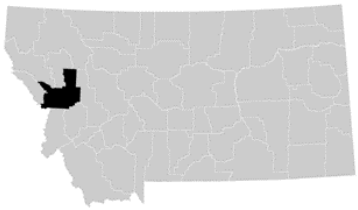
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 4



MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
MISSOULA COUNTY, UNINCORPORATED AREAS	300048
MISSOULA, CITY OF	300049

Preliminary Date: 8/28/2025

EFFECTIVE:

TBD

FLOOD INSURANCE STUDY NUMBER
30063CV001D
Version Number 2.6.4.6

FEMA

TABLE OF CONTENTS

Volume 1

Figures

Page

Tables

Page

Volume 2

Tables

Exhibits

Volume 3

Exhibits

Volume 4

Exhibits

Published Separately

FLOOD INSURANCE STUDY REPORT
MISSOULA COUNTY, MONTANA

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were built

by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community’s regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Missoula County, Montana.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC-8) sub-basins affecting each, are shown in Table 1. The FIRM panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Missoula County, Unincorporated Areas	300048	17010202 17010203 17010204 17010205 17010209 17010211 17010212	30063C0025D[1],30063C0032F 30063C0034F,30063C0035E[1] 30063C0042F,30063C0045E[1] 30063C0050E[1],30063C0053F 30063C0055E[1],30063C0061F 30063C0062F,30063C0063F 30063C0064F,30063C0075E[1] 30063C0100D[1],30063C0125D[1] 30063C0150D[1],30063C0175D[1] 30063C0177F,30063C0180E[1] 30063C0181F,30063C0183F 30063C0185E[1],30063C0190E[1]	

Table 1: Listing of NFIP Jurisdictions (Continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Missoula County, Unincorporated Areas	300048	17010202 17010203 17010204 17010205 17010209 17010211 17010212	30063C0191F,30063C0195E[1] 30063C0225D[1],30063C0250D[1] 30063C0275D[1],30063C0300D[1] 30063C0325D[1],30063C0350D[1] 30063C0375D[1],30063C0400D[1] 30063C0425D[1],30063C0450D[1] 30063C0475D[1],30063C0500D[1] 30063C0525D[1],30063C0550D[1] 30063C0575D[1],30063C0600D[1] 30063C0700D[1], 30063C0717F 30063C0720E,30063C0725E[1] 30063C0736F,30063C0737F[1] 30063C0738F,30063C0739F 30063C0750E[1],30063C0775D[1] 30063C0800D[1],30063C0819F 30063C0825F,30063C0838F 30063C0840F[1],30063C0841F 30063C0842F,30063C0843F 30063C0845F,30063C0850F 30063C0863F,30063C0864F 30063C0861F,30063C0861F 30063C0868F,30063C1478F 30063C0870F[1],30063C0875E 30063C0888F,30063C0889F 30063C0890F[1],30063C0900D[1] 30063C0925D[1],30063C0950D[1] 30063C0975D[1],30063C1000D[1] 30063C1025D[1],30063C1027F 30063C1030E,30063C1031F 30063C1050E[1],30063C1075D[1] 30063C1100D[1],30063C1105F 30063C1106F,30063C1110F[1] 30063C1125F[1],30063C1132F 30063C1135F[1],30063C1150D[1] 30063C1151F,30063C1152F 30063C1153F,30063C1154F 30063C1160E,30063C1162F 30063C1165F[1],30063C1166F 30063C1167F,30063C1168F 30063C1169F,30063C1180F 30063C1185E,30063C1186F 30063C1187F,30063C1188F 30063C1189F,30063C1191F 30063C1192F,30063C1193F 30063C1194F,30063C1205E 30063C1210D[1],30063C1214F	

Table 1: Listing of NFIP Jurisdictions (Continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Missoula County, Unincorporated Areas	300048	17010202 17010203 17010204 17010205 17010209 17010211 17010212	30063C1215F,30063C1218F 30063C1219F,30063C1220F[1] 30063C1240F,30063C1245E 30063C1250E[1],30063C1275E 30063C1300D[1],30063C1325D[1] 30063C1350D[1],30063C1375D[1] 30063C1395E,30063C1400D[1] 30063C1425E,30063C1432F 30063C1435F[1],30063C1450E 30063C1451F,30063C1452F 30063C1453F,30063C1454F 30063C1456F,30063C1457F 30063C1458F,30063C1459F 30063C1461F,30063C1462F 30063C1463F,30063C1464F 30063C1466F,30063C1468F 30063C1470F,30063C1476F 30063C1477F,30063C1478F 30063C1479F[1],30063C1481F 30063C1482F,30063C1485F[1] 30063C1490E,30063C1495D[1] 30063C1501F,30063C1502F[1] 30063C1503F,30063C1504F 30063C1508F,30063C1510F[1] 30063C1515D[1],30063C1516F 30063C1517F,30063C1520F[1] 30063C1536F,30063C1537F[1] 30063C1538F,30063C1539F 30063C1550E[1],30063C1575D[1] 30063C1600D[1],30063C1625D[1] 30063C1650D[1],30063C1675D[1] 30063C1700D[1],30063C1725D[1] 30063C1730E,30063C1735E 30063C1750E[1],30063C1752F 30063C1754F,30063C1755F 30063C1756F,30063C1758F 30063C1760F[1],30063C1762F 30063C1765F[1],30063C1766F 30063C1770F[1],30063C1800D[1] 30063C1825D[1],30063C1826F 30063C1827F,30063C1830F[1] 30063C1831F,30063C1832F 30063C1833F,30063C1834F[1] 30063C1840E[1],30063C1841F	

Table 1: Listing of NFIP Jurisdictions (Continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Missoula County, Unincorporated Areas	300048	17010202 17010203 17010204 17010205 17010209 17010211 17010212	30063C1851F,30063C1852F 30063C1853F,30063C1854F 30063C1856F,30063C1858F 30063C1860F[1],30063C1900D[1]	
Missoula, City of	300049	17010204 17010205	30063C1167F,30063C1169F 30063C1185E,30063C1186F 30063C1187F,30063C1188F 30063C1189F,30063C1191F 30063C1192F,30063C1193F 30063C1194F,30063C1214F 30063C1215F,30063C1218F 30063C1219F,30063C1452F 30063C1454F,30063C1456F 30063C1457F,30063C1458F 30063C1459F,30063C1462F 30063C1466F,30063C1470F 30063C1476F,30063C1477F 30063C1478F,30063C1481F 30063C1482F	

[1]Panel Not Printed

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1-percent-annual-chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

  It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 30, "Map Repositories," within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

  The initial Countywide FIS Report for Missoula County became effective on TBD. Refer to Table 27 for information about subsequent revisions to the FIRMs.

  The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at www.fema.gov/flood-insurance/rules-legislation/community-rating-system or contact your appropriate FEMA Regional Office for more information about this program.

- FEMA does not design, build, inspect, operate, maintain, or certify levees. FEMA is responsible for accurately identifying flood hazards and communicating those hazards and risks to affected stakeholders. FEMA has identified one or more levee systems in this jurisdiction summarized in Table 8 of this FIS Report. For FEMA to accredit the identified levee systems, the levee systems must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled "Mapping of Areas Protected by Levee Systems**."**

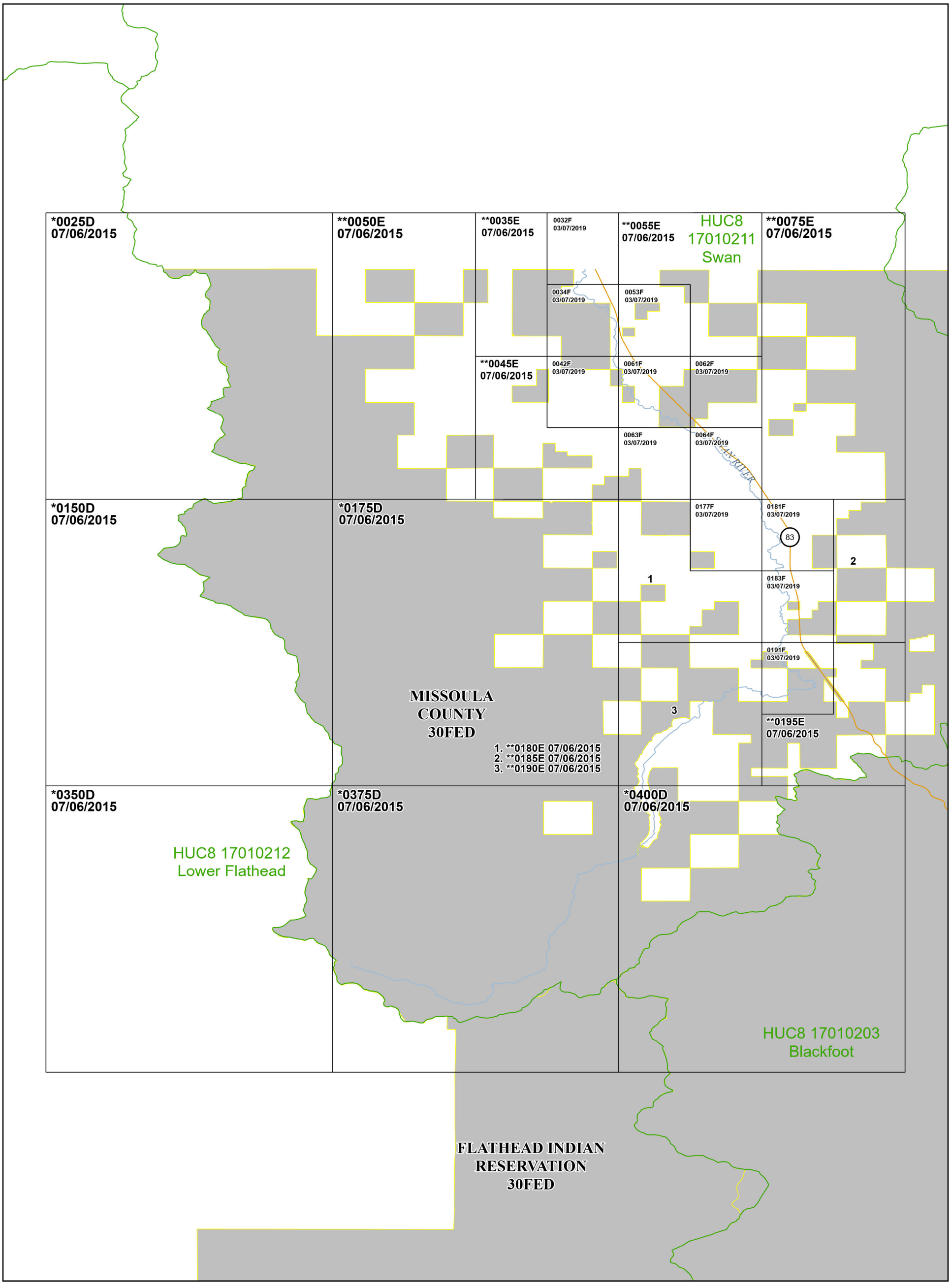
Information on the levee systems in this jurisdiction can be obtained from the USACE National Levee Database (https://levees.sec.usace.army.mil/). For additional information, the user should contact the appropriate jurisdiction floodplain administrator and the levee owner or sponsor.

- The U.S. Survey Foot was deprecated on December 31, 2022, in favor of the International Foot (referred to as foot). It may still be necessary to use U.S. Survey Feet for legacy data or for new data collected in locations which have not yet adopted the International Foot convention. The U.S. Survey Foot will not be supported in the modernized National Spatial Reference System (NSRS).

- FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at www.fema.gov/flood-maps/tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Missoula County, and also displays the panel number and effective date for each FIRM panel in the county. Other information shown on the FIRM Index includes community boundaries, flooding sources, watershed boundaries, and USGS HUC-8 codes.

FIGURE 1: FIRM Index



1 inch = 15,065 feet 1:180,785

N

0 5,000 10,000 20,000 30,000 feet

Map Projection:
GCS WGS 1984
Vertical Datum: NAVD88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA IN ZONE D
**PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

MISSOULA COUNTY, MONTANA And Incorporated Areas

PAGE 1 OF 4

PANELS PRINTED:

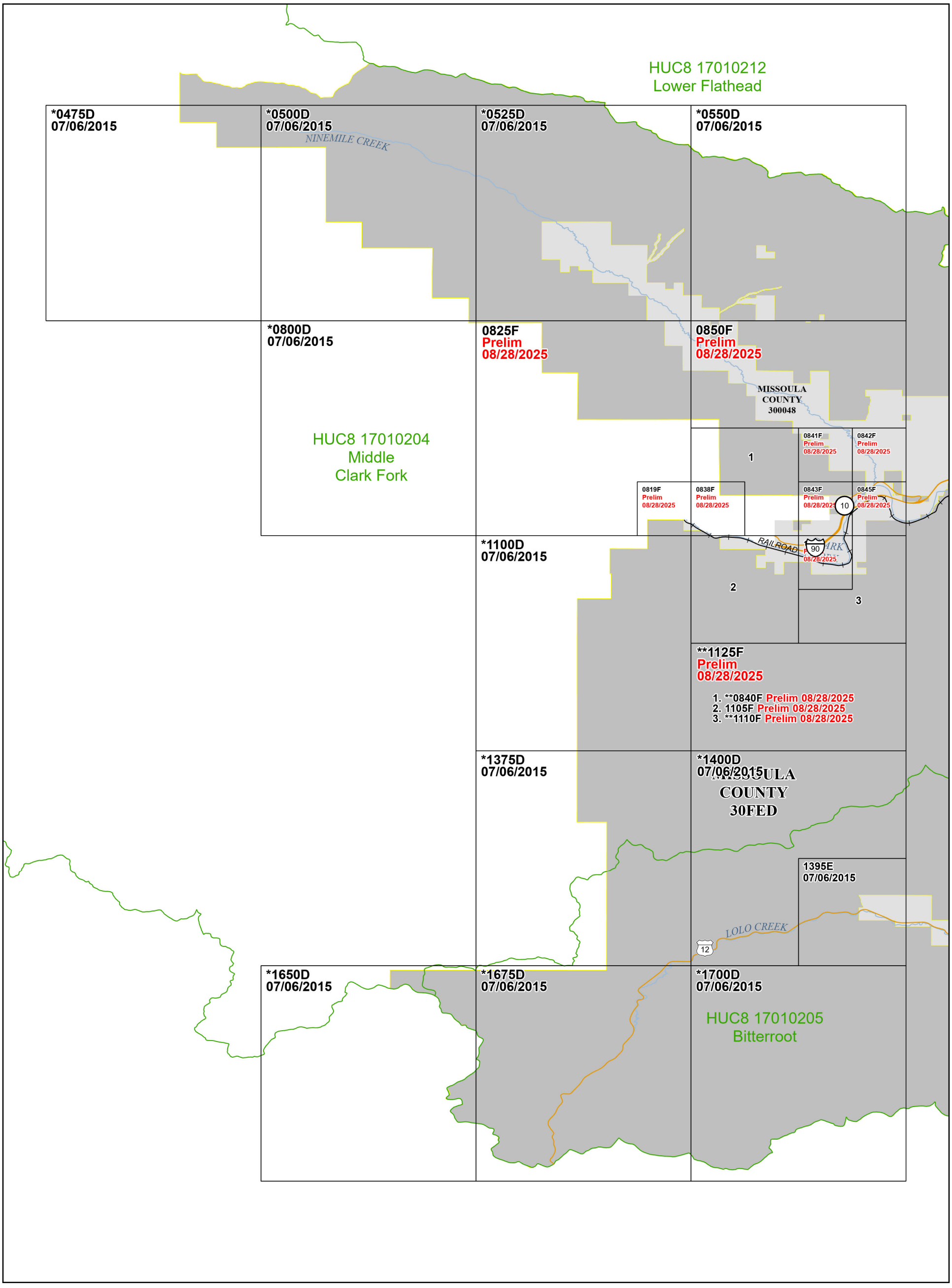
0032, 0034, 0042, 0053, 0061, 0062, 0063, 0064, 0177, 0181, 0183, 0191

FEMA

MAP NUMBER
30063CIND1D

EFFECTIVE DATE
Prelim Issue Date: 8/28/2025

FIGURE 1: FIRM Index



1 inch = 20,087 feet 1:241,046

N

feet
0 5,000 10,000 20,000 30,000

Map Projection:
GCS WGS 1984
Vertical Datum: NAVD88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA IN ZONE D
**PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

MISSOULA COUNTY, MONTANA And Incorporated Areas

PAGE 2 OF 4

PANELS PRINTED:

