FLOOD INSURANCE STUDY FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 1



GEM COUNTY, IDAHO AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
EMMETT, CITY OF	160063
GEM COUNTY, UNINCORPORATED AREAS	160127



EFFECTIVE: AUGUST 24, 2021

FLOOD INSURANCE STUDY NUMBER 16045CV000A

Version Number 2.5.3.5

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Payette River Overflow 2	11 P
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Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT GEM COUNTY, IDAHO

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 that will be used to establish actuarial flood insurance rates and 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 Gem County, Idaho.

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.

				If Not
				Included,
		HUC-8		Location of
		Sub-		Flood Hazard
Community	CID	Basin(s)	Located on FIRM Panel(s)	Data
Emmett, City of	160063	17050122	16045C0319B, 16045C0338B, 16045C0339B, 16045C0406B, 16045C0407B, 16045C0430B ¹	

Table 1: Listing of NFIP Jurisdictions

¹Panel Not Printed

Community	CID	HUC-8 Sub- Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Gem County, Unincorporated Areas	160127	17050114, 17050122, 17050123, 17050124	16045C0025B ¹ , 16045C0050B ¹ , 16045C0075B ¹ , 16045C0100B ¹ , 16045C0125B ¹ , 16045C0150B ¹ , 16045C0175B ¹ , 16045C0200B ¹ , 16045C0225B ¹ , 16045C0245B ¹ , 16045C0250B ¹ , 16045C0265B ¹ , 16045C0270B ¹ , 16045C0275B ¹ , 16045C0290B, 16045C0285B ¹ , 16045C0290B, 16045C0295B, 16045C0305B ¹ , 16045C0310B ¹ , 16045C0305B ¹ , 16045C0310B ¹ , 16045C0330B ¹ , 16045C0335B, 16045C0330B ¹ , 16045C0335B, 16045C0330B ¹ , 16045C0337B, 16045C0336B ¹ , 16045C0335B, 16045C0351B ¹ , 16045C0335B, 16045C0351B ¹ , 16045C0352B, 16045C0351B ¹ , 16045C0352B, 16045C0353B, 16045C0360B ¹ , 16045C0365B ¹ , 16045C0360B ¹ , 16045C0365B ¹ , 16045C0366B, 16045C0365B ¹ , 16045C0370B ¹ , 16045C0367B, 16045C0370B ¹ , 16045C0400B ¹ , 16045C0405B, 16045C0400B ¹ , 16045C0405B, 16045C0400B ¹ , 16045C0405B, 16045C0400B ¹ , 16045C0405B ¹ , 16045C0400B ¹ , 16045C045C045B ¹ , 16045C0450B ¹ , 16045C045C0455B ¹ , 16045C0450B ¹ , 16045C0455B ¹ ,	

Table 1: Listing of NFIP Jurisdictions (continued)

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 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 Gem County became effective on August 24, 2021. Refer to Table 27 for information about subsequent revisions to the FIRMs.

• Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map (FBFM) panels. In addition, former flood hazard zone designations have been changed as follows:

<u>Old Zone</u>	New Zone
A1 through A30	AE
В	X (shaded)
С	X (unshaded)

 Previous FIS Reports and FIRMs may have included levees that were accredited as reducing the risk associated with the 1-percent-annual-chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees, the levees 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."

Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 8 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE National Levee Database (<u>nld.usace.army.mil</u>). For all other levees, the user is encouraged to contact the appropriate local community.

Please also note that FEMA has identified one or more levees in this jurisdiction that have not been demonstrated by the community or levee owner to meet the requirements of 44 CFR 65.10, of the NFIP regulations as it relates to the levee's capacity to provide 1-percent-annual-chance flood protection. As such, temporary

actions are being taken until such time as FEMA is able to initiate a new flood risk project to apply new levee analysis and mapping procedures to leveed areas. These temporary actions involve using the flood hazard data shown on the previous effective FIRM exactly as shown on that prior FIRM and identifying the area with bounding lines and special map notes. Since the previously effective FIRM for this area was rescinded, the secluded area is temporarily shown as an area of minimal flood hazard. If a vertical datum conversion was executed for the county, then the Base Flood Elevations shown on the FIRM will now reflect elevations referenced to the North American Vertical Datum of 1988 (NAVD88). These levees are on FIRM panel(s) 16045C0319B, 16045C0338B, 16045C0406B, 16045C0407B, on the Payette River, and are identified on FIRM panels as potential areas of flood hazard data changes based on further review. Please refer to Section 4.4 of this FIS Report for more information.

 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 https://www.fema.gov/online-tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Gem 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.





ADA COUNTY

	1 in	ch = 30,00	0 feet	1:360,000
Ñ	0	16,000	32,000	64,000 Feet

Map Projection:

NAD 1983 StatePlane Idaho West FIPS 1103 Feet Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

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 - NO SPECIAL FLOOD HAZARD AREAS



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

GEM COUNTY, IDAHO and Incorporated Areas

PANELS PRINTED:

0280, 0290, 0295, 0315, 0318, 0319, 0335, 0337, 0338, 0339, 0341, 0345, 0352, 0353, 0354, 0358, 0361, 0362, 0366, 0367, 0405, 0406, 0407



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 map, 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 Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://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 Map Information 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.

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.

<u>BASE FLOOD ELEVATIONS</u>: 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.

<u>FLOODWAY INFORMATION</u>: 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.

<u>FLOOD CONTROL STRUCTURE INFORMATION</u>: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

Figure 2. FIRM Notes to Users (Continued)

<u>PROJECTION INFORMATION</u>: The projection used in the preparation of the map was State Plane Idaho West (FIPS 1103). The horizontal datum was the North American Datum of 1983 (NAD83). 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.

<u>ELEVATION DATUM</u>: 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 <u>https://www.ngs.noaa.gov/.</u>

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.

<u>BASE MAP INFORMATION</u>: Base map information shown on the FIRM consists of the following: Transportation Lines provided by Holladay Engineering Company of Payette, Idaho. Aerial imagery provided by United States Department of Agriculture (USDA) /Farm Service Agency (FSA) Aerial Photography Field office. Stream gages and hydrography provided by USGS. For information about base maps, refer to Section 6.2 "Base Map" in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

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.

NOTES FOR FIRM INDEX

<u>REVISIONS TO INDEX</u>: As new studies are performed and FIRM panels are updated within Gem County, Idaho, 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 Gem County, Idaho, effective August 24, 2021.

Figure 2. FIRM Notes to Users (Continued)

<u>FLOOD RISK REPORT</u>: 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 Gem 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.

