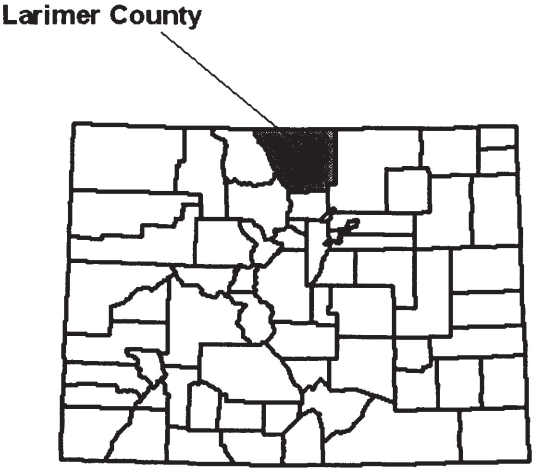
FLOOD INSURANCE STUDY

LARIMER COUNTY, COLORADO
AND INCORPORATED AREAS
VOLUME 1 OF 4

Community Name	Community Number
LARIMER COUNTY	
(UNINCORPORATED AREAS)	080101
BERTHOUD, TOWN OF	080296
ESTES PARK, TOWN OF	080193
FORT COLLINS, CITY OF	080102
JOHNSTOWN, TOWN OF	080250
LOVELAND, CITY OF	080103
TIMNATH, TOWN OF	080005
WELLINGTON, TOWN OF	080104



REVISED: FEBRUARY 6, 2013

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
08069CV001D

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Initial Countywide FIS Report Effective Date: December 19, 2006

Revised Countywide FIS Report Effective Dates: June 17, 2008
May 2, 2012
February 6, 2013

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Exhibit 1 – Flood Profiles (Continued)

FLOOD INSURANCE STUDY
LARIMER COUNTY, COLORADO AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and/or Flood Insurance Rate Maps (FIRMs)/Flood Boundary and Floodway Maps in the geographic area of Larimer County, Colorado, including the Cities of Fort Collins and Loveland, and the Towns of Berthoud, Estes Park, Johnstown, Timnath, and Wellington, and unincorporated areas of Larimer County (hereinafter referred to collectively as Larimer County) and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates. This information will also be used by Larimer County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

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 Town of Windsor on the Larimer County FIRM panels are for informational purposes only.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Town of Estes Park
The hydrologic and hydraulic analyses for the original study for the Town of Estes Park were performed by Gingery Associates, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. 8-4017. This study was completed in July 1977.

Revised hydraulic analyses for the Big Thompson River, Fall River, and Black Canyon Creek were performed by Simons, Li & Associates, Inc. (SLA), for FEMA, under Contract No. EMW-83-C-1l67. This work was completed in April 1985.

City of Fort Collins

The hydrologic and hydraulic analyses for the original study were performed by Ginery Associates, Inc., for FEMA under contract No. H-4017. This work, which was completed in October 1977, covered all significant flooding sources affecting the City of Fort Collins.

The hydrologic and hydraulic analyses for the Cache La Poudre River were reanalyzed by the U.S. Department of the Army, Corps of Engineers (USACE), Omaha District. The data was compiled by Simons, Li & Associates, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-86-C-2262. The revised analyses were for the reach of the Cache La Poudre River from Horsetooth Road upstream to the south end of Watson Lake. This work was completed in May 1994.

The revised hydrologic and hydraulic analyses for the Cache La Poudre River from Wood Street to Watson Lake were performed by Ayres Associates Inc. for Larimer County. This work was completed in October 2005.

For the Cache La Poudre River - Interstate Highway 25 Divided Flow area, the hydrologic analyses were performed by the USACE, Omaha District (Reference 38), and the hydraulic analyses were performed by Simons, Li & Associates, Inc., under Contract No. EMW-86-C-2262, for FEMA. This work was completed in August 1990.

The hydrologic and hydraulic analyses for Cooper Slough were performed by Love & Associates, Inc., for FEMA, under the Limited Map Maintenance Program (LMMP), Contract No. EMW-90-C313. This work was completed in November 1993. These analyses are now superseded by the 2005 Boxelder Creek/Cooper Slough study prepared by Anderson Consulting Engineers, Inc.

The hydraulic analysis for the Boxelder Creek Overflow Channel downstream of County Road 50 (CR-50) was performed by the U.S. Department of the Interior, Bureau of Reclamation (USBR), for FEMA, under Interagency Agreement No. EMW-88-E-2765. The work was completed in February 1992. The hydrologic analyses were taken from a Simons, Li & Associates, Inc., 1981 Master Drainage way Planning Study (Reference 9). This analysis is now superseded by the 2005 Boxelder Creek/Cooper Slough study prepared by Anderson Consulting Engineers, Inc.

The revised hydrologic and hydraulic analyses for Boxelder Creek/Cooper Slough downstream of County Road 54 were performed by Anderson Consulting Engineers, Inc. for the City of Fort Collins and Larimer County (Reference 75). This work was completed in 2005.

The hydrologic and hydraulic analyses for Dry Creek were performed by Gingery Associates, Inc., for the City of Fort Collins and Larimer County. This work was completed in April 1980.

The revised hydraulic analysis of Spring Creek was performed by Anderson Consulting Engineers, Inc. for the City of Fort Collins (Reference 71). This work was completed in October 2005. The hydrologic analysis was taken from the "Spring Creek Basin Master Drainage Plan – Baseline Hydrology" which was prepared for the City of Fort Collins by Anderson Consulting Engineers, Inc. in May 2003 (Reference 72).

Town of Johnstown

There was no previously printed FIS for the Town of Johnstown. For this countywide FIS, the hydrologic and hydraulic analyses for the portion of the Big Thompson River near Johnstown were performed by Anderson Consulting Engineers, Inc. This work was completed in March 2005.

Larimer County (Unincorporated Areas)

The hydrologic and hydraulic analyses for the original study for the unincorporated areas of Larimer County were performed by Gingery Associates, Inc., for FEMA, under Contract No. 8-4017. This study was completed in December 1977.

The revised hydrologic and hydraulic analyses for Big Thompson River upstream of Lake Estes, Fall River, and Black Canyon Creek were performed by Simons, Li & Associates, Inc., for FEMA under Contract No. EMW-83-C-1167. This work was completed in April 1985.

The hydraulic analysis at Boxelder Creek downstream of County Road 50 (CR-50) was performed by the U.S. Department of the Interior, Bureau of Reclamation (USBR), the study contractor, for FEMA, under Interagency Agreement No. EHW-88-E-2765, and completed in February 1992. This analysis is now superseded by the 2005 Boxelder Creek/Cooper Slough study prepared by Anderson Consulting Engineers, Inc.

The revised hydrologic and hydraulic analyses for Boxelder Creek/Cooper Slough downstream of County Road 54 were performed by Anderson Consulting Engineers, Inc. for the City of Fort Collins and Larimer County (Reference 75). This work was completed in 2005.

The hydraulic analysis for the Cache La Poudre River, affecting Larimer County downstream of the City of Fort Collins, and Boxelder Creek, from upstream of the confluence with Cooper Slough to just north of the Town of Wellington, was prepared by Simons, Li & Associates, Inc. (SLA), the study contractor, for FEMA, under Contract No. EMW-86-C-2262. This work was completed in August 1990. The hydrologic flood-frequency relationships used in the study were prepared by the USACE, Omaha District (Reference 38). The analyses for Boxelder Creek from upstream of the confluence with Cooper Slough to County Road 54 are now superseded by the 2005 Boxelder Creek/Cooper Slough study.

The hydrologic analyses for the restudy of the Cache La Poudre River from Horsetooth Road to Watson Lake were performed by the USACE, Omaha District (Reference 38), in 1993 and 1994. SLA revised the USACE's hydraulic study to depict cross-section stationing for consistency with downstream studies and to replot the water surface profiles in accordance with requirements of FEMA, under Contract No. EMW-86-C2262. This

work was completed in May 1994. These analyses from Wood Street to Watson Lake are now superseded by the 2005 Cache La Poudre River from Wood Street to Watson Lake study prepared by Ayres Associates Inc.

The revised hydrologic and hydraulic analyses for the Cache La Poudre River from Wood Street to Watson Lake were performed by Ayres Associates Inc. for Larimer County. This work was completed in October 2005.

Cooper Slough was revised by Love & Associates under the Limited Map Maintenance Program (LMMP), Contract No. EMW-90-C313, in November 1993, for FEMA. The limit of study for Cooper Slough was initially from its confluence with Boxe1der Creek to East Vine Drive. However, the Cooper Slough channel does not tie directly into Boxelder Creek. The LMMP project also included analyses of the Sherry Drive Overflow and State Highway 14 Overflow. These analyses are now superseded by the 2005 Boxelder Creek/Cooper Slough study prepared by Anderson Consulting Engineers, Inc.

The revised hydrologic and hydraulic analyses for Dry Creek were also performed by Gingery Associates, Inc., as reported in Major Drainageway Planning, Dry Creek, Fort Collins, Larimer County, Colorado (Reference 1). This work was completed in February 1985.