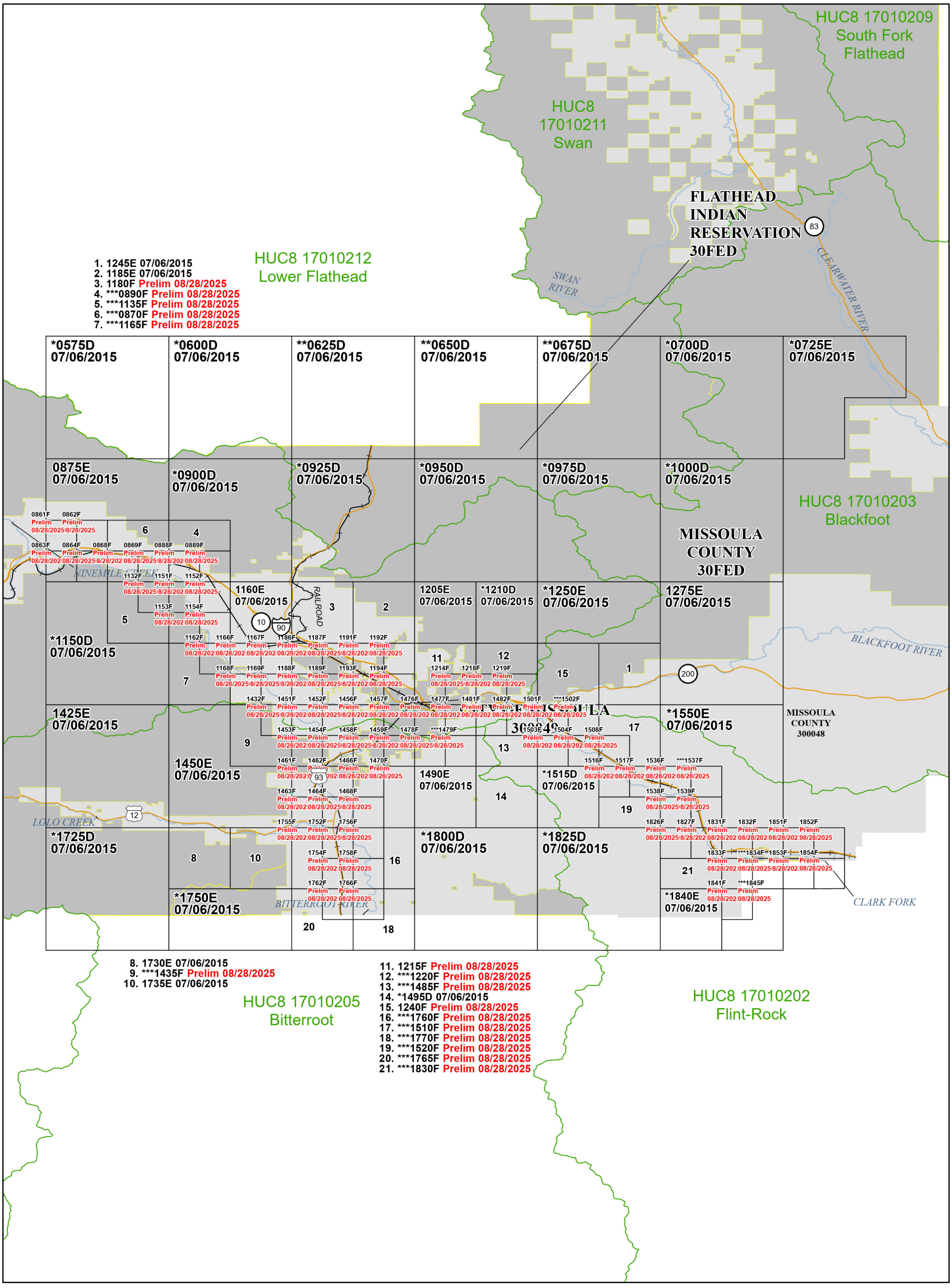
0819, 0825, 0838, 0841, 0842, 0843, 0845, 0850, 1105, 1106, 1395

FEMA

MAP NUMBER
30063CIND2D

EFFECTIVE DATE
Prelim Issue Date: 08/28/2025

FIGURE 1: FIRM Index



1 inch = 35,153 feet 1:421,831

feet
0 15,000 30,000 60,000 90,000

Map Projection:
GCS WGS 1984
Vertical Datum: NAVD88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA IN ZONE D
**PANEL NOT PRINTED - AREA NOT INCLUDED
***PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

MISSOULA COUNTY, MONTANA And Incorporated Areas

PAGE 3 OF 4

PANELS PRINTED:

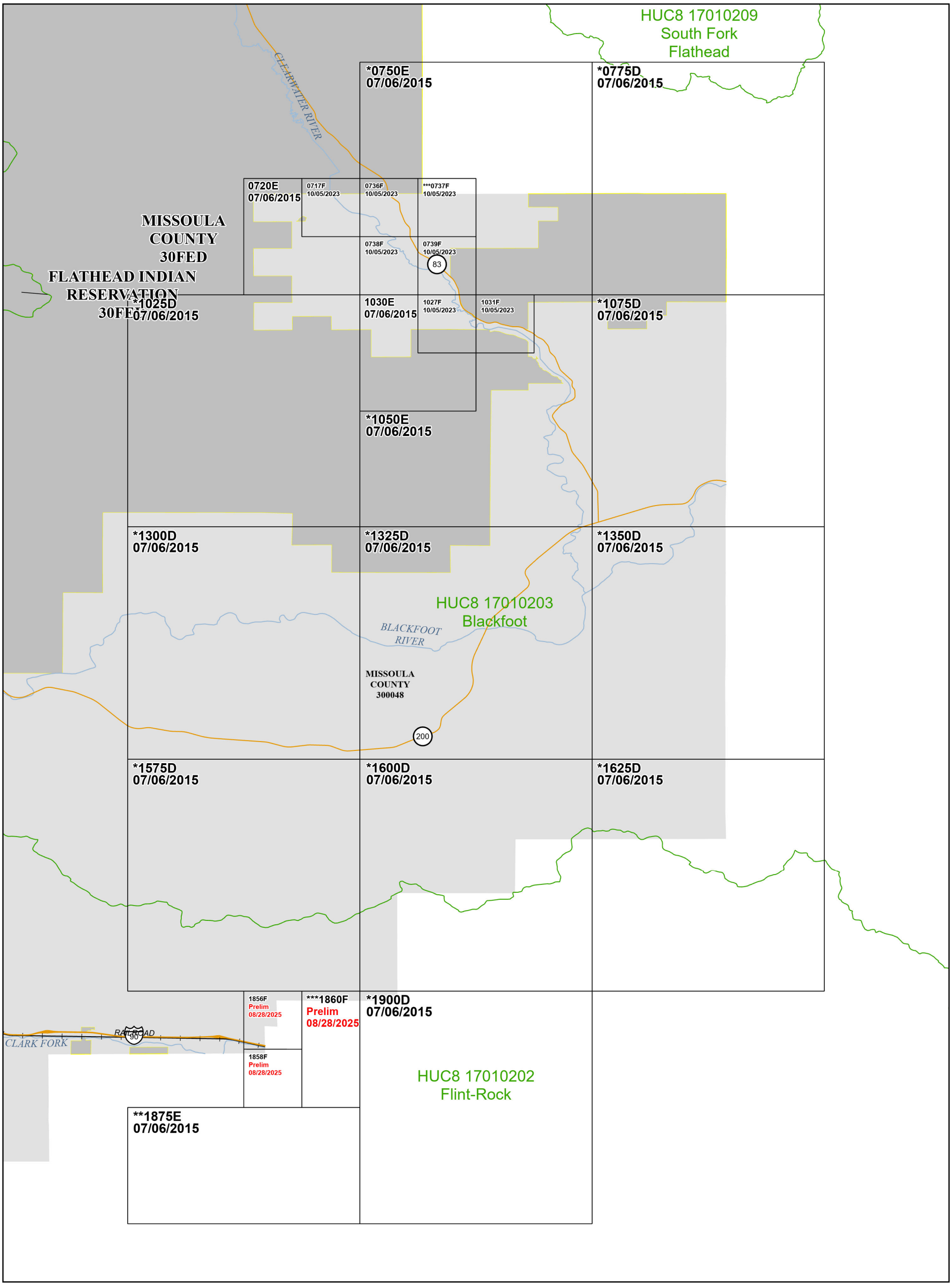
0861, 0862, 0863, 0864, 0868, 0869, 0875, 0888, 0889, 1132, 1151, 1152, 1153, 1154, 1160, 1162, 1166, 1167, 1168, 1169, 1180, 1185, 1186, 1187, 1188, 1189, 1191, 1192, 1193, 1194, 1205, 1214, 1215, 1218, 1219, 1240, 1245, 1275, 1425, 1432, 1450, 1451, 1452, 1453, 1454, 1456, 1457, 1458, 1459, 1461, 1462, 1463, 1464, 1466, 1468, 1470, 1476, 1477, 1478, 1481, 1482, 1490, 1501, 1503, 1504, 1508, 1516, 1517, 1536, 1538, 1539, 1730, 1735, 1752, 1754, 1755, 1756, 1758, 1762, 1766, 1826, 1827, 1831, 1832, 1833, 1841, 1851, 1852, 1853, 1854

FEMA

MAP NUMBER
30063CIND3D

EFFECTIVE DATE
Prelim Issue Date: 08/28/2025

FIGURE 1: FIRM Index



1 inch = 18,599 feet 1:223,191

N

feet

0 5,000 10,000 20,000 30,000

Map Projection:
GCS WGS 1984
Vertical Datum: NAVD88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA IN ZONE D
**PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY
***PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

MISSOULA COUNTY, MONTANA And Incorporated Areas

PAGE 4 OF 4

PANELS PRINTED:

0717, 0720, 0736, 0738, 0739, 1027, 1030, 1031, 1856, 1858

FEMA

MAP NUMBER
30063CIND4D

EFFECTIVE DATE
Prelim Issue Date: 08/28/2025

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Mapping and Insurance eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 27 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

Figure 2. FIRM Notes to Users

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may have reduced flood hazards due to flood control structures. Refer to Section 4.3 "Dams and Other Flood Hazard Reduction Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator (UTM) Zone 11N. The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 30 of this FIS Report.

BASE MAP INFORMATION:

July 6th, 2015 Study: Base map information shown on this FIRM was derived from NAIP Orthophotography produced with one meter ground resolution from photography dated 2011.

March 7th, 2019 Revision: Base map information shown on this FIRM was derived from USGS, dated 2006; Missoula County, dated 2005; Montana Spatial Data Infrastructure - Montana State Library, dated 2015 and 2014; And Digital Orthophoto provided by USDA, dated 2013.

October 5th, 2023 Revision: Base map information shown on the FIRM was provided by Montana State Library, dated 2017 & 2019; and the United States Department of Agricultue 7 Natural Resources Conservation Service, dated 2019. The digital orthophotgraphy was provided by the United States Department of Agriculuter, published in 2015 & 2017. All data and Imagery are at a scale of 1:24,000.

TBD Revision: Base map information shown on the FIRM was provided by the Montana State Library, dated 2017 & 2019; and the United States Department of Agriculture & Natural Resources Conservation Service, dated 2019. The digital orthophoto was provided by the U.S. Department of Agriculture, and published in 2017. All data and imagery are at a scale of 1:24,000. The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Figure 2. FIRM Notes to Users

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Missoula County, MT, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 27 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Missoula County, MT**,** effective **TBD**.

ACCREDITED LEVEE SYSTEM: Check with your local community to obtain more information on the levee system(s) shown as providing flood hazard reduction on this panel. To mitigate flood hazards in residual risk areas, property owners and residents are encouraged to review the community's emergency preparedness plan and to consider flood insurance and floodproofing or other risk reduction measures. For more information on flood insurance, interested parties should visit www.fema.gov/flood-insurance.

NON-ACCREDITED LEVEE SYSTEM: This panel contains a levee system that has not been accredited and is therefore not recognized as reducing the 1-percent-annual-chance flood hazard.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Missoula County.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

Figure 3: Map Legend for FIRM

OTHER AREAS OF FLOOD HAZARD

Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.

Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.

Area with Reduced Flood Hazard due to Accredited or Provisionally Accredited Levee System: Area is shown as reduced flood hazard from the 1-percent-annual-chance or greater flood by a levee system. Overtopping or failure of any levee system is possible. **See Notes to Users for important information.**

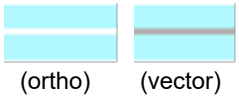
Area with Undetermined Flood Hazard due to Non-Accredited Levee System: Analysis and mapping procedures for non-accredited levee systems were applied resulting in a flood insurance rate zone where flood hazards are undetermined, but possible.

OTHER AREAS

Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Unshaded Zone X: Areas of minimal flood hazard.

FLOOD HAZARD AND OTHER BOUNDARY LINES



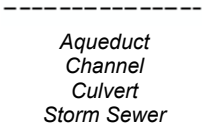
Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)

Limit of Study

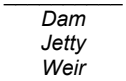
Jurisdiction Boundary

Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

GENERAL STRUCTURES



Channel, Culvert, Aqueduct, or Storm Sewer



Dam, Jetty, Weir

Levee, Dike, or Floodwall

Figure 3: Map Legend for FIRM

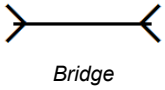
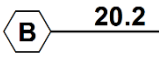
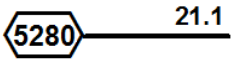
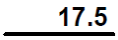
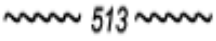
	Bridge
REFERENCE MARKERS	
	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
	Base Flood Elevation Line
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity
BASE MAP FEATURES	
	River, Stream or Other Hydrographic Feature
	Interstate Highway
	U.S. Highway
	State Highway
	County Highway

Figure 3: Map Legend for FIRM

MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}E$	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Missoula County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1-percent-annual-chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1-percent and 0.2-percent-annual-chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1-percent-annual-chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Missoula County, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 12. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1-percent-annual-chance floodplain corresponds to the SFHAs. The 0.2-percent-annual-chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Bitterroot River	Missoula County, Unincorporated Areas	Approximately 4,500 feet upstream of confluence with Clark Fork River	Approximately 21.6 miles upstream of confluence with Clark Fork and Missoula County line	17010204, 17010205	21.6	Y	AE	2021
Blackfoot River	Missoula County, Unincorporated Areas	Confluence with Clark Fork River	Approximately 1.0 mile upstream of confluence with Clark Fork	17010203	4.2	Y	AE	1973
Clark Fork River (near Mineral County)	Missoula County, Unincorporated Areas	Mineral/Sanders County Boundary	Approximately 2.8 miles upstream of Mineral/Missoula County Boundary	17010204	2.8	N	AE	2023
Clark Fork River	Missoula County, Unincorporated Areas; Missoula, City of	Mineral/Missoula County Boundary	Approximately 66.3 miles upstream of Missoula County Line	17010204, 17010202	66.3	Y	AE	2023
Clark Fork River (near Granite County)	Missoula County, Unincorporated Areas	Missoula/Granite County Boundary	Approximately 2.4 miles upstream of Missoula/Granite County Boundary	17010202	2.4	Y	AE	2023
Clearwater River	Missoula County, Unincorporated Areas	1,038 feet above confluence with Salmon Lake	Approximately 550 feet downstream of Boy Scout Rd	17010203	9.4	Y	AE	2020
DS Glacier Split	Missoula County, Unincorporated Areas	Confluence with Swan River	Approximately 8,300 feet upstream to split from Swan River	17010211	1.6	Y	AE	2016

Table 2: Flooding Sources Included in this FIS Report (Continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Glacier Rd Split	Missoula County, Unincorporated Areas	Confluence with Swan River	Approximately 1,800 feet upstream to split from Swan River	17010211	0.3	N	AE	2016
Grant Creek	Missoula County, Unincorporated Areas; Missoula, City of	Bridge at Interstate Highway 90	Approximately 40 Feet Upstream of Snow Bowl Rd	17010204	3.5	Y	AE	1973
Guest R Split	Missoula County, Unincorporated Areas	Confluence with Swan River	Approximately 290 feet upstream of Guest Ranch Road crossing to split from Swan River	17010211	0.2	Y	AE	2016
Honeysuckle Drainage Swale	Missoula, City of	100 Feet East of Reserve Street	150 South of Cohosset Drive	17010205	0.6	N	AE	1977
Kauffman Split	Missoula County, Unincorporated Areas	Confluence with Swan River	Approximately 3,800 feet upstream to split from Swan River	17010211	0.7	Y	AE	2016
La Valle Creek	Missoula County, Unincorporated Areas	Frenchtown Irrigation District Ditch Centerline	1 mile upstream of County Road 13	17010204	3.5	Y	AE	2006
Left Branch of Bitterroot River	Missoula County, Unincorporated Areas	Convergence with Bitterroot River	Approximately 2.9 miles upstream of convergence with Bitterroot River	17010205	2.9	N	AE	2021
Lolo Creek	Missoula County, Unincorporated Areas	Confluence with Bitterroot River	6.5 miles southwest of the City of Missoula	17010205	6.5	Y	AE	1975
Lower Grant Creek	Missoula County, Unincorporated Areas; Missoula, City of	Approximately 264 ft downstream of Mullan Rd	Burlington Northern and Santa Fe Railway	17010204	3.52	N	AE	2011

Table 2: Flooding Sources Included in this FIS Report (Continued)

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Lower Grant Creek Extension	Missoula County, Unincorporated Areas; Missoula, City of	Confluence with Unnamed Tributary of the Clark Fork	Approximately 264 ft downstream of Mullan Rd	17010204	0.7	N	AE	2011
Middle Grant Creek	Missoula County, Unincorporated Areas; Missoula, City of	Stream Distance in feet above Schramm St	Approximately 160 feet downstream of Interstate 90 East Bound Exit Ramp	17010204	0.59	Y	AE	2022
Miller Creek	Missoula County, Unincorporated Areas	Confluence with Bitterroot River	600 feet upstream of Mossy Ridge	17010205	3.7	Y	AE	1979
Monroc Split	Missoula County, Unincorporated Areas; Missoula, City of	Convergence with Clark Fork River	Approximately 1.3 miles upstream of convergence with Clark Fork	17010204	1.3	N	AE	2023
Pattee Creek	Missoula County, Unincorporated Areas; Missoula, City of	Approximately 295 feet upstream intersection of Higgins Avenue and Pattee Canyon Drive	1,300 Feet Upstream of Culvert on Pattee Canyon Drive	17010205	0.8	Y	AE	2004
Rattlesnake Creek	Missoula County, Unincorporated Areas; Missoula, City of	Confluence with Clark Fork River	5.6 miles north of the City of Missoula	17010204	5.6	Y	AE	1976
Rock Creek	Missoula County, Unincorporated Areas	Confluence with Clark Fork River	Approximately 5.7 miles upstream of confluence with Clark Fork River	17010202	5.7	Y	AE	2021
Swan River	Missoula County, Unincorporated Areas	Lake County Boundary	Confluence of Beaver Creek	17010211	19.1	Y	AE	2016
Zone A Streams	Missoula County, Unincorporated Areas; Missoula, City of	Various	Various	17010203, 17010204, 17010205	*	N	A	1988