Figure 3: Map Legend for FIRM (Continued)

	Regulatory Floodway determined in Zone AE.
OTHER AREAS OF FLOO	DD 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 Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. See Notes to Users for important information.
	Area with Flood Risk due to Levee: Areas where a non-accredited levee dike, or other flood control structure is shown as providing protection to less than the 1% annual chance flood.
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.
NO SCREEN	Unshaded Zone X: Areas of minimal flood hazard.
FLOOD HAZARD AND O	THER BOUNDARY LINES
(ortho) (vector)	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 STRUCTURE	5
Aqueduct Channel Culvert Storm Sewer	Channel, Culvert, Aqueduct, or Storm Sewer
Dam Jetty Weir	Dam, Jetty, Weir

	Levee, Dike, or Floodwall
Bridge	Bridge
REFERENCE MARKERS	
22.0	River mile Markers
CROSS SECTION & TRAI	NSECT INFORMATION
⟨ B ⟩ <u>20.2</u>	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
<u> </u>	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	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.
~~~~ 513 ~~~~	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	
Missouri Creek	River, Stream or Other Hydrographic Feature
(234)	Interstate Highway
234	U.S. Highway
(234)	State Highway

# Figure 3: Map Legend for FIRM (Continued)

# Figure 3: Map Legend for FIRM (Continued)

234	County Highway
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-annualchance (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 Gem 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- 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- and 0.2-percentannual-chance floodplain boundaries are close together, only the 1-percent-annualchance 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 Gem 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.

Within this jurisdiction, there are one or more levees that have not been demonstrated by the communities or levee owners to meet the requirements of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) as it relates to the levee's capacity to provide 1-percent-annual-chance flood protection. As such, the floodplain boundaries in this area are subject to change. Please refer to Section 4.4 of this FIS Report for more information on how this may affect the floodplain boundaries shown on this FIRM.

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub- Basin(s)	Length (mi) (streams or coastlines)	Area (mi ² ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Bissel Creek	Gem County, Unincorporated Areas	Confluence with Payette River	Approximately 450 feet downstream of Beacon Avenue	17050122	0.7		Ν	А	9/30/2017
Haw Creek	Gem County, Unincorporated Areas	Confluence with Payette River	Approximately 700 feet Upstream of Edgemont Road	17050122	3.1		Ν	А	9/30/2017
Haw Creek Overflow 1	Gem County, Unincorporated Areas	Confluence with Payette River	Divergence with Haw Creek	17050122	0.4		Ν	А	9/30/2017
Payette River (Reach 1)	Gem County, Unincorporated Areas	Approximately 8,000 feet downstream of convergence with Payette River Overflow 3.	Approximately 5,000 feet upstream of Divergence with Sevenmile Slough	17050122	12.1		Ν	A	9/30/2017
Payette River (Reach 2)	Emmett, City of, Gem County, Unincorporated Areas	Approximately 5,000 feet upstream of Divergence with Sevenmile Slough	Black Canyon Dam	17050122	8.6		Y	AE	9/30/2017
Payette River (Reach 3)	Gem County, Unincorporated Areas	Black Canyon Dam	Approximately 9,000 feet downstream of Montour Road	17050122	8.1		Ν	A	9/30/2017
Payette River (Reach 4)	Gem County, Unincorporated Areas	Approximately 9,000 feet downstream of Montour Road Gem/Boise County Boundary	Gem/Boise County Boundary	17050122	6.2		Y	AE	9/30/2017
Payette River Overflow 1	Gem County, Unincorporated Areas	Divergence from Payette River	Convergence with Payette River	17050122	1.1		Y	AE	9/30/2017
Payette River Overflow 2	Emmett, City of, Gem County, Unincorporated Areas	Divergence from Payette River	Convergence with Payette River	17050122	0.5		Y	AE	9/30/2017

## 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)	Area (mi ² ) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Payette River Overflow 3	Gem County, Unincorporated Areas	Divergence from Payette River	Convergence with Payette River	17050122	0.7		Y	AE	9/30/2017
Sevenmile Slough	Gem County, Unincorporated Areas	Divergence with Payette River	Convergence with Payette River	17050122	10.6		N	A	9/30/2017
Squaw Creek	Gem County, Unincorporated Areas	Confluence with Payette River	Approximately 800 feet downstream of State Hwy 52	17050122	2.1		Ν	A	9/30/2017
Squaw Creek	Gem County, Unincorporated Areas	Approximately 800 feet downstream of State Highway 52	Approximately 3.9 miles upstream of Butte Road	17050122	4.2		Y	AE	09/01/2001

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

#### 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 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. 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-percentannual-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 Base Flood Elevation (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.

BFEs are primarily intended for flood insurance rating purposes. 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 Project.

#### 2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Project.

#### 2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this Flood Risk Project.

#### 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 Project

#### 2.5.3 Coastal High Hazard Areas

This section is not applicable to this Flood Risk Project

#### 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 Project.

#### **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 insurance zones in Gem County.

#### Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Emmett, City of	AE, D, X
Gem County, Unincorporated Areas	A, AE, D, 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)
Lower Boise	17050114	Boise River	Begins at the confluence with the Snake River and extends to Lucky Peak Dam	1,330
North Fork Payette	17050123	North Fork Payette River	Begins at the confluence with the Payette River, extends north	912
Payette	17050122	Payette River	Begins at the confluence with the Snake River, extends east.	1,240
Weiser	17050124	Weiser River	Begins at confluence of Snake River, extends northeast	1,660

#### 4.2 Principal Flood Problems

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

#### Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Payette River	The pattern of flooding in the Emmett Valley is highly complicated by local variations in floodplain topography and numerous irrigation canals and sloughs used to convey irrigation water for extensive farming operations which dominate the Payette River Valley. The lower portion of the Montour Valley, located at the upper end of the Black Canyon Reservoir, is subject to frequent flooding during the spring snowmelt runoff season and during the winter when ice jam conditions develop.