The revised hydraulic analysis of Spring Creek was performed by Anderson Consulting Engineers, Inc. for the City of Fort Collins (Reference 71). This work was completed in October 2005. The hydrologic analysis was taken from the "Spring Creek Basin Master Drainage Plan – Baseline Hydrology" which was prepared for the City of Fort Collins by Anderson Consulting Engineers, Inc. in May 2003 (Reference 72).

City of Loveland

The initial hydrologic and hydraulic analyses for the original study for the City of Loveland were performed by Gingery Associates, Inc., for the Federal Insurance Administration under Contract No. H-4017. This study was completed in July 1977.

A revised hydraulic study of the Big Thompson River was completed in October 1981 by Resource Consultants, Inc. (Reference 60) to reflect current flood plain conditions, and was incorporated into this study.

The revised hydrologic and hydraulic analyses for the Big Thompson River and Dry Creek in Loveland, Colorado were performed by Ayres Associates Inc., under contract with the City of Loveland. The photogrammetric mapping effort was completed in July 2004. Anderson Consulting Engineers, Inc., performed the hydrologic analysis for Dry Creek in Loveland. This work was completed in August 2005.

Town of Wellington

The hydrologic and hydraulic analyses for the original study for the Town of Wellington were performed by Gingery Associates, Inc., for FEMA, under Contract No. H-4011. This work, which was completed in October 1977, covered all significant flooding sources affecting the Town of Wellington.

The revised hydraulic analysis of Boxelder Creek was taken from a 1983 U.S. Department of Agriculture, Soil Conservation Service (SCS) Floodplain Management Study (Reference 43) using hydrology developed by Simons, Li, and Associates (Reference 44).

There were no previously printed Flood Insurance Studies for the Towns of Berthoud, Johnstown, and Timnath.

1.3 Coordination

Town of Estes Park
For the original FIS, the community base map was selected and streams requiring detailed study were identified in meetings attended by personnel of the study contractor, FEMA, Colorado Water Conservation Board (CWCB), Larimer County, and Town of Estes Park in March and April 1976.

The results of the study were reviewed at a final coordination meeting in September 1977. No significant problems affecting the study were identified.

Streams requiring revision were identified at a meeting attended by representatives of the study contractor, FEMA, and Town of Estes Park in April 1983.

Results of the hydrologic analyses were coordinated with the CWCB, local consultants, and U.S. Geological Survey (USGS).

The results of the study were reviewed at the final meeting attended by representatives of the study contractor, FEMA, and the Town of Estes Park.

City of Fort Collins
For the original FIS, community base map selection and the identification of streams requiring detailed study were done at a meeting attended by Gingery Associates, Inc.; FEMA; the Larimer County Planning Department; and officials of the City on April 20. 1976. The USACE, Omaha District, was also contacted during the course of the original study.

During the course of the work done by Gingery Associates, Inc., flood elevations and boundaries and floodway delineations were reviewed with community officials. Revisions to the original study, completed in 1973, incorporated new data prepared for the City by the original study contractor.

The initial Consultation and Coordination Officer (CCO) meeting was held on July 25, 1988, and attended by representatives of FEMA; Gingery Associates, Inc.; and the City.

For the Cache La Poudre River restudy upstream of Horsetooth Road, coordination meetings were held on November 26, 1991, and March 13 and April 28, 1992, with representatives from Larimer County; the City of Fort Collins; SLA; the Colorado Water Conservation Board (CWCB); and FEMA.

For the Cooper Slough LMMP project, the initial meeting was held on July 13, 1992, in the City of Fort Collins' offices. Representatives of the City of Fort Collins; Larimer County; the CWCB; FEMA; and Love & Associates, Inc., attended the meeting. At this meeting, the hydrologic and hydraulic parameters for the LMMP project were established. The base mylar work maps, hydrologic base model, orthographic mapping, and benchmark descriptions were provided by the City of Fort Collins and Larimer County (References 47, 9, and 49). The final CCO meeting was held on October 26, 1993.

Coordination meetings for the Spring Creek LMMP project were held on February 27 and May 19, 1993, and January 18, 1994. Representatives of the City; Foothills Engineering Consultants, Inc.; Greenhorne & O'Mara, Inc.; and FEMA attended.

Larimer County (Unincorporated Areas)
For the original FIS, the identification of streams requiring detailed study was accomplished at a meeting attended by representatives of the study contractor, FEMA, and the Larimer County Planning Department on April 20, 1976. After the Big Thompson River flood of July 31, 1976, the study scope was increased to include the Big Thompson Canyon area.

The USACE, Omaha District, was contacted and provided flood plain data on the Big Thompson and the Cache La Poudre Rivers for use in preparing the Flood Insurance Study.

During the work by the study contractor, flood elevations, flood boundaries, and floodway delineations were reviewed with community officials.

Final coordination meetings were held in Loveland and Fort Collins on November 29 and 30, 1977, respectively. These meetings were attended by representatives of Larimer County, FEMA, the study contractor, and the general public. The results of these meetings have been incorporated into this report.

Streams requiring additional detailed study were identified at a meeting attended by representatives of the study contractor, FEMA, Larimer County, and the Town of Estes Park in April 1983. The results of this additional work were reviewed at a meeting attended by representatives of these groups on February 27, 1986.

On October 10, 1986, the initial coordination meeting for the Cache La Poudre study took place during a conference call between representatives of FEMA, the City of Fort Collins, Larimer County, and the study contractor. Various other meetings were held to discuss ongoing flood studies, the location of the upstream and downstream study limits, and the hydrology to be used in the analysis. It was decided that the study should begin at the Larimer-Weld County line and extend upstream to Horsetooth Road, a distance of approximately 7.6 river miles.

Representatives of FEMA, the City of Fort Collins, Larimer County, the Town of Windsor, and the study contractor met on July 6, 1989, to review the preliminary results of the study reach downstream of Horsetooth Road. Those present felt that the study contractor had done a technically correct analysis of the flood plain, including several divided-flow areas.

Meetings for Boxelder Creek were held in June and July 1988 between representatives of FEMA, the USBR, and the CWCB for the purpose of determining the scope of the USBR study. A meeting was held on November 3, 1988, at the SLA office in Fort Collins to discuss a variety of items pertinent to Boxe1der Creek. Representatives from FEMA, the U.S. Department of the Interior Bureau of Reclamation (USBR), Larimer County, and the Storm Water Utility Office (SWUO) in Fort Collins were in attendance. It was agreed that Larimer County would provide base mylar maps (Reference 30). The SCS and SLA were contacted to obtain information, data, and copies of reports relevant to previous studies (References 43 and 44). A meeting was held between FEMA and USBR representatives on December 9, 1988, to discuss changes to the study scope and limits.

The initial meeting for the revised study of Cooper Slough was held on July 13, 1992, in the City of Fort Collins offices. Representatives of the City of Fort Collins, Larimer County, the CWCB, FEMA, and the study contractor attended the meeting. At this meeting, the hydrologic and hydraulic parameters for the LMMP project were established. The base mylar work maps, hydrologic base model, orthographic mapping, and benchmark descriptions were provided by the City of Fort Collins and Larimer County (References 47-49). The final CCO meeting for this project was held on October 26, 1993.

Coordination meetings for the revised study of Cache La Poudre River were held on November 26, 1991, and March 13 and April 28, 1992, with representatives from Larimer County, the City of Fort Collins, SLA, the CWCB, and FEMA.

City of Loveland

For the original FIS, streams requiring detailed study were identified in a meeting attended by personnel of the study contractor and the Federal Insurance Administration, officials of Larimer County, and the Director of Public Works from the City of Loveland on April 16, 1976. The community base map was selected in a meeting attended by representatives of the FEMA, the City of Loveland, and the study contractor on January 12, 1977.

The results of the study were reviewed at a final coordination meeting held during a regular meeting of the Loveland City Council on September 6, 1977. The representatives of the Federal Insurance Administration and the study contractor were present for the meeting. No problems were raised concerning the results of the study.

Town of Wellington

The areas requiring detailed study for the original FIS were identified at a meeting attended by personnel of the study contractor, and the FIA, officials of the Town of Wellington, and members of the Larimer County Planning Department on April 20, 1976. Base maps were provided by Larimer County and the Town of Wellington.

The SCS was contacted in order to obtain data from their Boxelder Watershed Flood Plain Information report (Reference 43). They also provided information on the proposed storage reservoirs in regard to the effects of flood discharges and the anticipated and actual completion dates in all reservoirs.

On December 13, 1977, the results of the study were presented at a final coordination meeting, which was attended by representatives of the study contractor, FIA, the Town of Wellington, and Larimer County. The study was accepted by all parties present at this meeting. Comments from the CWCB which affected hydraulic computations have been incorporated into this study.

In 1991, the CWCB requested that information continued in the 1983 SCS study be used to revise the Flood Insurance Study for the Town of Wellington and Larimer County (Reference 43).

There was a final CCO meeting held on November 5, 2005 in the City of Fort Collins to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Larimer County, Colorado including the Cities of Fort Collins and Loveland, and the Towns of Berthoud, Estes Park, Johnstown, Timnath, and Wellington, and unincorporated areas of Larimer County.