* Information Not Available

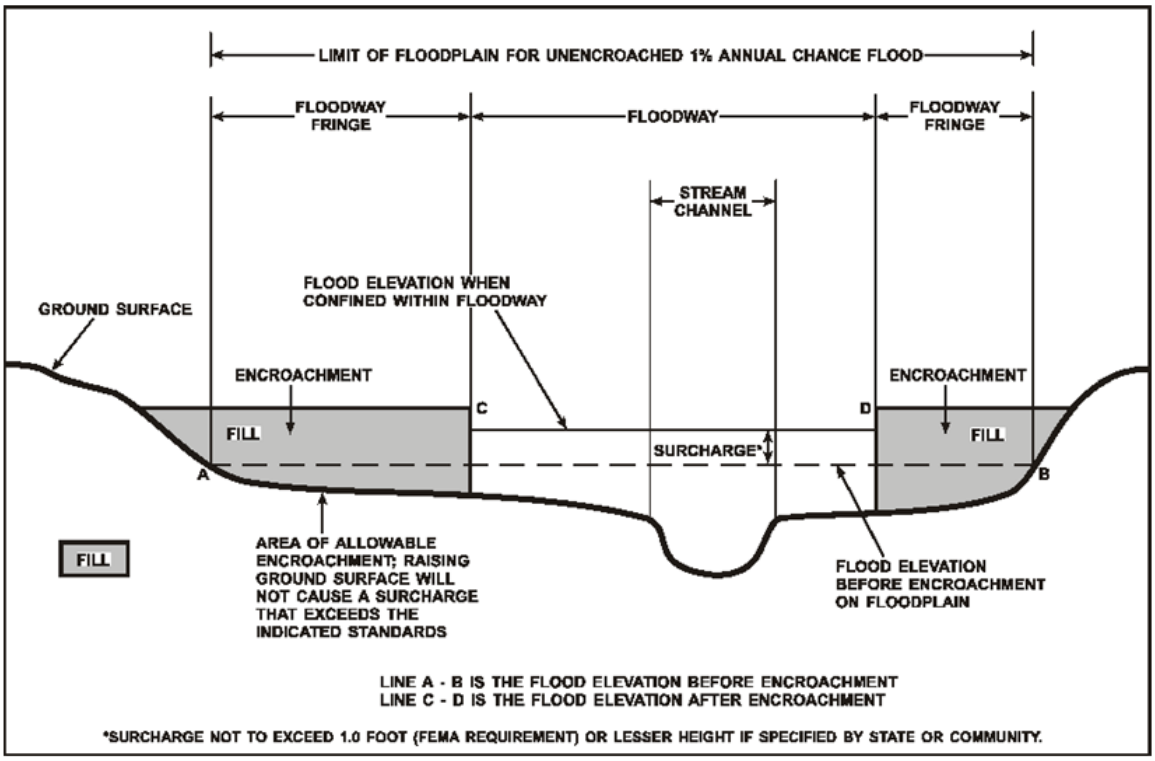
2.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1-percent-annual-chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1-percent-annual-chance flood. The floodway fringe is the area between the floodway and the 1-percent-annual-chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. Regulations for State require communities in Missoula County to limit increases caused by encroachment to 0.5 foot (MDNRC, 2014) and several communities have adopted additional restrictions. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 23, “Floodway Data.”

All floodways that were developed for this Flood Risk Project are shown on the FIRM using the symbology described in Figure 3. In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The BFE is the elevation of the 1-percent-annual-chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in

the Floodway Data table and Flood Profiles in this FIS Report. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. For example, the user may use the FIRM to determine the stream station of a location of interest and then use the profile to determine the 1-percent annual chance elevation at that location. Because only selected cross sections may be shown on the FIRM for riverine areas, the profile should be used to obtain the flood elevation between mapped cross sections. Additionally, for riverine areas, whole-foot elevations shown on the FIRM may not exactly reflect the elevations derived from the hydraulic analyses; therefore, elevations obtained from the profile may more accurately reflect the results of the hydraulic analysis.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Product.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Product.

2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this Flood Risk Product.

Figure 5: Wave Runup Transect Schematic

[Not Applicable to this Flood Risk Project]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this Flood Risk Product.

2.5.3 Coastal High Hazard Areas

This section is not applicable to this Flood Risk Product.

Figure 6: Coastal Transect Schematic

[Not Applicable to this Flood Risk Project]

2.5.4 Limit of Moderate Wave Action

This section is not applicable to this Flood Risk Product.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3, "Map Legend for FIRM." Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood zones in Missoula County**.**

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Missoula County, Unincorporated Areas	A, AE, AH, AO, X
Missoula, City of	A, AE, AO, X

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 4 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 4: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Flint-Rock	17010202	Clark Fork	Begins at the Granite County boundary, flows northwest to the confluence of Blackfoot River and Clark Fork	1,820
Blackfoot	17010203	Blackfoot River	Begins at the Powell County boundary, flows west to the confluence of Blackfoot River and Clark Fork	2,313
Middle Clark Fork	17010204	Clark Fork	Begins at the confluence of Blackfoot River and Clark Fork, flows northwest to the Mineral County boundary	1,985

Table 4: Basin Characteristics (Continued)

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Bitterroot	17010205	Bitterroot River	Begins at the Ravalli County boundary, flows north to the confluence with Clark Fork	2,858
South Fork Flathead	17010209	South Fork Flathead River	Begins at south end of Bob Marshall Wilderness and flows northward to confluence with Flathead River	1,676
Swan	17010211	Swan River	Begins at the confluence of Beaver Creek, flows northwest to the Lake County Boundary	729
Lower Flathead	17010212	Flathead River	Begins at the outlet of Flathead Lake, flows south to confluence with Clark Fork	2,009

4.2 Principal Flood Problems

Table 5 contains a description of the principal flood problems that have been noted for Missoula County by flooding source.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Bitterroot River	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff. A high ground water table contributes to shallow flooding in low-lying areas along Bitterroot River. June of 1974 flooding along the Bitterroot River was estimated at 29,000 cubic feet per second.
Blackfoot River	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff. Winter flooding has occurred due to ice jams in isolated areas.
Clark Fork	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff. A high ground water table contributes to shallow flooding in low-lying areas along Clark Fork. Winter flooding has occurred due to ice jams in isolated areas. May and June of 1908 was the largest known flood event to occur in Missoula County. Clark Fork had an estimated peak flow of 48,000 cubic feet per second.
Clearwater River	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Grant Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Honeysuckle Drainage Swale	Steep hills adjacent to the lowland alluvial area. Relatively large size of the contributory drainage area. Rapid urbanization of the formerly rural and agricultural land, including development on the hillsides. An inadequate stormwater drainage system in the developing area.
La Valle Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.

Table 5: Principal Flood Problems (Continued)

Flooding Source	Description of Flood Problems
Lolo Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Lower Grant Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Miller Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Pattee Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Rattlesnake Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff.
Rock Creek	The most severe flooding occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff. On June 20, 1975
Swan River	The most severe flooding in the Swan Valley typically occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff. On occasion, localized flooding is caused by long, sustained rainfall and/or ice jams and debris jams.

Table 6 contains information about historic flood elevations in the communities within Missoula County.

Table 6: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Bitterroot River	Bitterroot River near Missoula	13.1	1997	100	USGS gage
Blackfoot River	Blackfoot River near Bonner, MT	10.9	1964	20	USGS gage
Clark Fork	Clark Fork below Missoula, MT	12.2	1997	50	USGS gage
Clark Fork	Clark Fork above Missoula, MT	13.75	1975	50	USGS gage
Lolo Creek	Lolo Creek near Lolo, MT	n/a	1913	50	USGS gage
Rattlesnake Creek	Rattlesnake Creek at Missoula, MT	10.2	1964	10	USGS gage
Rock Creek	Rock Creek near Clinton	8.5	1972	10	USGS gage

4.3 Dams and Other Flood Hazard Reduction Measures

Table 7 contains information about non-levee flood hazard reduction measures within Missoula County such as dams or jetties. Levee systems are addressed in Section 4.4 of this FIS Report.

Table 7: Dams and Other Flood Hazard Reduction Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Lolo Creek	N/A	Dike	North bank immediately downstream of Burlington Northern Railroad Bridge	Non-certified earthfill dike

4.4 Levee Systems

For purposes of the NFIP, FEMA only recognizes levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with comprehensive floodplain management criteria. The Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) describes the information needed for FEMA to determine if a levee system reduces the flood hazard from the 1-percent-annual-chance flood. This information must be supplied to FEMA by the community or other party when a flood risk study or restudy is conducted, when FIRMs are revised, or upon FEMA request. FEMA reviews the information for the purpose of establishing the appropriate flood hazard zone.

Levee systems that are determined to reduce the hazard from the 1-percent-annual-chance flood are accredited by FEMA. FEMA can also grant provisional accreditation to a levee system that was previously accredited on an effective FIRM and for which FEMA is awaiting data and/or documentation to demonstrate compliance with 44 CFR 65.10. These levee systems are referred to as Provisionally Accredited Levees, or PALs. Provisional accreditation provides communities and levee owners with a specified timeframe to obtain the necessary data to confirm the levee system's accreditation status. Accredited levee systems and PALs are shown on the FIRM using the symbology shown in Figure 3. If the required information for a PAL is not submitted within the required timeframe, or if information indicates that a levee system no longer meets 44 CFR 65.10, FEMA will consider the levee system as non-accredited and issue an effective FIRM showing the levee-impacted area as a SFHA.

FEMA coordinated with the USACE, the local communities, and other organizations to compile a list of levee systems that exist within Missoula County. Table 8, "Levee Systems," lists all accredited levee systems, PALs, and non-accredited levee systems shown on the FIRM for this FIS Report. Other categories of levees may also be included in the table. The Levee ID shown in this table may not match numbers based on other identification systems that were listed in previous FIS Reports. Levee systems identified in the table are displayed on the FIRM with notes to users to indicate their flood hazard mapping status.

Please note that the information presented in Table 8 is subject to change at any time. For that reason, the latest information regarding the levee systems presented in the table may be obtained by accessing the National Levee Database. For additional information, contact the levee owner/sponsor or the local community shown in Table 30.

Table 8: Levee Systems

Community	Flooding Source(s)	NLD Levee System ID	NLD Levee System Name	Levee System Status on Effective FIRM	FIRM Panel(s)	Levee Owner(s) / Sponsor(s)
Missoula, City of	Clark Fork River	5505000005	Clark Fork Authorized Area III	Accredited	30063C1457F, 30063C1476F	City of Missoula
Missoula, City of	Clark Fork River	5505000004	Clark Fork Authorized Area V	Accredited	30063C1194F	City of Missoula
Missoula, City of	Clark Fork River	5505000306	McCormick Park	Non-Accredited	30063C1457F, 30063C1476F	City of Missoula
Missoula, City of	Grant Creek	5505000105	Grant Creek	Accredited	30063C1191F 30063C1192F	City of Missoula
Missoula County, Unincorporated Areas	Clark Fork River	1805000049	Stone Container - E side Clark Frk FIRM 1155	Non-Accredited	30063C1151F, 30063C1152F, 30063C1153F, 30063C1154F	
Missoula County, Unincorporated Areas	Clark Fork River	5505000288	Turah	Non-Accredited	30063C1516F	Missoula County
Missoula County, Unincorporated Areas	Lolo Creek	1805000025	North side Lolo Creek just east of Hwy93	Non-Accredited	30063C1752F	

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

In addition to these flood events, the “1-percent-plus”, or “1%+”, annual chance flood elevation has been modeled and included on the flood profile and/or in the FIRM database for certain flooding sources in this FIS Report. While not used for regulatory or insurance purposes, this flood event has been calculated to help illustrate the variability range that exists between the regulatory 1-percent-annual-chance flood elevation and a 1-percent-annual-chance elevation that has taken into account an additional amount of uncertainty in the flood discharges (thus, the 1% “plus”). For flooding sources whose discharges were estimated using regression equations, the 1%+ flood elevations are derived by taking the 1-percent-annual-chance flood discharges and increasing the modeled discharges by a percentage equal to the average predictive error for the regression equation. For flooding sources with gage- or rainfall-runoff-based discharge estimates, the upper 84-percent confidence limit of the discharges is used to compute the 1%+ flood elevations.

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 26, “Incorporated Letters of Map Change”, which include Letters of Map Revision (LOMRs). For more information about LOMRs, refer to Section 6.5, “FIRM Revisions.”

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 9. Stream gage information is provided in Table 11.

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Plus Annual Chance	0.2% Annual Chance
Bitterroot River	At junction with Clark Fork	2,857	23,500	27,300	29,800	32,400	37,800	38,000
Bitterroot River	Near Missoula	2,821	22,700	26,400	28,900	31,400	36,600	36,900
Bitterroot River	Lower Lolo Creek	2,742	21,900	25,300	27,900	30,400	35,900	36,100
Bitterroot River	At North Woodchuck Creek	2,413	18,500	21,000	23,900	26,100	33,100	32,800
Blackfoot River	At USGS Gage No. 3400	2,290	16,800	*	22,500	25,000	*	38,500
Butler Creek	Just Upstream of Interstate 90	9.28	*	*	*	*	380	*
Clark Fork River	Above Missoula, MT	6,013	26,600	32,100	36,100	39,900	48,400	46,600
Clark Fork River	At Turah Bridge near Bonner	3,661	12,000	15,200	17,700	20,400	28,500	27,000
Clark Fork River	Below Missoula, MT	9,007	47,200	54,900	60,200	65,000	73,500	75,200
Clark Fork River	Near Clinton, MT	2,646	7,930	10,800	13,100	15,800	26,400	23,200
Clark Fork River	Upstream of Bitterroot River	6,149	27,500	33,100	37,100	41,000	47,800	49,600
Clark Fork River	Upstream of Blackfoot River	3,691	12,200	15,400	17,900	20,600	28,700	27,300
Clark Fork River	Deep Creek	9,052	47,500	55,200	60,600	65,400	73,900	75,600
Clark Fork River	Grant Creek	6,087	27,100	32,600	36,700	40,500	47,200	49,000
Clark Fork River	Lower Rattlesnake Creek	6,018	26,600	32,100	36,100	39,900	46,600	48,400
Clark Fork River	Mill Creek	9,165	48,300	56,100	61,500	66,400	75,000	76,700
Clark Fork River	Missoula-Mineral County Boundary	9,548	50,900	59,100	64,700	69,800	78,700	80,400
Clark Fork River	Ninemile Creek	9,269	49,000	56,900	62,400	67,300	76,000	77,700

Table 9: Summary of Discharges (Continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Plus Annual Chance	0.2% Annual Chance
Clark Fork River	Petty Creek	9,463	50,300	58,400	64,000	69,000	77,900	79,600
Clark Fork River	Rock Creek	9,123	48,000	55,800	61,200	66,000	74,600	76,300
Clark Fork River	Rock Creek-Kitchen Gulch	2,682	8,060	10,900	13,300	16,000	26,500	23,300
Clark Fork River	Roman Creek	9,210	48,600	56,500	61,900	66,800	75,400	77,200
Clark Fork River	Schwartz Creek	3,580	11,700	14,800	17,300	20,000	28,400	26,700
Clark Fork River	Sixmile Creek	9,238	48,800	56,700	62,100	67,000	75,700	77,400
Clark Fork River	Wallace Creek	3,633	11,900	15,100	17,600	20,300	28,400	26,900
Clark Fork River (Near Granite County)	Above Flint Creek	1,900	6,450	8,610	10,300	12,200	*	16,700
Clark Fork River (Near Granite County)	Below Flint Creek (USGS Gage No. 12331600 Clark Fork at Drummond, MT)	2,383	7,220	9,880	12,100	14,600	*	21,300
Clark Fork River (Near Granite County)	At USGS Gage No. 12331800, Clark Fork near Drummond, MT	2,513	7,420	10,200	12,500	15,200	*	22,600
Clark Fork River (Near Granite County)	At USGS Gage No. 12331900, Clark Fork near Clinton, MT	2,646	7,930	10,800	13,100	15,800	*	23,200
Clark Fork River (Near Mineral County)	*	*	*	*	*	*	*	*
Clearwater River	Upstream of confluence with Morrel Creek	2,310	1,630	1,940	2,200	Clearwater River	*	3,010

