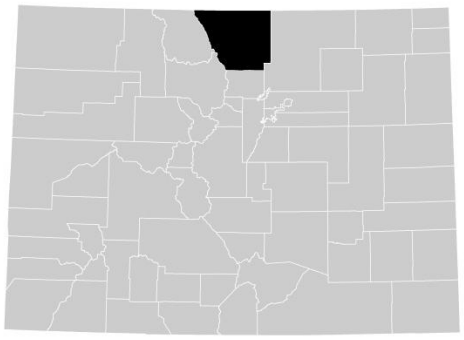
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 6



LARIMER COUNTY, COLORADO

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BERTHOUD, TOWN OF	**080296**
ESTES PARK, TOWN OF	**080193**
FORT COLLINS, CITY OF	**080102**
JOHNSTOWN, TOWN OF	**080250**
LARIMER COUNTY, UNINCORPORATED AREAS	**080101**
LOVELAND, CITY OF	**080103**
TIMNATH, TOWN OF	**080005**
WELLINGTON, TOWN OF	**080104**
WINDSOR, TOWN OF	**080264**

FEMA

REVISED PRELIMINARY 12/20/2021

REVISED:

FLOOD INSURANCE STUDY NUMBER
08069CV001F

Version Number 2.6.4.6

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FLOOD INSURANCE STUDY REPORT
LARIMER COUNTY AND INCORPORATED AREAS, COLORADO

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 Larimer County, Colorado.

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.

The location of flood hazard data for participating communities in multiple jurisdictions is also indicated in the table.

Please note that the Towns of Berthoud and Johnstown are located in more than one county but are included in their entirety in the Larimer County FIS report. Also note that any references to the Weld County or Town of Windsor on the Larimer County FIRM panels are for informational purposes only.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Berthoud, Town of	080296	10190006	08069C1375H 08069C1377H 08069C1386H 08069C1387H 08069C1391H 08069C1400G 08069C1405G 08069C1415G	
Estes Park, Town of	080193	10190006	08069C1089G 08069C1093G 08069C1094G 08069C1113G 08069C1281G 08069C1282G 08069C1284G 08069C1301G 08069C1325G	
Fort Collins, City of	080102	10190006 10190007	08069C0769F 08069C0775F[1] 08069C0960F 08069C0967G 08069C0970F 08069C0976G 08069C0977H 08069C0978G 08069C0979J 08069C0981H 08069C0982F 08069C0983J 08069C0984J 08069C0986G 08069C0987G 08069C0992H 08069C0994G 08069C1000F[1] 08069C1001F 08069C1003G 08069C1011G 08069C1013G 08069C1160F[1] 08069C1200F[1] 08069C1201G	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Johnstown, Town of	080250	10190005 10190006	08069C1194G 08069C1213G 08069C1214G 08069C1215F[1] 08069C1405G 08069C1410G 08069C1420G	
Larimer County, Unincorporated Areas	080101	10180001 10180002 10180010 10190005 10190006 10190007 14010001	08069C0025F[1] 08069C0050F[1] 08069C0075F[1] 08069C0100F[1] 08069C0125F[1] 08069C0150F[1] 08069C0175F[1] 08069C0200F[1] 08069C0225F[1] 08069C0250F[1] 08069C0275F[1] 08069C0300F[1] 08069C0325F[1] 08069C0350F[1] 08069C0375F[1] 08069C0400F[1] 08069C0425F[1] 08069C0450F[1] 08069C0475F 08069C0500F 08069C0525F 08069C0530F 08069C0540F 08069C0575F[1] 08069C0600F[1] 08069C0625F 08069C0650F 08069C0675F 08069C0700F 08069C0725G 08069C0743F 08069C0744F 08069C0750F 08069C0757G 08069C0759G 08069C0763G 08069C0764G 08069C0765F 08069C0767G 08069C0769F	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Larimer County, Unincorporated Areas (cont.)	080101	10180001 10180002 10180010 10190005 10190006 10190007 14010001	08069C0775F[1] 08069C0778F 08069C0780F 08069C0786G 08069C0788G 08069C0790F[1] 08069C0825F[1] 08069C0850F[1] 08069C0875F 08069C0900F 08069C0925G 08069C0950G 08069C0957F 08069C0960F 08069C0967G 08069C0970F 08069C0975G 08069C0976G 08069C0977H 08069C0978G 08069C0981H 08069C0982F 08069C0983J 08069C0984J 08069C0986G 08069C0992H 08069C0994G 08069C1000F[1] 08069C1001F 08069C1003G 08069C1011G 08069C1012F 08069C1013G 08069C1014G 08069C1025F[1] 08069C1050F[1] 08069C1075F 08069C1088G 08069C1089G 08069C1093G 08069C1094G 08069C1100F[1] 08069C1103G 08069C1104G 08069C1105F[1] 08069C1108F 08069C1109F 08069C1110F[1] 08069C1113G 08069C1114F 08069C1115F[1]	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Larimer County, Unincorporated Areas (cont.)	080101	10180001 10180002 10180010 10190005 10190006 10190007 10190008 14010001	08069C1116F 08069C1117F 08069C1118F 08069C1119F[1] 08069C1128F 08069C1136F 08069C1137F 08069C1141F 08069C1142F 08069C1150F[1] 08069C1151G 08069C1152G 08069C1153F[1] 08069C1154G 08069C1158G 08069C1160F[1] 08069C1161G 08069C1162G 08069C1165F[1] 08069C1166G 08069C1167G 08069C1168G 08069C1169G 08069C1186F 08069C1187F 08069C1188F 08069C1189G 08069C1193G 08069C1194G 08069C1200F[1] 08069C1201G 08069C1202G 08069C1205F[1] 08069C1213G 08069C1214G 08069C1215F[1] 08069C1250F[1] 08069C1275F 08069C1277G 08069C1280F 08069C1281G 08069C1282G 08069C1283G 08069C1284G 08069C1300G[1] 08069C1301G 08069C1302G 08069C1306G 08069C1307G 08069C1308G 08069C1309G 08069C1317G	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Larimer County, Unincorporated Areas (cont.)	080101	10180001 10180002 10180010 10190005 10190006 10190007 10190008 14010001	08069C1319G 08069C1320G 08069C1325G 08069C1340G 08069C1350G 08069C1368H 08069C1369G 08069C1375H 08069C1377H 08069C1381G 08069C1386H 08069C1387H 08069C1388H 08069C1389H 08069C1391H 08069C1400H[1] 08069C1405G	
Loveland, City of	080103	10190006 10190007	08069C1160F[1] 08069C1167G 08069C1168G 08069C1169G 08069C1186F 08069C1187F 08069C1188F 08069C1189G 08069C1193G 08069C1194G 08069C1200F[1] 08069C1205F[1] 08069C1213G 08069C1215F[1] 08069C1375H 08069C1377H 08069C1381G 08069C1400H[1] 08069C1405G	
Timnath, Town of	080005	10190007	08069C1003G 08069C1011G 08069C1012F 08069C1013G 08069C1014G 08069C1025F 08069C1202G	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Weld County, Unincorporated Areas	080266	10190006	08069C1381G 08069C1391H 08069C1400H 08069C1405G 08069C1410G 08069C1415G	Weld County FIS Report, 2020
Wellington, Town of	080104	10190007	08069C0757G 08069C0759G 08069C0767G 08069C0778F 08069C0786G	
Windsor, Town of	080264	10190007	08069C1201G 08069C1202G 08069C1205F 08069C1215F	

[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% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% 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 31, "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 Larimer County became effective on December 19, 2006. Refer to Table 28 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:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

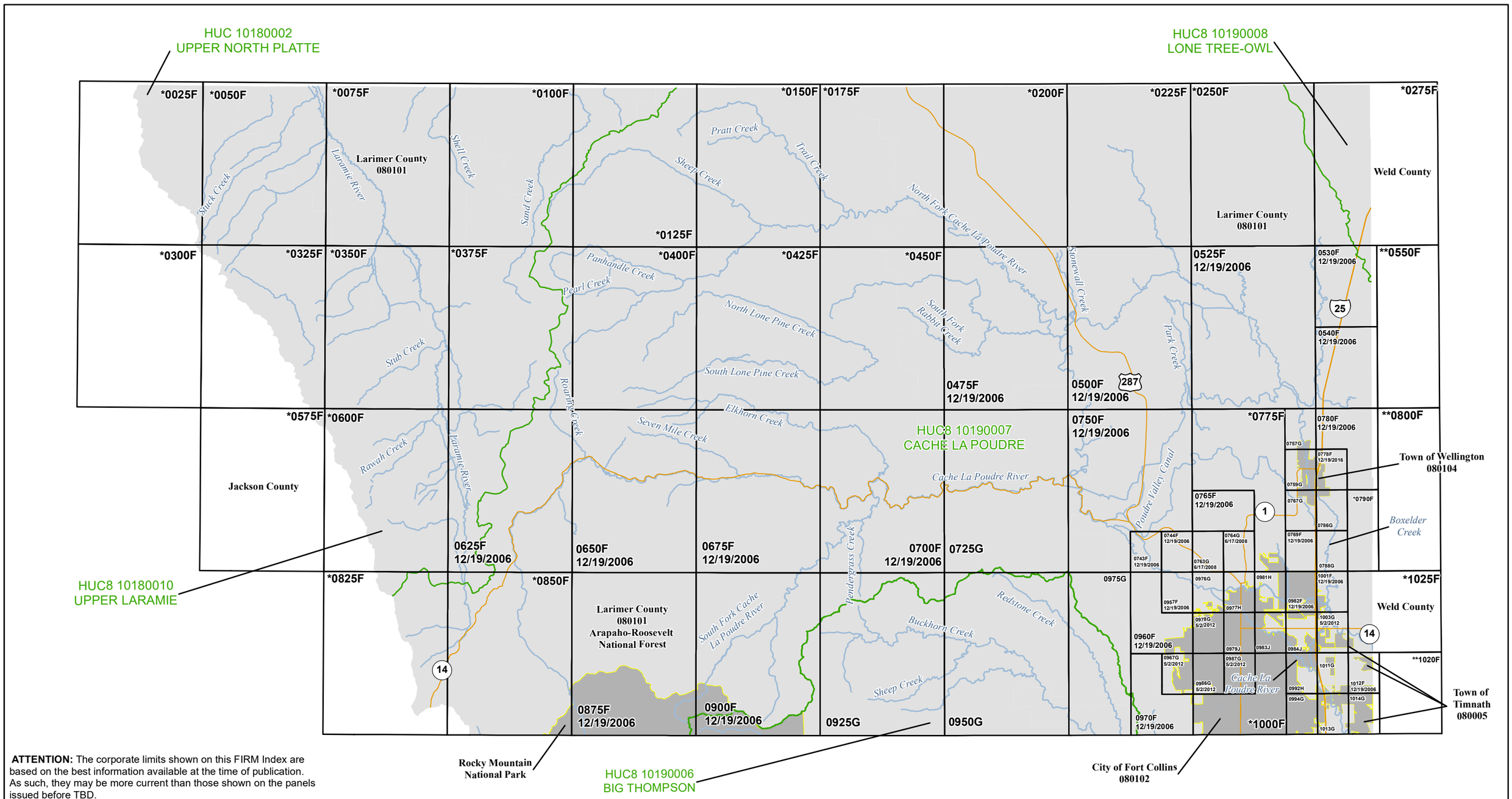
- Previous FIS Reports and FIRMs may have included levees that were accredited as reducing the risk associated with the 1% annual chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees, the levees must 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 (nld.usace.army.mil). For all other levees, the user is encouraged to contact the appropriate local community.

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

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

Figure 1: FIRM Index



ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on the panels issued before TBD.

N

1 inch = 25,828 feet 1:309,941

feet

0 13,000 26,000 52,000

Map Projection:
Universal Transverse Mercator Zone 13N;
North American Datum 1983

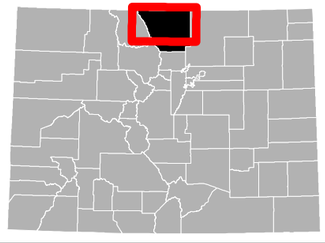
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

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

COUNTY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 1 of 2)

LARIMER COUNTY, COLORADO And Incorporated Areas
PANELS PRINTED:

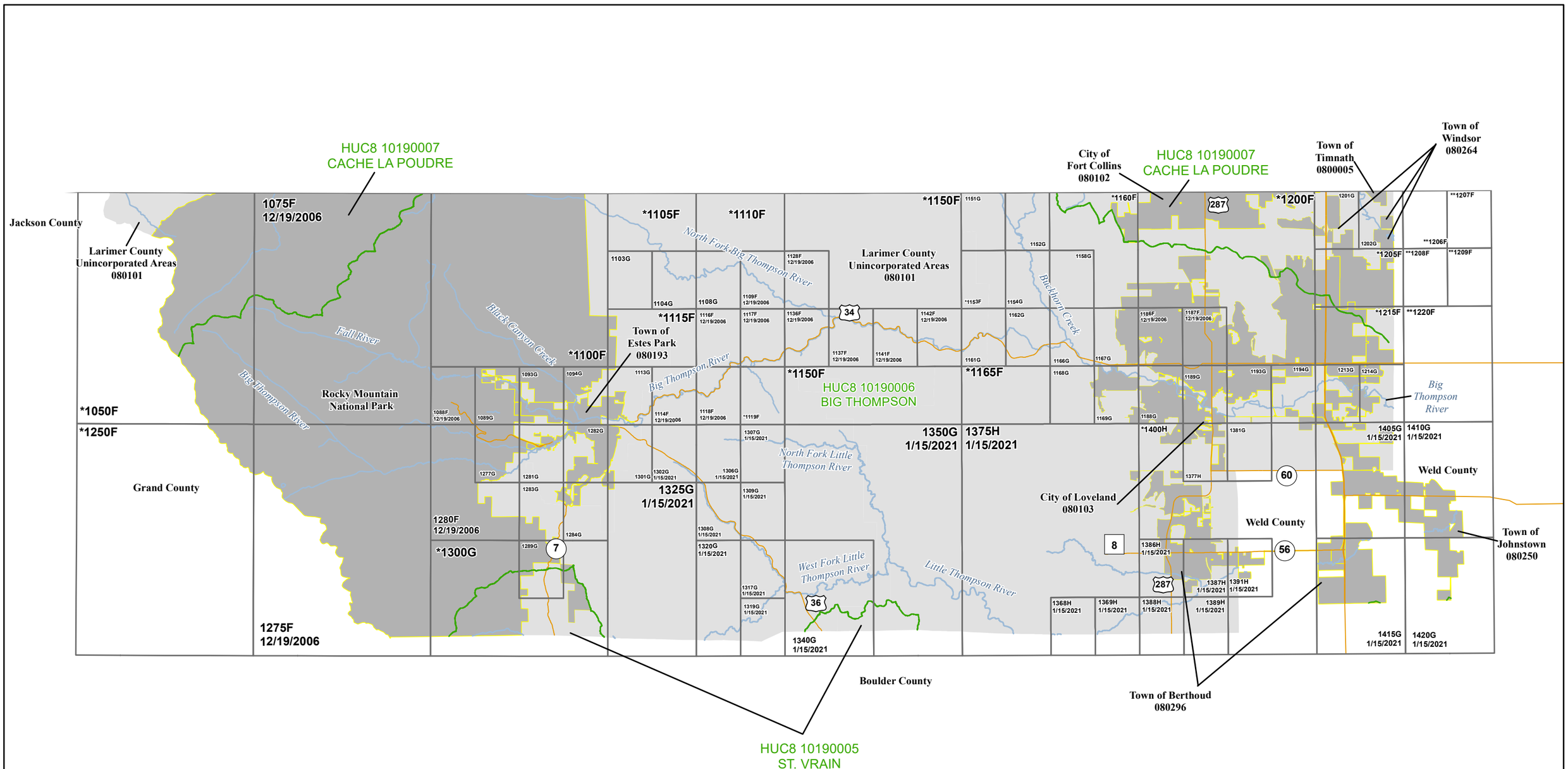
0475, 0500, 0525, 0530, 0540, 0625, 0650, 0675, 0700, 0725, 0743, 0744, 0750, 0757, 0759, 0763, 0764, 0765, 0767, 0769, 0778, 0780, 0786, 0788, 0875, 0900, 0925, 0950, 0957, 0960, 0967, 0970, 0975, 0976, 0977, 0978, 0979, 0981, 0982, 0983, 0984, 0986, 0987, 0992, 0994, 1001, 1003, 1011, 1012, 1013, 1014

REVISED PRELIMINARY 12/20/2021

FEMA

MAP NUMBER
08069CIND1F
MAP REVISED

Figure 1: FIRM Index



ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on the panels issued before TBD.