The streams studied by detailed methods are presented in Table 1.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through 2006.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Larimer County.

The upper and lower reaches of the Cache La Poudre River northwest and southeast of Fort Collins, portions of the Little Thompson River, and portions of Dry Creek were studied by approximate methods.

Table 1 – Streams Studied by Detailed Methods

Big Thompson River	Devils Gulch
Big Thompson River – Gravel Pit Split	Dickson Gulch
Big Thompson River Overflow	Dry Creek – BTR
Big Thompson River – South Spill	Dry Creek
Black Canyon Creek	Dry Gulch
Bobcat Gulch	Fall River
Boxelder Creek	Fall River Overflow
Boxelder Creek I-25 Split	Fish Creek
Boxelder Creek I-25 Split Overflow	Fox Creek
Boxelder Creek – Left Overbank Divided Flow at Indian Creek	Glade Road Split
Boxelder Creek Overflow – Downstream	Little Thompson River
Boxelder Creek Overflow – Upstream	Little Thompson River – Spill Reach
Buckhorn Creek	Long Gulch
Boxelder Overflow West	Miller Fork
Business Park Denrose	Noel's Draw
Business Park Middle	North Fork Big Thompson River
Business Park South	Quillan Gulch
Business Park West	Rabbit Gulch
Cache La Poudre LEMAYDS	Redstone Creek
Cache La Poudre LINC	Sherry Drive Overflow
Cache La Poudre Lowflow Channel	Shields Street Divided Flow Path – Hill Pond Road
Cache La Poudre LPATH	Shields Street Divided Flow Path – Shire Court
Cache La Poudre River	Shields Street Divided Flow Path – Windtrail Swale
Cache La Poudre River-Interstate Highway 25 Divided Flow	Shields Street Overflow
Cache La Poudre River Split LPATH	Spring Canyon Park Diversion
Cache La Poudre River Split RPATH	Spring Creek
Cedar Creek	Tributary BT-1
Coal Creek	Tributary BT-2
Cooper Slough	Tributary BT-3
Cooper Slough Overflow	Tributary BT-4
Dark Gulch	West Creek

2.2 Community Description

Larimer County is located in north-central Colorado, bounded by the Continental Divide to the west, Wyoming to the north, Weld County to the east, and Boulder County to the south. The county encompasses approximately 2,640 square miles. Approximately 50 percent of Larimer County is publicly owned, most of which is land within Rocky Mountain National Park and Roosevelt National Forest. The terrain ranges from steep mountainous areas in the west to gently rolling plains in the east.

Historically, the economy has consisted of irrigated farming in the southeast and dryland farming and grazing in the northeast, although the eastern section is rapidly urbanizing.

The industry in the western portion of the county consists mainly of tourism, with some ranching and timber operations.

Larimer County has grown from a 1970 population of 89,900 to a 2000 population of 251,494 (References 2 and 61).

The climate varies from the mountains in the west to the eastern plains. The average annual temperature in the western part of the county is in the lower 40°F range, with annual precipitation of approximately 16 inches. The eastern portion of the county has an average temperature of 50°F and annual precipitation of approximately 14 inches (Reference 3).

The studied section of the Big Thompson River is approximately 41 miles long. The river originates in the Rocky Mountains, and the basin extends to the Continental Divide at an elevation of 14,250 feet on Long's Peak. The Big Thompson River flows in an easterly direction through the southern part of Larimer County.

Considerable residential development has taken place along the riverbanks, especially in the narrow canyon area. Channel slopes range from approximately 18 feet per mile in the area near Loveland to 130 feet per mile through the narrows. The soils in the Big Thompson River study area consist of Fluvaquents-Fluvents, Haploborolls-Camborthids-Argiborolls, and Argiborolls-Rock Outcrop Associations (Reference 4).

The studied section of the North Fork Big Thompson River is approximately 9.8 miles long, with the lower study limit being at the confluence with the Big Thompson River at Drake. The average channel width through the studied section is 25 feet, and the channel slope averages 132 feet per mile. Soils consist of North Rock Outcrop and Haploborolls-Camborthids-Argiborolls Associations (Reference 4).

Numerous small tributaries were included in this study. The sections studied along these tributaries are generally less than 0.5 miles. The stream channels are narrow and have slopes averaging 400 feet per mile. Two larger tributaries to the North Fork Big Thompson River, West Creek and Devils Gulch, near Glen Haven were also studied. West Creek and Devils Gulch have average channel widths of 25 feet, and their slopes are 90 feet per mile and 400 feet per mile, respectively. The soils along West Creek and Devils Gulch are of the Haploborolls-Camborthids-Argiborolls Associations (Reference 4).

Buckhorn Creek flows east and south through Larimer County and joins the Big Thompson River approximately 5 miles west of Loveland. Redstone Creek flows south on the east side of the Buckhorn Creek basin and joins Buckhorn Creek at Masonville. Development in the two basins is confined to those areas where the valley width permits it, and consists mostly of farming units. The channel slope of Buckhorn Creek in the studied section is approximately 58 feet per mile, and the Redstone Creek channel slope averages approximately 185 feet per mile. Soils in the Buckhorn Creek and Redstone Creek basins are of the Fluvaquents Fluvents, Argiborolls-Rock Outcrop, and Arguistolls-Haplustolls Associations (Reference 4).

Boxelder Creek flows in a southerly direction through Larimer County past the west side

of the Town of Wellington. Very little development has occurred in the flood plain within the county. The Boxelder Creek watershed, approximately 32 miles long with an average width of 8 miles, flows from an altitude of 7,720 feet at its headwaters in Wyoming to 4,860 feet at its confluence with the Cache La Poudre River. Geological formations exposed within the watershed consist of rocks and sediments ranging from Precambrian to Quaternary in age, and the soils in the basin are of the Fluvaquents-Fluvents and Arguistolls-Haplustolls Associations (Reference 4).

Fish Creek flows north through Larimer County to its confluence with the Big Thompson River at Lake Estes in the Town of Estes Park. Fall River flows southeast through the county and joins the Big Thompson River in Estes Park. The channels of both streams are well defined and generally narrow, with cobble streambeds and heavy vegetation encroaching upon channel banks. The flood plains are largely undeveloped for both streams, and the soils are of the Argiborolls-Rock Outcrop and Cyroboralfs-Rock Outcrop Associations (Reference 4).

The Cache La Poudre River flows in a southeasterly direction through Larimer County. Development along the Cache La Poudre River flood plain is minor at the present time with only a few residential and commercial structures. The channel in the studied section is approximately 160 feet wide and 7 feet deep, with the gradient varying from 28 feet per mile in the upper parts of the study area and 16 feet per mile in the lower parts. The soils within the Cache La Poudre River study area consist of the Fluvaquents-Fluvents Association (Reference 4).

Black Canyon Creek was studied from its confluence with Big Thompson River upstream approximately 1.4 miles to McGregor Avenue. The upstream 0.4 mile of this study reach is in Larimer County.

The Spring Creek study reach is approximately 7.7 miles long and is located within the unincorporated areas of Larimer County and the City of Fort Collins. As of 1988, the Spring Creek Basin is nearly fully developed throughout its entire length from its confluence with the Cache La Poudre River to Horsetooth Road. Development is primarily residential but also includes some commercial and industrial development.

The Town of Berthoud

The Town of Berthoud is located in the southeast corner of Larimer County and the southwest corner of Weld County. The town is approximately 25 miles south of the City of Fort Collins.

The latest U.S. census population estimate for the Town of Berthoud in 2000 is 4,839 (Reference 61).

The Little Thompson River flows easterly through the town.

The Town of Estes Park

The Town of Estes Park is located in the southwest corner of Larimer County. The Rocky Mountains enhance the setting of this mountain town, which is situated in an upland valley at an elevation of 7,500 feet. The peaks of Rocky Mountain National Park tower to the

west. Roosevelt National Forest surrounds the rest of Estes Park. The town's 1980 population was 2,703 (Reference 2) and has grown to a population of 5,413 according to the 2000 U.S. Census (Reference 61).

The economy of the town is largely dependent on the summer tourist industry attracted to the Rocky Mountain National Park, located immediately to the west of the community. The town has developed along the Big Thompson and Fall Rivers, two Rocky Mountain streams whose waters rise each year in May, June, and July, carrying the snowmelt from the high mountain peaks to the west. The town's central business district consists of numerous retail and novelty shops located near the confluence of the Big Thompson and Fall Rivers. Areas along upstream reaches of the Big Thompson and Fall Rivers, and the entire Fish Creek basin within the corporate limits, are largely undeveloped.

The City of Fort Collins

The City of Fort Collins is located in eastern Larimer County, and is approximately 60 miles north of Denver. More specifically, the City of Fort Collins is 12 miles north of Loveland, 15 miles west of Ault, and 9 miles southwest of Wellington.

The City of Fort Collins was incorporated in 1873 and has grown rapidly, from approximately 1,376 residents in 1880 to an estimated 56,800 in 1975 (Reference 2). The latest U.S. census population estimate for the City of Fort Collins in 2005 is 139,908.