Table 9: Summary of Discharges (Continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Plus Annual Chance	0.2% Annual Chance
Clearwater River	Upstream of confluence with Owl Creek	2,310	1840	2,280	2,620	Clearwater River	*	3,890
Clearwater River	Downstream of confluence with Owl Creek	2,310	2,440	2,990	3,440	Clearwater River	*	5,040
Grant Creek	At Interstate Highway 90	25	245	*	380	Grant Creek	*	730
Honeysuckle Drainage Swale	100 Feet East of Reserve Street	_[1]	_[1]	_[1]	_[1]	_[1]	*	_[1]
La Valle Creek	At Mullan Road Crossing	27	448	*	778	943	*	1,381
Lolo Creek	At confluence with Bitterroot River	270	2,300	*	2,900	3,300	*	3,800
Lolo Creek	At USGS Gage No. 3520	250	2,100	*	2,700	3,000	*	3,500
Lower Grant Creek	At confluence with Clark Fork	29.6	170	*	358	629	*	864
Lower Grant Creek Extension	*	*	*	*	*	*	*	*
Middle Grant Creek	Approximately 430 Feet downstream of Schramm Street	24.9	*	*	*	623	*	*
Miller Creek	At confluence with Bitterroot River	48	350	*	550	675	*	1,150
Pattee Creek	At confluence with Bitterroot River	16	109	*	250	348	*	780
Pattee Creek	At South Higgins Avenue in the City of Missoula, Total Drainage	9.8	105	*	165	195	*	265

Table 9: Summary of Discharges (Continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Plus Annual Chance	0.2% Annual Chance
Rattlesnake Creek	At USGS Gage No. 3410 in the City of Missoula	80	1,905	*	2,690	3,000	*	3,750
Rock Creek	USGS Gage 12334510 Rock Creek near Clinton, MT	888	5,780	6,900	7,690	8,440	10,100	10,000
Rock Creek	Gilbert Creek	854	5,630	6,710	7,480	8,210	9,810	9,720
South Drainage East	At South Higgins Avenue in the City of Missoula, Total Drainage	1.3	45	*	70	80	*	105
South Drainage West	At Miller Creek Road in the City of Missoula, Total Drainage	1.7	25	*	40	50	*	65
Swan River	Upstream Study Limits	70.6	1,230	1,400	1,510	1,630	*	1,890
Swan River	Confluence with Holland Creek	109.7	1,730	1,960	2,120	2,280	*	2,650
Swan River	Confluence with Buck Creek	137.6	2,060	2,330	2,520	2,720	*	3,150
Swan River	Confluence with Glacier Creek	230.9	3,060	3,470	3,750	4,040	*	4,680
Swan River	Confluence with Cold Creek	271.1	3,470	3,920	4,250	4,560	*	5,290

*Not calculated for this Flood Risk Project
[1]Data not available

Figure 7: Frequency Discharge-Drainage Area Curves

[Not Applicable to this Flood Risk Project]

Table 10: Summary of Non-Coastal Stillwater Elevations

[Not Applicable to this Flood Risk Project]

Table 11: Stream Gage Information used to Determine Discharges

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Bitterroot River	12352500	USGS	Bitterroot River near Missoula, MT	2,824	1899	2018
Bitterroot River	12351200	USGS	Bitterroot River near Florence, MT	2,342	1958	2011
Blackfoot River	12340000	USGS	Blackfoot River near Bonner, MT	2,287	1899	1901
Blackfoot River	12340000	USGS	Blackfoot River near Bonner, MT	2,287	1903	1905
Blackfoot River	12335000	USGS	Blackfoot River near Helmville, MT	482	1940	1953
Clark Fork River	12353000	USGS	Clark Fork below Missoula, MT	9,017	1929	2021
Clark Fork River	12340500	USGS	Clark Fork above Missoula, MT	6,021	1929	2021
Clark Fork River	12334550	USGS	Clark Fork at Turah Bridge near Bonner MT	3,657	1984	2021
Clark Fork River	12331800	USGS	Clark Fork near Drummond MT	2,516	1993	2021
Clearwater River	12339450	USGS	Clearwater River near Clearwater MT	364	10/1/1974	9/29/1992
Lolo Creek	12352000	USGS	Lolo Creek above Sleeman Creek near Lolo, MT	250	1950	1960
Rattlesnake Creek	12341000	USGS	Rattlesnake Creek at Missoula, MT	80.7	1958	1967
Swan River	12369200	USGS	Swan River near Condon, MT	69.1	1973	1992

Table 11: Stream Gage Information used to Determine Discharges (Continued)

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Swan River	12370000	USGS	Swan River near Bigfork, MT	671	1922	2013

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed in Table 23, “Floodway Data.”

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 12. Roughness coefficients are provided in Table 13. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 12: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Bitterroot River	Approximately 4,500 feet upstream of confluence with Clark Fork River	Approximately 21.6 miles upstream of confluence with Clark Fork and Missoula County line	Other	HEC-RAS 5.0 and up	2021	AE w/ Floodway	
Blackfoot River	Confluence with Clark Fork River	Approximately 1.0 mile upstream of confluence with Clark Fork	Log-Pearson III flood frequency analysis; USGS Regional Flood Prediction Equation	HEC-2	1973	AE w/ Floodway	Complete valley cross sections from Flood Survey, 1977
Clark Fork River (near Mineral County)	Mineral/Sanders County Boundary	Approximately 2.8 miles upstream of Mineral/Missoula County Boundary	Other	HEC-RAS 5.0 and up	2023	AE	
Clark Fork River	Mineral/Missoula County Line	Approximately 66.3 miles upstream of Mineral/Missoula County Line	Other	HEC-RAS 5.0 and up	2023	AE w/ Floodway	
Clark Fork River (near Granite County)	Missoula/Granite County Boundary	Approximately 2.4 miles upstream of Missoula/Granite County Boundary	Other	HEC-RAS 5.0 and up	2023	AW w/ Floodway	
Clearwater River	1,038 feet above confluence with Salmon Lake	Approximately 550 feet downstream of Boy Scout Rd	Regional regression analysis, Basin area-weighted gage transfer	HEC-RAS 5.0.7	December 2020	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulic Analyses (Continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
DS Glacier Split	Confluence with Swan River	Approximately 8,300 feet upstream to split from Swan River	Log interpolation between two gages: Log-Pearson III flood frequency analysis (Gage 12370000) and Move.1 analysis (Gage 12369200)	HEC-RAS, 4.1.0	November 2016	AE w/ Floodway	Split flow path of Swan River; Swan River model used lateral weirs to calculate unsteady flows for DS Glacier Split
Glacier Rd Split	Confluence with Swan River	Approximately 1,800 feet upstream to split from Swan River	Log interpolation between two gages: Log-Pearson III flood frequency analysis (Gage 12370000) and Move.1 analysis (Gage 12369200)	HEC-RAS, 4.1.0	November 2016	AE	Split flow path of Swan River; Swan River model used lateral weirs to calculate unsteady flows for Glacier Rd Split
Grant Creek	Bridge at Interstate Highway 90	Approximately 40 Feet Upstream of Snow Bowl Rd	USGS Open File Report 81-917	HEC-2	1973	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulic Analyses (Continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Guest R Split	Confluence with Swan River	Approximately 290 feet upstream of Guest Ranch Road crossing to split from Swan River	Log interpolation between two gages: Log-Pearson III flood frequency analysis (Gage 12370000) and Move.1 analysis (Gage 12369200)	HEC-RAS, 4.1.0	November 2016	AE w/ Floodway	Split flow path of Swan River; Swan River model used lateral weirs to calculate unsteady flows for Guest R Split
Honeysuckle Drainage Swale	100 Feet East of Reserve Street	150 South of Cohosset Drive			1977	AE	Part of the South Hills Area Storm Drainage Plan (TD&H, 1977)
Kauffman Split	Confluence with Swan River	Approximately 3,800 feet upstream to split from Swan River	Log interpolation between two gages: Log-Pearson III flood frequency analysis (Gage 12370000) and Move.1 analysis (Gage 12369200)	HEC-RAS, 4.1.0	November 2016	AE w/ Floodway	Split flow path of Swan River; Swan River model used lateral weirs to calculate unsteady flows for Kauffman Split
La Valle Creek	Frenchtown Irrigation District Ditch Centerline	1 mile upstream of County Road 13	USGS Regression Equations (CCH Hydrology, 2006)	HEC-RAS 3.1.3	2006	AE w/ Floodway	
Left Branch of Bitterroot River	Convergence with Bitterroot River	Approximately 2.9 miles upstream of convergence with Bitterroot River	Other	HEC-RAS 5.0 and up	2021	AE	

Table 12: Summary of Hydrologic and Hydraulic Analyses (Continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Lolo Creek	Confluence with Bitterroot River	6.5 miles southwest of the City of Missoula	Log-Pearson III flood frequency analysis; USGS Regional Flood Prediction Equation; Dodge equation	HEC-2	1975	AE w/ Floodway	Increased drainage area adjustment done using Open-File Report 75-650
Lower Grant Creek	Approximately 264 ft downstream of Mullan Rd	Burlington Northern and Santa Fe Railway			2011	AE	
Lower Grant Creek Extension	Confluence with Unnamed Tributary of the Clark Fork	Approximately 264 ft downstream of Mullan Rd		HEC-2	2011	AE	LOMR # 11-08-0184P
Middle Grant Creek	Stream Distance in feet above Schramm St	Approximately 160 feet downstream of Interstate 90 East Bound Exit Ramp		HEC-RAS 5.0 and up	2022	AE	LOMR # 21-08-0878P
Miller Creek	Confluence with Bitterroot River	600 feet upstream of Mossy Ridge	USGS Open File Report 81-917	HEC-2	1979	AE w/ Floodway	A small portion of Miller Creek was field surveyed for the Rodeo Ranchettes Subdivision, and cross section geometry was supplemented with topographic information (Pro Consults, 1979)
Monroc Split	Convergence with Clark Fork River	Approximately 1.3 miles upstream of convergence with Clark Fork	Other	HEC-RAS 5.0 and up	2023	AE	
Pattee Creek	Approximately 295 feet upstream of Intersection of Higgins Avenue and Pattee Canyon Drive	1,300 Feet Upstream of Culvert on Pattee Canyon Drive	USGS Regional Flood Prediction Equation; Dodge equation; SCS rainfall runoff method	HEC-2	1977	AE w/ Floodway	Below water cross sections from Flood Survey, 1977

Table 12: Summary of Hydrologic and Hydraulic Analyses (Continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Rattlesnake Creek	Confluence with Clark Fork River	5.6 miles north of the City of Missoula	Log-Pearson III flood frequency analysis; USGS Regional Flood Prediction Equation	HEC-2	1976	AE w/ Floodway	
Rock Creek	Confluence with Clark Fork River	Approximately 5.7 miles upstream of confluence with Clark Fork River	Other	HEC-RAS 5.0 and up	2021	AE w/ Floodway	
Swan River	Lake County Boundary	Confluence of Beaver Creek	Log interpolation between two gages: Log-Pearson III flood frequency analysis (Gage 12370000) and Move.1 analysis (Gage 12369200)	HEC-RAS, 4.1.0	November 2016	AE w/ Floodway	Split flow discharges across junctions and lateral weirs
Zone A Streams	Various	Various	*	HEC-2	March 1986	A	

*Information not available

Table 13: Roughness Coefficients

Flooding Source	Channel "n"	Overbank "n"
Bitterroot River	0.02 - 0.04	0.03 - 0.1
Blackfoot River	0.032 – 0.042	0.045 - 0.060
Clark Fork River	0.03 - 0.055	0.016 - 0.1
Clearwater River	0.038	0.04 - 0.13
DS Glacier Split	0.055	0.07 - 0.1
Glacier Rd Split	0.05 – 0.1	0.05 - 0.1
Grant Creek	.060 – .080	0.080 - 0.125
Guest R Split	0.05	0.08 - 0.1
Honeysuckle Drainage Swale	0.035	0.035
Kauffman Split	0.05	0.06 - 0.1
La Valle Creek	0.045	0.07 - 0.08
Left Branch of Bitter Root River	0.02 - 0.04	0.03 - 0.1
Lolo Creek	0.036 – 0.047	0.050 - 0.095
Lower Grant Creek	0.035	0.040
Miller Creek	.040 - .045	0.050 - 0.055
Monroc Split	0.016 - 0.08	0.016 - 0.08
Pattee Creek	0.030 – 0.031	0.045 - 0.050
Rattlesnake Creek	0.045 – 0.080	0.050 - 0.125
Rock Creek	0.044 -0.048	0.067 -0.085
Swan River	0.045 - 0.05	0.05 - 0.1

5.3 Coastal Analyses

This section is not applicable to this Flood Risk Product.

Table 14: Summary of Coastal Analyses
[Not Applicable to this Flood Risk Project]

5.3.1 Total Stillwater Elevations

This section is not applicable to this Flood Risk Product.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas
[Not Applicable to this Flood Risk Project]

Table 15: Tide Gage Analysis Specifics
[Not Applicable to this Flood Risk Project]

5.3.2 Waves

This section is not applicable to this Flood Risk Product.

5.3.3 Coastal Erosion

This section is not applicable to this Flood Risk Product.

5.3.4 Wave Hazard Analyses

This section is not applicable to this Flood Risk Product.

Table 16: Coastal Transect Parameters

[Not Applicable to this Flood Risk Project]

Figure 9: Transect Location Map

[Not applicable to this Flood Risk Project]

5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Product.

Table 17: Summary of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

Table 18: Results of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to **NAVD88**. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please visit the NGS website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Missoula County are provided in Table 19.

Table 19: Countywide Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

A countywide conversion factor could not be generated for Missoula County because the maximum variance from average exceeds 0.25 feet. Calculations for the vertical offsets on a stream by stream basis are depicted in Table 20.

Table 20: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Blackfoot River	3.5
Clearwater River	3.7
Grant Creek	3.6
Honeysuckle Drainage Swale	3.5
La Valle Creek	3.5
Lolo Creek	3.6
Lower Grant Creek	3.5

Table 20: Stream-Based Vertical Datum Conversion (Continued)

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Miller Creek	3.5
Pattee Creek	3.5
Rattlesnake Creek	3.6

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM Database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/flood-maps/guidance-partners/guidelines-standards.

Base map information shown on the FIRM was derived from the sources described in Table 21.

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Corporate Boundaries	Montana State Library	2019	1: 24,000	Spatial and attribute information for Missoula County political boundaries
Digital Orthophoto	United States Department of Agriculture	2015	1 meter GSD	Color orthoimagery was provided for the county (2015 effective)
Hydrography Features	Montana State Library	2019	1: 24,000	Spatial and attribute information for Missoula County water lines and areas
HUC-8 Subbasins	USDA and NRCS	2019	1: 24,000	Spatial and attribute information for Missoula County HUC8 watersheds
Public Land Survey System (PLSS)	Montana State Library	2017	1: 24,000	Spatial and attribute information for Missoula County PLSS areas
Transportation Features	Montana State Library	2017	1: 24,000	Spatial and attribute information for Missoula County transportation features
USDA-FSA-AFPO Digital Ortho Mosiac	Aerial Photography Field Office	2017	1 meter GSD	2017 NAIP Imagery used for Missoula County, MT Study 20-08-0033S - grayscaled using Band 2 - 60 centimeter (2 foot) resolution

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22.

In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 23, “Floodway Data.”

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Missoula, City of; Missoula County	All within Missoula County	2017 LiDAR - Missoula-Granite County, Montana	0.051 m	0.49 m	TOPO 2019
Missoula County	Clearwater River	Light Detection and Ranging data (LiDAR)	N/A	N/A	Quantum Spatial Inc. 2020
Missoula County	Clark Fork, Bitterroot River, Blackfoot River, Grant Creek, Miller Creek, Lolo Creek, Rattlesnake Creek	Contour	N/A	N/A	Contours generated from 1999 LiDAR data in the vicinity of the City of Missoula

Table 22: Summary of Topographic Elevation Data used in Mapping (Continued)

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Missoula County	La Valle Creek	Contour	N/A	N/A	Contours created from LiDAR flown January 2006
Missoula County	Swan River	Light Detection and Ranging data (LiDAR)	N/A	N/A	Quantum Spatial Inc. 2015

BFEs shown at cross sections on the FIRM represent the 1-percent-annual-chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report.