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

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Payette River	USGS Gage 13249500 (Payette River Near Emmett, ID)	2,419.4	December 23, 1964	Between 50 and 100 years	USGS gage

#### 4.3 Non-Levee Flood Protection Measures

Table 7 contains information about non-levee flood protection measures within and upstream of Gem County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Payette River	Black Canyon Dam	Dam	Upstream of City of Emmett	Concrete gravity type dam with a structural height of 183 feet that diverts water to the Black Canyon Canal. The storage capacity is 31,200 acre-feet. Black Canyon Reservoir is operated by the U.S. Bureau of Reclamation (USBR) for the primary purpose of irrigation water supply.
Payette River	Deadwood Dam	Dam	90 Miles Above Black Canyon Dam	A concrete-arch structure with a structural height of 165 feet and a total capacity of 154,000 acre-feet Deadwood Reservoir is operated by USBR for the primary purpose of irrigation water supply. There is no flood control plan for this reservoir.
Payette River	Cascade Dam	Dam	On the North Fork of the Payette River Near Cascade, Idaho	Zoned Earthfill Structure Upstream of Gem County with 703,000 acre-ft of Storage Capacity. Cascade Reservoir is operated by the USBR for the primary purpose of irrigation water supply. There is no flood control plan for this reservoir.
Sevenmile Slough	N/A	Control Structure	Divergence from Payette River	Regulates the flow diversion from the Payette River.

**Table 7: Non-Levee Flood Protection Measures** 

#### 4.4 Levees

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 risk 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 FIRM flood zone.

Levee systems that are determined to reduce the risk 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 Section 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's certification status. Accredited levee systems and PALs are shown on the FIRM using the symbology shown in Figure 3 and in Table 8. 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 Section 65.10, FEMA will deaccredit the levee system and issue an effective FIRM showing the levee-impacted area as a SFHA.

FEMA coordinates its programs with USACE, who may inspect, maintain, and repair levee systems. The USACE has authority under Public Law 84-99 to supplement local efforts to repair flood control projects that are damaged by floods. Like FEMA, the USACE provides a program to allow public sponsors or operators to address levee system maintenance deficiencies. Failure to do so within the required timeframe results in the levee system being placed in an inactive status in the USACE Rehabilitation and Inspection Program. Levee systems in an inactive status are ineligible for rehabilitation assistance under Public Law 84-99.

FEMA coordinated with the USACE, the local communities, and other organizations to compile a list of levees that exist within Gem County. Table 8, "Levees," lists all accredited levees, PALs, and de-accredited levees 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. Levees identified as PALs in the table are labeled on the FIRM to indicate their provisional status.

Please note that the information presented in Table 8 is subject to change at any time. For that reason, the latest information regarding any USACE structure presented in the table should be obtained by contacting USACE and accessing the USACE National Levee Database. For levees owned and/or operated by someone other than the USACE, contact the local community shown in Table 30.

Please note that FEMA has identified levees in this jurisdiction that have not been demonstrated by the community or levee owner to meet the requirements of 44 CFR 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1-percent-annual-chance flood protection. As such, the existing flood hazard analysis in the affected areas has been carried forward from the previously-printed effective FIRM panel(s) and the area has been clearly identified on the FIRM panel with notes and bounding lines. Since the previously effective FIRM for this area was rescinded, the secluded area is temporarily shown as an area of minimal flood hazard. This has been done to inform users that a

temporary mapping action has been put in place until such time as FEMA is able to initiate a new flood risk project to apply new flood hazard mapping procedures for leveed areas. These levees occur on FIRM panel(s) 16045C0319B, 16045C0338B, 16045C0406B, 16045C0407B, on the Payette River, and are identified on the FIRM panel(s) as potential areas of flood hazard data changes based on further review. Levees and their accreditation status are listed in Table 8 of this FIS Report.

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Emmett, City of, Gem County, Unincorporated Areas	Payette River (Reach 2)	Left Bank of Payette River, wraps around north perimeter of the City of Emmett	City of Emmett	Yes	6005000280 (City of Emmett Levee)	Yes	16045C0319B, 16045C0338B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Left bank of Payette River at Gem/Payette County boundary	NP	Yes	6005000310 (Vikery/Highsmith Levee)	Inactive	16045C0280B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Left bank of Payette River west of City of Emmett	NP	Yes	6004000350 (Letha Bridge Lt. Bank Levee)	Yes	16045C0295B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Left bank of Payette River	NP	N/A	10000000000 (Perry-Fishback Levee)	N/A	16045C0295B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River	NP	N/A	100000000000 (Spillen Levee)	N/A	16045C0295B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River	NP	N/A	100000000000 (Fox Levee)	N/A	16045C0295B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River west of City of Emmett	NP	Yes	6005000300 (Garfield Levee)	Yes	16045C0315B

Table 8: Levees

#### Table 8: Levees (continued)

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Gem County, Unincorporated Areas	Payette Rive (Reach 1)	Left Bank of Payette River	NP	N/A	100000000000 Kesgard-Craig- Letha	N/A	16045C0315B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Left bank of Payette River	NP	N/A	100000000000 (Smith-Tschudy)	N/A	16045C0315B, 16045C0405B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River	NP	N/A	100000000000 (Wheatly Levee)	N/A	16045C0315B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River	NP	N/A	100000000000 (Sissler Levee)	N/A	16045C0315B, 16045C0405B
Gem County, Unincorporated Areas	Payette River (Reach 2)	Left Bank of Payette River at Sewage Treatment Plant	City of Emmett	Yes	6005000285 (Emmett Sewage Lagoon)	Yes	16045C0406B, 16045C0407B
Gem County, Unincorporated Areas	Payette River (Reach 2)	Right bank of Payette River	NP	N/A	10000000000 (Siller-Goslin Levee)	N/A	16045C0319B, 16045C0407B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River	NP	N/A	100000000000 (Letha Bridge Rt. Bank)	N/A	16045C0295B, 16045C0315B
Gem County, Unincorporated Areas	Payette River (Reach 1)	Right bank of Payette River	NP	N/A	(100000000000) Conrad-Horreth	N/A	16045C0315B