The Cache La Poudre River study reach is approximately 13.8 miles long. The stream flows southeasterly along an area north and east of the City of Fort Collins. There is a significant amount of development in the Cache La Poudre floodplain between Taft Hill Road and Interstate Highway 25 (I-25) (Reference 62). An estimated 220 structures are located within the floodplain in this area. The channel in the study reach averages 160 feet wide and 7 feet deep, with the gradient varying 28 feet per mile from the upstream corporate limits to State Highway 14 (SH-14), and 16 feet per mile from SH-14 to the downstream corporate limits (Reference 6). The soils within the Cache La Poudre study reach consist of the Fluvaquents-Fluvents Association (Reference 4).

The Spring Creek study reach is approximately 7.7 miles long. The stream is located in the center of the City, and flows from west to east, generally following Prospect Street. The channel averages 15 feet wide and 4 feet deep, with the gradient varying approximately 31 feet per mile.

As of 1988, the Spring Creek basin is nearly fully developed throughout its entire length from the confluence with the Cache La Poudre River to Horsetooth Road. Development is primarily residential, but also includes some industrial development near the confluence with the Cache La Poudre River, heavy commercial development along College Avenue, and scattered commercial developments throughout the basin at intersections of major arterial streets. The soils within the Spring Creek basin are typical of the Nunn-Fort Collins-Ulm and Table Mountain-Paoli-Caruso Associations. The Nunn-Fort Collins-Ulm Association predominates in the western portions of the Spring Creek basin, while the Table Mountain-Paoli-Caruso Association is located in the eastern portion of the basin. Soils in the Fluvaquents-Fluvents Association are found primarily along the Spring Creek channel itself. Soils of the Nunn-Fort Collins-Ulm and Table Mountain-Paoli-Caruso

Associations have moderate infiltration rates, while the soils of the Fluvaquents-Fluvents Association have moderate to low infiltration rates (Reference 4).

The Cooper Slough study reach is approximately 1.5 miles long. The tributary area for the Cooper Slough basin is approximately 10.2 square miles (Reference 9). The basin is approximately 6 miles long and 1.75 miles wide, and is fairly flat, with poorly defined drainage patterns. Cooper Slough flows in a southerly direction and joins Boxelder Creek in the vicinity of Prospect Street and I-25, east of the City of Fort Collins.

The Dry Creek study reach is approximately 1.9 miles long. The stream is a tributary of the Cache La Poudre River, which flows from the northwest in a southeasterly direction to its confluence with the Cache La Poudre River on the eastern corporate limits of the City of Fort Collins. Over 500 structures are located within the base floodplain in the City of Fort Collins. The total number of structures throughout the Dry Creek floodplain for both County and City areas was estimated as over 800 structures in 1995 (Reference 63). The channel is approximately 3 to 4 feet deep and 10 to 15 feet wide from the downstream limit to Andersonville, after which the channel is basically nonexistent to the upstream limit of the study. The stream channel gradient within the study reach is approximately 18 feet per mile. The soils within the Dry Creek basin floodplain are of the Fluvaquents-Fluvents and Otero-Nelson Associations (Reference 4).

The Town of Johnstown

The Town of Johnstown is located in the eastern portion of Larimer County and the western portion of Weld County. The town is approximately 20 miles south-southwest of the City of Fort Collins.

The population of the Town of Johnstown has grown from 1,579 in 1990 to 3,829 in 2000 (Reference 61).

The Big Thompson River flows easterly through the top portion of the town located in Larimer County.

The City of Loveland

The City of Loveland is located in eastern Larimer County, approximately 8 miles east of the mouth of Big Thompson Canyon and the Rocky Mountains. The city is approximately 42 miles north of Denver and 8 miles south of Fort Collins.

The City of Loveland is growing at a rapidly increasing rate having more than tripled in size from a population of 9,734 persons in 1960 to populations of 16,220, 30,244, and 50,608 persons in 1970, 1980, and 2000, respectively (References 2 and 61). The economy of the area is basically commercial and agricultural.

The Big Thompson River flows easterly through the southern end of Loveland from the high mountains of the Colorado Front Range. The river is steep and narrow through the mountains and canyon; however, once it enters the plains just west of Loveland, it widens with a meandering flow.

Within the corporate limits of Loveland, the Big Thompson River channel is approximately 100 feet wide and from 6 to 10 feet deep. The streambed, gravelly in composition, has an average channel slope of 18 feet per mile. The flood plain is from approximately 2000 to 3000 feet wide in this area and relatively flat.

Floodplain development within the corporate limits consists of fairgrounds, commercial facilities, and a few residential acreages.

The vegetation of the river area is composed of weeds and willow bushes covering the banks and several stands of cotton-wood trees growing in the flood plain.

The major soil types in the flood plain are of the Fluraquents-Fluvent Association, warm and deep in composition and poorly drained (Reference 4).

The Town of Timnath
The Town of Timnath is located in eastern Larimer County. The town is approximately 6 miles east of the City of Fort Collins. The latest census in 2000 estimates the town's population as 223 (Reference 61).

The Cache La Poudre River runs southeasterly through the western part of the town.

The Town of Wellington
The Town of Wellington is located in the eastern part of Larimer County. Wellington is approximately 10 miles northeast of Fort Collins. It had a population of 691 in 1970, and grew to a population of 2,672, according to the 2000 Census (References 2 and 61).

Floodplain development in Wellington is residential and commercial, with most of this development occurring in the shallow flooding area of Coal Creek. Boxelder Creek flows southward through the western side of Wellington. The channel ends several miles north of Wellington and the water flows through agricultural fields until it enters the channel in the southeast part of town. For purposes of this study, a stream baseline has been delineated for Coal Creek through Wellington.

2.3 Principal Flood Problems

Major floods on the streams are caused by intense rainfall from localized thunderstorms over the basins. The floods caused by such events will characteristically have high peak discharges of short duration for all of the mountain-area streams. Floods on the streams in the plains areas are normally of a longer duration with less velocity and considerable channel storage. Flooding can also occur as a result of rapid spring snowmelt. These floods characteristically are of longer duration.

Significant floods have occurred on the streams within the county in past years. 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 (Reference 5). 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 (Reference 13).

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 (Reference 13).

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 (Reference 8).

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 (Reference 7).

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 (Reference 6). 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.

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.

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 (Reference 1).

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 (Reference 1).

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.

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 flood plain (Reference 7).

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 (Reference 54).

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 (Reference 73).

2.4 Flood Protection Measures

There are no structures along the Big Thompson River or its tributaries that provide a major reduction in flood flows. Numerous levees along the river will contain a high frequency flood (10- and 4-percent annual chance) but provide little protection against the 1-percent annual chance flood.

The SCS has constructed four detention structures in the watersheds above the Town of Wellington to reduce the flood discharges of Boxelder Creek and Coal Creek. The reservoirs retain runoff from a combined area of 175.5 square miles or 70 percent of the drainage basin. The level of flood protection decreases, however, as the distance below the structures increases.

There are no flood-control structures located in the Cooper Slough basin (Reference 9).

Although they are not actual flood-control structures, Dry Creek has several lakes and storage reservoirs that reduce the contributing drainage area by approximately 13 percent. The network of irrigation canals in the Dry Creek basin has some capacity for intercepting Dry Creek flows (Reference 1). Douglas Lake, also an irrigation reservoir, significantly reduces peak discharges.

Numerous irrigation canals cross the Dry Creek channel and directly intercept drainage flows, as mentioned previously. Several of these canals, including the Larimer and Weld Canal Eaton Ditch), the Larimer County Canal, the Terry Inlet, the Poudre Valley Canal, and the North Poudre Ditch, have large enough flow capacity to significantly affect flood magnitudes on Dry Creek. For the more frequent flood events, the Larimer and Weld

Canal (Eaton Ditch), the Larimer County Canal, and the Terry Inlet were assumed to intercept all Dry Creek flows reaching their channels (Reference 1). As development within the basin continues, these canals will intercept greater flows on a more frequent basis. This will increase the probability of sporadic overflows from the canals, which can cause severe damage, particularly if an embankment fails. For this reason, separation of drainage flows and irrigation flows should be considered for at least the lower frequency events (Reference 1).

There is a levee on the right bank of the Cache La Poudre River upstream of Timberline Road that blocks flows that previously split down the Cache La Poudre RPATH. There are two irrigation dams on the North Fork Cache La Poudre River. The effect of the two dams is considered negligible in the study area. There are no flood control structures that reduce discharges on Buckhorn Creek, Redstone Creek, Fish Creek, Black Canyon Creek, or the Fall River.