Table 23: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,932	896	6,501	5.0	3,109.2	3,109.2	3,109.7	0.5
B	3,167	405	3,782	8.6	3,110.1	3,110.1	3,110.5	0.4
C	4,719	796	5,999	5.1	3,113.2	3,113.2	3,113.6	0.4
D	6,450	841	5,639	5.8	3,114.5	3,114.5	3,115.0	0.5
E	8,240	1,448	9,405	3.5	3,116.5	3,116.5	3,116.8	0.3
F	10,163	2,003	8,685	3.7	3,117.2	3,117.2	3,117.6	0.4
G	12,042	1,625	6,914	4.7	3,118.5	3,118.5	3,118.9	0.4
H	13,837	535	4,499	7.2	3,120.4	3,120.4	3,120.8	0.4
I	15,650	1,610	9,798	3.3	3,122.3	3,122.3	3,122.7	0.4
J	17,451	1,500	8,216	3.9	3,123.0	3,123.0	3,123.5	0.5
K	19,247	1,314	8,174	4.0	3,124.4	3,124.4	3,124.8	0.4
L	21,052	2,131	9,396	3.5	3,125.2	3,125.2	3,125.6	0.4
M	22,852	2,565	11,630	2.8	3,126.6	3,126.6	3,127.1	0.5
N	24,658	1,035[2]	4,401	7.4	3,127.8	3,127.8	3,128.1	0.3
O	26,440	380	4,305	7.5	3,130.4	3,130.4	3,130.6	0.2
P	28,261	1,211	9,494	3.3	3,133.4	3,133.4	3,133.9	0.5
Q	30,047	2,100	15,783	2.0	3,134.0	3,134.0	3,134.5	0.5
R	31,842	1,075	7,200	4.4	3,134.2	3,134.2	3,134.7	0.5
S	33,625	750	5,452	5.8	3,135.1	3,135.1	3,135.6	0.5
T	35,445	352	4,140	7.6	3,136.3	3,136.3	3,136.8	0.5
U	37,246	775	6,766	4.6	3,137.8	3,137.8	3,138.2	0.4
V	39,027	1,035	9,205	3.4	3,139.1	3,139.1	3,139.6	0.5

[1] Stream distance in feet approximately 4500 feet upstream of confluence with Clark Fork River
[2] Floodway top width includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BITTERROOT RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	40,845	2,295	16,276	1.9	3,139.7	3,139.7	3,140.2	0.5
X	42,646	1,075	7,444	4.2	3,140.2	3,140.2	3,140.6	0.4
Y	44,447	1,132	8,390	3.7	3,141.4	3,141.4	3,141.8	0.4
Z	46,247	2,025	11,952	2.6	3,142.2	3,142.2	3,142.6	0.4
AA	48,055	2,146	11,425	2.7	3,143.0	3,143.0	3,143.5	0.5
AB	49,825	1,720	8,846	3.4	3,143.8	3,143.8	3,144.2	0.4
AC	51,652	1,614	8,275	3.7	3,144.9	3,144.9	3,145.3	0.4
AD	53,450	1,825	8,337	3.7	3,146.1	3,146.1	3,146.3	0.2
AE	55,247	675	4,156	7.3	3,147.0	3,147.0	3,147.4	0.4
AF	57,045	705[2]	6,301	4.8	3,150.1	3,150.1	3,150.4	0.3
AG	58,837	1,732	11,557	2.6	3,151.1	3,151.1	3,151.5	0.4
AH	60,644	1,760	8,738	3.5	3,151.4	3,151.4	3,151.9	0.5
AI	62,461	811	5,072	6.0	3,152.5	3,152.5	3,153.0	0.5
AJ	64,250	1,865	9,166	3.3	3,154.5	3,154.5	3,154.9	0.4
AK	65,967	1,575	8,968	3.4	3,155.2	3,155.2	3,155.6	0.4
AL	67,795	939	5,191	5.9	3,156.2	3,156.2	3,156.6	0.4
AM	69,650	964	5,830	5.2	3,158.2	3,158.2	3,158.6	0.4
AN	71,442	2,495	13,857	1.9	3,160.0	3,160.0	3,160.3	0.3
AO	73,247	2,692	11,367	2.3	3,160.3	3,160.3	3,160.7	0.4
AP	74,959	3,501	14,865	1.8	3,161.2	3,161.2	3,161.7	0.5
AQ	76,741	3,613[2]	8,781	3.0	3,162.0	3,162.0	3,162.5	0.5
AR	78,011	3,489[2]	8,902	2.9	3,163.1	3,163.1	3,163.6	0.5
AS	80,464	3,717[2]	10,169	2.6	3,166.2	3,166.2	3,166.6	0.4
AT	81,776	4,582[2]	11,703	2.2	3,166.8	3,166.8	3,167.3	0.5

1 Stream distance in feet approximately 4500 feet upstream of confluence with Clark Fork River
2 Floodway top width includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BITTERROOT RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AU	83,596	3,568[2]	9,557	2.7	3,167.7	3,167.7	3,168.1	0.4
AV	85,385	2,740	7,353	3.6	3,169.3	3,169.3	3,169.7	0.4
AW	87,175	2,649	9,255	2.8	3,171.3	3,171.3	3,171.7	0.4
AX	89,003	1,844	8,862	3.0	3,172.8	3,172.8	3,173.3	0.5
AY	90,819	1,413	5,743	4.5	3,173.6	3,173.6	3,174.0	0.4
AZ	92,702	2,149	7,784	3.4	3,175.7	3,175.7	3,176.0	0.3
BA	94,425	1,142	4,827	4.9	3,176.6	3,176.6	3,177.1	0.5
BB	96,162	664	3,566	6.6	3,179.0	3,179.0	3,179.5	0.5
BC	98,129	1,480	7,310	3.2	3,181.5	3,181.5	3,181.9	0.4
BD	99,952	2,378	9,120	2.6	3,182.3	3,182.3	3,182.7	0.4
BE	101,939	1,589	7,104	3.3	3,183.7	3,183.7	3,184.0	0.3
BF	103,708	1,522	5,569	4.2	3,185.0	3,185.0	3,185.2	0.2
BG	105,373	2,664[2]	6,677	3.6	3,186.8	3,186.8	3,187.1	0.3
BH	106,912	2,429[2]	6,404	3.8	3,188.3	3,188.3	3,188.6	0.3
BI	108,756	4,622	9,880	2.5	3,190.4	3,190.4	3,190.8	0.4
BJ	110,759	5,335	11,449	2.1	3,192.4	3,192.4	3,192.7	0.3

1 Stream distance in feet approximately 4500 feet upstream of confluence with Clark Fork River
2 Floodway top width includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BITTERROOT RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	785	121	2,838	9.6	3,253.3	3,253.3	3,253.3	0.0
B	909	204	3,443	7.3	3,255.0	3,255.0	3,255.0	0.0
C	995	230	4,123	6.1	3,255.5	3,255.5	3,255.5	0.0
D	1,084	215	4,239	6.1	3,255.6	3,255.6	3,255.6	0.0
E	1,222	227	4,483	5.9	3,255.9	3,255.9	3,255.9	0.0
F	1,399	280	4,337	5.8	3,255.9	3,255.9	3,255.9	0.0
G	1,764	224	4,203	6.2	3,256.6	3,256.6	3,256.6	0.0
H	1,837	258	4,299	6.0	3,257.6	3,257.6	3,257.6	0.0
I	2,218	251	4,078	6.1	3,257.3	3,257.3	3,257.3	0.0
J	3,556	249	3,536	7.1	3,257.9	3,257.9	3,257.9	0.0
K	4,123	235	3,198	7.8	3,258.1	3,258.1	3,258.1	0.0
L	4,633	229	3,134	8.0	3,258.5	3,258.5	3,258.5	0.0
M	5,406	207	2,661	9.4	3,259.3	3,259.3	3,259.3	0.0
N	5,689	295	3,831	6.5	3,260.7	3,260.7	3,260.7	0.0
O	6,823	174	2,455	10.2	3,262.0	3,262.0	3,262.0	0.0
P	7,834	215	2,827	8.8	3,264.4	3,264.4	3,264.4	0.0
Q	8,677	212	2,389	10.5	3,265.8	3,265.8	3,265.8	0.0
R	10,636	157	2,208	11.3	3,271.5	3,271.5	3,271.9	0.4
S	13,166	162	2,319	10.8	3,279.9	3,279.9	3,280.2	0.3
T	14,368	157	2,525	9.9	3,283.6	3,283.6	3,286.9	0.3
U	15,054	284	3,569	7.2	3,286.0	3,286.0	3,286.4	0.4
V	16,145	193	2,522	9.9	3,288.3	3,288.3	3,288.6	0.3

[1]Feet above confluence with Clark Fork River

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	17,256	250	3,261	7.7	3,291.1	3,291.1	3,291.2	0.1
X	18,456	223	2,917	8.6	3,292.7	3,292.7	3,293.0	0.3
Y	22,611	187	2,006	12.5	3,304.3	3,304.3	3,304.8	0.5

[1]Feet above confluence with Clark Fork River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BLACKFOOT RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	14,775	384	7,769	8.9	2,964.7	2,964.7	2,965.2	0.5
B	15,989	395	7,556	9.2	2,965.5	2,965.5	2,966.0	0.5
C	17,279	673	10,212	6.8	2,967.1	2,967.1	2,967.5	0.4
D	18,949	710	9,447	7.3	2,967.8	2,967.8	2,968.2	0.4
E	20,158	415	7,890	8.7	2,968.3	2,968.3	2,968.7	0.4
F	21,121	387	8,364	8.3	2,969.3	2,969.3	2,969.7	0.4
G	22,524	607	11,146	6.2	2,970.3	2,970.3	2,970.7	0.4
H	23,536	508	8,495	8.1	2,970.6	2,970.6	2,971.0	0.4
I	24,886	501	8,409	8.2	2,971.5	2,971.5	2,971.9	0.4
J	25,886	358	5,763	12.0	2,971.8	2,971.8	2,972.2	0.4
K	26,854	383	6,363	10.8	2,973.5	2,973.5	2,973.8	0.3
L	27,998	480	8,026	8.6	2,975.2	2,975.2	2,975.5	0.3
M	29,507	330	6,162	11.2	2,976.2	2,976.2	2,976.4	0.2
N	30,499	311	6,947	9.9	2,977.5	2,977.5	2,977.8	0.3
O	31,639	285	5,543	12.4	2,978.7	2,978.7	2,978.9	0.2
P	32,907	402	8,442	8.2	2,981.4	2,981.4	2,981.5	0.1
Q	33,757	457	8,786	7.9	2,981.8	2,981.8	2,982.0	0.2
R	35,003	548	8,773	7.9	2,982.6	2,982.6	2,982.8	0.2
S	35,971	538	10,192	6.8	2,983.2	2,983.2	2,983.6	0.4
T	37,218	494	12,200	5.7	2,983.9	2,983.9	2,984.4	0.5

[1] Feet above Mineral/Missoula County Boundary

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
U	39,034	1,281	14,296	4.8	2,984.7	2,984.7	2,985.2	0.5
V	40,356	1,171	15,673	4.4	2,985.1	2,985.1	2,985.6	0.5
W	41,559	1,319	15,530	4.4	2,985.4	2,985.4	2,985.9	0.5
X	42,748	1,316	14,929	4.6	2,985.9	2,985.9	2,986.3	0.4
Y	43,933	1,724	16,387	4.2	2,986.3	2,986.3	2,986.7	0.4
Z	45,273	1,511	15,342	4.5	2,987.0	2,987.0	2,987.5	0.5
AA	46,637	1,168[2]	10,868	6.3	2,987.4	2,987.4	2,987.8	0.4
AB	48,165	490	8,265	8.1	2,989.2	2,989.2	2,989.6	0.4
AC	49,082	703	8,331	8.1	2,990.1	2,990.1	2,990.5	0.4
AD	50,077	483	7,641	8.8	2,990.9	2,990.9	2,991.4	0.5
AE	51,213	397	5,926	11.4	2,991.8	2,991.8	2,992.2	0.4
AF	52,458	466	7,984	8.4	2,994.5	2,994.5	2,994.6	0.1
AG	53,581	672	9,217	7.3	2,995.4	2,995.4	2,995.6	0.2
AH	54,704	731	9,950	6.8	2,996.1	2,996.1	2,996.4	0.3
AI	55,702	646	8,565	7.9	2,996.4	2,996.4	2,996.9	0.5
AJ	57,064	776	7,627	8.8	2,997.4	2,997.4	2,997.8	0.4
AK	58,496	696	11,477	5.9	2,999.1	2,999.1	2,999.4	0.3
AL	59,557	729	10,291	6.5	2,999.5	2,999.5	2,999.8	0.3
AM	60,325	580	8,363	8.0	2,999.8	2,999.8	3,000.1	0.3
AN	61,336	932	17,850	3.8	3,001.1	3,001.1	3,001.5	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AO	62,373	1,311	21,218	3.2	3,001.3	3,001.3	3,001.6	0.3
AP	63,611	1,798	21,391	3.1	3,001.4	3,001.4	3,001.8	0.4
AQ	64,673	2,104	21,408	3.1	3,001.6	3,001.6	3,002.0	0.4
AR	65,710	2,025	20,585	3.3	3,001.8	3,001.8	3,002.2	0.4
AS	66,706	2,497	20,518	3.3	3,002.1	3,002.1	3,002.4	0.3
AT	67,814	1,266	12,637	5.3	3,002.7	3,002.7	3,003.0	0.3
AU	68,651	1,111	10,781	6.2	3,003.5	3,003.5	3,003.9	0.4
AV	69,638	1,431	12,087	5.5	3,004.4	3,004.4	3,004.8	0.4
AW	70,718	1,517	12,878	5.2	3,005.2	3,005.2	3,005.6	0.4
AX	72,152	1,543	18,149	3.7	3,006.4	3,006.4	3,006.8	0.4
AY	73,511	2,125	12,630	5.3	3,007.0	3,007.0	3,007.4	0.4
AZ	74,770	4,144	26,317	2.5	3,008.9	3,008.9	3,009.4	0.5
BA	76,121	4,077	21,200	3.2	3,009.7	3,009.7	3,010.2	0.5
BB	77,712	2,297	14,394	4.7	3,010.8	3,010.8	3,011.2	0.4
BC	79,058	2,099	12,518	5.4	3,012.2	3,012.2	3,012.6	0.4
BD	80,521	2,255	10,710	6.3	3,013.3	3,013.3	3,013.8	0.5
BE	82,150	4,271	22,086	3.0	3,015.2	3,015.2	3,015.7	0.5
BF	83,467	3,613[2]	18,407	3.6	3,015.9	3,015.9	3,016.3	0.4
BG	85,566	2,654	16,236	4.1	3,017.0	3,017.0	3,017.4	0.4
BH	87,198	2,371	14,231	4.7	3,018.6	3,018.6	3,019.0	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BI	88,706	3,169	17,385	3.8	3,019.7	3,019.7	3,020.2	0.5
BJ	90,436	3,728	20,781	3.2	3,021.4	3,021.4	3,021.8	0.4
BK	93,617	5,674	22,240	3.0	3,022.7	3,022.7	3,023.1	0.4
BL	95,329	4,368[2]	18,803	3.6	3,023.6	3,023.6	3,023.9	0.3
BM	96,686	3,942[2]	18,209	3.7	3,024.6	3,024.6	3,025.0	0.4
BN	97,890	3,578[2]	12,406	5.4	3,025.2	3,025.2	3,025.5	0.3
BO	99,269	4,170	25,590	2.6	3,028.5	3,028.5	3,028.9	0.4
BP	100,809	3,233	13,125	5.1	3,028.7	3,028.7	3,029.1	0.4
BQ	101,760	2,820	12,746	5.2	3,030.0	3,030.0	3,030.4	0.4
BR	102,479	2,723	12,790	5.2	3,031.3	3,031.3	3,031.8	0.5
BS	103,278	2,423	14,341	4.6	3,032.5	3,032.5	3,032.9	0.4
BT	104,371	1,910	9,304	7.1	3,033.1	3,033.1	3,033.5	0.4
BU	105,034	1,922[2]	9,487	7.0	3,034.8	3,034.8	3,035.0	0.2
BV	106,405	1,464	13,157	5.0	3,037.0	3,037.0	3,037.5	0.5
BW	107,545	1,868	13,568	4.9	3,038.1	3,038.1	3,038.6	0.5
BX	108,578	1,981	11,987	5.5	3,038.8	3,038.8	3,039.2	0.4
BY	109,391	2,409	13,593	4.9	3,039.7	3,039.7	3,040.2	0.5
BZ	110,297	2,177	14,597	4.5	3,040.4	3,040.4	3,040.8	0.4
CA	111,111	1,221	10,989	6.0	3,040.7	3,040.7	3,041.1	0.4
CB	112,149	1,570	12,504	5.3	3,042.6	3,042.6	3,043.0	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
CC	113,347	830	7,321	9.1	3,043.1	3,043.1	3,043.5	0.4
CD	114,481	887	8,300	8.0	3,045.1	3,045.1	3,045.5	0.4
CE	115,658	812	10,599	6.2	3,046.7	3,046.7	3,047.1	0.4
CF	117,032	835	8,906	7.4	3,047.8	3,047.8	3,048.1	0.3
CG	118,100	560	7,482	8.8	3,049.0	3,049.0	3,049.4	0.4
CH	119,408	496	5,966	11.1	3,050.1	3,050.1	3,050.4	0.3
CI	120,599	604	9,909	6.7	3,052.5	3,052.5	3,053.0	0.5
CJ	121,771	507	7,277	9.1	3,053.3	3,053.3	3,053.5	0.2
CK	123,236	1,860	16,772	3.9	3,055.0	3,055.0	3,055.4	0.4
CL	124,350	1,330	12,029	5.5	3,055.5	3,055.5	3,055.8	0.3
CM	125,854	2,027	13,080	5.0	3,056.8	3,056.8	3,057.3	0.5
CN	127,093	2,155[2]	9,977	6.6	3,057.6	3,057.6	3,058.1	0.5
CO	128,342	3,368[2]	15,066	4.4	3,059.3	3,059.3	3,059.7	0.4
CP	129,814	4,277[2]	20,558	3.2	3,060.5	3,060.5	3,060.9	0.4
CQ	131,457	2,907[2]	13,847	4.7	3,060.9	3,060.9	3,061.2	0.3
CR	132,920	2,871[2]	17,765	3.7	3,061.8	3,061.8	3,062.2	0.4
CS	134,439	2,480[2]	13,372	4.9	3,063.3	3,063.3	3,063.7	0.4
CT	135,910	1,580	9,502	6.9	3,065.7	3,065.7	3,066.0	0.3
CU	137,099	2,636	15,503	4.2	3,067.5	3,067.5	3,067.9	0.4
CV	138,327	3,221[2]	11,001	5.9	3,069.1	3,069.1	3,069.5	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
CW	139,594	3,919	19,778	3.3	3,070.4	3,070.4	3,070.8	0.4
CX	141,204	3,182[2]	18,238	3.6	3,071.4	3,071.4	3,071.8	0.4
CY	142,665	3,697	20,177	3.2	3,072.4	3,072.4	3,072.8	0.4
CZ	144,009	5,224[2]	15,848	4.1	3,072.9	3,072.9	3,073.4	0.5
DA	145,865	4,426[2]	18,504	3.5	3,075.0	3,075.0	3,075.4	0.4
DB	147,807	2,969	13,560	4.8	3,076.6	3,076.6	3,077.0	0.4
DC	149,714	1,011	8,275	7.9	3,078.4	3,078.4	3,078.7	0.3
DD	151,362	1,993[2]	11,698	5.6	3,081.6	3,081.6	3,082.0	0.4
DE	153,236	1,532[2]	10,252	6.4	3,084.8	3,084.8	3,085.2	0.4
DF	154,022	845	7,885	8.3	3,085.9	3,085.9	3,086.1	0.2
DG	155,431	1,352	10,706	6.1	3,087.5	3,087.5	3,088.0	0.5
DH	156,664	1,161	7,640	8.6	3,088.4	3,088.4	3,088.9	0.5
DI	157,940	1,439	10,856	6.0	3,091.1	3,091.1	3,091.5	0.4
DJ	159,247	1,168[2]	7,593	8.6	3,092.0	3,092.0	3,092.4	0.4
DK	160,560	1,136[2]	8,321	7.9	3,093.9	3,093.9	3,094.3	0.4
DL	161,781	770	7,950	8.2	3,095.3	3,095.3	3,095.6	0.3
DM	162,984	1,018	10,062	6.5	3,097.5	3,097.5	3,097.8	0.3
DN	164,532	1,384	9,564	6.8	3,098.1	3,098.1	3,098.6	0.5
DO	165,892	760	10,267	6.4	3,100.2	3,100.2	3,100.7	0.5
DP	167,106	429	6,897	9.5	3,100.7	3,100.7	3,101.1	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
DQ	168,524	724	7,092	9.2	3,102.9	3,102.9	3,103.2	0.3
DR	169,936	1,195	8,654	7.5	3,104.7	3,104.7	3,105.1	0.4
DS	173,123	4,429[2]	18,997	3.4	3,107.1	3,107.1	3,107.5	0.4
DT	175,178	5,734[2]	22,686	1.8	3,108.4	3,108.4	3,108.8	0.4
DU	176,614	3,061[2]	6,572	6.2	3,110.6	3,110.6	3,110.7	0.1
DV	177,470	2,178[2]	4,047	10.1	3,112.4	3,112.4	3,112.4	0.0
DW	178,475	3,207[2]	8,470	4.8	3,116.9	3,116.9	3,117.4	0.5
DX	179,755	3,600[2]	9,765	4.2	3,118.7	3,118.7	3,119.1	0.4
DY	181,317	3,961[2]	9,828	4.2	3,121.2	3,121.2	3,121.6	0.4
DZ	183,077	4,293[2]	9,431	4.4	3,124.6	3,124.6	3,125.0	0.4
EA	185,079	3,894[2]	10,094	4.1	3,127.4	3,127.4	3,127.8	0.4
EB	186,377	3,651[2]	12,105	3.4	3,129.4	3,129.4	3,129.8	0.4
EC	188,407	3,597[2]	13,467	3.0	3,132.4	3,132.4	3,132.9	0.5
ED	189,615	4,168[2]	13,416	3.0	3,134.5	3,134.5	3,134.8	0.3
EE	190,921	4,442	10,389	3.9	3,137.1	3,137.1	3,137.5	0.4
EF	192,989	3,285	10,555	3.8	3,140.7	3,140.7	3,141.2	0.5
EG	194,329	2,619	7,149	5.7	3,142.4	3,142.4	3,142.9	0.5
EH	195,531	1,836[2]	9,123	4.4	3,146.0	3,146.0	3,146.4	0.4
EI	196,112	1,328[2]	5,640	7.2	3,147.1	3,147.1	3,147.3	0.2
EJ	197,451	795	4,529	8.9	3,150.6	3,150.6	3,150.6	0.0