#### **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 and for flood insurance rates. 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 one 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.

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. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected flooding sources. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 10. Stream gage information is provided in Table 11.

			Peak Discharge (cfs)				
Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Payette River	Just Upstream of Confluence with Bissel Creek	2,811	21,700	25,200	28,100	32,100	56,700
Payette River	Just Downstream of Divergence with Payette River Overflow 3	*	7,400	8,300	9,000	9,900	15,700
Payette River	Just Upstream of Confluence with Haw Creek	2,779	21,500	25,000	27,800	31,800	56,100
Payette River	Just Downstream of Divergence with Payette River Overflow 2	*	16,200	19,800	22,400	26,400	50,300
Payette River	Just Downstream of Convergence with Payette River Overflow 1	2,776	21,300	24,700	27,500	31,400	55,400
Payette River	Just Downstream of Convergence with Payette River Overflow 1	*	13,000	14,300	15,300	16,700	23,200
Payette River	Just Upstream of Farmers Cooperative Canal	2,739	21,300	24,700	27,500	31,400	55,400

#### Table 9: Summary of Discharges

*Data Not Available

			Peak Discharge (cfs)				
Flooding Source	Location	Drainage Area (Square Miles)	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Payette River	Just Upstream of Johnson Creek	2,359	19,800	22,600	24,800	28,000	50,400
Payette River Overflow 1	Divergence of Payette River Overflow 1	*	8,300	10,400	12,200	14,800	32,200
Payette River Overflow 2	Divergence of Payette River Overflow 2	*	5,300	5,300	5,400	5,400	5,800
Payette River Overflow 3	Divergence of Payette River Overflow 3	*	14,100	16,700	18,800	21,900	40,400
Squaw Creek	Mouth at Payette River	360	4,400	*	7,100	8,400	11,900

#### Table 9: Summary of Discharges (continued)

*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

		Elevations (feet NAVD88)					
Flooding Source	Location	10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance	
Black Canyon Reservoir	Upstream of Black Canyon Dam	*	*	*	2,500.7	*	

*Not calculated for this Flood Risk Project

		Agency		Drainage	Period of Record	
Flooding Source	Gage Identifier	that Maintains Gage	Site Name	Area (Square Miles)	From	То
Payette River	13249500	USGS	USGS 13249500 Payette River Near Emmet Idaho	2,680	5/5/1926	4/12/2012
Payette River	13247500	USGS	USGS 13247500 (Payette River Near Horseshoe)	2,220	5/13/1906	2/10/2015

Table 11: Stream Gage Information used to Determine Discharges

#### 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. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. 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.
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
Bissel Creek	Confluence with Payette River	Approximately 450 feet downstream of Beacon Avenue	Regression Equations (Water Resources Investigations Report (WRIR) 02-4170, USGS2002)	Hydrologic Engineering Center's River Analysis System (HEC-RAS) 4.1.0 (USACE 2010RAS)	9/30/2017	A	
Haw Creek	Confluence with Payette River	Approximately 700 feet Upstream of Edgemont Road	Regression Equations (WRIR 02-4170, USGS2002)	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	А	
Haw Creek Overflow 1	Confluence with Payette River	Divergence from Haw Creek	Split Flow Analysis in HEC-RAS 4.1.0	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	A	Split flow analysis was performed to determine the flood elevations for the overflow channel. However, it was determined that backwater flood elevations from the Payette River control the flood elevations for the entire length of the overflow channel.

# 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
Payette River (Reach 1)	Approximately 8,000 feet downstream of convergence with Payette River Overflow 3.	Approximately 5,000 feet upstream of Divergence with Sevenmile Slough	Hydrologic Engineering Center's Statistical Software Package (HEC-SSP) (USACE2010SSP)	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	A	A split population analysis of gage data from USGS Gage 13249500 (Payette River at Emmett) was used to develop a composite flow frequency curve considering winter and spring floods. Regulated and unregulated frequency curves were developed. The 0.2 percent exceedance probability was computed from the unregulated composite frequency curve because the upstream reservoirs were assumed to be unable to regulate the 0.2- percent annual chance event. Area-weighting was applied to estimate peak flows at ungaged sites on the Payette River. This reach is affected by irrigation that occurs each year between April 1 and November 1. The total diversion is approximately 2-perent of the 1-percent annual chance flow computed at the USGS Gage at Emmett (Gage Number 13249500). Therefore, it was determined that diversion flows should be neglected. Numerous levees exist on this reach that have not been demonstrated to meet the requirements of NFIP Regulation Section 65.10. The floodplain landward of the levee was determined using a "Natural Valley" approach which allows effective flow on the landward side of the levee

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
							approach which allows effective flow on the landward side of the levee. The results from the "Natural Valley" model run are shown on Profile 09P "Payette River (Without Right Levee)".
Payette River (Reach 3)	Black Canyon Dam	Approximately 9,000 feet downstream of Montour Road	HEC-SSP (USACE2010SSP)	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	A	A split population analysis of gage data from USGS Gage 13247500 (Payette River at Horseshoe Bend) was used to develop a composite flow frequency curve considering winter and spring floods. Area-weighting was applied to estimate peak flows at ungaged sites on the Payette River. Regulated and unregulated frequency curves were developed. The 0.2 percent exceedance probability was computed from the unregulated composite frequency curve because the upstream reservoirs were assumed to be unable to regulate the 0.2- percent annual chance elevation for the Black Canyon Reservoir was assumed equal to the Normal Maximum Water Surface Elevation at the Black Canyon Dam.

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
Payette River (Reach 4)	Approximately 9,000 feet downstream of Montour Road	Gem/Boise County Boundary	HEC-SSP (USACE2010SSP)	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	AE with Floodway	A split population analysis of gage data from USGS Gage 13247500 (Payette River at Horseshoe Bend) was used to develop a composite flow frequency curve considering winter and spring floods. Area-weighting was applied to estimate peak flows at ungaged sites on the Payette River. Regulated and unregulated frequency curves were developed. The 0.2 percent exceedance probability was computed from the unregulated composite frequency curve because the upstream reservoirs were assumed to be unable to regulate the 0.2- percent annual chance event.