The Horsetooth and Dixon Reservoirs are two major reservoirs within the Spring Creek basin. The Dixon Reservoir is located on the western edge of the basin immediately below the hogback that impounds the Horsetooth Reservoir. The Dixon Reservoir intercepts and stores runoff from approximately 250 acres of drainage area, making this area essentially non-contributing to the Spring Creek channel. The Horsetooth Reservoir is owned by the USBR and operated by the Northern Colorado Water Conservancy District. It was completed in the early 1950s as a water-supply reservoir, but has also helped reduce flooding problems in Spring Creek by reducing the tributary drainage area. The total drainage area for Spring Creek is approximately 30 square miles. Downstream of the Horsetooth Reservoir, the drainage area is approximately 12 square miles. The outlet works for the Horsetooth Reservoir are located on the north end of the reservoir, discharging to a water-supply canal. The outlet and canal are not within the boundaries of the Spring Creek basin. Off-stream detention ponds are located throughout the Spring Creek basin. In most cases, these ponds were designed to control local runoff and, in general, appear to have little effect on flows along Spring Creek. However, the Rossborough, Woodwest, Fairbrooke, and Colorado State University Animal Medical Center ponds have relatively larger storage areas and may have some effect on flows in Spring Creek. These ponds are controlled and operated by the City of Fort Collins for flood-control purposes and were included in the hydrologic analyses. Additionally, several man-made embankments for road and railroad crossings within the Spring Creek basin result in some flood attenuation. These crossings include the Taft Hill Roadway, Overland Trail Roadway, and Burlington Northern Railroad (BNRR) west of College Avenue, and the Colorado and Southern Railroad (C&SRR) west of Timberline Road. These areas were considered for detention in the hydrologic analysis.

The Town of Estes Park is replacing old bridges with bridges designed to avoid bridge backwater by perching the new bridges above the channel. Flood flows spill from the channel before water rises to the low chord of the bridge. The bridge does not create a backwater hence, it does not increase the flood hazard. Future replacement of inadequate bridges with these perched bridges will reduce flood potential in some areas.

Larimer County is providing some protection from floods through flood warning and forecasting by the National Oceanic and Atmospheric Administration (NOAA), National

Weather Service. Also, the City of Fort Collins operates a flood warning system consisting of over fifty gage sites that measure rain and/or water level.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods 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 once on the average during any 10-, 50-, 100-, and 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-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent annual chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent annual chance flood in any 50-year period is approximately 40 percent (4 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.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

The discharges on the Big Thompson River, the North Fork Big Thompson River, and their major tributaries were developed based upon a combination of gage records and regression equations contained in the Colorado Water Conservation Board's Technical Manual No.1, prepared by the U.S. Geological Survey (Reference 10). The locations of the stream gages analyzed and their respective years of record are as follows: Drake gage located on the Big Thompson River (47 years), Big Thompson River below Lake Estes (17 years), Big Thompson River above Lake Estes (27 years), and North Fork Big Thompson River at Drake (30 years). The gage records were analyzed using the log-Pearson Type III distribution as recommended in the U.S. Water Resources Council Bulletin 17 (Reference 11), and the discharges were adjusted as recommended in Technical Manual No. 1 (Reference 10).

The Storm Water Management Model (SWMM) (Reference 12) was used to determine discharges on drainage basins that are representative of the smaller Big Thompson River and North Fork Big Thompson River tributaries. These discharges were plotted on semi-log paper to develop discharge-drainage area curves for the region. These curves were entered with the drainage areas of the smaller tributaries, and the appropriate discharges were tabulated.

The hydrology for the Big Thompson River near Loveland was prepared by Ayres Associates. In 1971, the USACE presented flood flow frequencies for the lower portion of the Big Thompson River near Loveland based on statistical analysis of USGS gage data (Reference 13). Those flood frequencies were verified and used for the hydraulic study by Resource Consultants, Inc., which became effective in 1981. For the purposes of the latest study revision, the flood flow frequencies presented in the USACE study were further verified by augmenting the stream flow data with entries from the intervening period of record. An updated flood frequency relationship was developed in accordance with criteria outlined in Bulletin 17B, Guidelines for Determining Flood Flow Frequencies with the aid of the flood-frequency analysis program HEC-FFA, developed by the Hydrologic Engineering Center of the USACE. The updated flood frequency analysis used a systematic record of 80 years. Comparison showed that the effective flood discharges were higher than those from the updated flood frequency but typically plotted within the 90% confidence interval. The effective flood discharges were therefore adopted for this revision.

The hydrology for Dry Creek – BTR near Loveland was prepared by Anderson Consulting Engineers, Inc., utilizing the HEC's Hydrologic Modeling System program, HEC-HMS.

The hydrology for the Big Thompson River near the Town of Johnstown was prepared by Anderson Consulting Engineers, Inc. A thorough review of discharges from the 1970 hydrologic study of the Big Thompson River and the 1974 Floodplain Information Report for the Big Thompson River both completed by the USACE was performed. These discharges were then utilized in the hydraulic analysis of the Big Thompson River in the Johnstown area.

The discharges for Buckhorn Creek, Redstone Creek, and Black Canyon Creek were calculated based upon the regression equations found in Technical Manual No.1 (Reference 10). Parameters needed for the regression equations were taken from U.S. Geological Survey topographic maps at a scale of 1:250,000 (Reference 14), SCS County Soils Maps (Reference 15) and County Land Use Maps Reference 16). For Buckhorn Creek and Redstone Creek, discharges for each design point were calculated for the portions of the basin above 7,500 feet and below 7,500 feet, and the largest discharge at each point was used.

The hydrology for the Boxelder Creek/Cooper Slough area was prepared by Anderson Consulting Engineers, Inc. (Reference 75). The peak discharges for the 10-, 2-, and 1-percent annual chance floods were determined using the MODSWMM model.

The USACE hydrology for the Cache La Poudre River was developed using HEC-l, a general rainfall runoff computer model developed by the USACE's Hydrologic Engineering Center (Reference 39). The appropriateness of this routing method was verified using historical data for the 1976 and 1983 floods on the Cache La Poudre River. The HEC-1 routing method is considered valid to use for the routing of the hypothetical 1-percent annual chance flood. The results of the USACE hydrologic analysis were reviewed and accepted by Larimer County, FEMA, and the Colorado Water Control Board (CWCB).

For Coal Creek SLA used the Environmental Protection Agency SWMM (Reference 12) in determining discharges for the original report. SLA assumed that all irrigation ditches and canals would already be full from upstream runoff and would not have the capacity to intercept additional runoff. The Natural Resources Conservation Service (NRCS) found that one exception to this assumption is Windsor Ditch, which crosses the basin upstream of the Town of Wellington. The NRCS determined that 200 cfs would be diverted from Coal Creek by Windsor Ditch.

Discharges for Dry Creek were computed using the SWMM (Reference 12). The drainage basin was divided into 190 subbasins that drained into 139 channel sections. Basins were selected so that hydrographs would be available at critical design points, particularly at irrigation canal crossings and at on-stream reservoirs (Reference 1). Precipitation information was obtained from the NOAA Atlas (Reference 18). The 0.2-percent annual chance rainfall, not available from the atlas, was extrapolated assuming a Gumbel probability distribution (Reference 1).

Discharges for Fish Creek and the Fall River were computed based upon records of stream gages located on the two streams. The Fish Creek gage has 30 years of record, and the Fall River gage has 9 years of record. These records were analyzed using a log-Pearson Type III distribution as recommended in U.S. Water Resources Council Bulletin 17 (Reference 11). These discharges were weighted with those obtained using regression equations from the Colorado Water Conservation Board's Technical Manual No.1 (Reference 10).

The hydrologic study for Spring Creek completed by Anderson Consulting Engineers, Inc., was conducted in 2003 (Reference 72). MODSWMM was used to determine peak discharges for the 10- and 1-percent annual chance floods. The study was updated to reflect current drainage patterns, revise detention pond routing parameters, and improve modeling techniques, if applicable.

Peak discharge-drainage area relationships for streams studied in detail are shown in Table 2.

3.2 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. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in the FIS report. 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.

Cross sections for the Big Thompson River and its tributaries were taken from topographic maps at a scale of 1:2,400, with a contour interval of 2 feet (References 19, 20, and 21) and field surveys. These tributaries include the North Fork Big Thompson River, Big Thompson River Tributaries 1, 2, 3, and 4, Long Gulch, Rabbit Gulch, Quillan Gulch,

West Creek, Fox Creek, Dark Gulch, Cedar Creek, Devils Gulch, Bobcat Gulch, Dry Gulch, Noel's Draw, Dickson Gulch, and Miller Fork. Bridges and culverts were measured to determine size and structural geometry.

Roughness coefficients (Manning's "n") were estimated by field inspection. Channel values ranged from 0.035 to 0.045, and overbank values ranged from 0.050 to 0.060. Water-surface elevations were computed using the USACE HEC-2 computer program (Reference 22).

Cross sections for the backwater analysis of the Big Thompson River in Loveland were obtained from photogrammetric topographic maps. Below-water sections were obtained by field surveys. Bridges and culverts were surveyed to obtain elevation data and structural geometry.

Cross sections for the backwater analysis of Dry Creek – BTR were obtained from the topographic mapping. The two cross sections at the upstream end of the study reach required supplemental station-elevation data at their far ends. The supplemental data were obtained from an earlier study.