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
EK	198,329	549	4,884	8.3	3,154.5	3,154.5	3,155.0	0.5
EL	199,070	607	5,364	7.6	3,155.7	3,155.7	3,156.1	0.4
EM	201,470	588	3,673	11.0	3,159.4	3,159.4	3,159.6	0.2
EN	202,881	360	3,928	10.3	3,161.5	3,161.5	3,161.6	0.1
EO	203,855	300	3,291	12.3	3,163.0	3,163.0	3,163.2	0.2
EP	205,259	424	4,236	9.6	3,166.6	3,166.6	3,167.0	0.4
EQ	206,318	340	4,598	8.8	3,169.6	3,169.6	3,169.9	0.3
ER	207,322	387	5,702	7.1	3,171.5	3,171.5	3,171.6	0.1
ES	208,071	492	5,366	7.6	3,172.4	3,172.4	3,172.5	0.1
ET	209,242	423	4,910	8.3	3,174.7	3,174.7	3,174.8	0.1
EU	209,856	322	3,675	11.0	3,176.1	3,176.1	3,176.1	0.0
EV	210,689	221	3,507	11.6	3,178.2	3,178.2	3,178.3	0.1
EW	211,523	342	4,775	8.5	3,180.9	3,180.9	3,181.1	0.2
EX	212,437	526	6,075	6.7	3,182.2	3,182.2	3,182.3	0.1
EY	213,213	401	4,084	9.9	3,182.6	3,182.6	3,182.8	0.2
EZ	214,360	241	2,974	13.6	3,185.5	3,185.5	3,185.5	0.0
FA	215,345	229	3,543	11.4	3,188.2	3,188.2	3,188.2	0.0
FB	216,431	438[2]	4,378	9.3	3,190.4	3,190.4	3,190.6	0.2
FC	217,183	478[2]	3,961	10.1	3,191.8	3,191.8	3,191.8	0.0
FD	218,391	452	5,446	7.3	3,193.6	3,193.6	3,194.0	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
FE	219,739	220	2,870	13.9	3,194.2	3,194.2	3,194.6	0.4
FF	220,937	261	3,922	10.2	3,197.5	3,197.5	3,197.7	0.2
FG	222,083	279	3,918	10.2	3,199.0	3,199.0	3,199.2	0.2
FH	223,435	297	4,651	8.6	3,201.5	3,201.5	3,201.8	0.3
FI	224,652	561	5,431	7.4	3,202.7	3,202.7	3,203.0	0.3
FJ	225,968	390	4,491	8.9	3,203.5	3,203.5	3,203.8	0.3
FK	227,203	239	4,092	9.8	3,207.0	3,207.0	3,207.0	0.0
FL	228,543	498	5,108	7.8	3,208.3	3,208.3	3,208.6	0.3
FM	229,893	378	4,177	9.6	3,210.3	3,210.3	3,210.8	0.5
FN	231,166	271	3,832	10.4	3,213.4	3,213.4	3,213.6	0.2
FO	231,673	317	4,869	8.2	3,215.1	3,215.1	3,215.2	0.1
FP	232,599	271	3,925	10.1	3,216.0	3,216.0	3,216.1	0.1
FQ	233,697	304[2]	4,253	9.4	3,217.6	3,217.6	3,217.7	0.1
FR	234,785	203	3,977	10.0	3,218.6	3,218.6	3,218.8	0.2
FS	235,674	381	6,033	6.6	3,221.0	3,221.0	3,221.1	0.1
FT	236,913	295	3,457	11.5	3,221.5	3,221.5	3,221.5	0
FU	238,273	234	2,737	14.6	3,223.8	3,223.8	3,224.0	0.2
FV	239,417	348	4,710	8.5	3,228.3	3,228.3	3,228.5	0.2
FW	240,584	314	4,557	8.8	3,229.5	3,229.5	3,229.8	0.3
FX	241,943	317	4,392	9.1	3,231.4	3,231.4	3,231.7	0.3

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
FY	243,267	244	3,587	11.1	3,232.5	3,232.5	3,232.8	0.3
FZ	244,398	239	3,567	11.2	3,234.4	3,234.4	3,234.6	0.2
GA	245,573	269	3,732	10.7	3,236.3	3,236.3	3,236.5	0.2
GB	246,903	254	3,448	11.6	3,238.3	3,238.3	3,238.5	0.2
GC	247,923	728	7,841	5.1	3,241.2	3,241.2	3,241.6	0.4
GD	249,073	506	4,024	9.9	3,242.1	3,242.1	3,242.4	0.3
GE	250,573	827	4,103	5.0	3,246.3	3,246.3	3,246.4	0.1
GF	251,805	807	3,809	5.4	3,249.6	3,249.6	3,250.0	0.4
GG	253,082	880	3,742	5.5	3,253.3	3,253.3	3,253.7	0.4
GH	254,265	921	3,776	5.5	3,256.9	3,256.9	3,257.2	0.3
GI	254,531	947	3,124	6.6	3,257.4	3,257.4	3,257.9	0.5
GJ	255,810	1,883[2]	3,894	5.3	3,261.2	3,261.2	3,261.5	0.3
GK	257,019	3,176[2]	7,269	2.8	3,264.2	3,264.2	3,264.3	0.1
GL	258,014	1,971	4,807	4.3	3,267.9	3,267.9	3,268.3	0.4
GM	259,150	1,934[2]	4,724	4.4	3,271.6	3,271.6	3,272.0	0.4
GN	260,097	1,963	4,708	4.4	3,274.9	3,274.9	3,275.2	0.3
GO	261,165	2,203	5,600	3.7	3,278.0	3,278.0	3,278.4	0.4
GP	262,078	1,439	4,819	4.3	3,281.5	3,281.5	3,281.6	0.1
GQ	262,995	1,180	4,629	4.5	3,284.9	3,284.9	3,285.2	0.3
GR	263,911	1,370[2]	4,849	4.2	3,287.8	3,287.8	3,288.2	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
GS	265,227	1,113	4,890	4.2	3,291.7	3,291.7	3,291.9	0.2
GT	266,475	1,211	5,361	3.8	3,294.3	3,294.3	3,294.7	0.4
GU	267,613	842	3,476	5.9	3,298.4	3,298.4	3,298.7	0.3
GV	268,754	899	3,594	5.7	3,301.9	3,301.9	3,302.3	0.4
GW	270,059	653	4,984	4.1	3,306.5	3,306.5	3,306.9	0.4
GX	271,397	801[2]	3,264	6.3	3,308.8	3,308.8	3,309.1	0.3
GY	273,042	823	3,589	5.7	3,315.4	3,315.4	3,315.8	0.4
GZ	274,472	1,095	4,975	4.1	3,318.0	3,318.0	3,318.3	0.3
HA	275,841	1,215[2]	3,686	5.6	3,322.1	3,322.1	3,322.2	0.1
HB	277,037	1,071	3,659	5.6	3,326.6	3,326.6	3,327.1	0.5
HC	278,042	402	3,109	6.6	3,333.4	3,333.4	3,333.4	0.0
HD	279,187	422	2,976	6.9	3,335.2	3,335.2	3,335.7	0.5
HE	280,667	349	2,900	7.0	3,338.7	3,338.7	3,339.1	0.4
HF	281,704	631	2,686	7.6	3,343.1	3,343.1	3,343.4	0.3
HG	282,752	324	2,383	8.6	3,345.6	3,345.6	3,345.9	0.3
HH	283,878	390	3,738	5.5	3,348.6	3,348.6	3,349.0	0.4
HI	284,975	549	3,159	6.5	3,350.6	3,350.6	3,351.0	0.4
HJ	285,891	457	3,463	5.9	3,353.2	3,353.2	3,353.6	0.4
HK	286,853	489	3,318	6.1	3,356.4	3,356.4	3,356.8	0.4
HL	287,674	846	3,492	5.8	3,358.0	3,358.0	3,358.3	0.3

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
HM	287,923	482[2]	2,571	7.9	3,360.6	3,360.6	3,360.6	0.0
HN	289,171	364	2,130	9.6	3,365.7	3,365.7	3,365.7	0.0
HO	290,535	668[2]	3,480	5.9	3,369.5	3,369.5	3,370.0	0.5
HP	291,451	738	2,573	7.9	3,372.7	3,372.7	3,373.1	0.4
HQ	292,586	939[2]	3,354	6.1	3,378.4	3,378.4	3,378.8	0.4
HR	293,993	586	3,759	5.4	3,382.4	3,382.4	3,382.9	0.5
HS	295,512	1,409	5,436	3.7	3,385.2	3,385.2	3,385.5	0.3
HT	296,941	971	3,962	5.1	3,390.6	3,390.6	3,390.8	0.2
HU	298,385	778	3,502	5.8	3,393.9	3,393.9	3,394.1	0.2
HV	299,675	960[2]	3,202	6.3	3,397.9	3,397.9	3,398.3	0.4
HW	300,758	1,040[2]	3,498	5.8	3,401.3	3,401.3	3,401.8	0.5
HX	302,276	923	3,490	5.8	3,405.6	3,405.6	3,406.0	0.4
HY	303,579	564	2,919	7.0	3,408.8	3,408.8	3,409.2	0.4
HZ	304,605	803[2]	3,404	6.0	3,411.9	3,411.9	3,412.4	0.5
IA	305,326	950	3,565	5.7	3,414.9	3,414.9	3,415.3	0.4
IB	306,236	1,029	5,213	3.9	3,417.6	3,417.6	3,418.1	0.5
IC	308,042	1,992[2]	4,686	4.3	3,423.4	3,423.4	3,423.7	0.3
ID	309,309	1,323[2]	3,582	5.7	3,428.4	3,428.4	3,428.7	0.3
IE	310,782	1,081	4,666	4.4	3,435.0	3,435.0	3,435.4	0.4
IF	311,716	1,464[2]	2,638	7.7	3,437.7	3,437.7	3,437.8	0.1

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
IG	312,787	1,113[2]	3,516	5.8	3,443.4	3,443.4	3,443.8	0.4
IH	314,033	544	2,907	7.0	3,448.0	3,448.0	3,448.4	0.4
II	314,858	1,186	5,190	3.9	3,450.0	3,450.0	3,450.3	0.3
IJ	315,864	1,274[2]	3,879	5.2	3,453.5	3,453.5	3,454.0	0.5
IK	316,762	903[2]	2,808	7.2	3,457.0	3,457.0	3,457.4	0.4
IL	317,799	666	3,869	5.2	3,461.1	3,461.1	3,461.5	0.4
IM	318,428	350	2,392	8.5	3,463.7	3,463.7	3,463.7	0.0
IN	319,554	1,261	5,369	3.8	3,468.5	3,468.5	3,469.0	0.5
IO	320,706	972[2]	3,525	5.8	3,471.0	3,471.0	3,471.4	0.4
IP	321,842	1,089[2]	2,803	7.2	3,475.3	3,475.3	3,475.8	0.5
IQ	322,526	1,246	4,833	4.2	3,477.4	3,477.4	3,477.7	0.3
IR	323,014	1,037	3,780	5.3	3,479.3	3,479.3	3,479.7	0.4
IS	324,299	752	3,866	5.2	3,483.2	3,483.2	3,483.6	0.4
IT	325,990	1,135	4,549	4.4	3,486.8	3,486.8	3,487.3	0.5
IU	326,400	714	3,076	6.5	3,489.5	3,489.5	3,490.0	0.5
IV	327,981	1,130	4,361	4.6	3,494.2	3,494.2	3,494.3	0.1
IW	329,246	860	3,541	5.6	3,497.7	3,497.7	3,498.0	0.3
IX	330,499	998	3,714	5.4	3,502.6	3,502.6	3,502.9	0.3
IY	331,692	714	3,442	5.8	3,506.1	3,506.1	3,506.4	0.3
IZ	332,602	821	4,276	4.7	3,510.6	3,510.6	3,511.0	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
JA	333,681	677	4,991	4.0	3,513.2	3,513.2	3,513.7	0.5
JB	334,747	812[2]	3,973	5.0	3,515.3	3,515.3	3,515.8	0.5
JC	335,737	516[2]	2,384	8.4	3,518.3	3,518.3	3,518.6	0.3
JD	336,341	423	3,025	6.6	3,522.4	3,522.4	3,522.8	0.4
JE	337,231	512	2,786	7.2	3,524.8	3,524.8	3,525.2	0.4
JF	338,385	535	3,253	4.9	3,529.4	3,529.4	3,529.8	0.4
JG	339,169	215	1,471	10.9	3,530.4	3,530.4	3,530.9	0.5
JH	340,426	274	3,075	5.2	3,535.8	3,535.8	3,536.3	0.5
JI	341,559	365	2,423	6.6	3,537.4	3,537.4	3,537.9	0.5
JJ	342,259	435	3,320	4.8	3,541.1	3,541.1	3,541.3	0.2
JK	343,072	471	2,911	5.5	3,542.0	3,542.0	3,542.3	0.3
JL	344,221	325	2,049	7.8	3,544.8	3,544.8	3,545.3	0.5
JM	345,450	249	2,466	6.5	3,549.9	3,549.9	3,550.4	0.5
JN	346,458	599	3,977	4.0	3,551.5	3,551.5	3,552.0	0.5
JO	347,659	466[2]	1,830	8.7	3,553.0	3,553.0	3,553.4	0.4
JP	349,319	271	1,905	8.4	3,559.1	3,559.1	3,559.3	0.2
JQ	350,802	353[2]	1,606	10.0	3,564.2	3,564.2	3,564.7	0.5
JR	352,356	326	2,252	7.1	3,568.7	3,568.7	3,569.0	0.3
JS	353,848	452	2,252	7.1	3,572.8	3,572.8	3,573.3	0.5
JT	355,370	856	4,051	3.9	3,576.5	3,576.5	3,576.9	0.4