Payette River Overflow 1	Convergence with Payette River	Divergence from Payette River	Split Flow Analysis in HEC-RAS 4.1.0	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	AE with Floodway	This is an overflow channel for the Payette River. Peak flows and peak water surface elevations were computed using HEC-RAS.
Payette River Overflow 2	Convergence with Payette River	Divergence from Payette River	Split Flow Analysis in HEC-RAS 4.1.0	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	AE with Floodway	This is an overflow channel for the Payette River. Peak flows and peak water surface elevations were computed using HEC-RAS.
Payette River Overflow 3	Convergence with Payette River	Divergence from Payette River	Split Flow Analysis in HEC-RAS 4.1.0	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	AE with Floodway	This is an overflow channel for the Payette River. Peak flows and peak water surface elevations were computed using HEC-RAS.

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
Sevenmile Slough	Convergence with Payette River	Divergence with Payette River	Regression Equations (WRIR 02-4170, USGS2002)	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	A	Between April and November, flows from the Payette River is diverted into Sevenmile Slough for irrigation. For this analysis, the diversion gage was assumed to be closed and the flow was estimated using the watershed parameters for Sevenmile Slough's watershed. Note that Sevenmile Slough flows parallel to the Payette River for the entire length of the slough. Downstream of cross section station 51,726.9 miles, the Payette River flood elevation controls the flooding on Sevenmile Slough.
Squaw Creek	Approximately 800 feet downstream of State Highway 52	Approximately 3.9 miles upstream of Butte Road	Regression Equations (USGS WRIR 81-909, USGS1981)	HEC-RAS 3.0.1	11/19/2001	AE w/ Floodway	Flow were computed by USACE using equations in USGS Open File Report 81- 909. Sage Hen Reservoir was assumed to be full at the time of the flood event and provide no flood protection. Hydraulic modeling was developed by U.S. Army Corps of Engineers Walla Walla District in support of Letter of Map Revision 03-10-0299P. Cross Sections were surveyed by Rogers Surveying in August 2001. The floodplains were redelineated by STARR using LiDAR acquired in 2012.
Squaw Creek	Confluence with Payette River	Approximately 800 feet downstream of State Highway 52	Regression Equations (USGS WRIR 81-909, USGS1981)	HEC-RAS 4.1.0 (USACE 2010RAS)	9/30/2017	А	Discharges computed as part of 03-10- 0299P were applied (see entry above).

Flooding Source	Channel "n"	Overbank "n"
Bissel Creek	0.035	0.045
Haw Creek	0.013-0.040	0.05
Haw Creek Overflow 1	0.035	0.045
Payette River – Reach 1	0.035-0.040	0.045-0.080
Payette River – Reach 2	0.035-0.040	0.013-0.080
Payette River – Reach 3	0.035-0.040	0.013-0.045
Payette River – Reach 4	0.035-0.080	0.013-0.080
Payette River Overflow 1	0.035-0.040	0.013-0.080
Payette River Overflow 2	0.035-0.040	0.013-0.080
Payette River Overflow 3	0.035-0.040	0.013-0.080
Sevenmile Slough	0.030	0.030-0.035
Squaw Creek	0.037	0.055

Table 13: Roughness Coefficients

#### 5.3 Coastal Analyses

This section is not applicable to this Flood Risk Project.

# 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 Project.

## Figure 8: 1-Percent-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 Project.

#### 5.3.3 Coastal Erosion

This section is not applicable to this Flood Risk Project.

## 5.3.4 Wave Hazard Analyses

This section is not applicable to this Flood Risk Project.

### **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 Project.

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 <a href="https://www.ngs.noaa.gov/">https://www.ngs.noaa.gov/</a>.

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 <u>https://www.ngs.noaa.gov/.</u>

The datum conversion locations and values that were calculated for Gem County are provided in Table 19. Note that the conversion points were focused on the central and southern areas of Gem County where the special flood hazards areas have been identified. The northern area of Gem County was not included.

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
New Plymoth	SE	43.875	-116.750	+3.110
Letha	SE	43.875	-116.625	+3.120
NW Emmett	SE	43.875	-116.500	+3.130
NE Emmett	SE	43.875	-116.375	+3.251
Montour	SE	43.875	-116.250	+3.320
Birding Island	SE	44.000	-116.750	+3.113
Sheep Ridge	SE	44.000	-116.625	+3.234
Hog Cove Butte	SE	44.000	-116.500	+3.281
Squaw Butte	SE	44.000	-116.375	+3.376
Webb Creek	SE	44.000	-116.250	+3.392
Average Conversion from NGVD	29 to NAVD88	3 = 3.235 feet		

Table 19: Countywide Vertical Datum Conversion

## Table 20: Stream-Based Vertical Datum Conversion

#### [Not Applicable to this Flood Risk Project]

#### 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/guidelines--partners/guidelines-standards.

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

Data Type	Data Provider	Data Date	Data Scale	Data Description
2002 Master Transportation Plan	Holladay Engineering Company of Payette, Idaho	2002	1:24,000	Transportation Lines From 2002 Master Transportation Plan (HEC2002)
FIRM Panel Layout	STARR	2012	1:24,000	FIRM Panel Layout (STARR2012)
USGS Gages	United States Geological Survey (USGS)	2011	1:24,000	USGS Peak Streamflow Gages
Idaho Rail	Idaho Transportation Department		1:24,000	Idaho Railroad Data (ITD8888)
National Hydrography Dataset	USGS	2012	1:24,000	Water Areas and Water Lines (USGS2012)
Public Land Survey System	BLM Cadastral Survey	2011	1:24,000	Public Land System (BLM2011)
Aerial Imagery	USDA/FSA Aerial Photography Field Office	2017	1:24,000	USDA-FSA-APFO NAIP MrSID Mosaic (USDA2017)

#### Table 21: Base Map Sources

#### 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- 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."

		Sourc	e for Topographi	c Elevation Data	
Community	Flooding Source	Description	Vertical Accuracy	Horizontal Accuracy	Citation
Emmett, City of	Payette River, Payette River Overflow 2	Light Detection and Ranging data (LiDAR)	Consolidated Vertical Accuracy 95% Confidence Level =10.9 cm	Consolidated Horizontal Accuracy 95% Confidence Level =2.7 cm	FEMA2012
Gem County, Unincorporated Areas	Bissel Creek, Haw Creek, Haw Creek Overflow 1, Payette River, Payette River Overflow 1, Payette River Overflow 2, Payette River Overflow 3, Sevenmile Slough, Squaw Creek	Light Detection and Ranging data (LiDAR)	Consolidated Vertical Accuracy 95% Confidence Level =10.9 cm	Consolidated Horizontal Accuracy 95% Confidence Level =2.7 cm	FEMA2012

## Table 22: Summary of Topographic Elevation Data used in Mapping

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.

LOCA	TION	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
•	20.22	225	0.467	10	0.007.0	0.007.0	0.007.5	0.2
A	30.32	335	2,407	4.9	2,337.2	2,337.2	2,337.5	0.3