N

1 inch = 989,142 feet 1:11,869,703

feet

0 475,000 950,000 1,900,000

Map Projection:
Universal Transverse Mercator Zone 13N;
North American Datum 1983

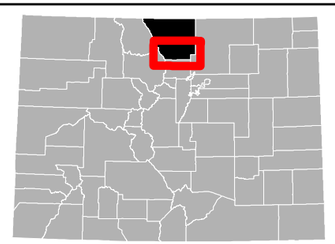
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

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

COUNTY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 2 of 2)

LARIMER COUNTY, COLORADO And Incorporated Areas

PANELS PRINTED:

1075, 1088, 1089, 1093, 1094, 1103, 1104, 1108, 1109, 1113, 1114, 1116, 1117, 1118, 1128, 1136, 1137, 1141, 1142, 1151, 1152, 1154, 1158, 1161, 1162, 1166, 1167, 1168, 1169, 1186, 1187, 1188, 1189, 1193, 1194, 1201, 1202, 1213, 1214, 1275, 1277, 1280, 1281, 1282, 1284, 1289, 1301, 1302, 1306, 1307, 1308, 1309, 1317, 1319, 1320, 1325, 1340, 1350, 1368, 1369, 1375, 1381, 1386, 1387, 1388, 1389, 1391, 1400, 1405, 1410, 1415, 1420

REVISED
PRELIMINARY
12/20/2021

FEMA

MAP NUMBER
08069CIND2F
MAP REVISED

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 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 28 in this FIS Report.

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

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

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

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

Figure 2. FIRM Notes to Users

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

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may 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.

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator (UTM) Zone 13N**.** 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.

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

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 31 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was derived from the National Flood Hazard layer, dated 2013 and digital data provided by Larimer County GIS Department, dated 2018. 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

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Larimer County, Colorado 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 28 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 Larimer County, Colorado**,** effective TBD**.**

Figure 2. FIRM Notes to Users

PROVISIONALLY ACCREDITED LEVEE: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations by January 18, 2023 (WWTP Cache La Poudre RB Levee), and February 28, 2023 (Fort Collins Oxbow-Cache La Poudre LB Levee). If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicate the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit www.fema.gov/national-flood-insurance-program.

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

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

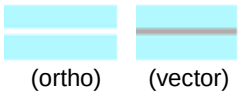
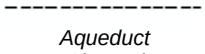
	Regulatory Floodway determined in Zone AE.
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.
	Area with Reduced Flood 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.
	Unshaded Zone X: Areas of minimal flood hazard.
FLOOD HAZARD AND OTHER BOUNDARY LINES	
	Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)
	Limit of Study
	Jurisdiction Boundary
	Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet
GENERAL STRUCTURES	
 *Aqueduct* *Channel* *Culvert* *Storm Sewer*	Channel, Culvert, Aqueduct, or Storm Sewer
Dam *Jetty* *Weir*	Dam, Jetty, Weir

Figure 3: Map Legend for FIRM

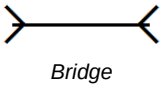
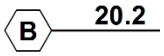
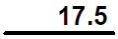
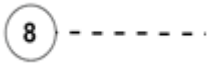
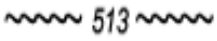
	Levee, Dike, or Floodwall
	Bridge
REFERENCE MARKERS	
	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
	Unlettered Cross Section with Regulatory Water Surface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

Figure 3: Map Legend for FIRM

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-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

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

Depending on the accuracy of available topographic data (Table 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1-percent and 0.2-percent-annual-chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1-percent-annual-chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM. Table 22, “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 22 and Table 3 indicate the flood zone designations for each flooding source and each community within Larimer County**,** respectively.

Table 22, “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 Table 22. On the map, the 1-percent-annual-chance floodplain corresponds to the SFHAs. The 0.2-percent-annual-chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

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

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Big Thompson River	Loveland, City of; Larimer County Unincorporated Areas; Johnstown, Town of	At Larimer-Weld County Boundary	Approximately 350 feet downstream of S County Road 9E	10190006	7.2	Y	AE	2017
Big Thompson River	Loveland, City of; Larimer County Unincorporated Areas	Approximately 350 feet downstream of S County Road 9E	Confluence of Dry Creek – At Big Thompson River	10190006	8.9	N	AE	2018
Big Thompson River	Loveland, City of; Larimer County Unincorporated Areas	Confluence of Dry Creek - At Big Thompson River	Confluence of Buckhorn Creek	10190006	2.4	Y	AE	2017
Big Thompson River	Loveland, City of; Larimer County Unincorporated Areas	Confluence of Buckhorn Creek	Approximately 0.6 miles upstream of N Co Rd 31D	10190006	3.5	Y	AE	2018
Big Thompson River	Larimer County Unincorporated Areas	Approximately 0.6 Miles Upstream of N Co Rd 31D	At Olympus Dam	10190006	13.9	Y	AE	1985
Big Thompson River	Estes Park, Town of; Larimer County Unincorporated Areas	At Olympus Dam	Approximately 0.3 Upstream of W Riverside Drive	10190006	2.6	Y	AE	2018
Big Thompson River	Estes Park, Town of; Larimer County Unincorporated Areas, Rocky Mountain National Park	Approximately 0.3 Miles Upstream of W Riverside Drive	Approximately 0.3 miles Upstream of Tunnel Road	1019006	3.6	Y	AE	2018
Big Thompson River	Larimer County Unincorporated Areas, Rocky Mountain National Park	Approximately 0.3 Miles Upstream of Tunnel Road	Approximately 0.5 Miles Upstream of S Moraine Road	1019006	1.3	N	A	2018

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Big Thompson River – I25 Split	Loveland, City of; Larimer County Unincorporated Areas	Confluence with Big Thompson River	Divergence from Big Thompson River	10190006	0.7	Y	AE	2017
Black Canyon Creek	Larimer County Unincorporated Areas; Estes Park, Town of	Confluence with Big Thompson River	200 feet upstream of Devil Gulch Rd	10190006	1.5	Y	AE	2018
Bobcat Gulch	Larimer County Unincorporated Areas	Confluence with North Fork Big Thompson River	0.2 upstream of confluence with North Fork Big Thompson River	10190007	0.2	Y	AE	1985
Boxelder Creek	Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 0.4 miles downstream of E County Road 54	10190007	1.3	Y	AE	2019
Boxelder Creek	Wellington, Town of; Larimer County Unincorporated Areas	Approximately 0.4 miles downstream of E County Road 54	Approximately 100 feet upstream of E County Road 66	10190007	8.1	Y	AE	2020
Boxelder Creek	Larimer County Unincorporated Areas	Approximately 100 feet upstream of E County Road 66	At SE Frontage Road	10190007	2.5	N	A	2005
Boxelder Creek - Larimer County Road 58 DFP	Larimer County Unincorporated Areas	Confluence with Boxelder Creek	Approximately 20 feet downstream of E County Road 58	10190007	1.3	Y	AE	2020
Boxelder Creek - Larimer County Road 60 DFP	Wellington, Town of; Larimer County Unincorporated Areas	Confluence with Indian Creek	Approximately 0.2 miles upstream of McClellan Road	10190007	0.9	Y	AE	2020
Boxelder Creek -Legacy Lane DFP	Larimer County Unincorporated Areas	Confluence with Boxelder Creek	Approximately 0.8 miles upstream of confluence with Boxelder Creek	10190007	0.8	Y	AE, AO	2020
Boxelder Creek DFP	Larimer County Unincorporated Areas	Confluence with Indian Creek	Approximately 0.5 miles upstream of confluence with Indian Creek	10190007	0.5	Y	AE	2020

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Boxelder Creek Overflow – Upstream	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Boxelder Creek	Divergence from Boxelder Creek	10190007	1.9	Y	AE	2019
Buckhorn Creek	Larimer County Unincorporated Areas	Confluence with Big Thompson River	At Buckhorn Road	10190006	6.4	Y	AE	2017
Buckhorn Creek	Larimer County Unincorporated Areas	At Buckhorn Road	1 mile upstream of the intersection of Billard Rd. and Donner Hill Trail	10190006	28.2	N	A	2017
Cache La Poudre River	Fort Collins, City of; Timnath, Town of; Windsor, Town of; Larimer County Unincorporated Areas	At Larimer-Weld County Boundary	Approximately 0.3 miles upstream of N Shields Street	10190007	16.8	Y	AE	2020
Cache La Poudre River	Larimer County Unincorporated Areas	Approximately 0.3 miles upstream of N Shields Street	Approximately 0.7 miles upstream of N Taft Hill Road	10190007	3.1	Y	AE	2005
Cache La Poudre River - 3 Bells	Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 0.5 miles upstream of confluence with Cache La Poudre River	10190007	0.5	Y	AE	2020
Cache La Poudre River – College SFP	Fort Collins, City of	Confluence with Cache La Poudre River	Approximately 250 feet upstream of U.S. Highway 287	10190007	0.2	Y	AE	2020
Cache La Poudre River – County Road 36	Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – I25 Divided Flow Path	Divergence from Cache La Poudre River – I25 Divided Flow Path – L1	10190007	0.5	N	AE	2020
Cache La Poudre River – Dry Creek	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – Mulberry Split	Pascal Street crossing	10190007	2.9	Y	AE	2020

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Cache La Poudre River – Environmental Learning Center SFP	Fort Collins, City of;	Confluence with Cache La Poudre River	Approximately 0.8 miles upstream of confluence with Cache La Poudre River	10190007	0.8	N	AE	2020
Cache La Poudre River – I25 Divided Flow Path	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Divergence from Cache La Poudre River	10190007	6.7	Y	AE	2020
Cache La Poudre River – I25 Divided Flow Path – L1	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – I25 Divided Flow Path	Divergence from Cache La Poudre River – I25 Divided Flow Path	10190007	0.3	Y	AE	2020
Cache La Poudre River – I25 Divided Flow Path – L2	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – I25 Divided Flow Path	Divergence from Cache La Poudre River – I25 Divided Flow Path	10190007	0.5	Y	AE	2020
Cache La Poudre River – I25 Divided Flow Path – L3	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – I25 Divided Flow Path	Approximately 0.7 miles upstream of confluence with Cache La Poudre River – I25 Divided Flow Path	10190007	0.7	N	AE	2020
Cache La Poudre River – I25 Divided Flow Path – R1	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – I25 Divided Flow Path	Approximately 75 feet upstream of Mariah Lane	10190007	0.2	N	AE	2020
Cache La Poudre River – Larimer County Road 32E SFP	Larimer County Unincorporated Areas; Windsor, Town of	Confluence with Cache La Poudre River	Divergence from Cache La Poudre River – State Highway 392 SFP	10190007	1.2	Y	AE	2020
Cache La Poudre River – Lee Martinez SFP	Fort Collins, City of	Confluence with Cache La Poudre River	Divergence from Cache La Poudre River	10190007	0.4	Y	AE	2020

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Cache La Poudre River – Linc SFP	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River – Dry Creek	Divergence from Cache La Poudre River	10190007	1.8	N	X	2020
Cache La Poudre River-L PATH SFP	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 1.7 miles upstream of confluence with Cache La Poudre River	10190007	1.7	Y	AE	2020
Cache La Poudre River – Mulberry Split	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 100 feet downstream of S Lemay Avenue	10190007	1.5	N	X	2020
Cache La Poudre River – POE Pit SFP	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 1.7 miles upstream of confluence with Cache La Poudre River	10190007	1.7	Y	AE	2020
Cache La Poudre River – Rprospect SFP	Fort Collins, City of	Confluence with Cache La Poudre River	Approximately 0.8 miles upstream of confluence with Cache La Poudre River	10190007	0.8	Y	AE	2020
Cache La Poudre River – SRigden	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 1.3 miles upstream of confluence with Cache La Poudre River	10190007	1.3	Y	AE	2020
Cache La Poudre River – State Highway 392 SFP	Larimer County Unincorporated Areas	Larimer -Weld County Boundary	Approximately 0.3 miles upstream of divergence of Cache La Poudre River – State Highway 392 SFP	10190007	0.9	Y	AE	2020
Cache La Poudre River – Timberline SFP	Fort Collins, City of	Confluence with Cache La Poudre River	Approximately 0.7 miles upstream of confluence with Cache La Poudre River	10190007	0.7	N	AE	2020

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Cache La Poudre River Split R Path	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cach La Poudre River	Divergence from Boxelder Creek	10190007	0.8	Y	AE	2019
Cedar Creek	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.1 miles upstream of Cedar Cove Road	10190006	0.1	Y	AE	1985
Clark Inlet Canal	Larimer County Unincorporated Areas	At Interstate 25 Frontage Road	Approximately 150 feet upstream of Burlington Northern Railroad	10190007	0.7	Y	AE	2013
Clark Spillway	Larimer County Unincorporated Areas	At Confluence with Indian Creek	Clark Lake	10190007	0.6	Y	AE	2013
Coal Creek	Wellington, Town of; Larimer County Unincorporated Areas	Confluence with Boxelder Creek	2.4 miles upstream of confluence with Boxelder Creek	10190007	2.4	N	AE	2013
Coal Creek Split Flow	Wellington, Town of	Confluence with Coal Creek	Divergence from Coal Creek	10190007	0.5	N	AE	2013
Cooper Slough	Larimer County Unincorporated Areas	Confluence with Lake Canal	At East Poudre Trail	10190007	1.3	Y	AE	2019
Cooper Slough Overflow	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Lake Canal	Divergence from Cooper Slough	10190007	0.8	Y	AE	2019
Dark Gulch	Larimer County Unincorporated Areas	Confluence with Big Thompson River	At Devils Gulch Road	10190006	0.2	Y	AE	1985
Devils Gulch	Larimer County Unincorporated Areas	Confluence with West Creek	0.2 miles upstream of confluence with West Creek	10190006	0.2	Y	AE	1985
Dickson Gulch	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.4 miles downstream of Deer Meadow Drive	10190006	0.6	Y	AE	1985