[1] Feet above Mineral/Missoula County Boundary

[2] Floodway topwidth includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION(FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
JU	356,778	362	2,171	7.4	3,579.4	3,579.4	3,579.9	0.5
JV	357,876	298	2,050	7.8	3,582.7	3,582.7	3,583.0	0.3
JW	358,823	337	2,011	8.0	3,585.1	3,585.1	3,585.6	0.5
JX	359,875	480	3,108	5.1	3,589.5	3,589.5	3,589.9	0.4
JY	360,905	606	3,375	4.7	3,592.0	3,592.0	3,592.5	0.5
JZ	361,849	427	2,499	6.4	3,594.1	3,594.1	3,594.5	0.4
KA	363,046	548	3,226	5.0	3,596.7	3,596.7	3,597.1	0.4
KB	363,601	465/384[3]	2,808	5.6	3,597.9	3,597.9	3,598.3	0.4
KC	364,802	1275/94[3]	4,378	3.6	3,600.2	3,600.2	3,600.4	0.2

[1] Feet above Mineral/Missoula County Boundary

[3] Floodway width within county/ total floodway width

Table 23: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
E	5,795	812	2,401	6.6	3,616.1	3,616.1	3,616.1	0.0
F	6,970	593	2,702	5.8	3,619.5	3,619.5	3,619.8	0.3
G	7,344	282	2,293	6.9	3,621.6	3,621.6	3,622.0	0.4
H	8,284	261	2,222	7.1	3,625.5	3,625.5	3,625.7	0.2
I	9,874	254	1,926	8.2	3,629.6	3,629.6	3,630.1	0.5
J	11,368	228	2,430	6.5	3,634.1	3,634.1	3,634.5	0.4
K	12,725	215	2,126	7.4	3,638.0	3,638.0	3,638.4	0.4

[1] Feet above Missoula/Granite County Boundary

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLARK FORK RIVER (NEAR GRANITE COUNTY)

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,038	637	1,920	2.0	3,914.0	3,914.0	3,914.5	0.5
B	4,137	1,058	4,407	0.9	3,916.8	3,916.8	3,917.2	0.4
C	7,346	1,427	4,571	0.9	3,918.1	3,918.1	3,918.5	0.4
D	8,688	1,736	4,205	0.9	3,920.0	3,920.0	3,920.5	0.5
E	10,035	1,368	3,087	1.3	3,922.6	3,922.6	3,923.1	0.5
F	11,906	326	1,445	2.1	3,927.3	3,927.3	3,927.7	0.4
G	12,607	276	1,373	2.2	3,929.6	3,929.6	3,929.9	0.3
H	13,634	1,004	3,165	0.9	3,930.1	3,930.1	3,930.5	0.4
I	14,069	424	1,067	2.8	3,930.3	3,930.3	3,930.6	0.3
J	14,435	545	1,283	2.3	3,931.2	3,931.2	3,931.7	0.5
K	14,989	153	520	5.7	3,932.2	3,932.2	3,932.6	0.4
L	15,663	257	981	3.0	3,934.4	3,934.4	3,934.7	0.3
M	16,619	215	856	3.5	3,935.9	3,935.9	3,936.3	0.4
N	17,491	635	1,976	1.5	3,937.6	3,937.6	3,938.1	0.5
O	18,326	244	689	4.3	3,939.5	3,939.5	3,939.9	0.4
P	19,491	446	1,295	2.3	3,942.7	3,942.7	3,943.1	0.4
Q	20,039	380	1,390	2.2	3,944.8	3,944.7	3,945.1	0.4
R	20,606	126	576	5.2	3,945.7	3,945.4	3,945.7	0.3
S	21,765	445	1,239	2.4	3,946.9	3,946.9	3,947.3	0.4
T	22,266	267	577	5.2	3,948.6	3,948.6	3,949.1	0.5
U	22,670	80	421	5.8	3,949.9	3,949.9	3,950.3	0.4
V	23,245	78	268	9.2	3,951.6	3,951.6	3,951.9	0.3
W	23,834	107	626	3.9	3,954.3	3,954.3	3,954.7	0.4
X	24,443	223	1,087	2.3	3,955.8	3,955.8	3,956.2	0.4
Y	25,140	449	1,558	1.6	3,956.7	3,956.7	3,957.2	0.5
Z	26,424	434	1,092	2.3	3,958.2	3,958.2	3,958.6	0.4

[1] Feet above confluence with Salmon Lake

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORAED AREAS

FLOODWAY DATA

FLOODING SOURCE: CLEARWATER RIVER

Table 23: Floodway Data (Continued)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AA	27,507	719[2]	891	2.8	3,960.4	3,960.4	3,960.8	0.4
AB	28,408	229	535	4.6	3,963.3	3,963.3	3,963.7	0.4
AC	29,596	217	927	2.7	3,966.6	3,966.6	3,967.0	0.5
AD	31,205	272	1,001	2.3	3,971.0	3,971.0	3,971.4	0.4
AE	31,987	124	526	4.6	3,972.9	3,972.9	3,973.1	0.2
AF	32,315	88	426	5.8	3,974.5	3,974.5	3,974.5	0.1
AG	33,007	98	451	5.5	3,976.2	3,976.2	3,976.3	0.1
AH	34,011	99	386	6.4	3,979.8	3,979.8	3,980.2	0.4
AI	34,271	114	547	4.5	3,981.3	3,981.3	3,981.7	0.4
AJ	34,866	94	318	7.7	3,982.9	3,982.9	3,982.9	0.0
AK	35,568	101	579	4.3	3,985.8	3,985.8	3,986.1	0.3
AL	36,572	118	591	4.2	3,988.5	3,988.5	3,988.7	0.2
AM	37,419	102	435	5.7	3,990.4	3,990.4	3,990.5	0.1
AN	38,197	118	423	5.8	3,992.8	3,992.8	3,992.9	0.1
AO	38,646	196	645	3.8	3,994.1	3,994.1	3,994.1	0.0
AP	39,726	114	529	4.7	3,998.1	3,998.1	3,998.3	0.2
AQ	40,283	126	639	3.9	3,999.1	3,999.1	3,999.5	0.3
AR	41,143	181	1,155	2.1	4,001.2	4,001.2	4,001.6	0.4
AS	42,191	427	2,933	0.8	4,001.4	4,001.4	4,001.7	0.3
AT	43,340	464	3,574	0.7	4,001.4	4,001.4	4,001.8	0.4
AU	44,843	808	5,605	0.4	4,001.4	4,001.4	4,001.8	0.4
AV	46,256	393	3,667	0.7	4,001.4	4,001.4	4,001.8	0.4
AW	47,745	282	2,817	0.9	4,001.5	4,001.5	4,001.8	0.3
AX	48,866	367	3,542	0.7	4,001.5	4,001.5	4,001.8	0.3
AY	49,821	440	3,757	0.7	4,001.5	4,001.5	4,001.9	0.4
AZ	50,541	559	4,129	0.6	4,001.5	4,001.5	4,001.9	0.4

[1] Feet above confluence with Salmon Lake

[2] Floodway top width includes width of high ground area.

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORAED AREAS

FLOODWAY DATA

CLEARWATER RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,520	203[2]	336	4.5	3,642.8	3,642.8	3,642.8	0.0
B	3,155	90	294	5.2	3,650.7	3,650.7	3,650.8	0.1
C	4,228	185	552	3.1	3,655.0	3,655.0	3,655.5	0.5
D	5,703	221	536	3.7	3,660.1	3,660.1	3,660.6	0.5
E	7,101	153	357	5.5	3,666.5	3,666.5	3,666.7	0.2
F	8,336	179	375	5.2	3,673.6	3,673.6	3,673.8	0.2

[1]Feet above confluence with Swan River
[2]Floodway top width includes width of high ground area

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	25	30	111	4.2	3,276.3	3,276.3	3,276.3	0.0
B	200	38	75	6.2	3,279.4	3,279.4	3,279.4	0.0
C	500	29	101	4.6	3,283.7	3,283.7	3,283.7	0.0
D	675	24	85	5.5	3,285.9	3,285.9	3,285.9	0.0
E	1,399	60	103	4.5	3,299.1	3,299.1	3,299.1	0.0
F	2,103	37	106	4.4	3,315.0	3,315.0	3,315.0	0.0
G	3,780	32	88	5.3	3,343.4	3,343.4	3,343.4	0.0
H	4,805	118	176	2.6	3,362.6	3,362.6	3,363.1	0.5
I	6,930	79	155	3.0	3,412.3	3,412.3	3,412.8	0.5
J	8,830	81	95	4.9	3,451.5	3,451.5	3,451.5	0.0
K	10,130	38	101	4.6	3,484.7	3,484.7	3,485.2	0.5
L	12,530	31	96	4.8	3,544.2	3,544.2	3,544.2	0.0
M	13,405	93	116	4.0	3,561.0	3,561.0	3,561.0	0.0
N	14,855	105	193	2.4	3,606.8	3,606.8	3,606.8	0.0
O	17,830	47	131	3.8	3,687.3	3,687.3	3,687.3	0.0
P	19,380	27	94	4.9	3,730.8	3,730.8	3,731.3	0.5
Q	21,080	100	157	3.3	3,779.0	3,779.0	3,779.2	0.2
R	21,305	25	96	4.8	3,785.6	3,785.6	3,785.6	0.0

[1]Feet above East Bound Exit Ramp I-90

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	477	63	216	4.6	3,766.4	3,766.4	3,766.4	0.0
B	1,186	116	549	1.7	3,773.5	3,773.5	3,774.0	0.5

[1]Feet above confluence with Swan River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: GUEST R SPLIT

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	480	98	378	5.0	3,596.8	3,596.8	3,597.0	0.2
B	1,851	298[2]	604	3.5	3,602.4	3,602.4	3,602.9	0.5
C	3,213	145	556	3.6	3,606.9	3,606.9	3,607.4	0.5

[1]Feet above confluence with Swan River
[2]Floodway top width includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: KAUFFMAN SPLIT

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	100	525	2,066	0.5	3,074.5	3,074.5	3,074.5	0.0
B	1,061	545	2,467	0.4	3,074.5	3,074.5	3,074.5	0.0
C	1,796	318	1010	0.9	3,074.5	3,074.5	3,074.6	0.1
D	2,535	746	2,356	0.4	3,074.6	3,074.6	3,074.7	0.1
E	2,697	737	1,953	0.5	3,074.6	3,074.6	3,074.7	0.1
F	2,814	733	1,878	0.5	3,074.6	3,074.6	3,074.7	0.1
G	2,905	693	1,496	0.6	3,074.6	3,074.6	3,074.7	0.1
H	3,261	643	1,505	0.6	3,074.6	3,074.6	3,074.7	0.1
I	4,741	876	1,476	0.6	3,074.8	3,074.8	3,075.0	0.2
J	6,209	650	795	1.2	3,075.7	3,075.7	3,075.8	0.1
K	7,835	174	362	2.6	3,078.5	3,078.5	3,078.5	0.0
L	8,917	183	572	1.6	3,079.5	3,079.5	3,079.6	0.1
M	9,725	274	699	1.4	3,079.8	3,079.8	3,080.0	0.2
N	10,442	377	923	1.0	3,080.1	3,080.1	3,080.3	0.2
O	11,290	396	1,165	0.8	3,080.3	3,080.3	3,080.5	0.2
P	11,757	304	961	1.0	3,080.3	3,080.3	3,080.5	0.2
Q	12,128	357	1,046	0.9	3,080.4	3,080.4	3,080.6	0.2
R	12,267	528	1,734	0.5	3,081.4	3,081.4	3,081.5	0.1
S	12,681	735	2,371	0.4	3,081.5	3,081.5	3,081.5	0.0
T	13,326	738	2,442	0.4	3,081.5	3,081.5	3,081.6	0.1
U	13,925	685	1,820	0.5	3,081.5	3,081.5	3,081.6	0.1
V	14,633	386	1,094	0.9	3,081.6	3,081.6	3,081.7	0.1

[1]Feet above Frenchtown Irrigation District Ditch Centerline

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	15,259	621	1,872	0.3	3,081.6	3,081.6	3,081.7	0.1
X	15,708	598	1,850	0.3	3,081.6	3,081.6	3,081.7	0.1
Y	16,607	978	2,219	0.2	3,081.6	3,081.6	3,081.7	0.1
Z	17,264	1,465	2,061	0.3	3,081.7	3,081.7	3,081.8	0.1
AA	18,447	2,057	1,295	0.4	3,082.1	3,082.1	3,082.1	0.0

[1]Feet above Frenchtown Irrigation District Ditch Centerline

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: LA VALLE CREEK

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,700	1,380	771	4.3	3,165.1	3,165.1	3,165.6	0.5
B	4,100	1,000	1,712	1.9	3,169.3	3,169.3	3,169.7	0.4
C	5,190	111	415	7.9	3,174.1	3,174.1	3,174.6	0.5
D	5,240	66	393	8.4	3,174.4	3,174.4	3,174.8	0.4
E	5,270	66	413	8.0	3,174.7	3,174.7	3,175.1	0.4
F	5,870	120	508	6.5	3,178.0	3,178.0	3,178.0	0.0
G	6,370	123	462	7.1	3,180.3	3,180.3	3,180.6	0.3
H	6,450	120	492	6.7	3,180.7	3,180.7	3,181.1	0.4
I	6,480	120	519	6.4	3,180.8	3,180.8	3,181.3	0.5
J	7,900	200	749	4.4	3,186.9	3,186.9	3,187.0	0.1
K	8,300	161	570	5.8	3,188.4	3,188.4	3,188.7	0.3
L	9,080	294	570	5.8	3,194.7	3,194.7	3,194.7	0.0
M	10,520	236	734	4.5	3,202.9	3,202.9	3,203.1	0.2
N	11,940	201	513	6.4	3,211.4	3,211.4	3,211.4	0.0
O	12,515	203	631	5.2	3,215.3	3,215.3	3,215.4	0.1
P	14,170	141	412	8.0	3,225.9	3,225.9	3,225.9	0.0
Q	15,335	159	563	5.9	3,233.6	3,233.6	3,233.8	0.2
R	16,220	246	574	5.8	3,238.1	3,238.1	3,238.5	0.4
S	18,385	340	546	6.0	3,249.6	3,249.6	3,250.1	0.5
T	20,830	314	684	4.8	3,263.9	3,263.9	3,263.9	0.0
U	22,200	250	610	5.4	3,272.7	3,272.7	3,272.9	0.2
V	24,275	75	390	8.5	3,286.2	3,286.2	3,286.3	0.1

[1]Feet above confluence with Bitterroot River

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	26,075	99	369	8.1	3,299.5	3,299.5	3,299.5	0.0
X	27,925	78	404	7.4	3,311.7	3,311.7	3,311.7	0.0
Y	27,955	78	448	6.7	3,311.8	3,311.8	3,312.3	0.5
Z	28,050	343	1,173	2.6	3,312.7	3,312.7	3,313.0	0.3
AA	28,375	177	419	7.2	3,313.0	3,313.0	3,313.2	0.2
AB	31,870	532	916	3.3	3,332.5	3,332.5	3,333.0	0.5
AC	35,180	397	619	4.8	3,356.3	3,356.3	3,356.3	0.0
AD	36,550	79	402	7.5	3,365.9	3,365.9	3,365.9	0.0
AE	36,580	79	420	7.1	3,366.1	3,366.1	3,366.1	0.0
AF	36,680	107	548	5.5	3,366.8	3,366.8	3,366.8	0.0
AG	36,940	142	441	6.8	3,367.7	3,367.7	3,367.7	0.0

[1]Feet above confluence with Bitterroot River

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	-234	28	70	9.0	3,225.9	3,225.9	3,225.9	0.0
X	758	32	73	8.5	3,241.9	3,241.9	3,241.9	0.0
Y	1,574	24	67	9.4	3,253.9	3,253.9	3,253.9	0.0
Z	2,270	30	71	8.7	3,266.3	3,266.3	3,266.3	0.0

[1]Feet above Schramm Street

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: MIDDLE GRANT CREEK

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A through D (No Floodway Computed)								
E	14,800	82	130	5.2	3,364.8	3,364.8	3,365.3	0.5
F	15,286	257	264	2.6	3,371.7	3,371.7	3,372.0	0.3
G	15,500	200	608	1.1	3,372.0	3,372.0	3,372.4	0.4
H	15,800	70	99	6.8	3,375.1	3,375.1	3,375.1	0.0
I	16,350	79	150	4.5	3,382.8	3,382.8	3,383.0	0.2
J	17,475	116	153	4.4	3,403.2	3,403.2	3,403.2	0.0
K	18,000	79	103	6.6	3,413.3	3,413.3	3,413.3	0.0
L	18,550	65	133	5.1	3,421.6	3,421.6	3,421.9	0.3
M	20,850	70	183	3.7	3,470.8	3,470.8	3,470.8	0.0
N	22,400	61	128	5.3	3,487.4	3,487.4	3,487.6	0.2
O	24,000	67	96	7.1	3,518.3	3,518.3	3,518.8	0.5
P	25,400	90	176	3.8	3,544.3	3,544.3	3,544.4	0.1
Q	26,250	20	65	10.4	3,557.6	3,557.6	3,557.6	0.0
R	27,800	145	235	2.9	3,581.1	3,581.1	3,581.6	0.5
S	30,250	99	190	3.6	3,608.8	3,608.8	3,609.2	0.4
T	31,350	55	91	7.4	3,626.5	3,626.5	3,626.5	0.0
U	32,900	212	180	3.7	3,652.4	3,652.4	3,652.4	0.0
V	34,250	155	124	5.4	3,666.6	3,666.6	3,666.6	0.0
W	36,400	194	149	4.5	3,703.1	3,703.1	3,603.6	0.5