В	30.52	235	1,885	0.4	2,338.1	2,338.1	2,338.8	0.7
	30.62	2,224	9,678	3.3	2,340.8	2,340.8	2,341.7	0.9
D	30.73	1,970	9,905	3.2	2,341.3	2,341.3	2,342.1	0.8
E	30.91	1,460	8,519	3.7	2,341.9	2,341.9	2,342.7	0.8
F	31.30	1,714	6,825	4.7	2,344.7	2,344.7	2,345.4	0.7
G ²	31.33	1,552	6,801	4.7	2,345.2	2,345.2	2,345.8	0.6
H ²	31.55	1,637	7,427	4.3	2,349.1	2,349.1	2,349.8	0.7
2	31.74	1,130	5,846	5.4	2,350.3	2,350.3	2,350.8	0.5
J	31.91	395	4,418	7.2	2,352.3	2,352.3	2,353.3	1.0
K	31.95	408	4,925	6.5	2,353.8	2,353.8	2,354.4	0.6
L	32.13	467	4,918	6.5	2,355.3	2,355.3	2,355.6	0.3
Μ	32.34	472	4,490	7.1	2,357.4	2,357.4	2,357.6	0.2
N	32.46	623	5,512	5.8	2,359.0	2,359.0	2,359.1	0.1
0	32.57	988	7,361	4.3	2,359.7	2,359.7	2,360.4	0.7
Р	32.77	1,848	8,703	3.7	2,361.0	2,361.0	2,361.7	0.7
Q	32.83	1,051	6,510	4.0	2,362.9	2,362.9	2,363.5	0.6
R	32.98	1,520	6,651	3.9	2,364.4	2,364.4	2,364.9	0.5
S	33.03	1,211	5,609	4.6	2,364.9	2,364.9	2,365.8	0.9
T ²	33.17	1,326	6,860	6.9	2,367.2	2,367.2	2,368.1	0.9
U ²	33.23	873	5,649	7.8	2,368.3	2,368.3	2,369.2	0.9
V ²	33.37	385	4,767	6.7	2,370.5	2,370.5	2,370.9	0.4

Table 23: Floodway Data

²Portions of this cross section lies within an area that has not been updated on the FIRM at this time due to the presence of levees that have not been demonstrated to meet the requirements of NFIP Regulation Section 65.10. Please refer to Section 4.4 of this FIS for more information.

FEDERAL EMERGENCY MANAGEMENT AGENCY

TABLE 23

GEM COUNTY, IDAHO and incorporated areas **FLOODWAY DATA** 

## FLOODING SOURCE: PAYETTE RIVER

CROSS SECTION W ² X ² Y	DISTANCE ¹ 33.40	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY		WITHOUT		
W ² X ² Y	33.40			(FEET/SEC)	REGULATORY	FLOODWAY	FLOODWAY	INCREASE
X ² Y	33.40	000	6 422	6.0	2 271 0	0.071.0	0 074 4	0.4
Y	22 EC	029	0,432	0.0	2,371.0	2,371.0	2,371.4	0.4
ř	33.30	1,759	11,002	2.0	2,372.2	2,372.2	2,372.0	0.4
	33.00 22.75	2,430	10,000	2.4	2,372.3	2,372.3	2,372.9	0.4
	33.75	1,979	6 7 9 2	2.9	2,372.0	2,372.0	2,373.2	0.4
	33.0Z	1,020	0,702	4.7	2,372.0	2,372.0	2,373.2	0.4
AD	24.22	1,393	5.074	4.7	2,374.2	2,374.2	2,374.3	0.5
	34.22	1,170	5,974	5.5	2,373.0	2,373.0	2,370.3	0.5
	34.4Z	1,277	0,492	4.9	2,370.0	2,370.0	2,370.3	0.5
	24.01	620	0,309	3.0	2,370.9	2,370.9	2,379.0	0.0
	34.30 24.70	221	4,700	5.0	2,379.4	2,379.4	2,300.0	0.0
AG	34.70	321	2,903	5.0	2,300.7	2,300.7	2,301.4	0.7
	34.09	475	2,940	5.9	2,302.2	2,302.2	2,303.0	0.0
AI	34.95	403	3,719	4.7	2,303.0	2,303.0	2,304.3	0.5
AJ	34.90	407	3,070	4.7	2,304.3	2,304.3	2,305.5	1.0
	33.0Z	371	3,020	5.0 6.4	2,304.7	2,304.7	2,303.3	0.0
	35.05	200	2,724	0.4	2,304.9	2,304.9	2,303.7	0.8
	30.23 25.20	242	2,000	0.7	2,300.0	2,300.0	2,307.4	0.0
	33.3Z	204	2,044	0.0	2,307.4	2,307.4	2,300.2	0.0
AU	33.41	1,940	0,109	3.9 5.5	2,300.4	2,300.4	2,309.3	0.9
AP	35.71	1,150	5,734	5.5 5.7	2,391.0	2,391.0	2,391.7	0.7
	30.03	192	5,540	5.7	2,394.0	2,394.0	2,394.0	0.5
	30.48	004	4,930	0.4	2,398.5	2,398.5	2,399.1	0.6
AS	30.00	700	4,930	0.4	2,403.0	2,403.0	2,403.0	0.0

²Portions of this cross section lies within an area that has not been updated on the FIRM at this time due to the presence of levees that have not been demonstrated to meet the requirements of NFIP Regulation Section 65.10. Please refer to Section 4.4 of this FIS for more information.

ΤA	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA		
BLE	GEM COUNTY, IDAHO			
23	AND INCORPORATED AREAS	FLOODING SOURCE: PAYETTE RIV		

CROSS		WIDTH	SECTION	MEAN		ELEVATION (FE	ET NAVD88) WITH	
SECTION	DISTANCE	(FEET)	AREA (SQ. FEET)	(FEET/SEC)	REGULATORY	FLOODWAY	FLOODWAY	INCREASE
AU	37 80	255	3 899	8 1	2 412 0	2 412 0	2 4 1 2 9	0.9
AV	37.83	242	3,810	8.2	2.413.8	2.413.8	2.413.8	0.0
AW	37.88	393	5,899	5.3	2,415,1	2.415.1	2.415.1	0.0
AX	37.91	614	7,565	4.2	2.415.2	2.415.2	2.415.4	0.2
AY	37.92	611	7.004	4.5	2.415.3	2.415.3	2.415.5	0.2
AZ	37.98	436	5.228	6.0	2,415,4	2,415,4	2,415.6	0.2
BA	38.22	455	5641	5.6	2,416.9	2,416.9	2,417.1	0.2
BB	38.62	236	4.390	7.1	2,419,2	2,419,2	2,420.2	0.9
BC	38.64	209	4.017	7.8	2,420.7	2,420,7	2,420.8	0.2
BD	38.90	258	3.300	9.5	2,422.3	2,422,3	2,422.8	0.5
BE	47.02	270	4,180	6.7	2,514.2	2,514.2	2,515.2	1.0
BF	47.76	815	10,420	2.7	2,516.1	2,516.1	2517.0	0.9
BG	48.22	2,678	18,729	1.5	2,516.8	2,516.8	2,517.4	0.7
BH	48.65	2,484	13,823	5.8	2,517.5	2,517.5	2,518.1	0.6
BI	48.69	2,456	14,857	2.1	2,518.1	2,518.1	2,518.8	0.7
BJ	49.33	371	3,747	7.5	2,521.2	2,521.2	2,521.9	0.7
BK	49.85	625	5,282	5.3	2,526.5	2,526.5	2,527.2	0.7
BL	50.18	497	5,400	5.2	2,529.7	2,529.7	2,530.1	0.4
BM	50.59	314	3,473	8.1	2,532.8	2,532.8	2,533.2	0.4
BN	51.01	344	3,812	7.3	2,537.4	2,537.4	2,538.0	0.5
BO	51.65	214	2,574	10.9	2,543.4	2,543.4	2,543.7	0.3
	52.14	270	3,358	8.3	2,549.5	2,549.5	2,550.0	0.5

## FEDERAL EMERGENCY MANAGEMENT AGENCY

# **GEM COUNTY, IDAHO**

TABLE 23

AND INCORPORATED AREAS

# FLOODWAY DATA

## FLOODING SOURCE: PAYETTE RIVER

# Table 23: Floodway Data (continued)

LOCAT	ION		FLOODWAY		1% ANNU	AL CHANCE FLO ELEVATION (FE	DOD WATER SU EET NAVD88)	RFACE
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BQ BR	52.71 53.16	298 199/24 ²	4,144 3,534	6.8 7.9	2,556.4 2,559.2	2,556.4 2,559.2	2,557.0 2,559.9	0.6 0.7
¹ Miles above conf ² Total floodway w FEDERAL EN GE	luence with Sna ridth/width in Ge MERGENCY MA	ke River m County NAGEMENT /	AGENCY		FL	.OODWAY [	DATA	
AN	D INCORPORA	TED AREAS			FLOODING	SOURCE: PA	YETTE RIVE	R

# Table 23: Floodway Data (continued)

LOCAT	ION		FLOODWAY		1% ANNU	AL CHANCE FLO ELEVATION (FE	DOD WATER SU EET NAVD88)	RFACE
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A B C D E F G H I I	0.09 0.27 0.40 0.45 0.50 0.52 0.56 0.80 1.09	873 1,012 257 1,401 1,398 1,363 1,075 760 1,374	4,859 4,709 1,995 6,982 6,784 6,317 4,750 3,709 5,512	2.9 3.0 7.0 2.0 2.1 2.2 2.9 3.8 2.5	2,380.5 2,381.6 2,382.3 2,383.2 2,383.3 2,383.4 2,383.5 2,385.5 2,387.9	2,380.5 2,381.6 2,382.3 2,383.2 2,383.3 2,383.4 2,383.5 2,385.5 2,387.9	2,380.9 2,382.2 2,383.0 2,384.2 2,384.3 2,384.4 2,384.4 2,386.3 2,388.8	0.4 0.6 0.7 1.0 1.0 1.0 0.9 0.8 0.9
FEDERAL EN		NAGEMENT	AGENCY		FL	OODWAY	DATA	
GE	GEM COUNTY, IDAHO AND INCORPORATED AREAS				FLOODING SO	URCE: PAYE		OW 1

LOCAT			FLOODWAY		1% ANNU	AL CHANCE FLO ELEVATION (FE	DOD WATER SU EET NAVD88)	RFACE
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A B C ² D ²	0.39 0.68 0.69 0.81	590 263 97 237	4,128 1,435 834 1,880	1.4 4.1 7.1 3.1	2,362.9 2,363.2 2,363.7 2,365.0	2,362.9 2,363.2 2,363.7 2,365.0	2,363.5 2,363.8 2,364.7 2,366.0	0.6 0.6 1.0 1.0
¹ Miles above conf ² Portions of this c demonstrated to r FEDERAL E	luence with Paye ross section lie w neet the requirer MERGENCY MA	ette River vithin an area t ments of NFIP	hat has not bee Regulation Sec AGENCY	n updated on the ction 65.10. Plea	e FIRM at this time se refer to Section <b>FL</b>	due to the preser 4.4 of this FIS fo OODWAY	nce of levees that r more information <b>DATA</b>	have not been n.
	INCORPORA	Y, IDAHO		FLC	ODING SOUR	CE: PAYETTE		RFLOW 2

	LOCAT	ION		FLOODWAY		1% ANNU	AL CHANCE FLO ELEVATION (FE	DOD WATER SU EET NAVD88)	RFACE		
	CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE		