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Dry Creek – At Big Thompson River	Loveland, City of; Larimer County Unincorporated Areas	Confluence with Big Thompson River	Approximately 900 Feet Upstream of Cedar Valley Drive	10190006	0.5	Y	AE	2017
Dry Creek	Berthoud, Town of; Larimer County Unincorporated Areas	Confluence with Little Thompson River	1.2 miles upstream of Schofield Rd	10190006	8.1	N	A	2017
Dry Creek (North of Canal)	Larimer County Unincorporated Areas	Confluence with Larimer and Weld Canal	1.7 miles upstream of confluence with Larimer and Weld Canal	10190007	1.7	Y	AE	2008
Dry Creek (South of Canal)	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Approximately 1,410 Feet upstream of the Confluence of Old Dry Creek (Historic Channel)	10190007	3.4	Y	AE	2008
Dry Creek (South of Canal)	Fort Collins, City of; Larimer County Unincorporated Areas	Approximately 1,410 Feet upstream of the Confluence of Old Dry Creek (Historic Channel)	Approximately 890 feet upstream of Redwood Street	10190007	NP	Y	AE	2020
Dry Creek (West)	Larimer County Unincorporated Areas	Confluence with Little Thompson River	3.0 miles upstream of confluence with Little Thompson River	10190006	3.0	N	A	1985
Dry Gulch	Estes Park, Town of; Larimer County Unincorporated Areas	Confluence with Big Thompson River	Approximately 450 Feet Upstream of Stonegate Drive	10190006	1.5	Y	AE	2018
East Vine Diversion	Fort Collins, City of; Larimer County Unincorporated Areas	Confluence with Dry Creek (South of Canal)	Larimer and Weld Canal	10190007	1.2	Y	AE	2020
Fall River	Estes Park, Town of	Confluence with Big Thompson River	Approximately 0.2 Miles Upstream of Fish Hatchery Road	10190006	1.5	Y	AE	2018

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Fall River	Estes Park, Town of; Larimer County Unincorporated Areas; Rocky Mountain National Park	0.2 miles upstream of Fish Hatchery Road	Approximately 0.2 miles upstream of Old Ranger Drive	10190006	4.1	Y	AE	2018
Fish Creek	Estes Park, Town of; Larimer County Unincorporated Areas; Rocky Mountain National Park	Confluence with Lake Estes	Lily Lake	10190006	5.3	Y	AE	2018
Fox Creek	Larimer County Unincorporated Areas	Confluence with North Fork Big Thompson River	Approximately 0.4 Miles Upstream of Fox Creek Road	10190006	1.5	Y	AE	2018
Glade Road Split	Larimer County Unincorporated Areas	Confluence with Big Thompson River	4.9 miles upstream of confluene with Big Thompson River	10190006	1.4	Y	AE	2017
Indian Creek	Larimer County Unincorporated Areas	Confluence with Boxelder Creek	Approximately 0.2 miles upstream of E County Road 60	10190007	0.8	Y	AE	2020
Indian Creek	Larimer County Unincorporated Areas	Approximately 0.2 miles upstream of E County Road 60	Approximately 0.4 miles upstream of E County Road 60	10190007	0.2	N	A	2006
Larimer and Weld Canal	Fort Collins, City of; Larimer County Unincorporated Areas	Downstream Face of Mulberry Street Bridge	125 feet upstream of Unnamed Bridge	10190007	2.9	Y	AE	2008
Little Thompson River	Berthoud, Town of; Johnstown, Town of; Larimer County Unincorporated Areas	Larimer-Weld County Boundary	0.7 miles upstream of Parrish Ranch Rd (In Boulder County)	10190007	25.3	Y	AE	2017
Little Thompson River	Larimer County Unincorporated Areas	0.7 miles upstream of Parrish Ranch Rd	Confluence of West Fork Little Thompson River	10190006	16.8	N	AE	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)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Little Thompson River	Larimer County Unincorporated Areas	Confluence of West Fork Little Thompson River	Approximately 0.2 miles downstream of Hermit Park Rd	10190006	16.7	Y	AE	2017
Long Gulch	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.4 miles upstream of confluence with Big Thompson River	10190006	0.4	Y	AE	1985
Miller Fork	Larimer County Unincorporated Areas	Confluence with North Fork Big Thompson River	0.2 miles upstream of confluence with Big Thompson River	10190006	0.2	Y	AE	1985
Noel's Draw	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.1 miles upstream of confluence with Big Thompson River	10190006	0.1	Y	AE	1985
North Fork Big Thompson River	Larimer County Unincorporated Areas	Confluence with Big Thompson River	Approximately 0.1 miles downstream of Horseshoe Bend Road	10190006	8.7	Y	AE	1985
North Fork Big Thompson River	Larimer County Unincorporated Areas	Approximately 0.1 miles downstream of Horseshoe Bend Road	Approximately 0.3 miles upstream of North Fork Road	10190006	2.2	Y	AE	2018
North Fork Little Thompson River	Larimer County Unincorporated Areas	Confluence with Little Thompson River	Approximately 13 miles upstream of confluence with Little Thompson River	10190006	12.6	N	A	2017
Old Dry Creek (Historic Channel)	Larimer County Unincorporated Areas	Confluence with Cache La Poudre River	Confluence with Dry Creek (South of Canal)	10190006	0.9	Y	AE	2008
Quillan Gulch	Larimer County Unincorporated Areas	Confluence with Big Thompson River	At N County Road 25E	10190006	4.7	Y	A, AE	1985
Rabbit Gulch	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.2 miles upstream of confluence with Big Thompson River	10190006	0.2	Y	AE	1985

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Redstone Creek	Larimer County Unincorporated Areas	Confluence with Buckhorn Creek	700 feet upstream of CO RD 25E	10190006	1.3	N	AE	2017
Redstone Creek	Larimer County Unincorporated Areas	700 feet upstream of CO RD 25E	CO RD 41	10190006	15.6	N	A	2017
Sherry Drive Overflow	Fort Collins, City of	Confluence with Cache La Poudre Reservoir Inlet Canal	Divergence from Lake Canal	10190007	0.2	Y	AE	2019
Shields Street Divided Flow Path – Hill Pond Road	Larimer County Unincorporated Areas	NP	NP	10190007	-	N	A	2012
Shields Street Divided Flow Path – Shire Court	Larimer County Unincorporated Areas	NP	NP	10190007	-	N	A	2012
Shields Street Divided Flow Path – Windtrail Swale	Larimer County Unincorporated Areas	NP	NP	10190007	-	N	A	2012
Shields Street Overflow	Larimer County Unincorporated Areas	Confluence with Spring Creek	0.2 miles upstream of confluence with Spring Creek	10190007	0.2	Y	AE	2012
Spring Canyon Park Diversion	Larimer County Unincorporated Areas	Confluence with Spring Creek	0.1 miles upstream of confluence with Spring Creek	10190007	0.1	Y	AE	2012
Spring Creek	Fort Collins, City of	Confluence with Cache La Poudre River	Approximately 700 feet downstream of S Shields Street	10190007	2.1	Y	AE	2012
Tributary BT-1	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.1 miles upstream of Canyon River Road	10190006	0.1	Y	A, AE	1985
Tributary BT-2	Larimer County Unincorporated Areas	Confluence with Big Thompson River	At Canyon Cove Lane	10190006	0.1	Y	AE	1985

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Tributary BT-3	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.1 miles upstream of US Highway 34	10190006	0.1	Y	AE	1985
Tributary BT-4	Larimer County Unincorporated Areas	Confluence with Big Thompson River	0.1 miles upstream of confluence with Big Thompson River	10190006	0.1	Y	AE	1985
West Creek	Larimer County Unincorporated Areas	Confluence with Big Thompson River	Approximately 250 Feet Upstream of West Creek Road	10190006	1.2	Y	AE	2018
West Fork Little Thompson River	Larimer County Unincorporated Areas	Confluence with Little Thompson River	2.3 miles upstream of CO Rd 82E	10190006	10.1	N	A	2017

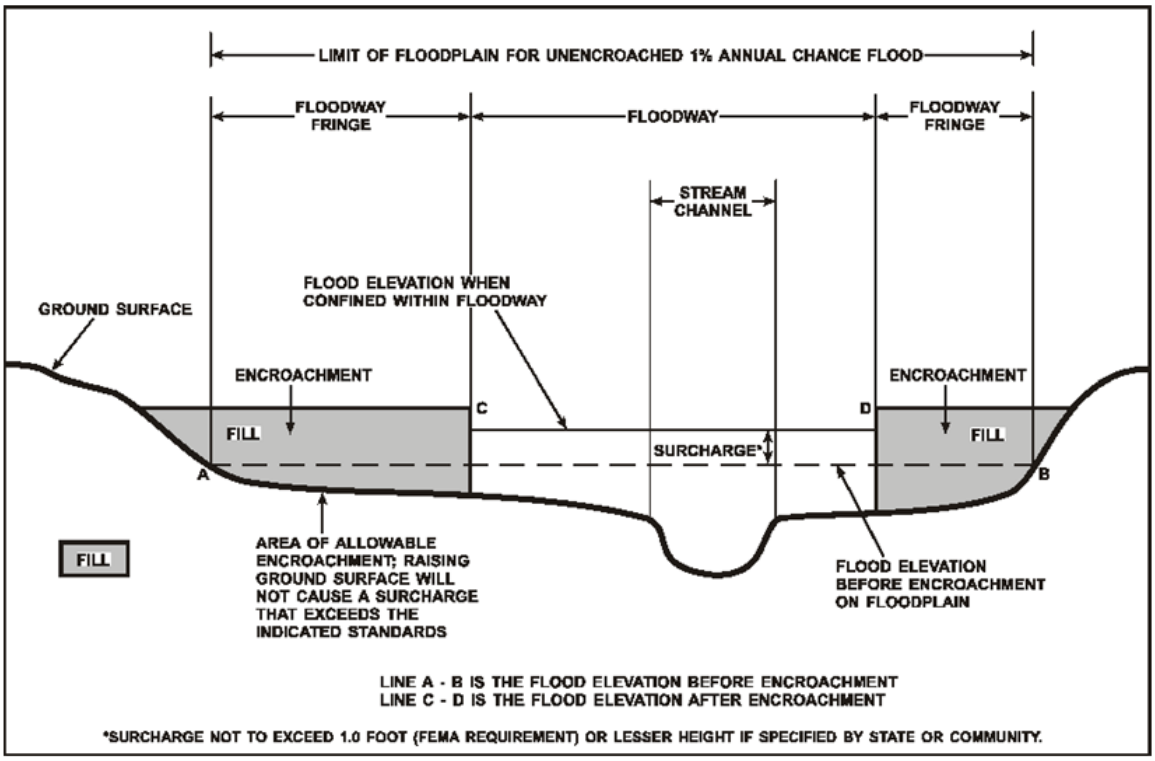
2.2 Floodways

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% 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% annual chance flood. The floodway fringe is the area between the floodway and the 1% 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% annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

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

Figure 4: Floodway Schematic



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

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

2.3 Base Flood Elevations

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

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs 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.

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

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% 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% annual chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Larimer County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Berthoud, Town Of	A, AE, X
Estes Park, Town Of	AE, X
Fort Collins, City Of	A, AE, AH, AO, X
Johnstown, Town Of	AE, X
Larimer County, Unincorporated Areas	A, AE, AH, AO, X
Loveland, City Of	AE, AH, AO, X
Timnath, Town Of	A, AE, X
Wellington, Town Of	A, AE, 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)
Big Thompson	10190006	Big Thompson River	Largest watershed within Larimer County.	776
Cache La Poudre	10190007	Cache La Poudre River	Affects northern portion of Larimer County. Crosses Colorado and Wyoming.	1,476
Lone Tree-Owl	10190008	Lone Tree Creek	Affects small portion of northern Larimer County. Crosses Colorado and Wyoming.	23
St. Vrain	10190005	St. Vrain Creek	Small portion of watershed affecting southern Larimer County.	23
Upper Laramie	10180010	Laramie River	Small portion of watershed affecting north western Larimer County.	395
Colorado Headwaters	14010001	Colorado Headwaters	Sliver of watershed affecting the western boundary of Larimer County.	0.4

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
North Platte Headwaters	10180001	North Platte Headwaters	Sliver of watershed affecting the western boundary of Larimer County.	1

