reduces risk to life and property.

Riverine – Of, or produced by, a river. Riverine floodplains have readily identifiable channels.

Special Flood Hazard Area (SFHA) – Portion of the floodplain subject to inundation by the 1-percent-annual or base flood.

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. This Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Stillwater – Projected elevation that flood waters would assume referenced to National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or other datum, in the absence of waves resulting from wind or seismic effects.

Stream Flow Constrictions – A point where a human-made structure constricts the flow of a river or stream.

Total Exposure in Floodplain - An analysis of the total potential economic losses (exposure) in the special flood hazard area (SFHA).

6 Additional Resources

ASCE 7 – National design standard issued by the American Society of Civil Engineers (ASCE), *Minimum Design Loads for Buildings and Other Structures*, which gives current requirements for dead, live, soil, flood, wind, snow, rain, ice, and earthquake loads, and their combinations, suitable for inclusion in building codes and other documents.

ASCE 24-05 – National design standard issued by the ASCE, *Flood Resistant Design and Construction*, which outlines the requirements for flood resistant design and construction of structures in flood hazard areas.

National Flood Insurance Program (NFIP), Federal Emergency Management Agency (FEMA), www.floodsmart.gov

FEMA, www.fema.gov

FEMA, *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping

ASCE, 2010. *So, You Live Behind a Levee!* Reston, VA.

FEMA Publications – available at www.fema.gov

FEMA, 1985. *Manufactured Home Installation in Flood Hazard Areas*, FEMA 85. Washington, DC, September 1985.

FEMA and the American Red Cross, 1992. *Repairing Your Flooded Home*, FEMA 234/ARC 4476. Washington, DC, August 1992.

FEMA, 1996. *Addressing Your Community's Flood Problems*, FEMA 309. Washington, DC, June 1996.

FEMA, 1998. *Homeowner's Guide to Retrofitting*, FEMA 312. Washington, DC, June 1998.

FEMA, 1999. *Protecting Building Utilities from Flood Damage*, FEMA 348. Washington, DC, November 1999.

FEMA, 1999. Riverine Erosion Hazard Areas Mapping Feasibility Study. Washington, DC, September 1999.

FEMA, 2003. *Interim Guidance for State and Local Officials - Increased Cost of Compliance Coverage*, FEMA 301. Washington, DC, September 2003.

FEMA, 2000. *Above the Flood: Elevating Your Floodprone House,* FEMA 347. Washington, DC, May 2000.

FEMA, 2001. *Understanding Your Risks: Identifying Hazards and Estimating Losses*, FEMA 386-2. Washington, DC, August 2001.

FEMA, 2002a. *Getting Started: Building Support for Mitigation Planning*, FEMA 386-1. Washington, DC, September 2002.

FEMA, 2002b. *Integrating Manmade Hazards into Mitigation Planning*, FEMA 386-7. Washington, DC, September 2002.

FEMA, 2003a. *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*, FEMA 386-3. Washington, DC, April 2003.

FEMA, 2003b. *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan*, FEMA 386-4. Washington, DC, August 2003.

FEMA, 2004a. *Design Guide for Improving School Safety in Earthquakes, Floods, and High Winds*, FEMA 424. Washington, DC, January 2004.

FEMA, 2004b. *Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners*, FEMA 64. Washington, DC, April 2004.

FEMA, 2005. *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning*, FEMA 386-6. Washington, DC, May 2005.

FEMA, 2006a. *Multi-Jurisdictional Mitigation Planning*, FEMA 386-8. Washington, DC, August 2006.

FEMA, 2006b. *Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects*, FEMA 386-9. Washington, DC, August 2008.

FEMA, 2006c. "*Designing for Flood Levels Above the BFE," Hurricane Katrina Recovery Advisory 8, Hurricane Katrina in the Gulf Coast: Building Performance Observations, Recommendations, and Technical Guidance*, FEMA 549, Appendix E. Washington, DC, July 2006.

FEMA, 2007b. *Property Acquisition Handbook for Local Communities*, FEMA 317. Washington, DC, September 2007.

FEMA, 2007c. *Public Assistance Guide*, FEMA 322. Washington, DC, June 2007.