Water-surface elevations on both the Big Thompson River in Loveland and Dry Creek – BTR for floods of the selected recurrence interval were computed using the USACE HEC-RAS version 3.1.2 step-backwater computer program. Starting water-surface elevations for the Big Thompson River were taken from the 1977 study of the Big Thompson River prepared by the U.S. Army Corp of Engineers. Starting water-surface elevations for Dry Creek – BTR were specified as normal depth with a friction slope of 0.005 feet/foot.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas. Surveyed high water marks and anecdotal evidence of flood stage from flood that occurred on the Big Thompson River between April 30th and May 1st of 1999 were used to approximately calibrate the "n" value in the main channel of the Big Thompson River. Horizontal variation was applied to the "n" values in the overbanks and main channels throughout the study reaches. Overbank "n" values varied from 0.013 (wet ponds) to 0.20 (dense vegetation). At some cross sections the overbank "n" values were artificially set higher than 0.20 in order to maintain reasonable continuity of flow in the overbanks between adjacent cross sections. Main channel bank "n" values ranged from 0.013 (bike trails) to 0.08, and main channel bed "n" values ranged from 0.03 to 0.035.

Cross-sections for the Big Thompson River in the area near the Town of Johnstown were taken from existing topography from Weiland, Inc. Bridge information and road geometry were based on survey information, field inspections, and construction plans.

Water-surface elevations for the Big Thompson River around Johnstown were computed using the USACE HEC-RAS computer program. Starting water-surface elevations were taken from the Weld County FIS and the Weld County Floodplain Information Report.

Manning's "n" roughness coefficients were estimated based on field inspection and correlation with published information. The roughness value for the main channel of the Big Thompson River was 0.035. Roughness values for the overbanks were 0.050. A roughness value of 0.020 was utilized where gravel pits were present.

Cross sections for Buckhorn Creek and Redstone Creek were taken from topographic maps at a scale of 1:2,400, with a contour interval of 2 feet (Reference 23). Bridges were measured to determine size and structural geometry. Roughness coefficients were estimated by field inspection. The channel value for both streams was 0.035, and the overbank values ranged from 0.045 to 0.100. Water-surface elevations were computed using the USACE HEC-2 computer program (Reference 22).

For Coal Creek water-surface profiles for the return frequencies were determined using the U.S. Army Corps of Engineers HEC-2 computer program (Reference 22). Roughness coefficients (Manning's "n" values) were determined from field inspections and ranged from 0.040 to 0.070 in the channel and from 0.050 to 0.070 in the overbanks.

Table 2 – Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Big Thompson River					
At Larimer-Weld County Line	595	3,600	7,600	10,000	18,500
At Interstate 25	515	4,300	8,800	11,500	21,000
At County Road 9E	515	4,700	12,300	19,000	44,000
At Railroad Avenue	515	4,700	12,300	19,000	44,000
At Mouth of Canyon (Drake Gage)	535	4,700	12,300	19,000	44,000
At Drake Below North Fork	274	3,700	7,850	10,400	19,200
At Drake Above North Fork	191	2,750	5,700	7,500	13,600
At Lake Estes Below Dry Gulch	156	2,250	3,800	4,700	7,200
At Lake Estes	137.5	1,510	1,1990	2,180	2,600
At St. Vrain Avenue	136.9	1,510	1,1990	2,180	2,600
At Confluence with Fall River	87.1	980	1,340	1,460	1,760
At Crags Drive in Estes Park	87	980	1,340	1,460	1,760
Black Canyon Creek					
At Confluence with Big Thompson River	10	130	200	230	310
At Estes Park Corporate Limits	9.3	120	190	210	290
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	- -[1]	764	1,692	2,476	- -[1]
At Prospect Street	- -[1]	854	2,349	3,999	- -[1]
At the Boxelder Creek I-25 Split	- -[1]	854	2,346	3,993	- -[1]
At Lake Canal	- -[1]	853	2,229	3,866	- -[1]
At I-25	- -[1]	827	1,408	1,469	- -[1]
At State Highway 14	- -[1]	829	2,903	4,366	- -[1]
At C&S Railroad	- -[1]	599	2,378	3,239	- -[1]
At Vine Drive	- -[1]	439	2,011	2,774	- -[1]
Upstream of Larimer and Weld Canal	- -[1]	975	2,624	3,152	- -[1]
At County Road 50	- -[1]	982	2,616	3,141	- -[1]
At County Road 52	- -[1]	950	2,467	2,908	- -[1]

[1] Not Determined

Table 2 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Boxelder Creek (Continued)					
At County Road 54	- -[1]	952	3,958	6,978	- -[1]
Downstream of I-25 Near Wellington	24.46	900	1,670	2,140	3,100
Upstream of I-25 Near Wellington	13.86	480	920	1,170	1,690
Upstream of C&S Railroad	12.68	480	900	1,140	1,640
Upstream of Windsor Ditch	10.84	470	850	1,080	1,530
Boxelder Creek Overflow Channel					
At State Highway 14	- -[1]	74	510	1,342	- -[1]
At C&S Railroad	- -[1]	45	839	2,317	- -[1]
At Vine Drive	- -[1]	23	701	1,840	- -[1]
At Larimer and Weld Canal	- -[1]	33	1,111	3,450	- -[1]
At County Road 50	- -[1]	17	1,112	3,450	- -[1]
At County Road 52	- -[1]	0	1,486	4,069	- -[1]
Buckhorn Creek					
At Confluence with Big Thompson River	142.90	6,844	15,090	20,244	36,000
At Masonville Below Redstone Creek	122.50	6,321	13,593	18,059	32,000
At Masonville Above Redstone Creek	92.00	4,674	10,321	13,862	24,000
Cache La Poudre Lowflow Channel					
Upstream of Convergence with Cache La Poudre River	- -[1]	- -[1]	- -[1]	1,309	- -[1]
At Fossil Creek Ditch Diversion Dam	- -[1]	- -[1]	- -[1]	12,071	- -[1]
Cache La Poudre LPATH					
Upstream of Convergence with Cache La Poudre River	- -[1]	- -[1]	1,142	3,983	16,015
Cache La Poudre River					
Downstream of Confluence with Boxelder Creek	1,537	6,750	13,200	17,400	32,400
Upstream of Confluence with Boxelder Creek	1,537	5,820	11,400	15,000	27,900
Downstream of Confluence with Dry Creek	- -[1]	6,700	12,700	16,600	30,100
Upstream of Confluence with Dry Creek	- -[1]	5,370	10,200	13,300	24,100

[1] Not Determined

Table 2 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Cedar Creek					
At Confluence with Big Thompson River	19.75	2,460	6,530	9,400	20,000
Coal Creek					
At Town of Wellington	10.6	230	600	830	1,300
Cooper Slough					
At Prospect Road	- -[1]	69	156	265	- -[1]
At Lake Canal	- -[1]	67	200	200	- -[1]
Downstream of State Highway 14	- -[1]	45	200	200	- -[1]
Upstream of State Highway 14	- -[1]	45	934	2,511	- -[1]
At C&S Railroad	- -[1]	19	942	2,522	- -[1]
At Vine Drive	- -[1]	44	754	2,096	- -[1]
Cooper Slough Overflow					
Downstream of State Highway 14	- -[1]	0	735	2,312	- -[1]
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
Dickson Gulch					
At Confluence with Big Thompson River	2.10	970	1,600	1,900	2,650
Dry Creek – BTR					
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	--[1]
Dry Creek (South of Canal)					
At Confluence with Cache La Poudre River	63.3	381	805	1,195	--[1]

[1] Not Determined

Table 2 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
East Vine Diversion					
At Larimer and Weld Canal	58.6	30	163	330	- -[1]
Dry Gulch					
At Confluence with Big Thompson River	6.25	1,200	2,150	2,600	4,100
Fall River					
At Confluence with Big Thompson River	39.9	450	610	680	830
At Estes Park Corporate Limits	37.3	450	610	680	830
At Upstream Detailed Study Limit	37.3	450	610	680	830
Fish Creek					
At Lake Estes	16.0	105	280	400	840
At Estes Park Corporate Limits	13.4	105	208	400	840
At Upstream Detailed Study Limit	13.4	105	280	400	840
Fox Creek					
At Confluence with North Fork Big Thompson River	7.35	1,200	2,200	2,750	4,800
Little Thompson River					
At Larimer-Weld County Line	138.9	- -[1]	- -[1]	9,500	19,300
At Confluence with Dry Creek	133.0	- -[1]	- -[1]	9,200	18,800
At County Road 17	118.9	- -[1]	- -[1]	8,600	17,500
At County Road 21	113.2	- -[1]	- -[1]	8,300	16,900
At County Road 23E	107.7	- -[1]	- -[1]	8,000	16,300
Little Thompson – Spill Reach					
At Confluence with Little Thompson River	- -[1]	- -[1]	- -[1]	3,827	12,511
Long Gulch					
At Confluence with Big Thompson River	2.00	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

[1] Not Determined

Table 2 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
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	83.00	1,500	4,100	6,100	14,100
At Glen Haven Below Devils Gulch	51.00	1,450	3,400	4,400	11,500
Old Dry Creek (Historic Channel)					
At Confluence with Cache La Poudre River	- -[1]	- -[1]	- -[1]	939	- -[1]
Quillan 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	30.50	4,187	9,217	12,370	22,500
Sherry Drive Overflow					
At Sherry Drive	- -[1]	0	112	225	- -[1]