4.2 Principal Flood Problems

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

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Big Thompson River	One significant flood within the county occurred on the Big Thompson River, July 31 to August 1, 1976. This flood was one of the worst natural disasters in the history of Colorado. Intense precipitation over an approximate 60-square-mile area between Lake Estes and Drake, with rainfall depths up to 12 inches, generated a flood discharge of approximately 31,200 cubic feet per second (cfs) at the mouth of the canyon. This flood is known to have taken 139 lives. Property damage was estimated at $16.5 million, while hundreds of people were left homeless. Over 200 residential structures were damaged or destroyed by the flood, while nearly 1,200 land parcels were adversely affected (Gingery 1976). Floods on the Big Thompson River caused damage in 1864 and 1894, but no discharge or damage estimates were recorded. Floods also occurred on the Big Thompson River in 1919, 1923, 1945, and 1949 with discharges of 8,000, 7,000, 7,600, and 7,750 cfs, respectively. Approximately 13 floods have occurred in Loveland on the Big Thompson River since 1864. These floods occurred in 1864, 1894, 1906, 1919, 1921, 1923, 1938, 1941, 1942, 1945, 1949, 1951, and 1976. All but the 1919 flood did damage to crops, homes, and businesses in the Loveland area. On June 9, 1921, the Colorado and Southern Railroad bridge was destroyed due to heavy rains on June 2 through 7, 1921. On June 4 through 7, 1949, heavy rains in the headwaters area of the Big Thompson River basin caused a flood with a magnitude of 7750 cubic feet per second (cfs), as estimated at the Loveland station. Although considerably less than the l00-year flood discharge of 19,000 cfs, lowland areas just west of Loveland were damaged (USACE 1971). In both Larimer and Weld Counties, the most significant recent flood event resulted from heavy rainfall spanning September 9th to September 18th, 2013. The extended storm duration escalated flooding as soils became saturated, thereby, increasing runoff potential. The flooding resulted in considerable changes to channel geometry and alignment, damage to property infrastructure, and caused 10 fatalities.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Big Thompson River, Buckhorn Creek	The largest floods recorded at Loveland have also been the most recent ones. On August 2 and 3, 1951, intense rains over much of the Big Thompson River basin caused a dam to break on the Buckhorn Creek on August 3. This caused severe flooding from the mouth of Buckhorn Creek to the mouth of the Big Thompson River, especially through the Loveland area. Approximately 1 mile of U.S. Highway 34 was destroyed just west of Loveland. Irrigation works were destroyed, crop loss was heavy, and much sediment and erosion damage occurred. The lives of four people were lost and many were left homeless. Total damages from the flood were estimated at $602,000. The estimated discharge from this flood was 22,000 cfs at Loveland, larger than the 1-percent annual chance flood discharge of 19,000 cfs (USACE 1971).
Boxelder Creek	Floods have been recorded in the Boxelder Creek watershed on 13 occasions since 1900. On August 1, 1961, a storm with a frequency of 2- to 1-percent annual chance caused an estimated $76,150 in damage in the Wellington vicinity. In May and June 1967, two overlapping 4-percent annual chance storms caused an estimated $46,100 in damage and took four lives in the Wellington vicinity (USDA 1971).
Buckhorn Creek	Buckhorn Creek has flooded on several occasions. The largest floods were in 1923, 1938, 1948, and 1951 with discharges of 10,500, 10,200, 5,750 and 14,000 cfs, respectively (USGS 1948).
Cache La Poudre River	Notable floods on the Cache La Poudre River in the study area occurred in 1844, 1864, 1884, 1891, 1904, 1923, and 1930. There were apparently three large floods of comparable size in 1864, 1891, and 1904. All of these floods peaked near 21,000 cfs. The 1904 flood was probably the worst flood in terms of dollar damage (USACE 1973). The snowmelt runoff from 1983 produced a peak near 7,000 cfs. This was the highest peak in 53 years. Extensive channel damage occurred because of the prolonged duration of the runoff. A rain-on-snow event in April 1999 resulted in a peak flow of 6,270 cfs.
Cooper Slough	The Cooper Slough floodplain is predominantly flat. Channel capacity is limited in places, promoting overbank flows and divided-flow conditions. Channel flow is restricted by relatively small culverts at Vine Drive, the Colorado and Southern Railroad (C&SRR), and State Highway 14. Due to an undersized culvert at State Highway 14, a ponded area will form north of the highway, and eventually overtop the highway during storm events. In places, the width of the l00-year floodplain averages over 1,000 feet, although the depth of flooding is generally less than 3 feet, except in areas where ponding occurs. Hydrologic data from stream gages were not available, thus no discharge and recurrence intervals for major floods along Cooper Slough were determined.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Dry Creek	Limited information is available regarding past flooding from Dry Creek. In 1904, a flood occurred that resulted in the drowning death of a child when floodwaters overtopped the Eaton Ditch (which intercepts Dry Creek near Willox Road. Flooding also occurred in 1924 with depths of flows several feet deep. However, it is unclear as to whether the flooding was due to overflow from the Cache La Poudre River (Gingery 1980). Numerous irrigation canals cross the Dry Creek channel and directly intercept drainage flows. In the past, much of the excess drainage in the lower Dry Creek basin (below Eaton Ditch) was intercepted by irrigation canals. However, the impact of development has increased the magnitude and frequency of drainage flow, and many of the canals no longer have the capacity to intercept the increased drainage flows. Several of the canals, including the Larimer and Weld Canal (Eaton Ditch), Larimer County Canal, Terry Inlet, Poudre Valley Canal, and North Poudre Ditch, have large enough flow capacities to impact flood magnitudes on Dry Creek (Gingery 1980).
Fish Creek, Fall River	Fish Creek and the Fall River have not often been subject to major flooding, although the Fall River did overflow its banks in 1965 and cause some damage. In July 1982, extensive damage occurred throughout the Town of Estes Park because of the failure of Lawn Lake Dam located in the headwaters of the Fall River. On July 15, 1982, the Lawn Lake Dam on the Roaring River failed. According to the Rocky Mountain News, this catastrophic failure sent “a 30-foot wall of water down Roaring River...The water swept into Fall River...At about 8 A.M., it slammed into resorts perched on the river's banks at the west end of Estes Park.” The Lawn Lake Dam failure caused property damage estimated at $20 to $30 million, and the loss of several lives. The flooding from this event was more extensive than that which would be caused by the 0.2-percent annual chance flood. The Town of Estes Park has not frequently been subject to damaging flood flows however, the flood of 1965 demonstrated the potential for flooding that does exist, particularly in areas where buildings encroach upon the riverbanks. The 1965 flood, which was the most recent, was the result of a combination of heavy rain and rapid snowmelt on a warm day in June. Rainfall depth over a 2-day period was approximately 1.9 inches. The peak in the Big Thompson River near Lake Estes was approximately double the normal flow. The 1965 peak of 1,640 cubic feet per second (cfs) was the most damaging flow in recent history, although flows of this magnitude were also recorded in 1949, 1951, 1953, and 1957. Damage from the 1965 event was the result of continued encroachment upon the river channels and blockage of the Fall River culvert at Elkhorn Avenue that diverted flows through the center of town. The most significant recent flood event resulted from heavy rainfall spanning September 9th to September 18th, 2013. The extended storm duration escalated flooding as soils became saturated, thereby, increasing runoff potential. The flooding resulted in considerable changes to channel geometry and alignment, damage to property infrastructure, and caused 10 fatalities.

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Little Thompson River and Tributaries	In both Larimer and Weld Counties, the most significant recent flood event resulted from heavy rainfall spanning September 9th to September 18th, 2013. The extended storm duration escalated flooding as soils became saturated, thereby, increasing runoff potential. The flooding resulted in considerable changes to channel geometry and alignment, damage to property infrastructure, and caused 10 fatalities.
Redstone Creek	Documentation of floods on Redstone Creek is relatively sparse. However, an intense rainstorm on September 10, 1938, caused flooding in some of the lower areas of the floodplain (USGS 1948).
Spring Creek	Floods occurred on Spring Creek in 1902, 1904, 1938, 1949, and 1951, prior to the completion of the Horsetooth Reservoir, which cuts off the upper portion of the Spring Creek Drainage basin. The Horsetooth Reservoir was completed in the early 1950s and has helped reduce flooding problems by reducing drainage area. Floods occurred in 1975 and 1977, causing flooding in several basements, but there are no recorded discharges or damage estimates available. A flood occurred on June 25, 1983, that produced 1.9 inches of rainfall over 2 hours. The storm sewer that carries Spring Creek under the mobile home park surcharged and water ponded to a depth of several feet. Property damage was estimated in the $5,000 to $10,000 range (EPI 1988). A devastating flash flood occurred on July 28, 1997, on Spring Creek. Over 14.5 inches of rain fell between 4:00 PM on July 27th and 11:00 PM on July 28th, with over 10 inches of that amount occurring during a six hour time period on July 28th. There were five deaths and over $200 million in property damage. The discharge was estimated at 8,250 cfs going into the detention pond behind the Burlington Northern Railroad just west of College Avenue. This event was greater than a 0.2-percent annual chance flood event (CSU 1997).

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

Table 6: Historic Flooding Elevations

[Not Applicable to this Flood Risk Project]

4.3 Non-Levee Flood Protection Measures

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

Table 7: Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Cache La Poudre River	Larimer/Weld Canal Diversion Dam	Dam	At Lawton Lane	Levee Intact/Levee Fail scenarios depicted in LOMR 17-08-0129P

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 not longer meets Section 65.10, FEMA will de-accredit 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 Larimer 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 29.

Table 8: Levees

Community	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered Under PL84-99 Program?	FIRM Panel(s)
Fort Collins, City of	Cache La Poudre River	Left Bank	NP	Yes	4705000157	N/A	08069C0979J
Fort Collins, City of	Cache La Poudre River	Right Bank	NP	Yes	4705000119	N/A	08069C0983J
Fort Collins, City of	Cache La Poudre River	Right Bank	NP	Yes	4705000118	N/A	08069C0992H

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% annual chance, respectively, of being equaled or exceeded during any year.

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

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

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

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the

hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 9. 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. (Coastal stillwater elevations are discussed in Section 5.3 and shown in Table 16.) Stream gage information is provided in Table 11.

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Big Thompson River	At Larimer-Weld County Line	591.8	4,598	8,502	13,361	19,548	25,803	41,684
Big Thompson River	At Interstate 25	576.7	5,089	9,528	14,902	21,750	28,710	45,136
Big Thompson River	200 feet downstream of Interstate 25	580.1	5,096	9,542	14,936	21,820	28,802	45,314
Big Thompson River	At County Road 9E	546.6	4,775	9,166	14,276	21,008	27,731	43,757
Big Thompson River	At Highway 287	531.2	4,703	8,979	13,912	20,429	30,644	42,628
Big Thompson River	At Railroad Avenue	530	4,707	8,974	13,897	20,411	30,617	42,647
Big Thompson River	At Taft Avenue	503.7	4,417	8,515	13,140	19,305	28,958	40,841
Big Thompson River	At Wilson Avenue	499.3	4,332	8,383	12,941	19,021	28,532	40,536
Big Thompson River	Downstream of the confluence of Dry Creek	499.3	4,318	8,371	12,923	18,997	28,496	40,400
Big Thompson River	Upstream of the confluence of Dry Creek	467.2	3,279	6,379	10,016	14,845	22,268	32,400

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Big Thompson River	Downstream of the confluence of Buckhorn Creek	461.1	4,529	8,582	13,012	18,920	28,380	41,780
Big Thompson River	Downstream of the confluence of Davy Ditch	316.4	3,078	6,341	10,201	15,672	23,508	34,458
Big Thompson River	At Mouth of Canyon (Drake Gauge)	535	4,700	*	12,300	19,000	*	44,000
Big Thompson River	At Drake Above North Fork	191	2,750	*	5,700	7,500	*	13,600
Big Thompson River	At Lake Estes Below Dry Gulch	156	2,250	*	3,800	4,700	*	7,200
Big Thompson River	At Lake Estes	137.5	1,510	*	11,990	2,180	*	2,600
Big Thompson River	At St. Vrain Avenue	136.9	1,510	*	11,990	2,180	*	2,600
Big Thompson River	Downstream of the confluence of Cedar Creek	300.4	2,693	5,582	9,048	14,020	17,385	31,273
Big Thompson River	Upstream of the confluence of Cedar Creek	281.4	2,212	4,736	7,808	12,277	15,223	27,993
Big Thompson River	900 feet downstream of Sullivan Gulch (Mountain Shadows)	187.6	960	2,278	3,961	6,453	8,002	15,686

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Big Thompson River	At Loveland Heights Cottages	164.3	936	2,176	3,748	6,055	7,508	14,520
Big Thompson River	At Estes Park Visitor Center	137.6	1,680	2,020	2,600	3,100	3,441	4,040
Big Thompson River	Upstream of the confluence of Fall River	87.4	1,020	1,210	1,400	2,170	2,409	3,700
Big Thompson River	At Confluence with Fall River	87.1	980	*	1,340	1,460	*	1,760
Big Thompson River	At Crags Drive in Estes Park	87	980	*	1,340	1,460	*	1,760
Big Thompson River	At Moccasin Street	87.3	1,010	1,210	1,400	2,170	2,409	3,700
Big Thompson River	Near Fun City	87.2	1,010	1,200	1,400	2,160	2,398	3,700
Big Thompson River	At Pine River Lane	87.1	1,010	1,200	1,390	2,160	2,398	3,700
Big Thompson River	At Riverside Drive & Turqoise Trail	87.1	1,010	1,200	1,390	2,150	2,387	3,700
Big Thompson River	At WorldMark Estes Park	86.5	1,000	1,190	1,380	2,150	2,387	3,700
Big Thompson River	At Mary’s Lake Road	85.5	985	1,170	1,360	2,100	2,331	3,700
Big Thompson River - I25 Split	Big Thompson River - I25 Split	*	1	1	195	652	4,380	10,945

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Black Canyon Creek	At Confluence with Big Thompson River	10	130	*	200	230	*	310
Black Canyon Creek	At Estes Park Corporate Limits	9.3	120	*	190	210	*	290
Black Canyon Creek	Appriximately 800 feet Upstream of W. Wonderview Avenue	9.9	160	250	275	305	339	875
Black Canyon Creek	Near MacGregor Avenue & Evergreen Lane	9.9	160	240	265	295	327	850
Black Canyon Creek	Upstream of Devils Gulch Road	9.0	160	240	265	295	327	820
Bobcat Gulch	At Confluence with North Fork Big Thompson River	2.73	1,000	*	1,700	2,050	*	3,000
Boxelder Creek	At Confluence with Cache La Poudre River	102.8	475	*	801	951	*	*
Boxelder Creek	Upstream of Prospect Road	102.3	893	*	2,418	3,378	*	*
Boxelder Creek	At Interstate 25	73.6	543	*	2,163	3,782	*	*
Boxelder Creek	Downstream of Burlington Northern Railroad	72.5	495	*	2,025	2,617	*	*
Boxelder Creek	Upstream of Burlington Northern Railroad	72.4	480	*	1,944	2,513	*	*

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Boxelder Creek	Upstream of Larimer and Weld Canal	70.9	669	*	2,064	2,622	*	*
Boxelder Creek	Upstream of County Road 50	70.7	671	*	3,433	6,646	*	*
Boxelder Creek	At County Road 52	67.6	301	*	602	960	*	*
Boxelder Creek	Upstream of divergence of Boxlder Creek Overflow Upstream	66.8	663	*	3,411	6,607	*	*
Boxelder Creek	At County Road 54	*	952	*	3,958	6,978	*	*
Boxelder Creek	Downstream of I-25 Near Wellington	24.46	900	*	1,670	2,140	*	3,100
Boxelder Creek	Upstream of I-25 Near Wellington	13.86	480	*	920	1,170	*	1,690
Boxelder Creek	Upstream of C&S Railroad	12.68	480	*	900	1,140	*	1,640
Boxelder Creek	Upstream of Windsor Ditch	10.84	470	*	850	1,080	*	1,530
Boxelder Creek Overflow Upstream	At Confluence with Boxelder Creek	*	349	*	2,914	6,047	*	*
Boxelder Creek Overflow Upstream	At County Road 52	*	351	*	2,763	5,578	*	*

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Boxelder Creek Overflow Upstream	At Divergence from Boxelder Creek	*	358	*	2,554	4,821	*	*
Buckhorn Creek	At Confluence with Big Thompson River	142.9	6,844		15,090	20,244	*	36,000
Buckhorn Creek	Downstream of Indian Creek below County Road 24H	143.8	4,850	8,695	12,591	17,408	36,383	32,501
Buckhorn Creek	Upstream of the confluence of Indian Creek	135.9	4,319	7,796	11,355	15,810	33,043	29,828
Buckhorn Creek	1750 feet downstream of Llama Ranch Road/Apple Valley	131.6	4,060	7,349	10,742	15,016	31,383	28,491
Buckhorn Creek	At Masonville below Redstone Creek	122.5	6,321	*	13,593	18,059	*	32,000
Buckhorn Creek	At Masonville above Redstone Creek	92	4,674	*	10,321	13,862	*	24,000
Cache La Poudre River	Intersection of County Road 32E/County Road 3/Downstream of Boxelder Creek I-25 Split	1,563.8	4,900	7,500	9,800	12,600	*	24,900
Cache La Poudre River	Interstate 25	1,521	5,400	8,500	10,600	14,300	*	28,000