[1]Feet above confluence with Bitterroot River

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	315	26	46	4.2	3,233.7	3,233.7	3,233.7	0.0
B	1,375	47	52	3.8	3,262.6	3,262.6	3,262.6	0.0
C	1,550	116	117	1.7	3,268.7	3,268.7	3,268.7	0.0
D	1,815	40	36	5.4	3,275.7	3,275.7	3,275.7	0.0
E	1,885	41	36	5.4	3,279.6	3,279.6	3,279.6	0.0
F	2,655	23	30	6.5	3,300.7	3,300.7	3,300.7	0.0
G	2,855	222	629	0.3	3,311.2	3,311.2	3,311.2	0.0
H	3,055	33	34	5.7	3,316.5	3,316.5	3,316.5	0.0
I	3,555	31	33	5.9	3,334.5	3,334.5	3,334.5	0.0
J	4,085	46	38	5.2	3,355.6	3,355.6	3,355.6	0.0

[1]Feet above South Higgins Avenue in the City of Missoula

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: PATTEE CREEK

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	220	150	289	12.1	3,189.9	3,182.1[2]	3,182.1[2]	0.0
B	500	230	652	4.6	3,189.9	3,188.3[2]	3,188.3[2]	0.0
C	750	63	354	8.5	3,191.6	3,191.6	3,191.6	0.0
D	940	210	270	11.1	3,195.6	3,195.6	3,195.6	0.0
E	1,030	230	638	4.7	3,197.5	3,197.5	3,197.5	0.0
F	1,540	64	323	9.3	3,202.4	3,202.4	3,202.4	0.0
G	1,570	66	345	8.7	3,202.7	3,202.7	3,202.7	0.0
H	1,680	85	322	9.3	3,204.2	3,204.2	3,204.2	0.0
I	2,110	74	423	7.1	3,211.7	3,211.7	3,211.7	0.0
J	2,145	73	436	6.9	3,211.9	3,211.9	3,211.9	0.0
K	3,025	270	378	7.9	3,222.5	3,222.5	3,222.5	0.0
L	4,205	380	440	6.8	3,240.9	3,240.9	3,240.9	0.0
M	5,205	390	609	4.9	3,256.4	3,256.4	3,256.4	0.0
N	5,585	42	226	13.3	3,263.5	3,263.5	3,263.5	0.0
O	5,885	354	861	5.7	3,269.4	3,269.4	3,269.4	0.0
P	6,065	154	336	10.3	3,271.2	3,271.2	3,271.2	0.0
Q	6,875	475	822	4.3	3,285.0	3,285.0	3,285.0	0.0
R	7,870	74	272	11.0	3,302.8	3,302.8	3,302.8	0.0
S	8,370	102	415	8.5	3,313.1	3,313.1	3,313.1	0.0
T	9,000	288	472	9.1	3,321.6	3,321.6	3,321.6	0.0
U	9,750	570	606	6.3	3,334.0	3,334.0	3,334.0	0.0
V	10,330	295	391	9.4	3,342.8	3,342.8	3,342.8	0.0

[1]Feet above confluence with Clark Fork River
[2]Elevations Computed Without Consideration of Backwater Effects From Clark Fork River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: RATTLESNAKE CREEK

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	10,800	360	1,760	1.5	3,354.4	3,354.4	3,354.4	0.0
X	10,850	370	685	4.4	3,354.4	3,354.4	3,354.4	0.0
Y	11,900	500	338	9.9	3,370.6	3,370.6	3,370.6	0.0
Z	12,350	450	930	2.7	3,377.6	3,377.6	3,377.6	0.0
AA	12,600	494	1,250	2.9	3,379.0	3,379.0	3,379.0	0.0
AB	13,425	436	667	9.7	3,393.2	3,393.2	3,393.2	0.0
AC	14,530	490	556	8.5	3,409.0	3,409.0	3,409.0	0.0
AD	15,340	470	1,601	7.3	3,421.2	3,421.2	3,421.2	0.0
AE	16,170	460	450	6.7	3,434.6	3,434.6	3,434.6	0.0
AF	17,145	390	526	7.1	3,450.0	3,450.0	3,450.0	0.0
AG	18,250	230	421	9.9	3,467.6	3,467.6	3,467.6	0.0
AH	19,340	410	528	7.6	3,484.3	3,484.3	3,484.3	0.0
AI	19,790	210	256	11.7	3,490.6	3,490.6	3,490.6	0.0
AJ	20,405	124	349	8.6	3,500.2	3,500.2	3,500.0	0.0
AK	20,509	180	484	6.2	3,501.9	3,501.9	3,501.9	0.0
AL	20,580	186	408	7.4	3,503.1	3,503.1	3,503.1	0.0
AM	21,278	162	479	6.3	3,513.7	3,513.7	3,513.8	0.1
AN	21,489	75	365	8.2	3,516.2	3,516.2	3,516.2	0.0
AO	21,729	75	273	11	3,520.0	3,520.0	3,520.0	0.0
AP	22,209	125	421	7.1	3,530.2	3,530.2	3,530.2	0.0
AQ	22,860	110	325	9.5	3,542.5	3,542.5	3,542.5	0.0
AR	23,920	120	565	6.4	3,557.6	3,557.6	3,557.6	0.0
AS	23,960	52	253	11.9	3,557.6	3,557.6	3,557.6	0.0

[1]Feet above confluence with Clark Fork River

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AT	23,980	52	344	8.7	3,559.4	3,559.4	3,559.4	0.0
AU	24,500	340	433	8.5	3,565.8	3,565.8	3,565.8	0.0
AV	25,450	410	541	8.0	3,582.3	3,582.3	3,582.3	0.0
AW	26,225	110	553	6.8	3,594.4	3,594.4	3,594.4	0.0
AX	27,260	170	470	8.6	3,607.2	3,607.2	3,607.2	0.0
AY	27,900	160	375	8.6	3,617.1	3,617.1	3,617.1	0.0
AZ	28,400	190	416	9.3	3,626.6	3,626.6	3,626.6	0.0
BA	29,400	200	742	5.6	3,641.3	3,641.3	3,641.3	0.0

[1]Feet above confluence with Clark Fork River

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION[3]	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	865	664	2,036	4.2	3,528.5	3,528.5	3,529.0	0.5
B	1,165	553	1,350	6.3	3,529.9	3,529.9	3,530.2	0.3
C	3,027	991	2,151	3.9	3,538.9	3,538.9	3,539.4	0.5
D	4,721	412[2]	1,130	7.5	3,548.7	3,548.7	3,549.0	0.3
E	6,695	621	1,430	5.9	3,560.1	3,560.1	3,560.6	0.5
F	8,633	456	1,596	5.3	3,570.5	3,570.5	3,571.0	0.5
G	10,451	734	1,755	4.8	3,577.9	3,577.9	3,578.3	0.4
H	12,431	493	1,762	4.8	3,588.9	3,588.9	3,589.4	0.5
I	13,086	475	1,946	4.3	3,592.2	3,592.2	3,592.7	0.5
J	14,897	976/55[4]	2,086	4.1	3,599.6	3,599.6	3,599.8	0.2
M	20,417	1,576[2]/32[4]	2,498	3.4	3,628.3	3,628.3	3,628.5	0.2
N	22,131	931/683[4]	2,925	2.9	3,638.8	3,638.8	3,639.3	0.5
O	23,976	541	1,629	5	3,651.0	3,651.0	3,651.2	0.2
P	25,652	732	2,176	3.8	3,661.4	3,661.4	3,661.9	0.5
Q	27,409	478	1,409	5.8	3,672.9	3,672.9	3,673.2	0.3
R	29,232	505	1,871	4.4	3,684.3	3,684.3	3,684.7	0.4

[1] Stream distance in feet upstream of Clark Fork River
[2] Floodway top width includes width of high ground area
[3] Cross Sections K and L are not located in Missoula County, they are not shown in this FIS
[4] Floodway width within county/total floodway width

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MT

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: ROCK CREEK

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	330	716	1,783	2.6	3,512.3	3,512.3	3,512.7	0.4
B	1,156	1,160[2]	1,518	3.0	3,516.3	3,516.3	3,516.5	0.2
C	2,478	736[2]	1,850	2.5	3,520.1	3,520.1	3,520.4	0.3
D	3,460	707	1,505	3.0	3,523.2	3,523.2	3,523.5	0.3
E	4,614	625[2]	885	5.2	3,526.5	3,526.5	3,526.7	0.2
F	6,101	366	940	4.8	3,533.8	3,533.8	3,534.3	0.5
G	7,420	207	785	5.8	3,539.0	3,539.0	3,539.3	0.3
H	9,616	138	671	6.8	3,547.8	3,547.8	3,548.3	0.5
I	10,819	304	962	4.2	3,552.2	3,552.2	3,552.5	0.3
J	11,861	367	1,163	3.5	3,557.4	3,557.4	3,557.9	0.5
K	12,994	308[2]	910	4.4	3,562.0	3,562.0	3,562.1	0.1
L	14,128	406	888	4.5	3,566.7	3,566.7	3,566.8	0.1
M	15,692	600	1,340	3.0	3,572.2	3,572.2	3,572.5	0.3
N	16,920	306[2]	736	5.5	3,578.0	3,578.0	3,578.0	0.0
O	18,205	245	589	6.9	3,583.8	3,583.8	3,584.0	0.2
P	19,739	232	690	5.9	3,590.8	3,590.8	3,591.1	0.3
Q	20,844	246[2]	538	4.0	3,594.9	3,594.9	3,595.2	0.3
R	22,075	229[2]	445	4.4	3,599.7	3,599.7	3,600.2	0.5
S	23,661	122[2]	373	5.4	3,607.4	3,607.4	3,607.8	0.4
T	24,917	315[2]	901	4.5	3,612.1	3,612.1	3,612.3	0.2
U	26,120	331	1,008	4.0	3,617.5	3,617.5	3,617.9	0.4
V	27,271	740	1,652	2.4	3,623.3	3,623.3	3,623.8	0.5

[1]Feet above Lake/Missoula County Line
[2]Floodway top width includes width of high ground area

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	28,597	485	1,264	3.2	3,629.2	3,629.2	3,629.6	0.4
X	29,862	314	897	4.5	3,634.0	3,634.0	3,634.1	0.1
Y	31,508	315	823	3.1	3,643.0	3,643.0	3,643.4	0.4
Z	32,759	275	775	3.2	3,650.0	3,650.0	3,650.5	0.5
AA	33,949	196	536	4.1	3,656.3	3,656.3	3,656.3	0.0
AB	35,329	151	422	4.9	3,664.7	3,664.7	3,664.7	0.0
AC	36,432	175	564	3.7	3,671.7	3,671.7	3,671.8	0.1
AD	37,785	396	1,044	3.9	3,679.5	3,679.5	3,680.0	0.5
AE	39,066	82	376	6.3	3,686.1	3,686.1	3,686.1	0.0
AF	40,224	155	595	4.6	3,691.8	3,691.8	3,692.1	0.3
AG	41,505	433[2]	1,082	2.5	3,699.2	3,699.2	3,699.6	0.4
AH	42,699	624[2]	932	2.9	3,705.0	3,705.0	3,705.1	0.1
AI	44,082	340	686	4.0	3,713.9	3,713.9	3,714.4	0.5
AJ	45,417	266[2]	526	5.2	3,721.5	3,721.5	3,722.0	0.5
AK	46,612	76	340	8.0	3,730.4	3,730.4	3,730.7	0.3
AL	48,127	184	571	4.8	3,739.3	3,739.3	3,739.6	0.3
AM	49,406	249	769	3.5	3,746.6	3,746.6	3,747.1	0.5
AN	50,832	169	485	5.6	3,755.5	3,755.5	3,755.9	0.4
AO	52,324	84	331	5.8	3,768.8	3,768.8	3,769.2	0.4
AP	53,460	341[2]	764	3.6	3,777.9	3,777.9	3,778.4	0.5
AQ	54,642	74	381	7.1	3,787.5	3,787.5	3,787.7	0.2
AR	55,795	82	379	7.2	3,796.1	3,796.1	3,796.2	0.1
AS	57,095	512[2]	848	2.7	3,803.5	3,803.5	3,804.0	0.5
AT	58,409	300	526	4.3	3,813.3	3,813.3	3,813.3	0.0
AU	59,913	266	565	4.0	3,823.6	3,823.6	3,824.1	0.5

[1]Feet above Lake/Missoula County Line
[2]Floodway top width includes width of high ground area

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

MISSOULA COUNTY, MONTANA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: SWAN RIVER

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AV	61,399	82	299	7.6	3,833.1	3,833.1	3,833.3	0.2
AW	62,446	206	483	4.7	3,840.6	3,840.6	3,841.0	0.4
AX	63,577	166	348	6.6	3,848.5	3,848.5	3,848.6	0.1
AY	64,987	288[2]	585	3.9	3,861.3	3,861.3	3,861.5	0.2
AZ	66,140	173	486	4.7	3,869.3	3,869.3	3,869.8	0.5
BA	67,478	180[2]	470	4.8	3,878.6	3,878.6	3,879.0	0.4
BB	68,448	240	619	3.7	3,884.6	3,884.6	3,885.0	0.4
BC	70,028	244[2]	475	4.8	3,892.2	3,892.2	3,892.7	0.5
BD	71,244	201	598	3.8	3,899.8	3,899.8	3,900.3	0.5
BE	72,369	155	591	3.9	3,904.9	3,904.9	3,905.2	0.3
BF	73,473	160	515	4.4	3,909.0	3,909.0	3,909.4	0.4
BG	74,645	95	403	5.7	3,915.1	3,915.1	3,915.2	0.1
BH	75,870	322	963	2.4	3,918.6	3,918.6	3,919.1	0.5
BI	77,103	506	1,209	1.9	3,920.6	3,920.6	3,920.9	0.3
BJ	78,540	620	916	2.5	3,922.1	3,922.1	3,922.3	0.2
BK	79,960	668[2]	1,145	2.0	3,924.8	3,924.8	3,925.2	0.4
BL	81,436	370	859	2.7	3,929.8	3,929.8	3,930.3	0.5
BM	82,852	377	932	2.4	3,933.7	3,933.7	3,934.1	0.4
BN	84,053	177	523	4.4	3,939.1	3,939.1	3,939.5	0.4
BO	85,177	251	769	3.0	3,943.9	3,943.9	3,944.4	0.5
BP	86,365	315	678	3.4	3,949.3	3,949.3	3,949.8	0.5
BQ	87,454	241	424	3.8	3,953.8	3,953.8	3,954.2	0.4
BR	88,140	152	396	4.1	3,958.2	3,958.2	3,958.5	0.3
BS	89,355	89	370	4.4	3,966.5	3,966.5	3,966.8	0.3

[1]Feet above Lake/Missoula County Line

[2]Floodway top width includes width of high ground area

Table 23: Floodway Data (Continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BT	90,672	78	249	6.6	3,977.5	3,977.5	3,977.8	0.3
BU	92,067	124	399	4.1	3,991.4	3,991.4	3,991.4	0.0
BV	93,589	144	413	3.9	4,004.3	4,004.3	4,004.3	0.0
BW	94,738	86	307	5.3	4,010.8	4,010.8	4,010.9	0.1
BX	95,943	89	378	4.3	4,015.9	4,015.9	4,016.1	0.2
BY	97,262	154	822	2.0	4,018.2	4,018.2	4,018.5	0.3
BZ	98,491	225	802	2.0	4,018.8	4,018.8	4,019.3	0.5
CA	99,773	459	1,067	1.5	4,020.0	4,020.0	4,020.5	0.5

[1]Feet above Lake/Missoula County Line

Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable to this Flood Risk Product.

Table 25: Summary of Coastal Transect Mapping Considerations

[Not applicable to this Flood Risk Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 30, “Map Repositories”).

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA.

To obtain an application for a LOMA, visit www.fema.gov/flood-maps/change-your-flood-zone and download the form “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill”. Visit the “Flood Map-Related Fees” section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/flood-maps/tutorials.

For more information about how to apply for a LOMA, call the FEMA Mapping and Insurance eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/flood-maps/change-your-flood-zone for the "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill" or by calling the FEMA Mapping and Insurance eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the "Flood Map-Related Fees" section.

A tutorial for LOMR-F is available at www.fema.gov/flood-maps/tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/flood-maps/change-your-flood-zone and download the form "MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision". Visit the "Flood Map-Related Fees" section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Mapping and Insurance eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Missoula County FIRM are listed in Table 26. Please note that while this table only includes LOMCs that have been issued on the FIRM panels updated by this map revision, the FIS Report includes all previously issued LOMRs prior to effective date.

Table 26: Incorporated Letters of Map Change

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
11-08-0184P	12/02/2011	Lower Grant Creek Extension	30063C1189F
15-08-1043P[1]	07/29/2005	Clark Fork River	30063C1220F 30063C1240F 30063C1485F 30063C1505F
21-08-0781P	06/27/2022	Rattlesnake Creek	30063C1215F
21-08-0878P	4/27/2022	Middle Grant Creek	30063C1191F 30063C1192F
22-08-0126P	5/22/2023	Butler Creek	30063C1180F 30063C1186F

[1] LOMR 15-08-1043P is partially superseded by new study data.