[1] Not Determined

Table 2 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Spring Creek					
At Confluence with Cache La Poudre River	- -[1]	1,380	- -[1]	2,570	- -[1]
At C&S Railroad	- -[1]	1,370	- -[1]	2,510	- -[1]
At Lemay Avenue	- -[1]	1,390	- -[1]	3,520	- -[1]
At Stover Street	- -[1]	1,060	- -[1]	2,300	- -[1]
At College Avenue	- -[1]	1,040	- -[1]	1,970	- -[1]
At Burlington Northern Railroad	- -[1]	1,040	- -[1]	1,970	- -[1]
At Arthur Ditch	- -[1]	1,010	- -[1]	2,930	- -[1]
At Shields Street	- -[1]	920	- -[1]	2,290	- -[1]
At Larimer County Canal #2	- -[1]	890	- -[1]	2,430	- -[1]
At New Mercer Ditch	- -[1]	830	- -[1]	1,990	- -[1]
At Drake Road	- -[1]	650	- -[1]	1,540	- -[1]
At Taft Hill Road	- -[1]	390	- -[1]	840	- -[1]
Upstream of Taft Hill Road Detention Pond	- -[1]	420	- -[1]	1,570	- -[1]
At Pleasant Valley and Lake Canal	- -[1]	280	- -[1]	1,130	- -[1]
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-44					
At Confluence with Big Thompson River	0.25	200	340	500	800
West Creek					
At Confluence with North Fork Big Thompson River	24.6	1,500	3,100	4,000	8,000

[1] Not Determined

Hydraulic analyses for Boxelder Creek and Cooper Slough were conducted by Anderson Consulting Engineers, Inc. (Reference 75). Water surface profiles were developed using HEC-RAS. A combination of field survey data and orthophoto based topographic mapping (prepared at a 2-foot contour interval) was used as the base information for defining cross section geometry and for delineating floodplains. For Boxelder Creek and Cooper Slough, Manning's n-values generally range from 0.035 to 0.060 for the channels and from 0.045 to 0.070 for the overbanks.

Eight study reaches located within the Boxelder Creek/Cooper Slough basins required boundary conditions. During the hydraulic analyses, twelve splitflows were identified within the Boxelder Creek basin, and two splitflows were identified within the Cooper Slough basin. Also, many shallow flooding areas exist adjacent to the floodplains for both basins.

Cross-sectional data for Cache La Poudre River, including overbanks, for the backwater analyses were obtained by field survey. All bridges were surveyed to obtain elevation data and structural geometry. The land-use and hydraulic-roughness data were also obtained by field surveys.

Water-surface elevations for floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater program (Reference 22). Starting water-surface elevations for the Cache La Poudre River at the Larimer-Weld County line were obtained from a concurrent study in Weld County (Reference 40).

Channel and overbank hydraulic roughness factors (Manning's "n") used in the hydraulic computations were determined using engineering judgment and were based on field observations of the stream and flood plain areas and the descriptions presented in standard engineering references (Reference 41). The channel "n" value for the Cache La Poudre River was estimated as 0.035 throughout the study reach, and the overbank "n" values ranged from 0.043 to 0.100. The hydraulic analyses for this study were based on unobstructed flow.

During the analysis, several divided-flow and split-flow reaches were identified. The most prominent split flows occur near the upstream end of the study reach, just downstream of Horsetooth Road. For the 2-, 1-, and 0.2-percent annual chance flood events, water splits out over the right overbank and becomes separated from the main flow by the embankment for Interstate Highway 25 (I-25).

The divided-flow path extends southerly along the west side of I-25, before crossing I-25 and returning to the main flow path. There are two locations where water splits away from the divided flow path and returns to the main path.

A third flow path occurs just north of County Road 36E. This path is caused by flow escaping from the I-25 divided-flow path as it returns to the main channel.

At the downstream end of the study reach, another split-flow situation is present. Water splits from the left overbank over the Larimer-Weld County Line Road. This split is affected by backwater conditions, so the weir coefficient for the split has been greatly

reduced. This water does not return to the main channel within the study reach, but is accounted for in the concurrent Flood Insurance Study for Weld County, located immediately downstream (Reference 40).

Each of these divided-flow paths were modeled separately using HEC-2.

For the revised area of Cache La Poudre River from Wood Street to Watson Lake, the cross sections for the backwater analyses were obtained from photogrammetric topographic maps provided by Larimer County. Below-water sections were obtained by field surveys performed by Ayres Associates Inc. in 2005. Bridges and culverts were also surveyed by Ayres Associates Inc., in 2005 to obtain elevation data and structural geometry.

Water-surface elevations on the Cache La Poudre River in Larimer County for floods of the selected recurrence intervals were computed using the USACE HEC-RAS version 3.1.2 step-backwater computer program. Starting water-surface elevations for the Cache La Poudre River in Larimer County were taken from the 1999 FIS.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas. No reliable calibration data was available for the Cache La Poudre River. Horizontal variation was applied to the "n" values in the overbanks and main channels throughout the study reaches. Overbank "n" values varied from 0.013 (wet ponds) to 0.200(dense vegetation). At some cross sections the overbank "n" values were artificially set higher than 0.200 in order to maintain reasonable continuity of flow in the overbanks between adjacent cross sections. Main channel bank "n" values ranged from 0.013 (bike trails) to 0.080, and main channel bed "n" values ranged from 0.030 to 0.035.

For the lower reach of the Cache La Poudre River below the Timnath Reservoir Inlet ditch diversion, a hydraulic model was developed for the 10-, 2-, and 1-percent annual chance floods and a separate model was developed for the 0.2-percent annual chance flood.

A model was developed to provide a 1-percent annual chance flood water-surface profile for the Cache La Poudre Lowflow channel between Sections 201202 and 205242 of the main channel. When the river rises above a certain level, the majority of the flow breaks out to the east and then travels through a low-gravel pit, bypassing the Lowflow channel. The Lowflow channel HEC-2 model was created for the reach between Cross Sections 201202 and 204025 of the main channel. The gravel pit east of the river was blocked using encroachments. The HEC-2 split-flow option calculated the discharge that breaks out of the Lowflow channel to the east.

The split-flow computations showed that most of the 1-percent annual chance flood discharge bypasses the Lowflow channel, leaving approximately 10 percent of the 1-percent annual chance flood discharge within the Lowflow channel. The discharge used to compute the 1-percent annual chance flood water-surface elevations along the gravel pit was not reduced by the 10-percent flow conveyed in the Lowflow channel. A separate profile was developed for the Cache La Poudre Lowflow channel.

The BNRR embankment divides the flood plain downstream of the City of Fort Collins' Wastewater Treatment Plant Number 2. For the 10-, 2-, and 1-percent annual chance floods, only the area of the right bank north of the railroad embankment was considered effective for flow. To develop water-surface elevations south of the railroad, a model was developed to consider the results of railroad embankment failure. For the 0.2-percent annual chance flood, the split-flow option was used to calculate the flows that overtop the railroad embankment. The 1-percent annual chance flood water-surface elevations south and north of the railroad embankment are shown on the same profile panels.

There are two major flow diversions in the lower reach of the Cache La Poudre River. Between Cross Sections AE and AF (Sections 211017 and 212317 in the HEC-2 model) on the main channel, flow spills to the left-bank gravel pit area and flows along a separate flow path (referenced as Cache La Poudre LPATH) before rejoining the main flow path just below the Fossil Creek Ditch diversion. The amount of flow diverted to LPATH was computed using the split-flow routine from the 1989 SFH study.

In the reach above the Timnath Reservoir Ditch diversion, the main flow of the Cache La Poudre River was modeled using two separate HEC-2 models. One model was for the 10-, 2-, and 1-percent annual chance floods and the other was for the 0.2-percent annual chance flood. In addition, there are several divided flows. Between Mulberry Street and Lincoln Avenue, the 0.2-percent annual chance flood overtops Lemay Avenue on the left bank. This flow enters the drainage basin for Dry Creek and returns to the Cache La Poudre River below the Timnath Reservoir Ditch diversion.

Just upstream of the Lincoln Avenue bridge, flow splits and travels east along the north side of Lincoln Avenue. Much of the split flow spills back across Lincoln Avenue to the Cache La Poudre River along the flow path referenced as Cache La Poudre LINC. For the 1-percent annual chance flood, less than 55 cfs continues east along Lincoln Avenue.

A large drainage ditch runs along the north side of Lincoln Avenue from just west of Lemay Avenue east through the airport area. The small amount of flow not returning to the Cache La Poudre flood plain is collected by this ditch. A normal-depth analysis shows this ditch could carry a discharge of 55 cfs. The flow in this ditch eventually enters Dry Creek.

A separate HEC-2 model was created to calculate the 1-percent annual chance flood discharge that would be lost east of Lemay Avenue if the road embankment failed. The split-flow option in HEC-2 was used to calculate the spill, assuming normal-depth flow and no embankment. Using this discharge, another model was developed to compute the 1-percent annual chance flood water-surface profile downstream of Lemay and between Lincoln Avenue and Mulberry Street (referenced as Cache La Poudre LEMAYDS). This breakout spills over Lincoln Avenue into the 1-percent annual chance flood plain of Dry Creek and returns to the Cache La Poudre River via that stream.