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Cache La Poudre River	Downstream of Confluence with Boxelder Creek	1,515.4	6,000	8,600	10,700	14,600	*	26,500
Cache La Poudre River	Downstream of Confluence with Dry Creek	1,220.1	6,000	8,400	10,300	14,100	*	24,800
Cache La Poudre River	Upstream of Confluence with Boxelder Creek	1,220.1	5,800	8,300	10,300	14,000	*	24,800
Cache La Poudre River	North of intersection of State Highway 14/Riverside Drive	1,128.9	5,700	7,900	9,900	13,800	*	24,500
Cache La Poudre River	Upstream of Confluence with Dry Creek	1,128.9	5,600	7,900	9,800	13,300	*	23,600
Cache La Poudre River	Downstream of County Road 17 (Shields Street)	1,124.2	5,800	8,000	9,900	13,900	*	24,500
Cache La Poudre River Split R Path	At Confluence with Cache La Poudre River	*	418	*	1,617	2,427	*	*
Cache La Poudre Lowflow Channel	Upstream of Convergence with Cache La Poudre river	*	*	*	*	1,309	*	*
Cache La Poudre Lowflow Channel	At Fossil Creek Ditch Diversion Dam	*	*	*	*	12,071	*	*
Cache La Poudre L Path	Upstream of Convergence with Cache La Poudre River	*	*	*	1,142	3,983	*	16,015

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Cedar Creek	At Confluence with Big Thompson River	19.75	2,460	*	6,530	9,400	*	20,000
Clark Inlet Canal	At Interstate 25	*	*	*	*	1,830	*	*
Clark Outlet Ditch	Just Downstream of Clark Lake	*	*	*	*	90	*	*
Clark Spillway	Just Downstream of Clark Lake	*	*	*	*	103	*	*
Coal Creek	At Town of Wellington	10.6	42[2]	*	92[2]	120[2]	*	1,300
Coal Creek Split Flow	At the Confluence with Coal Creek	*	21	*	46	60	*	750
Cooper Slough	Downstream of Mulberry Street	27.4	127	*	215	280	*	*
Cooper Slough	Upstream of Mulberry Street	27.2	39	*	463	767	*	*
Cooper Slough	Downstream of Vine Drive	26.7	45	*	387	777	*	*
Cooper Slough	Upstream of Vine Drive	26.5	26	*	351	745	*	*
Cooper Slough Overflow	At Confluence with Lake Canal	*	568	*	987	1,267	*	*
Dark Gulch	At Confluence with Big Thompson River	1.10	560	*	950	1,250	*	1,850
Devils Gulch	At Confluence with West Creek	0.91	540	*	900	1,200	*	1,800

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Dickson Gulch	At Confluence with Big Thompson River	2.10	970	*	1,600	1,900	*	2,650
Dry Creek – At Big Thompson River	At Confluence with Big Thompson River	33.0	3,020	*	7,465	10,090	*	17,135
Dry Creek (North of Canal)	At Confluence with Larimer and Weld Canal	58.6	221	*	721	1,098	*	*
Dry Creek (South of Canal)	At Confluence with Cache La Poudre River	63.3	381	*	805	1,195	*	*
Dry Creek (South of Canal)	Downstream Diversion	*	1	*	4	6	*	*
Dry Creek (South of Canal)	At Lemay Avenue	*	29	*	73	109	*	*
Dry Gulch	At Confluence with Big Thompson River	6.25	1,200	*	2,150	2,600	*	4,100
Dry Gulch	At Confluence With Big Thompson River Downstream of Lake Estes	5.9	105	160	415	715	794	1,580
Dry Gulch	Approx. 500 Feet Upstream of Dry Gulch Road & N Lake Avenue	5.6	100	150	380	670	744	1,510

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Dry Gulch	Approx. 400 Feet Downstream of Dry Gulch Road & Wildfire Road	5.4	90	140	355	630	699	1,440
Dry Gulch	At Dry Gulch Road Crossing Just Upstream of Stone Gate Drive	4.3	80	120	300	535	594	1230
East Vine Diversion	Upstream of East Vine Drive	*	105	*	370	680	*	*
East Vine Diversion	At Larimer and Weld Canal	58.6	30	*	163	330	*	*
Fall River	At Confluence with Big Thompson River	39.9	450	*	610	680	*	830
Fall River	At Estes Park Corporate Limits	37.3	450	*	610	680	*	830
Fall River	At Upstream Detailed Study Limit	37.3	450	*	610	680	*	830
Fall River	Between W Elkhorn Avenue and Fibey Court	39.8	665	1,010	1,370	1,860	2,585	3,360
Fall River	Approx. 200 Feet Downstream of Old Ranger Drive	39.5	660	1,010	1,360	1,850	2,572	3,340

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Fall River	Approx. 260 Feet Upstream of Fall River Lane bridge	39.2	660	1,000	1,360	1,840	2,558	3,300
Fall River	At Fish Hatchery Road	36.5	580	885	1,200	1,650	2,294	2,885
Fall River	Approx. 900 feet downstream of Cascade Cottage	33.3	530	810	1,090	1,490	2,071	2,275
Fish Creek	At Lake Estes	16	105	*	280	400	*	840
Fish Creek	At Estes Park Corporate Limits	13.4	105	*	208	400	*	840
Fish Creek	At Upstream Detailed Study Limit	13.4	105	*	280	400	*	840
Fish Creek	Adjacent to Powelly Lane	15.7	177	407	637	970	1,472	3,359
Fish Creek	At Johnsen Lane	14.6	154	360	568	870	1,321	3,055
Fish Creek	250 Feet Upstream of Scott Avenue	13.2	141	326	515	786	1,193	2,750
Fish Creek	200 Feet Upstream of Little Valley Road	9.2	58	159	266	426	647	1,636
Fish Creek	100 Feet Upstream of Rockwood Lane	3.8	23	66	111	178	270	684
Fox Creek	At Confluence with North Fork Big Thompson River	7.35	1,200	*	2,200	2,750	*	4,800

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Glade Road Split	At confluence with Big Thompson River	*	*	*	744	4,425	12,336	19,671
Little Thompson River	1.2 miles downstream of County Road 15	186.5	4,636	7,381	10,795	15,765	20,810	32,297
Little Thompson River	900 feet upstream of Interstate 25	165.9	4,626	7,378	10,638	15,502	20,463	33,661
Little Thompson River	At Larimer-Weld County Line	138.9	*	*	*	9,500	*	19,300
Little Thompson River	At confluence of Dry Creek	133	*	*	*	9,200	*	18,800
Little Thompson River	At County Road 17	118.9	*	*	*	8,600	*	17,500
Little Thompson River	At County Road 21	113.2	*	*	*	8,300	*	16,900
Little Thompson River	At County Road 23E	107.7	*	*	*	8,000	*	16,300
Little Thompson River	3800 feet downstream of County Road 23E	109	3,645	6,941	10,646	15,342	20,251	26,665
Little Thompson River	Downstream of Chimney Hollow Road	93.9	2,732	5,323	8,239	11,999	20,878	24,335
Little Thompson River	1000 feet downstream of the confluence of Rowell Gulch	81.8	2,309	4,498	6,971	10,175	17,705	20,742

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Little Thompson River	Below confluence of North Fork Little Thompson River	71.7	2,209	4,273	6,611	9,651	16,793	19,682
Little Thompson River	At U.S. Highway 36	44	650	1,400	2,300	3,500	6,090	7,600
Little Thompson River	4000 feet downstream of U.S. Highway 36	44	650	1,400	2,300	3,500	6,090	7,600
Little Thompson River	Above confluence of North Fork Little Thompson River	43.8	892	1,903	3,153	4,850	8,439	10,796
Little Thompson River	Below confluence of West Fork Little Thompson River	43	650	1,400	2,200	3,400	5,916	7,500
Little Thompson River	Above confluence of West Fork Little Thompson River	18	74	240	480	840	1,462	2,300
Little Thompson River	At confluence of Lion Gulch	14	58	190	380	660	1,148	1,800
Little Thompson River	At confluence of Grizzly Gulch	8.8	37	120	230	410	713	1,100
Little Thompson River	Downstream of the confluence of Big Gulch (downstream of Meadowdale Lane)	5.8	30	89	170	300	522	780

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Little Thompson River	Upstream of the confluence of Big Gulch downstream of Meadowdale Lane	2.9	14	43	86	150	261	400
Little Thompson – Spill Reach	At Confluence with Little Thompson River	*	*	*	*	3,827	*	12,511
Long Gulch	At Confluence with Big Thompson River	2.0	1,000	*	1,660	2,000	*	2,870
Miller Fork	At Confluence with North Fork Big Thompson River	13.67	1,350	*	2,650	3,350	*	6,300
Noel's Draw	At Confluence with Big Thompson River	3.41	1,050	*	1,800	2,200	*	3,400
North Fork Big Thompson River	At Drake Road	83	1,500	*	4,100	6,100	*	14,100
North Fork Big Thompson River	At Glen Haven Below Devils Gulch	51.0	1,450	*	3,400	4,400	*	11,500
North Fork Little Thompson River	Downstream of Fox Creek before West Creek	26.2	864	1436	2,112	3,078	4,432	6,632
North Fork Little Thompson River	Upstream of the Confluence of Fox Creek	18.9	18.9	1,297	1,839	2,589	3,728	5,267
Old Dry Creek (Historical Channel)	At Confluence with Cache La Poudre River	*	*	*	*	939	*	*

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Quillian Gulch	At Confluence with Big Thompson River	3.01	1,050	*	1,750	2,100	*	3,200
Rabbit Gulch	At Confluence with Big Thompson River	3.45	1,050	*	1,800	2,200	*	3,400
Redstone Creek	At Confluence with Buckhorn Creek	30.5	4,187	*	9,217	12,370	*	22,500
Redstone Creek	700 feet upstream of intersection of County Road 25E and Red Cliff Road Gate 2	24.4	713	1,418	2,191	3,175	6,636	6,352
Redstone Creek	Near intersection of County Road 25E and Feverfew Road	17.5	402	831	1,317	1,950	4,075	4,042
Sherry Drive Overflow	Upstream of Cache La Poudre Reservoir Inlet	*	45	180	*	282	*	*
Spring Creek	At Confluence with Cache La Poudre River	*	1,380	*	*	2,570	*	*
Spring Creek	At C&S Railroad	*	1,370	*	*	2,510	*	*
Spring Creek	At Lemay Avenue	*	1,390	*	*	3,520	*	*
Spring Creek	At Stover Street	*	1,060	*	*	2,300	*	*
Spring Creek	At College Avenue	*	1,040	*	*	1,970	*	*
Spring Creek	At Burlington Northern Railroad	*	1,040	*	*	1,970	*	*

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
Spring Creek	At Arthur Ditch	*	1,010	*	*	2,930	*	*
Spring Creek	At Shields Street	*	920	*	*	2,290	*	*
Spring Creek	At Larimer County Canal #2	*	890	*	*	2,430	*	*
Spring Creek	At New Mercer Ditch	*	830	*	*	1,990	*	*
Spring Creek	At Drake Road	*	650	*	*	1,540	*	*
Spring Creek	At Taft Hill Road	*	390	*	*	840	*	*
Spring Creek	Upstream of Taft Hill Road Detention Pond	*	420	*	*	1,570	*	*
Spring Creek	At Pleasant Valley and Lake Canal	*	280	*	*	1,130	*	*
Tributary BT-1	At Confluence with Big Thompson River	0.31	260	*	390	570	*	900
Tributary BT-2	At Confluence with Big Thompson River	1.63	750	*	1,250	1,650	*	2,400
Tributary BT-3	At Confluence with Big Thompson River	1.51	720	*	1,200	1,550	*	2,300
Tributary BT-4	At Confluence with Big Thompson River	0.25	200	*	340	500	*	800
West Creek	At Confluence with North Fork Big Thompson River	24.8	555	1,084	1,752	2,702	3,891	6,296

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance Plus	0.2% Annual Chance
West Creek	Downstream of the Confluence of Devils Gulch	24.2	538	1,047	1,692	2,609	3,757	6,080
West Creek	Upstream of the Confluence of Devils Gulch	23.2	513	989	1,593	2,456	3,537	5,714
West Fork Little Thompson River	At confluence with Little Thompson River	25	600	1,100	1,800	2,600	4,524	5,300
West Fork Little Thompson River	Downstream of Deer Creek 2500 feet before paralleling Big Elk Road	21	540	1,000	1,600	2,300	4,002	4,500
West Fork Little Thompson River	By Aspen Drive 2300 feet downstream of Deer Creek	20	500	930	1,400	2,100	3,654	4,100
West Fork Little Thompson River	At Willow Lake 2400 feet upstream of Deer Creek	15	370	690	1,100	1,600	2,784	3,300

*Not calculated for this Flood Risk Project

[2]Discharges Decrease Due to Flows Diverted to Clark Lake

Figure 7: Frequency Discharge-Drainage Area Curves

[Not applicable to this Flood Risk Project]

Table 10: Summary of Non-Coastal Stillwater Elevations

	Elevation (Feet NAVD)			
Flooding Source	10-Year	50-Year	100-Year	500-Year
Clark Lake[1]	--	--	5,303.7	--
Lake Loveland[2]	--	--	5,014.5	--

[1]North American Vertical Datum of 1998
[2]North American Vertical Datum of 1988

Table 11: Stream Gage Information used to Determine Discharges

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Big Thompson River	06733000	USGS	Big Thompson at Estes Park, CO	138	6/21/1947	6/13/2015
Big Thompson River	06735500	USGS	Big Thompson near Estes Park, CO	155	7/18/1930	7/13/1995
Fall River	06732500	USGS	Fall River near Estes Park, CO	40	6/25/1945	10/18/1975
Little Thompson River	06742000	USGS	Little Thompson River Near Berthoud, CO	100	7/20/1929	7/3/2012

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 on Table 23, “Floodway Data.”