	A B	0.35 0.66	2,046 1,238	5,238 2,813	4.0 7.1	2,335.3 2,337.8	2,335.3 2,337.8	2,336.0 2,338.5	0.7 0.7		
l	¹ Miles above confluence with Payette River										
TABL	FEDERAL EN			AGENCY		FL	OODWAY I	ΟΑΤΑ			
-E 23	GEM COUNTY, IDAHO			FLO		CE: PAYETTE	RIVER OVER	FLOW 3			

LOCA	ΓΙΟΝ		FLOODWAY		1% ANNU	AL CHANCE FLO ELEVATION (FE	DOD WATER SU EET NAVD88)	RFACE
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Δ	11 1/15	223 ²	2 781	3.0	2 51/ 3	2 51/ 3	2 515 3	1.0
B	12 717	<u>412</u>	3 892	2.0	2,516.6	2,514.5	2,517.5	0.9
C	13 187	900	7 934	1 1	2,516.6	2,516.6	2,517.6	1.0
D	14 404	1 027	7 044	1.1	2,010.0	2,010.0	2,017.0	1.0
F	15 718	642	4 055	21	2,517.0	2,517.0	2,518.0	1.0
F	16,810	608	3 344	2.5	2,517.6	2,517.6	2,518.6	1.0
Ġ	18 132	847	4 069	2.0	2,518,5	2,518,5	2,519,3	0.8
н	19 440	430	2 328	3.6	2,519,5	2,519,5	2,520.3	0.8
	20 451	655	2 673	3.1	2,521.0	2,521.0	2,521.8	0.8
	21 295	355	2,590	3.2	2,524.6	2,524.6	2,525,5	0.9
ĸ	22 549	499	3 084	27	2 525 4	2 525 4	2 526 4	1.0
L	23,961	383	2,646	3.2	2.526.6	2,526.6	2.527.5	0.9
M	25.099	663	2,673	3.1	2.528.4	2.528.4	2.528.9	0.5
N	26,308	409	2.043	4.1	2,530.7	2.530.7	2.531.1	0.4
0	27.421	558	2,688	3.1	2,532.2	2.532.2	2.533.2	1.0
P	28,755	463	2,506	3.4	2.537.0	2.537.0	2.537.0	0.0
Q	29,733	507	2,312	3.6	2,538.3	2,538.3	2,539.1	0.8
R	30,745	822	2,832	3.0	2,540.4	2,540.4	2,540.9	0.5
S	31,656	253	2,058	4.1	2,545.6	2,545.6	2,545.6	0.0
eet above confl he floodway wid duction in the S	uence with Paye oth at this cross s pecial Flood Haz	tte River section was re card Area widt	duced by 52 fee	et from the prior	study due to a			1
FEDERAL EI					FLOODWAY DATA			
G			-		FLOODING	SOURCE: SO		(
ΔΝ	D INCORPORA	TED AREAS						

# 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 Project.

# 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 <u>www.fema.gov/flood-maps/change-your-flood-zone/</u> 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 <u>https://www.fema.gov/online-tutorials.</u>

For more information about how to apply for a LOMA, call the FEMA Map Information 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: <u>www.fema.gov/flood-maps/change-your-flood-zone</u> 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 Map Information 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 <u>https://www.fema.gov/online-tutorials</u>.

## 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 <u>https://www.fema.gov/media-library/assets/documents/1343</u> 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 Map Information 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 Gem County FIRM are listed in Table 26.

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
03-10-0299P	12-04-2003	Squaw Creek	16045C0352B, 16045C0353B, 16045C0354B

Table 26: Incorporated Letters of Map Change

## 6.5.4 Physical Map Revisions

A Physical Map Revisions (PMR) is an official republication of a community's NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs. The community's chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit <u>https://www.fema.gov/</u> and visit the "Flood Map Revision Processes" section.

## 6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit <u>https://www.fema.gov/</u> to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

#### 6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Gem County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBMs) and/or Flood Boundary and Floodway Maps (FBFMs) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 27, "Community Map History." A description of each of the column headings and the source of the date is also listed below.

- Community Name includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.
- Initial Identification Date (First NFIP Map Published) is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or "pending" (for Preliminary FIS Reports) is shown. If the community is listed in Table 27 but not identified on the map, the community is treated as if it were unmapped.
- *Initial FHBM Effective Date* is the effective date of the first FHBM. This date may be the same date as the Initial NFIP Map Date.

- FHBM Revision Date(s) is the date(s) that the FHBM was revised, if applicable.
- Initial FIRM Effective Date is the date of the first effective FIRM for the community.
- FIRM Revision Date(s) is the date(s) the FIRM was revised, if applicable. This is
  the revised date that is shown on the FIRM panel, if applicable. As countywide
  studies are completed or revised, each community listed should have its FIRM
  dates updated accordingly to reflect the date of the countywide study. Once the
  FIRMs exist in countywide format, as PMRs of FIRM panels within the county are
  completed, the FIRM Revision Dates in the table for each community affected by
  the PMR are updated with the date of the PMR, even if the PMR did not revise all
  the panels within that community.

The initial effective date for the Gem County FIRMs in countywide format was August 24, 2021.

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Emmett, City of ¹	08/24/2021	N/A	N/A	08/24/2021	N/A
Gem County, Unincorporated Areas	04/17/1978	N/A	N/A	04/17/1978	08/24/2021

Table 27: Community Map History

¹ This community did not have an effective FIRM prior to the first countywide FIRM for Gem County. This community's initial FIRM and FHBM were rescinded.

## SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

## 7.1 Contracted Studies

Table 28 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Bissel Creek	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Haw Creek	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Haw Creek Overflow 1	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Payette River	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Emmett City of, Gem County, Unincorporated Areas
Payette River Overflow 1	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Payette River Overflow 2	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Emmett, City of Gem County, Unincorporated Areas
Payette River Overflow 3	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Sevenmile Slough	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Squaw Creek	08/24/2021	STARR	HSFEHQ-09- D-0370	03/01/2018	Gem County, Unincorporated Areas
Squaw Creek	LOMR Effective 12/04/2003	Hydraulic modeling was developed by U.S. Army Corps of Engineers Walla Walla District in support of Letter of Map Revision 03- 10-0299P		09/01/2001	Gem County, Unincorporated Areas

# Table 28: Summary of Contracted Studies Included in this FIS Report

## 7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 29. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

## Table 29: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
		09/15/2009	Scoping	FEMA, Gem County, Homeland Security, Idaho Department of Homeland Security (IDHS), Idaho Department of Water Resources (IDWR), Keller Associates, Stantec
Emmott City of	08/24/2021	12/03/2015	Flood Risk Review	FEMA, Gem County, Homeland Security, STARR
Emmen, City of	08/24/2021	06/07/2018	Flood Risk Review	City of Emmett, FEMA, Gem County, IDWR, Idaho Office of Emergency Management (IOEM), STARR, USBR