FEMA, 2007d. *Using Benefit-Cost Review in Mitigation Planning*, FEMA 386-5. Washington, DC, May 2007.

FEMA, 2007e. *Design Guide for Improving Critical Facility Safety from Flooding and High Winds: Providing Protection to People and Buildings*, FEMA 543. Washington, DC, January 2007.

FEMA, 2007f. *Selecting Appropriate Mitigation Measures for Floodprone Structures*, FEMA 551. Washington, DC, March 2007.

FEMA, 2007g. *Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds: Providing Protection to People and Buildings,* FEMA 577. Washington, DC, June 2007.

FEMA, 2008a. *Reducing Flood Losses Through the International Codes: Meeting the Requirements of the National Flood Insurance Program,* FEMA 9-0372, Third Edition. Washington, DC, December 2007.

FEMA, 2009c. *Local Officials Guide for Coastal Construction,* FEMA P-762. Washington, DC, February 2009.

FEMA, 2009d. *Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations,* FEMA P-550, Second Edition. Washington, DC, December 2009.

FEMA, 2010b. *Home Builder's Guide to Coastal Construction,* FEMA P-499. Washington, DC, December 2010.

FEMA, 2010. *Flood Insurance Study, Monongalia County, West Virginia and Incorporated Areas*, Washington, D.C., Revised, January 20, 2010.

FEMA, 2011. *Flood Insurance Study, Taylor County, West Virginia and Incorporated Areas*, Washington, D.C., Revised, August 2, 2011.

FEMA, 2011. *Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas*, Fourth Edition, FEMA P-55. Washington, DC, August 2011.

FEMA, 2012. *Flood Insurance Study, Preston County, West Virginia and Incorporated Areas*, Washington, D.C., Revised, June 5, 2012.

FEMA, 2012. *Flood Insurance Study, Marion County, West Virginia and Incorporated Areas*, Washington, D.C., Revised, June 19, 2012.

FEMA, 2013. *Total Exposure in Floodplain (TEIF) Loss Estimation Database*, FEMA Region III. Philadelphia, PA, May 2013.

USGS. *USGS National Assessment of Shoreline Change Project,* http://coastal.er.usgs.gov/shoreline-change/

7 Data Used to Develop Flood Risk Products

Engineering study information was leveraged from Risk Assessment, Mapping, and Planning Partners (RAMPP) with coordination from FEMA Region III and the United States Army Corps of Engineers (USACE).

Hazard Mitigation Plan information was provided by FEMA.

AAL data was based on FEMA's National Hazus Level 1 analysis, published in 2010. This data has limited distribution and can be made available upon request.

Flood Insurance Claim, Policy, and additional Mitigation Plan information were acquired from FEMA.

Photos shown on the Flood Risk Map were taken from publically available sources on the Internet.

HUC boundaries were provided by the U.S. Department of Agriculture (USDA).

GIS basemap information was acquired from the Preliminary FIS DFIRM database. This dataset is available for download from the FEMA Map Service Center at http://msc.fema.gov/portal. The Preliminary FIS DFIRM database will be posted within Effective Products under the *NFHL-Data County* directory after the new study effective date on June 2, 2015.

Census Information

Census information was collected from FEMA's HAZUS version 2.2 software products. Population data reported for each community is based on the 2010 census. As such, there may be minor discrepancies in the FRD when comparing census blocks to communities to arrive at total population.

TEIF Dataset

TEIF ranks each community by its total potential structural economic losses in the special flood hazard area, and geospatially associates those losses, aggregated to each Census block. The economic losses are estimates, derived from national level datasets – 2010 Census and ACS data applying 2012 RS Means valuations. The National Flood Hazard Layer that was used to develop TEIF was extracted in May 2013.

Changes Since Last FIRM (CSLF)

CSLF are provided both for the project area, only as summarized in this Flood Risk Report, as developed for the most recent map revision of the Flood Insurance Rate Map (FIRM). All data was digitally captured from the previously effective maps.

Hillshade

Hillshade, also known as Shaded Relief is shown on the background of the Flood Risk Map. It is a cartographic process of 3-D visualization of the terrain on maps and charts that implements

graded shadows created by light shining from the north-west direction. These data were acquired from the USGS. This data layer is called a “Hillshade” in the Flood Risk Database.