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

Table 12: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Big Thompson River	At Larimer-Weld County Boundary	Approximately 350 feet downstream of S County Rd 9E	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Big Thompson River	Approximately 350 feet downstream of S County Rd 9E	Confluence with Dry Creek – At Big Thompson River	HEC-HMS 3.5	SRH-2D Version 12.2.13	2/28/2018	Zone AE with Floodway	
Big Thompson River	Confluence with Dry Creek – At Big Thompson River	Confluence of Buckhorn Creek	HEC-HMS 3.5	HEC-RAS Version 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Big Thompson River	Confluence of Buckhorn Creek	Approximately 0.6 miles upstream of N Co Rd 31D	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	XS Lettering not tied into effective data. Inconsistent lettering to be addressed during future study.
Big Thompson River	Approximately 0.6 miles upstream of N Co Rd 31D	At Olympus Dam	Gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	XS Lettering not tied into effective data. Inconsistent lettering to be addressed during future study.
Big Thompson River	At Olympus Dam	Approximately 0.3 Miles Upstream of W Riverside Drive	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
Big Thompson River	Approximately 0.3 Miles Upstream of W Riverside Drive	Approximately 0.3 Miles Upstream of Tunnel Road	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	XS Lettering not tied into effective data. Inconsistent lettering to be addressed during future study.
Big Thompson River	Approximately 0.3 Miles Upstream of Tunnel Road	Approximately 0.5 Miles Upstream of S Moraine Road	HEC-HMS 3.5	HE-RAS Version 5.0.3	2/28/2018	Zone A	

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
Big Thompson River – I25 Split	Confluence with Big Thompson River	Divergence from Big Thompson River	NP	NP	11/16/2017	Zone AE with Floodway	LOMR 16-08-1159P
Black Canyon Creek	Confluence with Big Thompson River	200 feet upstream of Devil Gulch Rd	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
Bobcat Gulch	Confluence with North Fork Big Thompson River	0.2 upstream of confluence with North Fork Big Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Boxelder Creek	Confluence with Cache La Poudre River	Approximately 0.4 miles downstream of E County road 54	NP	NP	2/21/2019	Zone AE with Floodway	LOMR 17-08-1354P
Boxelder Creek	Approximately 0.4 miles downstream of E County road 54	Approximately 100 feet upstream of E County Road 66	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Boxelder Creek	Approximately 100 feet upstream of E County Road 66	At SE Frontage Road	MODSWMM model	Field survey data and ortho-photo based topographic mapping	2005	Zone A	
Boxelder Creek - Larimer County Road 58 DFP	Confluence with Boxelder Creek	Approximately 20 feet downstream of E County Road 58	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Boxelder Creek – Larimer County Road 60 DFP	Confluence with Indian Creek	Approximately 0.2 miles upstream of McClellan Road	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Boxelder Creek – Legacy Lane DFP	Confluence with Boxelder Creek	Approximately 0.8 miles upstream of confluence with Boxelder Creek	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	

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
Boxelder Creek DFP	Confluence with Indian Creek	Approximately 0.5 miles upstream of confluence with Indian Creek	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Boxelder Creek Overflow – Upstream	Confluence with Boxelder Creek	Divergence from Boxelder Creek	NP	NP	2019	Zone AE with Floodway	LOMR 17-08-1354P
Buckhorn Creek	Confluence with Big Thompson River	At Buckhorn Road	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Buckhorn Creek	At Buckhorn Road	1 mile upstream of Ballard Rd and Donner Hill Trail	HEC-HMS 3.5	HEC-RAS 5.0.1	2/28/2017	Zone A	
Cache La Poudre Lowflow Channel	Confluence with Cache La Poudre River	1.9 miles upstream of confluence with Cache La Poudre River	HEC-I	USACE HEC-2	10/1/2005	Zone AE	
Cache La Poudre River	Confluence with South Platte River	Approximately 0.3 miles upstream of N Shields Street	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River	Approximately 0.3 miles upstream of N Shields Street	Approximately 0.7 miles upstream of N Taft Hill Road	HEC-1	USACE-HEC-2	10/1/2005	Zone AE with Floodway	Portions of floodway were studied using the one-foot floodway requirement. LOMR 17-08-0129P partially supersedes.
Cache La Poudre River – 3 Bells	Confluence with Cache La Poudre River	Approximately 0.5 miles upstream of confluence with Cache La Poudre River	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE	
Cache La Poudre River – College SFP	Confluence with Cache La Poudre River	Approximately 250 feet upstream of U.S. Highway 287	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	

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
Cache La Poudre River – County Road 36	Confluence with Cache La Poudre River – I25 Divided Flow Path	Divergence from Cache La Poudre River – I25 Divided Flow Path – L1	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE	
Cache La Poudre River – Dry Creek	Confluence with Cache La Poudre River – Mulberry Split	Pascal Street crossing	HEC-l SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE	
Cache La Poudre River – Environmental Learning Center SFP	Confluence with Cache La Poudre River	Approximately 0.8 miles upstream of confluence with Cache La Poudre River	HEC-l SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-Ras Version 5.0.5	1/31/2020	Zone AE	
Cache La Poudre River – I25 Divided Divided Flow Path	Confluence with Cache La Poudre River	Divergence from Cache La Poudre River	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River – I25 Divided Flow Path – L1	Confluence with Cache La Poudre River – I25 Divided Flow Path	Divergence from Cache La Poudre River – I25 Divided Flow Path	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River – I25 Divided Flow Path – L2	Confluence with Cache La Poudre River – I25 Divided Flow Path	Divergence from Cache La Poudre River – I25 Divided Flow Path	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS Version 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River – I25 Divided Flow Path – L3	Confluence with Cache La Poudre River – I25 Divided Flow Path	Approximately 0.7 miles upstream of confluence with Cache La Poudre River – I25 Divided Flow Path	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS 5.0.5	1/31/2020	Zone AE	
Cache La Poudre River – I25 Divided Flow Path – R1	Confluence with Cache La Poudre River – I25 Divided Flow Path	Approximately 75 feet upstream of Mariah Lane	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS 5.0.5	1/31/2020	Zone AE	

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
Cache La Poudre River – Larimer County Road 32E SFP	Confluence with Cache La Poudre River	Divergence from Cache La Poudre River – State Highway 392 SFP	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River – Lee Martinez SFP	Confluence with Cache La Poudre River	Divergence from Cache La Poudre River	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River – Linc SFP	Confluence with Cache La Poudre River – Dry Creek	Divergence from Cache La Poudre River	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS 5.0.5	1/31/2020	Zone AE	
Cache La Poudre River – LPATH SFP	Confluence with Cache La Poudre River	Approximately 1.7 miles upstream of confluence with Cache La Poudre River	SWMM 5 Version 5.0.005 (May 2005 and up)	HEC-RAS 5.0.5	1/31/2020	Zone AE with Floodway	
Cache La Poudre River Split R Path	Confluence with Cache La Poudre River	Divergence from Boxelder Creek	NP	NP	2/21/2019	Zone AE with Floodway	LOMR 17-08-1354P
Cedar Creek	Confluence with Big Thompson River	650 feet upstream of confluence with Big Thompson River	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
Clark Inlet Canal	At Interstate 25 Frontage Road	Approximately 150 feet upstream of Burlington Northern Railroad	NP	NP	2/4/2013	Zone AE with Floodway	LOMR 12-08-1629P
Clark Spillway	At Indian Creek	Clark Lake	NP	NP	2/4/2013	Zone AE with Floodway	LOMR 12-08-1629P
Coal Creek	Confluence with Boxelder Creek	2.4 miles upstream of confluence with Boxelder Creek	MODSWMM model	field survey data and ortho- photo based topographic mapping	2/4/2013	Zone AE	LOMR 12-08-1629P
Coal Creek Split Flow	Confluence with Coal Creek	Divergence from Coal Creek	NP	NP	2/4/2013	Zone AE	LOMR 12-08-1629P

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
Cooper Slough	Confluence with Lake Canal	At East Poudre Trail	NP	NP	2/21/2019	Zone AE with Floodway	LOMR 17-08-1354P
Cooper Slough Overflow	Confluence with Lake Canal	Divergence from Cooper Slough	NP	NP	2/21/2019	Zone AE with Floodway	LOMR 17-08-1354P
Dark Gulch	Confluence with Big Thompson River	At Devils Gulch Road	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Devils Gulch	Confluence with West Creek	0.2 miles upstream of confluence with West Creek	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	For the floodway, the mountain area criteria was based upon the channel of the stream plus all flood plain areas where the depth of flooding was 18 inches or greater and the floodway fringe area was the area where flooding depths were 18 inches or less and velocities were 3 feet per second or less.
Dickson Gulch	Confluence with Big Thompson River	0.4 miles downstream of Deer Meadow Drive	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Dry Creek – At Big Thompson River	Confluence with Big Thompson River	900 feet upstream of Cedar Valley Drive	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	

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
Dry Creek	Confluence with Little Thompson River	1.2 miles upstream of Schofield Rd	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone A	
Dry Creek (North of Canal)	Confluence with Larimer and Weld Canal	1.7 miles upstream of confluence with Larimer and Weld Canal	HEC-1, EPA-SWMM, MODSWMM	USACE HEC-3.1.3	6/17/2008	Zone AE with Floodway	
Dry Creek (South of Canal)	Confluence with Cache La Poudre River	Apprximately 1,410 Feet Upstream of the Confluence of Old Dry Creek (Historical Channel)	HEC-1, EPA-SWMM, MODSWMM	USACE HEC-3.1.3	6/17/2008	Zone AE with Floodway	
Dry Creek (South of Canal)	Apprximately 1,410 Feet Upstream of the Confluence of Old Dry Creek (Historical Channel)	Approximately 890 Feet Upstream of Redwood Street	NP	NP	6/15/2020	Zone AE with Floodway	LOMR 19-08-0751P
Dry Creek (West)	Confluence with Little Thompson River	3.0 miles upstream of confluence with Little Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone A	
Dry Gulch	Confluence with Big Thompson River	400 feet upstream of Stonegate Drive	HEC-HMS 3.5	HEC-RAS 5.0.3	2/28/2018	Zone AE with Floodway	
East Vine Diversion	Confluence with Dry Creek (South of Canal)	Divergence from Larimer and Weld Canal	NP	NP	6/15/2020	Zone AE with Floodway	19-08-0751P
Fall River	Confluence with Big Thompson River	0.2 miles upstream of Fish Hatchery Road	HEC-HMS 3.5	HEC-RAS 5.0.3	2/28/2018	Zone AE with Floodway	

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
Fall River	Upstream of detailed study	NP	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-RAS	4/1/1985	Zone A	
Fish Creek	Confluence with Lake Estes	Lili Lake	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
Fox Creek	Confluence with North Fork Big Thompson River	0.4 miles upstream of Fox Creek Road	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
Glade Road Split	Confluence with Big Thompson River	150 feet downstream of Becker Ln	HEC-HMS 3.5	HEC-RAS 5.01 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Larimer and Weld Canal	Downstream Face of Mulberry Street Bridge	125 feet upstream of Unnamed Bridge	HEC-1, EPA-SWMM, MODSWMM	USACE HEC-3.1.3	6/17/2008	Zone AE with Floodway	
Little Thompson River	Larimer-Weld County Boundary	0.7 miles upstream of Parrish Ranch Road (In Boulder County)	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Little Thompson River	0.7 miles upstream of Parrish Ranch Road	Confluence of West Fork Little Thompson River	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone A	
Little Thompson River	Confluence of West Fork Little Thompson River	0.2 miles downstream of Hermit Park Road	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Little Thompson River – Railroad Split	1500 feet upstream of Great Western Railroad	State Hwy 257	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Little Thompson River – Schaal Split	Confluence with Little Thompson River	0.5 miles upstream of Co Rd 3	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	

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
Little Thompson River – SH60 Split	Broad St	750 feet upstream of State Hwy 257	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Long Gulch	Confluence with Big Thompson River	0.4 miles upstream of confluence with Big Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Miller Fork	Confluence with North Fork Big Thompson River	0.2 miles upstream of confluence with Big Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Noel's Draw	Confluence with Big Thompson River	0.1 miles upstream of confluence with Big Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
North Fork Big Thompson Rvier	Confluence of Big Thompson River	Approximately 0.1 miles downstream of Horseshoe Bend Road	Gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
North Fork Big Thompson River	Approximately 0.1 miles downstream of Horseshoe Bend Road	0.3 miles upstream of North Fork Road	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
North Fork Little Thompson River	Confluence with Little Thompson River	13 miles upstream of confluence with Little Thompson River	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone A	
Old Dry Creek (Historic Channel)	Confluence with Cache La Poudre River	Confluence with Dry Creek (South of Canal)	HEC-1, EPA-SWMM, MODSWMM	USACE HEC-3.1.3	6/17/2008	Zone AE with Floodway	

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
Quillan Gulch	Confluence with Big Thompson River	At N County Road 25E	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone A, AE with Floodway	
Rabbit Gulch	Confluence with Big Thompson River	0.2 miles upstream of confluence with Big Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Redstone Creek	Confluence with Buckhorn Creek	700 feet upstream of Co Rd 25E	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone AE with Floodway	
Redstone Creek	700 feet upstream of Co Rd 25E	Co Rd 41	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone A	
Sherry Drive Overflow	1000 ft above confluence with Cache La Poudre Reservoir Inlet Ditch	At Shire Court	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Sherry Drive Overflow	Confluence with Cache La Poudre Reservoir Inlet Canal	Divergence from Lake Canal	NP	NP	2/21/2019	Zone AE with FLoodway	LOMR – 17-08-1354P
Shields Street Divided Flow Path – Hill Pond Road	NP	NP	UDSWMM2000 version 1.4, MODSWMM	USACE HEC-RAS River Analysis System, Version 3.1.3	5/2/2012	Zone A	
Shields Street Divided Flow Path – Shire Court	NP	NP	UDSWMM2000 version 1.4, MODSWMM	USACE HEC-RAS River Analysis System, Version 3.1.3	5/2/2012	Zone A	

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
Shields Street Divided Flow Path – Windtrail Swale	NP	NP	UDSWMM2000 version 1.4, MODSWMM	USACE HEC-RAS River Analysis System, Version 3.1.3	5/2/2012	Zone A	
Shields Street Overflow	Confluence with Spring Creek	0.2 miles upstream of confluence with Spring Creek	UDSWMM2000 version 1.4, MODSWMM	USACE HEC-RAS River Analysis System, Version 3.1.3	5/2/2012	Zone AE with Floodway	
Spring Canyon Park Diversion	Confluence with Spring Creek	0.1 miles upstream of confluence with Spring Creek	UDSWMM2000 version 1.4, MODSWMM	USACE HEC-RAS River Analysis System, Version 3.1.3	5/2/2012	Zone AE with Floodway	
Spring Creek	Confluence with Cache La Poudre River	At Welch Street	UDSWMM2000 version 1.4, MODSWMM	USACE HEC-RAS River Analysis System, Version 3.1.3	5/2/2012	Zone AE with Floodway	
Spring Creek	Approximately 180 Feet Downstream from Central and Southern Railroad	Approximately 230 Feet Downstream from Central and Southern Railroad	NP	NP	3/28/2016	Zone AE with Floodway	
Spring Creek	Approximately 50 Feet Upstream of College Avenue	Downstream of C and S Railroad	NP	NP	2/26/2018	Zone AE with Floodway	
Tributary BT-1	Confluence with Big Thompson River	0.1 miles upstream of Canyon River Road	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone A, AE with Floodway	
Tributary BT-2	Confluence with Big Thompson River	At Canyon Cove Lane	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	