		06/05/2019	Final CCO	City of Emmett, FEMA, Gem County, IDWR, Idaho Office of Emergency Management (IOEM), STARR, USBR, Gem County Prosecutors Office, Development Services, Rose Advocates
		09/15/2009	Scoping	FEMA, Gem County, Homeland Security, IDHS, IDWR, Keller Associates, Stantec
Gem County		12/03/2015	Flood Risk Review	FEMA, Gem County, Homeland Security, STARR
Unincorporated Areas	08/24/2021	06/07/2018	Flood Risk Review	City of Emmett, FEMA, Gem County, IDWR, IOEM, STARR, USBR,
		06/05/2019	Final CCO	City of Emmett, FEMA, Gem County, IDWR, Idaho Office of Emergency Management (IOEM), STARR, USBR, Gem County Prosecutors Office, Development Services, Resilience Action Partners, Rose Advocates

## **SECTION 8.0 – ADDITIONAL INFORMATION**

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see <u>https://www.fema.gov/.</u>

The additional data that was used for this project includes the FIS Report and FIRM that were previously prepared for Gem County Unincorporated Areas, (FEMA 1977). In addition, the USACE prepared a Hydrologic Analysis for the Payette River Basin (USACE 2016).

Table 30 is a list of the locations where FIRMs for Gem County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Community Address		City	State	Zip Code
Emmett, City of	Public Works and Building Department 601 East 3 rd Street	Emmett	ID	83617
Gem County, Unincorporated Areas	Development Services Department 109 South McKinley Avenue	Emmett	ID	83617

#### Table 30: Map Repositories

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM Databases and LOMCs. Together they create a GIS data layer for a state or territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 31.

Table 31 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of state or territorial government to coordinate that state's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of state and local GIS data in their state.

FEMA and the NFIP						
FEMA and FEMA Engineering Library website	https://www.fema.gov/engineering-library					
NFIP website	https://www.fema.gov/national-flood-insurance-program					
NFHL Dataset	https://msc.fema.gov/portal/home					
FEMA Region X	Federal Regional Center 130 228th Street SW Bothell, WA 98021-9796 (425) 487-4657					
	Other Federal Agencies					
USGS website	https://www.usgs.gov/					
Hydraulic Engineering Center website	http://www.hec.usace.army.mil/					
State Agencies and Organizations						
State NFIP Coordinator	State National Floodplain Insurance Program (NFIP) Coordinator Maureen O'Shea, AICP, CFM Idaho Dept. of Water Resources 322 E. Front Street P.O. Box 83720 Boise, ID 83720-0098 Phone: 208-287-4928, FAX 208-287-6700 maureen.oshea@idwr.idaho.gov					
State Risk Map Coordinator	State Risk Mapping, Assessment and Planning (MAP) Coordinator Robin Kiska Idaho Office of Emergency Management 4040 W. Guard Street, Building 600 Boise, ID 83705-5004 Phone: 208-258-6593 rkiska@imd.idaho.gov					
State GIS Coordinator	State GIS Coordinator Becky Rose GIS Section Chief Idaho Office of Emergency Management 4040 W. Guard Street Boise, ID 83705 Phone: 208-258-6547 brose@imd.idaho.gov					

## **Table 31: Additional Information**

## SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 32 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

## Table 32: Bibliography and References

Citation in this FIS	Publisher/ Issuer	<i>Publication Title,</i> "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
BLM2011	BLM Cadastral Survey	Public Land Survey System	BLM	BLM.GOV	January 3, 2011	
CHOW1959	McGraw-Hill	Open-Channel Hydraulics, "Manning's N Values"	V. T. Chow	New York, NY	January 1959	
FEMA 258	Federal Emergency Management Agency	Guide to Flood Maps: Using the Flood Map to Improve your Understanding of Risk	Federal Emergency Management Agency	Washington, DC	December 2009	https://www.hsdl.org/?ab stract&did=30130
FEMA1977	Federal Emergency Management Agency	Flood Insurance Study, Gem County, Idaho Unincorporated Areas	Federal Emergency Management Agency	Washington, DC	October 1977	
FEMA2003	Federal Emergency Management Agency	Letter of Map Revision (03-10-0299P	Federal Emergency Management Agency	Washington, DC	December 4, 2003	
FEMA2012	Federal Emergency Management Agency	Payette Phase I LiDAR Data	STARRII	Washington, DC	April 24, 2012	
HEC2002	Holladay Engineering Company of Payette, Idaho	2002 Master Transportation Plan	Holladay Engineering Company of Payette, Idaho	Gem, Idaho	01/01/2002	
ITD8888	Idaho Transportation Department	Idaho Rail	Idaho Transportation Department			

# Table 32: Bibliography and References (continued)

Citation in this FIS	Publisher/ Issuer	<i>Publication Title,</i> "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
STARR2012	STARR	FIRM Panel Layout	STARR	Lexington, KY	12/17/2012	
STARR2018	Federal Emergency Management Agency	Hydrology Analysis Update	STARR	Lexington, KY	9/20/2017	
STARR2018-2	Federal Emergency Management Agency	Hydraulics Analysis Report for Gem County, Idaho	STARR	Lexington, KY	2/28/2018	
STARR2018-3	Federal Emergency Management Agency	Boundaries of Areas with Unknown Flood Risk (Zone D)	STARRII	Lexington, KY	11/21/2018	
USACE2016	U.S. Army Corps of Engineers Walla Walla District	Payette River Watershed, ID Hydrology Submission	USACE	Walla Walla, WA	2016	
USACE2010RAS	USACE-HEC	Hydrologic Engineering Center's River Analysis System (HEC-RAS) Version 4.1.0	USACE Hydrologic Engineering Center	Davis, CA	01/2010	
USACE2010SSP	USACE-HEC	Statistical Software Package (HEC-SSP),	USACE Hydrologic Engineering Center	Davis, CA	2010	
USDA2017	USDA/FSA Aerial Photography Field Office	USDA-FSA-APFO NAIP MrSID Mosaic	USDA/FSA	Salt Lake City, UT	2017	

# Table 32: Bibliography and References (continued)

Citation in this FIS	Publisher/ Issuer	<i>Publication Title,</i> "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USGS1981	United States Geological Survey	A method of estimating flood-frequency parameters for streams in Idaho. WRIR 81-909	United States Geological Survey	Reston, VA	1981	
USGS2002	United States Geological Survey	Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Stream in Idaho. WRIR 02-4170	Barenbrock, Charges	Boise, ID	2002	Estimating the Magnitude of Peak flows at Selected Recurrence Intervals for Streams in Idaho (usgs.gov)
USGS2011	United States Geological Survey	Peakflow Gages	United States Geological Survey	Reston, VA	10/12/2011	
USGS 2012	United States Geological Survey	National Hydrography Dataset	United States Geological Survey	Reston, VA	01/01/2012	






















		2,385		
		2,380	-LOOD PROFILES	TTE RIVER OVERFLOW 2
		- 2,375		
		- 2,370		
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		- 2,355	ut agency HO AS	
	GEND 0.2% ANNUAL CHANCE FLOOD "1%+" ANNUAL CHANCE FLOOD* 1% ANNUAL CHANCE FLOOD	2,350	NCY MANAGEMEN DUNTY, IDAH RPORATED ARE	
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	STREAM BED CROSS SECTION LOCATION * DATA NOT AVAILABLE		FEDERAL	5 2
1.1	1.2	1.3		
		11P		