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
Tributary BT-3	Confluence with Big Thompson River	0.1 miles upstream of US Highway 34	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
Tributary BT-4	Confluence with Big Thompson River	0.1 miles upstream of confluence with Big Thompson River	gage records and regression equations analyzed using the log-Pearson Type III	USACE HEC-2	4/1/1985	Zone AE with Floodway	
West Creek	Confluence with Big Thompson River	261 feet upstream of confluence with Big Thompson River	HEC-HMS 3.5	HEC-RAS Version 5.0.3	2/28/2018	Zone AE with Floodway	
West Fork Little Thompson River	Confluence with Little Thompson River	2.3 miles upstream of CO Rd 82E	HEC-HMS 3.5	HEC-RAS 5.0.1 and HEC-RAS 4.1.0	2/28/2017	Zone A	

Table 13: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
Big Thompson River	0.03 – 0.078	0.013 – 1
Big Thompson River – I25 Split	0.025 – 0.05	0.025 – 0.05
Black Canyon Creek	0.34 – 0.05	0.016 – 0.1
Bobcat Gulch	0.035 – 0.045	0.050 – 0.060
Boxelder Creek	0.02 - 0.08	0.02 - 0.094
Boxelder Creek – Larimer County Road 58 DFP	0.065 - 0.08	0.065 - 0.08
Boxelder Creek – Larimer County Road 60 DFP	0.02 - 0.04	0.025 - 0.055
Boxelder Creek – Legacy Lane DFP	0.04 - 0.04	0.08 - 0.08
Boxelder Creek DFP	0.044 - 0.044	0.06 - 0.06
Buckhorn Creek	0.032 – 0.055	0.016 – 0.12
Cache La Poudre River	0.02 - 0.103	0 - 0.85
Cache La Poudre River – 3 Bells	0.02 - 0.04	0.04 - 0.04
Cache La Poudre River – College SFP	0.04 - 0.05	0.04 - 0.05
Cache La Poudre River – County Road 36	0.015 - 0.06	0.015 - 0.06
Cache La Poudre River – Dry Creek	0.02 - 0.08	0.02 - 0.08
Cache La Poudre River – Environmental Learning Center SFP	0.053 - 0.055	0.02 - 0.08
Cache La Poudre River – I25 Divided Flow Path	0.015 - 0.065	0.015 - 0.065
Cache La Poudre River – I25 Divided Flow Path – L1	0.015 - 0.08	0.015 - 0.06
Cache La Poudre River – I25 Divided Flow Path – L2	0.02 - 0.08	0.02 - 0.08
Cache La Poudre River – I25 Divided Flow Path – L3	0.025 - 0.06	0.025 - 0.06
Cache La Poudre River – I25 Divided Flow Path – R1	0.02 - 0.05	0.02 - 0.06
Cache La Poudre River – Lee Martinez SFP	0.02 - 0.098	0.05 - 0.098
Cache La Poudre River – Linc SFP	0.025 - 0.06	0.025 - 0.06
Cache La Poudre River – LPATH SFP	0.02 - 0.06	0.02 - 0.06
Cache La Poudre River – Mulberry Split	0.025 - 0.065	0.025 - 0.05
Cache La Poudre River – RProspect SFP	0.02 - 0.08	0.02 - 0.08

Flooding Source	Channel “n”	Overbank “n”
Cache La Poudre River – POE Pit SFP	0.02 - 0.06	0.04 - 0.06
Cache La Poudre River – SRigden	0.02 - 0.05	0.04 - 0.05
Cedar Creek	0.035 – 0.045	0.050 – 0.060
Coal Creek	0.040 – 0.070	0.050 – 0.070
Dark Gulch	0.035 – 0.045	0.050 – 0.060
Devils Gulch	0.035 – 0.045	0.050 – 0.060
Dickson Gulch	0.035 – 0.045	0.050 – 0.060
Dry Creek	0.03 - 0.055	0.015 - 0.105
Dry Creek – At Big Thompson River	0.035 – 0.085	0.016 – 0.095
Dry Gulch	0.04 – 0.045	0.016 – 0.1
Fox Creek	0.041 – 0.055	0.025 – 0.082
Glade Road Split	0.016 – 0.085	0.016 – 0.085
Indian Creek	0.04-0.045	0.04 - 0.08
Little Thompson River	0.03 - 0.065	0.016 - 0.12
Little Thompson River – Railroad Split	0.045 – 0.055	0.016 – 0.12
Little Thompson River – Schaal Split	0.054 – 0.055	0.045 – 0.085
Little Thompson River – SH60 Split	0.016 – 0.085	0.016 – 0.1
Long Gulch	0.035 – 0.045	0.050 – 0.060
Miller Fork	0.035 – 0.045	0.050 – 0.060
Noel’s Draw	0.035 – 0.045	0.050 – 0.060
North Fork Big Thompson River	0.035 – 0.045	0.050 – 0.060
North Fork Little Thompson River	0.03 - 0.055	0.04 - 0.11
Quillian Gulch	0.035 – 0.045	0.050 – 0.060
Rabbit Gulch	0.035 – 0.045	0.050 – 0.060
Redstone Creek	0.03 – 0.05	0.016 – 0.12
Tributary BT-1	0.035 – 0.045	0.050 – 0.060
Tributary BT-2	0.035 – 0.045	0.050 – 0.060
Tributary BT-3	0.035 – 0.045	0.050 – 0.060
Tributary BT-4	0.035 – 0.045	0.050 – 0.060
West Creek	0.048 – 0.052	0.025 – 0.085
West Fork Little Thompson River	0.032 - 0.055	0.02 - 0.12

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% 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 www.ngs.noaa.gov.

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

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

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

Table 19: Countywide Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

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

Table 20: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Bobcat Gulch	3.7
Boxelder Creek	3.0
Boxelder Creek I-25 Split	3.0
Boxelder Creek I-25 Split Overflow	3.0

Table 20: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Boxelder Creek – Left Overbank Divided Flow at Indian Creek	3.0
Boxelder Creek Overflow - Downstream	3.0
Cache La Poudre LEMAYDS	3.0
Cache La Poudre LINC	3.0
Cache La Poudre Low Flow Channel	3.0
Cache La Poudre LPATH	3.0
Cache La Poudre River	3.0
Cache La Poudre Rive Split LPATH	3.0
Cedar Creek	3.5
Coal Creek	3.0
Cooper Slough	3.0
Cooper Slough Overflow	3.0
Dark Gulch	4.0
Devils Gulch	4.0
Dickson Gulch	3.4
Dry Creek (North of Canal)	3.0
Fall River Overflow	4.2
Little Thompson River	3.0
Little Thompson River – Spill Reach	3.0
Long Gulch	3.9
Miller Fork	4.0
Noel's Draw	4.0
North Fork Big Thompson River	3.9
Quillian Gulch	3.7
Rabbit Gulch	3.9
Sherry Drive Overflow	3.0
Shields Street Divided Flow Path – Hill Pond Road	3.0
Shields Street Divided Flow Path – Shire Court	3.0
Shields Street Divided Flow Path – Windtrail Swale	3.0
Spring Creek	3.0
Tributary BT-1	4.0

Table 20: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Tributary BT-2	4.0
Tributary BT-3	4.0
Tributary BT-4	4.0

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-and-standards-flood-risk-analysis-and-mapping.

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

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Political boundaries	Larimer County GIS Department	2018	N/A	Municipal and county boundaries
Public Land Survey System (PLSS)	FEMA National Flood Hazard Layer Database	2013	N/A	Spatial and attribute information for PLSS data were derived from NFHL database
Surface Water Features	FEMA National Flood Hazard Layer Database	2013	N/A	Streams, rivers, and lakes were derived from NHFL database
Transportation Features	Larimer County GIS Department	2018	N/A	Roads and railroads were delineated from County GIS Department data

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

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

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data					
		Description	Scale	Contour Interval	$RMSE_z$	$Accuracy_z$	Citation
Berthoud, Town of; Loveland, City of; Estes Park, Town of; Johnstown, Town of; Larimer County, Unincorporated Areas	Big Thomspon River and Tributaries, Buckhorn Creek, Redstone Creek, Cache La Poudre River, Dry Creek, Dry Creek – At Big Thompson River, Little Thompson River and Tributaries, Fish Creek, Fall River, West Creek	Light Detection and Ranging data (LiDAR)	N/A	2 ft	3 cm	0.6 m	USGS 2013
Larimer County, Unincorporated Areas	Big Thompson River and Tributaries	Contour lines	N/A	N/A	N/A	N/A	Kucera 1981
Larimer County, Unincorporated Areas	Cache La Poudre River	Contour lines	1:1,200	2 ft	N/A	N/A	ARIX 1984

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data					
		Description	Scale	Contour Interval	$RMSE_z$	$Accuracy_z$	Citation
Larimer County, Unincorporated Areas; Wellington, Town of	Boxelder Creek, Cooper Slough	Contour lines	1:100	2 ft	N/A	N/A	M&I 1977
Fort Collins, City of; Larimer County, Unincorporated Areas	Spring Creek	Contour lines	1:1, 200	2 ft	N/A	N/A	Greenhorne
Fort Collins, City of; Larimer County, Unincorporated Areas	Spring Creek	Contour lines	1:1,200	1 ft	N/A	N/A	Greenhorne
Fort Collins, City of; Larimer County, Unincorporated Areas	Spring Creek	Contour lines	1:1,200	2 ft	N/A	N/A	Nelson 1974
Fort Collins, City of; Larimer County, Unincorporated Areas	Spring Creek	Contour lines	1:1,200	2 ft	N/A	N/A	ARIX 1984
Fort Collins, City of; Larimer County, Unincorporated Areas	Spring Creek	Contour lines	1:1,200	2 ft	N/A	N/A	Scharf 1986

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface 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.

Table 23: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Y	82,986	1,256	6,014	3.3	4,813.3	4,813.3	4,813.6	0.3
Z	86,668	959	4,789	4.1	4,820.0	4,820.0	4,820.4	0.4
AA	88,226	1,540	6,703	2.9	4,823.3	4,823.3	4,823.3	0.0
AB	89,101	1,945	8,554	2.3	4,824.0	4,824.0	4,824.0	0.0
AC	92,098	1,684	5,476	3.6	4,826.1	4,826.1	4,826.5	0.4
AD	97,440	1,500	5,017	3.9	4,833.3	4,833.3	4,833.4	0.1
AE	98,201	1,470	5,722	3.4	4,835.0	4,835.0	4,835.0	0.0
AF	101,140	1,405	5,659	3.5	4,838.1	4,838.1	4,838.4	0.3
AG	103,233	1,083	4,106	4.8	4,842.1	4,842.1	4,842.1	0.0
AH	104,990	1,370	4,969	3.9	4,845.1	4,845.1	4,845.5	0.4
AI	105,261	1,320	5,765	3.8	4,845.5	4,845.5	4,845.9	0.4
AJ	107,001	123	1,063	15.9	4,847.9	4,847.9	4,847.9	0.0
AK	107,486	2,168	18,866	1.2	4,856.1	4,856.1	4,856.1	0.0
AL	109,870	2,486	8,728	2.5	4,856.1	4,856.1	4,856.2	0.1
AM	111,661	1,921	5,935	3.7	4,859.4	4,859.4	4,859.4	0.0
AN	113,518	3,454	6,916	3.1	4,862.0	4,862.0	4,862.0	0.0
AO	115,164	3,680	4,894	4.4	4,867.2	4,867.2	4,867.2	0.0
AP	116,964	3,704	3,168	6.9	4,870.3	4,870.3	4,870.4	0.1
AQ	118,843	2,602	5,357	3.9	4,876.5	4,876.5	4,876.5	0.0
AR	120,152	2,289	5,400	3.9	4,877.8	4,877.8	4,877.8	0.0

[1]Feet above confluence with South Platte River
XS A-X located in Weld County FIS

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
*[2]	120,736	3,050	*	3.4	4,884.1	4,884.1	4,884.1	0.0
*[2]	122,238	2,090	*	3.7	4,885.1	4,885.1	4,885.1	0.0
*[2]	123,360	1,448	*	11.7	4,887.8	4,887.8	4,887.8	0.0
*[2]	124,710	2,508	*	10.9	4,892.9	4,892.9	4893.1	0.2
*[2]	125,516	301	*	10.5	4,896.1	4,896.1	4,896.1	0.0
*[2]	126,360	2,633	*	5.7	4,900.1	4,900.1	4,900.1	0.0
*[2]	127,210	3,530	*	8.5	4,900.8	4,900.8	4,900.8	0.0
*[2]	128,097	1,696	*	7.7	4,903.4	4,903.4	4,903.4	0.0
*[2]	129,066	1,173	*	6.7	4,911.6	4,911.6	4,912.0	0.4
*[2]	130,209	2,340	*	4.7	4,912.8	4,912.8	4,913.0	0.2
*[2]	131,251	2,142	*	5.6	4,914.9	4,914.9	4,915.0	0.1
*[2]	133,470	1,377	*	10.5	4,918.1	4,918.1	4,918.1	0.0
*[2]	134,380	1,609	*	5.8	4,923.8	4,923.8	4,924.0	0.2
*[2]	135,168	1,874	*	6.2	4,924.7	4,924.7	4,925.0	0.3
*[2]	136,018	1,556	*	5.9	4,927.9	4,927.9	4,928.0	0.1
*[2]	137,090	2,133	*	5.3	4,930.0	4,930.0	4,930.0	0.0
*[2]	137,839	2,138	*	11.3	4,931.1	4,931.1	4,931.1	0.0
*[2]	138,548	1,645	*	6.0	4,936.1	4,936.1	4,936.1	0.0
*[2]	139,479	1,905	*	7.5	4,939.0	4,939.0	4,939.0	0.0
*[2]	140,718	2,889	*	4.2	4,942.1	4,942.1	4,942.1	0.0
*[2]	141,851	3,311	*	7.2	4,944.1	4,944.1	4,944.1	0.0
*[2]	142,499	868	*	8.7	4,946.8	4,946.8	4,947.0	0.2

[1]Feet above confluence with South Platte River

[2]Values computed using a 2D model. Locations are represented by the BFEs on the FIRMs. Additional information is available to help determine floodway information including depth and velocity grids. Contact the Larimer County Floodplain Administrator for more information.

* Data not available

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
*[2]	143,106	2,748	*	6.4	4,949.9	4,949.9	4,950.0	0.0
*[2]	143,823	3,043	*	5.5	4,951.0	4,951.0	4,951.0	0.0
*[2]	144,573	2,705	*	10.3	4,954.8	4,954.8	4,955.0	0.0
*[2]	145,401	2,845	*	7.7	4,958.9	4,958.9	4,959.0	0.1
*[2]	145,976	3,449	*	8.3	4,960.9	4,960.9	4,961.0	0.1
*[2]	146,812	954	*	7.9	4,964.0	4,964.0	4,964.0	0.0
*[2]	147,512	1,272	*	5.7	4,966.0	4,966.0	4,966.0	0.0
*[2]	148,207	1,122	*	7.7	4,967.9	4,967.9	4,968.0	0.1
*[2]	148,749	2,032	*	5.2	4,969.9	4,969.9	4,970.0	0.1
*[2]	149,471	975	*	5.6	4,971.0	4,971.0	4,971.0	0.0
*[2]	149,795	1,527	*	5.1	4,972.0	4,972.0	4,972.0	0.0
*[2]	150,373	1,323	*	8.6	4,972.9	4,972.9	4,973.0	0.1
*[2]	150,834	1,686	*	9.2	4,974.9	4,974.9	4,975.0	0.1
*[2]	151,507	1,602	*	5.4	4,979.0	4,979.0	4,979.0	0.0
*[2]	151,964	1,781	*	13	4,979.7	4,979.7	4,979.7	0.0
*[2]	152,713	3,014	*	14.7	4,986.0	4,986.0	4,986.0	0.0
*[2]	153,522	1,285	*	19	4,988.4	4,988.4	4,989.0	0.6
*[2]	154,930	1,502	*	6.9	4,994.9	4,994.9	4,995.0	0.1
*[2]	155,987	3,866	*	13.7	4,994.8	4,994.8	4,995.0	0.2
*[2]	156,728	2,532	*	10.9	4,999.8	4,999.8	5,000.0	0.2
*[2]	157,335	2,557	*	8.6	5,001.4	5,001.4	5,001.4	0.0
*[2]	157,824	1,743	*	11.6	5,007.4	5,007.4	5,007.4	0.0

[1]Feet above confluence with South Platte River

[2]Values computed using a 2D model. Locations are represented by the BFEs on the FIRMs. Additional information is available to help determine floodway information including depth and velocity grids. Contact the Larimer County Floodplain Administrator for more information.

*Data not available

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
*[2]	158,243	1,204	*	11.4	5,010.1	5,010.1	5,010.1	0.0
*[2]	158,783	995	*	8.3	5,012.7	5,012.7	5,013.0	0.3
*[2]	159,471	2,485	*	9.5	5,014.4	5,014.4	5,014.9	0.6
*[2]	160,553	1,673	*	11.0	5,019.3	5,019.3	5,019.3	0.0
*[2]	161,533	804	*	13.6	5,023.0	5,023.0	5,023.0	0.0
*[2]	162,043	1,086	*	9.9	5,026.9	5,026.9	5,027.0	0.1
*[2]	162,790	895	*	7.6	5,029.5	5,029.5	5,029.9	0.4
*[2]	163,490	791	*	5.9	5,032.0	5,032.0	5,032.0	0.0
*[2]	164,179	1,172	*	6.8	5,034.9	5,034.9	5,035.0	0.1
*[2]	165,030	1,233	*	6.2	5,037.9	5,037.9	5,038.0	0.1
*[2]	165,827	1,308	*	10.0	5,038.9	5,038.9	5,039.0	0.1
*[2]	166,471	860	*	7.3	5,042.0	5,042.0	5,042.0	0.0
*[2]	166,995	921	*	3.7	5,044.0	5,044.0	5,044.0	0.0

[1]Feet above confluence with South Platte River

[2]Values computed using a 2D model. Locations are represented by BFEs on the FIRMs. Additional information is available to help determine floodway information including depth and velocity grids. Contact Larimer County Floodplain Administrator for more information.

*Data not available

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AS	167,566	797	6,495	2.9	5,044.3	5,044.3	5,044.3	0.0
AT	169,172	954	5,662	3.3	5,048.2	5,048.2	5,048.6	0.4
AU	171,076	797	2,642	5.7	5,057.1	5,057.1	5,057.1	0.0
AV	172,157	860	3,123	4.6	5,062.2	5,062.2	5,062.7	0.5
AW	173,418	1,001	1,745	8.3	5,066.4	5,066.4	5,066.6	0.2
AX	174,464	177	1,133	12.8	5,071.6	5,071.6	5,071.8	0.2
AY	175,634	422[2]	2,402	6.5	5,079.9	5,079.9	5,079.9	0.0
AZ	176,708	582[2]	3,464	5.5	5,086.2	5,086.2	5,086.2	0.0
BA	178,120	688	4,165	4.5	5,090.6	5,090.6	5,090.7	0.1
BB	180,137	774	3,237	5.8	5,099.2	5,099.2	5,099.2	0.0
BC	181,123	689	1,863	10.3	5106.5	5106.5	5106.5	0.0
BD	182,443	470	1,780	8.8	5115.7	5115.7	5115.9	0.2
BE	184,016	435	1,671	9.4	5126.9	5126.9	5127.2	0.3
BF	184,993	354	2,148	7.3	5138.0	5138.0	5138.0	0.0
BG	185,978	287	2,403	6.4	5149.1	5149.1	5149.1	0.0
BH	187,400	262	1,672	9.2	5158.7	5158.7	5158.7	0.0
BI	188,489	309	1,828	8.5	5166.4	5166.4	5166.7	0.3
BJ	189,412	246	1,268	12.2	5174.7	5174.7	5174.7	0.0
BK	190,459	237	1,410	11.0	5181.2	5181.2	5181.3	0.1
BL	191,294	393	1,655	9.3	5188.7	5188.7	5188.7	0.0
BM	192,430	160	1,184	13.0	5198.1	5198.1	5198.1	0.0

[1]Feet above confluence with South Platte River
[2]The floodway limits extend beyond this cross section

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
BN	193,244	81	847	18.2	5248.9	5248.9	5248.9	0.0
BO	194,104	124	1,838	8.4	5257.9	5257.9	5258.1	0.2
BP	195,398	363	2,543	6.1	5261.2	5261.2	5261.7	0.5
BQ	196,324	301	1,534	10.1	5266.7	5266.7	5266.7	0.0
BR	197,357	319	3,245	5.6	5283.5	5283.5	5283.7	0.2
BS	198,446	120	1,565	9.9	5294.6	5294.6	5294.6	0.0
ET[2]	202,120	120	1,040	16.3	5,306.8	5,306.8	5,306.8	0.0
EU	202,575	112	1,007	16.8	5,317.8	5,317.8	5,317.8	0.0
EV	203,295	117	1,319	12.8	5,328.5	5,328.5	5,328.5	0.0
EW	203,495	100	847	20.0	5,332.7	5,332.7	5,332.7	0.0
EX	204,240	124	1,049	16.1	5,353.3	5,353.3	5,353.3	0.0
EY	205,050	83	899	18.8	5,368.2	5,368.2	5,368.2	0.0
EZ	205,440	100	1,057	16.0	5,381.6	5,381.6	5,381.6	0.0
FA	205,745	115	856	19.7	5,387.9	5,387.9	5,387.9	0.0
FB	206,050	160	1,066	15.9	5,398.0	5,398.0	5,398.0	0.0
FC	206,480	120	893	18.9	5,407.2	5,407.2	5,407.2	0.0
FD	206,690	145	965	17.5	5,412.2	5,412.2	5,412.2	0.0
FE	207,185	131	1,075	15.7	5,421.7	5,421.7	5,421.7	0.0
FF	207,590	92	955	17.7	5,429.0	5,429.0	5,429.0	0.0
FG	208,530	109	1,555	10.8	5,460.5	5,460.5	5,460.5	0.0
FH	208,900	84	1,042	16.2	5,465.6	5,465.6	5,465.6	0.0

[1]Feet above confluence with South Platte River

[2]Gap in Cross Section lettering is due to the large area of 2D flooding added during 2020 update. The Canyon reach of the Big Thompson is currently being studied and XS lettering in this stretch will be updated during that study.

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
FI	209,820	79	897	18.8	5,481.5	5,481.5	5,481.5	0.0
FJ	210,325	117	1,003	16.8	5,501.2	5,501.2	5,501.2	0.0
FK	210,435	139	1,681	10.1	5,504.8	5,504.8	5,504.8	0.0
FL	210,590	117	1,037	16.3	5,509.0	5,509.0	5,509.0	0.0
FM	211,215	96	943	17.3	5,517.5	5,517.5	5,517.5	0.0
FN	211,410	103	984	16.6	5,522.1	5,522.1	5,522.1	0.0
FO	211,920	190	1,117	11.2	5,529.2	5,529.2	5,529.2	0.0
FP	212,435	170	1,097	14.9	5,535.7	5,535.7	5,535.7	0.0
FQ	212,760	240	1,763	9.2	5,540.4	5,540.4	5,540.4	0.0
FR	212,960	300	1,817	9.2	5,543.8	5,543.8	5,543.8	0.0
FS	213,030	129	1,290	13.0	5,544.1	5,544.1	5,544.1	0.0
FT	213,080	134	1,638	10.3	5,546.5	5,546.5	5,546.5	0.0
FU	213,650	250	1,604	10.5	5,548.7	5,548.7	5,548.7	0.0
FV	214,250	365	1,681	10.0	5,554.7	5,554.7	5,554.7	0.0
FW	214,630	300	1,591	10.6	5,559.2	5,559.2	5,559.2	0.0
FX	214,740	280	1,450	11.6	5,561.2	5,561.2	5,561.2	0.0
FY	215,350	320	1,625	10.3	5,570.2	5,570.2	5,570.2	0.0
FZ	215,750	360	1,909	8.8	5,573.0	5,573.0	5,573.0	0.0
GA	216,300	207	1,511	11.1	5,575.5	5,575.5	5,575.5	0.0
GB	216,460	201	1,330	12.6	5,576.4	5,576.4	5,576.4	0.0
GC	217,015	293	1,422	11.8	5,582.9	5,582.9	5,582.9	0.0

[1]Feet above confluence with South Platte River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
GD	217,600	482	1,954	8.6	5,592.0	5,592.0	5,592.0	0.0
GE	218,170	380	2,139	7.9	5,595.9	5,595.9	5,595.9	0.0
GF	218,570	291	999	10.5	5,598.6	5,598.6	5,598.6	0.0
GG	218,775	285	1,095	9.6	5,602.2	5,602.2	5,602.2	0.0
GH	218,900	310	1,028	10.2	5,605.9	5,605.9	5,605.9	0.0
GI	219,700	155	812	12.9	5,615.6	5,615.6	5,615.6	0.0
GJ	220,280	107	713	14.7	5,621.9	5,621.9	5,621.9	0.0
GK	220,565	137	806	13.0	5,630.5	5,630.5	5,630.5	0.0
GL	221,240	80	596	17.6	5,645.0	5,645.0	5,645.0	0.0
GM	221,970	65	603	17.4	5,657.6	5,657.6	5,657.6	0.0
GN	222,095	73	629	16.7	5,665.3	5,665.3	5,665.3	0.0
GO	222,405	111	745	14.1	5,671.3	5,671.3	5,671.3	0.0
GP	222,690	81	650	16.2	5,677.7	5,677.7	5,677.7	0.0
GQ	223,380	160	869	12.1	5,688.7	5,688.7	5,688.7	0.0
GR	224,065	260	914	11.5	5,702.6	5,702.6	5,702.6	0.0
GS	224,260	260	790	13.3	5,709.9	5,709.9	5,709.9	0.0
GT	224,560	134	556	18.9	5,718.7	5,718.7	5,718.7	0.0
GU	224,860	49	473	22.2	5,728.4	5,728.4	5,728.4	0.0
GV	225,180	105	406	25.9	5,741.1	5,741.1	5,741.1	0.0
GW	225,670	90	618	17.0	5,762.9	5,762.9	5,762.9	0.0
GX	226,280	90	479	21.9	5,770.5	5,770.5	5,770.5	0.0

[1]Feet above confluence with South Platte River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
GY	226,575	89	675	15.6	5,781.9	5,781.9	5,781.9	0.0
GZ	226,765	78	484	21.7	5,783.6	5,783.6	5,783.6	0.0
HA	226,860	80	574	18.3	5,787.8	5,787.8	5,787.8	0.0
HB	227,020	100	898	11.7	5,794.0	5,794.0	5,794.0	0.0
HC	227,070	86	783	13.4	5,797.9	5,797.9	5,797.9	0.0
HD	227,490	115	738	14.2	5,803.9	5,803.9	5,803.9	0.0
HE	227,895	131	772	13.6	5,812.1	5,812.1	5,812.1	0.0
HF	228,900	98	692	15.2	5,841.3	5,841.3	5,841.3	0.0
HG	229,610	122	764	13.7	5,854.4	5,854.4	5,854.4	0.0
HH	230,230	160	776	13.5	5,868.9	5,868.9	5,868.9	0.0
HI	230,840	160	850	12.4	5,885.4	5,885.4	5,885.4	0.0
HJ	231,310	114	719	14.6	5,895.7	5,895.7	5,895.7	0.0
HK	231,460	110	715	14.7	5,898.6	5,898.6	5,898.6	0.0
HL	231,575	140	806	13.0	5,904.7	5,904.7	5,904.7	0.0
HM	232,180	174	900	11.7	5,919.3	5,919.3	5,919.3	0.0
HN	232,385	184	909	11.6	5,924.6	5,924.6	5,924.6	0.0
HO	233,220	149	803	13.1	5,942.9	5,942.9	5,942.9	0.0
HP	233,835	86	471	22.3	5,956.7	5,956.7	5,956.7	0.0
HQ	234,360	130	576	18.2	5,980.4	5,980.4	5,980.4	0.0
HR	234,570	78	326	32.2	5,982.3	5,982.3	5,982.3	0.0
HS	235,070	125	623	16.9	6,007.7	6,007.7	6,007.7	0.0

[1]Feet above confluence with South Platte River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
HT	236,060	155	549	19.1	6,025.0	6,025.0	6,025.0	0.0
HU	236,365	180	888	11.8	6,037.2	6,037.2	6,037.2	0.0
HV	236,670	230	939	11.2	6,041.9	6,041.9	6,041.9	0.0
HW	236,760	240	1,056	9.9	6,043.5	6,043.5	6,043.5	0.0
HX	237,420	120	487	21.6	6,052.5	6,052.5	6,052.5	0.0
HY	237,610	109	528	19.9	6,059.7	6,059.7	6,059.7	0.0
HZ	238,230	150	686	15.3	6,078.7	6,078.7	6,078.7	0.0
IA	238,425	175	816	12.9	6,082.9	6,082.9	6,082.9	0.0
IB	239,030	100	456	23.0	6,092.3	6,092.3	6,092.3	0.0
IC	239,225	113	623	16.9	6,101.4	6,101.4	6,101.4	0.0
ID	239,430	180	623	16.9	6,104.8	6,104.8	6,104.8	0.0
IE	239,630	200	932	11.2	6,110.8	6,110.8	6,110.8	0.0
IF	240,410	117	868	12.0	6,118.0	6,118.0	6,118.0	0.0
IG	241,100	125	796	13.1	6,128.2	6,128.2	6,128.2	0.0
IH	241,505	150	1,090	9.5	6,132.7	6,132.7	6,132.7	0.0
II	242,070	219	1,006	10.3	6,138.8	6,138.8	6,138.8	0.0
IJ	242,440	242	987	10.5	6,143.3	6,143.3	6,143.3	0.0
IK	242,495	239	1,030	10.1	6,144.4	6,144.4	6,144.4	0.0
IL	242,895	215	1,707	6.1	6,149.0	6,149.0	6,149.0	0.0
IM	243,335	186[2]	912	11.4	6,152.7	6,152.7	6,152.7	0.0
IN	243,625	210	777	9.7	6,156.9	6,156.9	6,156.9	0.0

[1]Feet above confluence with South Platte River

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BIG THOMPSON RIVER