The discharge in the main channel of the Cache La Poudre River was not reduced for the loss of flow through the Lemay Avenue breakout due to the low probability of road embankment failure. At the upstream side of the BNRR bridge, the 0.2-percent annual chance flood flows east along Vine Drive. The amount of flow that spills was determined from a rating curve for normal-depth flow over the control section at this location. The

spill along Vine Drive flows into the drainage for Dry Creek and returns to the Cache La Poudre River below the Timnath Reservoir Canal diversion via Dry Creek.

Downstream of Taft Hill Road, there are two diversion structures (for Larimer and Weld Canal and Arthur Ditch) and large excavations on both sides of the river. Most of the effective flow was on the left bank during the 1-percent annual chance flood due to the protective berms. Upstream of Taft Hill Road, split flow occurs during the 0.2-percent annual chance flood.

The same Manning's "n" value of 0.035 for the channel in the 1989 study was used for this restudy. For the overbank areas, the values were revised to reflect existing conditions. The values for the overbanks range from 0.04 to 0.104.

Starting water-surface elevations for the main channel of the Cache La Poudre River were taken from the 1993 Flood Insurance Study report for Larimer County, Colorado.

Cross sections on Dry Creek were taken from topographic maps at a scale of 1:1,200, with a contour interval of 2 feet (Reference 25). Roughness coefficients were estimated by field inspection. Channel values ranged from 0.03 to 0.05, and overbank values ranged from 0.015 to 0.10. Water-surface profiles were computed using the USACE HEC-2 computer program (Reference 22).

Cross section data for Fish Creek and the Fall River were taken from topographic maps at a scale of 1:1,200, with a contour interval of 2 feet (Reference 26) and were supplemented with field surveyed cross sections. Roughness coefficients were estimated by field inspection. The channel value was 0.04, and the overbank values ranged from 0.03 to 0.08. Water-surface profiles were computed using the USACE HEC-2 computer program (Reference 22).

Cross section data for Black Canyon Creek were taken from topographic maps at a scale of 1:1,200 with a contour interval of 2 feet (Reference 19) and were supplemented with field-surveyed cross sections. Roughness coefficients were estimated by field inspection. The channel value was 0.04 and the overbanks were 0.06. Water- surface profiles were computed using the USACE HEC-2 computer program (Reference 22).

Cross section data for the Fall River were field-surveyed. A water supply dam located in the upper watershed failed in July 1982 and changed the channel. Roughness coefficients were estimated by field inspection. The channel roughness ranged from 0.04 to 0.05and the overbank roughness ranged from 0.03 to 0.06. Water-surface profiles were computed using the USACE HEC-2 program (Reference 22).

Approximate flood elevations for the Little Thompson River were determined from a USACE Flood Plain Information report (Reference 27).

Starting water-surface elevations for the Big Thompson River upstream of Lake Estes and Fish Creek were the maximum normal operating level of Lake Estes. Starting water-surface elevations for Dry Creek were computed assuming critical depth. On Fall River, Black Canyon Creek, Boxelder Creek, and Cooper Slough, starting water-surface

elevations were computed using the slope area method.

The Spring Creek hydraulic analysis was conducted by Anderson Consulting Engineers, Inc., in 2003 (Reference 72). Water surface profiles were generated using the USACE HEC-RAS model. A combination of field survey data and ortho-photo based topographic mapping (dated April 1999 and prepared at a 2-foot contour interval) was used as the base information for defining cross section geometry and delineating floodplains. From Timberline Road to just downstream of Welch Street, topography in the form of 1-foot contours was generated based on field survey data. Field survey data was used to define cross-sections at bridges and the geometry of the low flow channel at nearly all cross sections defined in the HEC-RAS model. In addition, the field surveys included irrigation ditch embankments and other features needing more definition than was available on the topographic mapping.

For the main Spring Creek channel, Manning's "*n*" values generally range from 0.030 to 0.070, with heavily vegetated areas exhibiting values up to 0.090. Overbank Manning's "*n*" values generally range from 0.060 to 0.090, with isolated areas as smooth as 0.035 or as rough as 0.100.

A detailed splitflow path east of Shields Street (Shields Street Divided Flow Path) was identified and analyzed by Anderson Consulting Engineers in 2005 (Reference 71). This path consists of several subreaches through the Hill Pond and Windtrail neighborhoods and along Shire Court. Water surface profiles were generated using the USACE HEC-RAS version 3.0.1. Manning's "n" values range from 0.035 to 0.050 for the channels and from 0.100 to 0.150 for the overbank areas. Many shallow flooding areas were identified.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Vertical Datum

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 in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using the NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Elevation Reference Marks (ERMs) shown on the FIRM represent those used during the preparation of this and previous FIS reports. Users should be aware that these ERM elevations may have changed since the publication of this FIS report. To obtain up-to-date elevation information on National Geodetic Survey (NGS) ERMs shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov. Map users should seek verification of non-NGS ERM monument elevations when using these elevations for construction or floodplain management purposes. It is important to note that adjacent communities may be referenced to NGVD. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between communities.

For this revision, a vertical datum conversion was completed for each studied reach. The range of conversion factors was prohibitively high; therefore, a standard conversion factor was not applied for the entire community. The Profile Panel and FDT conversion from NGVD29 to NAVD88 was carried out in accordance to the procedure outlined in the FEMA document Map Modernization – Guidelines and Specifications for Flood Hazard Mapping Partners Appendix B: Guidance for Converting to the North American Vertical Datum of 1988.

Using the multiple conversion factor approach, an average conversion factor for each flooding source was developed by establishing separate conversion factors at the upstream end, at the downstream end and at an intermediate point of the studied reach. From this data, the average conversion factors for each reach were developed. In some cases, it was necessary to divide each reach into multiple sections in order for the maximum offset from the average conversion factor to be less than or equal to 0.25 feet.

For more information on NAVD88, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (FEMA, June 1992), or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://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 Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access this data.

Conversion factors for each studied reach are shown in Table 3.

For the Big Thompson River new studies in the areas of the Towns of Johnstown and Loveland, no datum conversion was needed.

Table 3 – Datum Conversion Factors

Stream/Reach	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset	Begin Station	End Station
Big Thompson River-1	2.96	3.43	3.2	0.24	At Station 172,865	Approximately 2,400' Downstream of Cedar Creek
Big Thompson River-2	3.43	3.92	3.7	0.25	Approximately 2,400' Downstream of Cedar Creek	Approximately 3,400' Downstream of Long Gulch
Big Thompson River-3	3.92	4.10	4.0	0.11	Approximately 3,400' Downstream of Long Gulch	Limit of Detailed Study
Big Thompson River Overflow	3.92	4.10	4.0	0.11	Entire Reach	
Black Canyon Creek	4.12	4.44	4.2	0.19	Entire Reach	
Bobcat Gulch	3.70	3.71	3.7	0.01	Entire Reach	
Boxelder Creek	2.95	3.06	3.0	0.07	Entire Reach	
Boxelder Creek I-25 Split	2.95	3.06	3.0	0.07	Entire Reach	
Boxelder Creek I-25 Split Overflow	2.95	3.06	3.0	0.07	Entire Reach	
Boxelder Creek – Left Overbank Divided Flow at Indian Creek	2.95	3.06	3.0	0.07	Entire Reach	
Boxelder Creek Overflow - Downstream	2.95	3.06	3.0	0.07	Entire Reach	
Boxelder Creek Overflow - Upstream	2.95	3.06	3.0	0.07	Entire Reach	
Buckhorn Creek	3.25	3.28	3.3	0.02	Entire Reach	

Table 3 – Datum Conversion Factors (*Continued*)

Stream/Reach	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset	Begin Station	End Station
Cache La Poudre LEMAYDS	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre LINC	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre Lowflow Channel	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre LPATH	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre River	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre River Interstate Highway 25 Divided Flow	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre River Split LPATH	2.93	3.15	3.0	0.11	Entire Reach	
Cache La Poudre River Split RPATH	2.93	3.15	3.0	0.11	Entire Reach	
Cedar Creek	3.45	3.46	3.5	0.00	Entire Reach	
Coal Creek	2.95	3.06	3.0	0.07	Entire Reach	
Cooper Slough	2.95	3.06	3.0	0.07	Entire Reach	
Cooper Slough Overflow	2.95	3.06	3.0	0.07	Entire Reach	
Dark Gulch	3.92	4.10	4.0	0.11	Entire Reach	
Devils Gulch	4.03	4.03	4.0	0.00	Entire Reach	

Table 3 – Datum Conversion Factors (*Continued*)

Stream/Reach	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset	Begin Station	End Station
Dickson Gulch	3.40	3.40	3.4	0.00	Entire Reach	
Dry Creek	2.93	3.02	3.0	0.05	Entire Reach	
Dry Gulch	4.07	4.12	4.1	0.03	Entire Reach	
Fall River	4.12	4.25	4.2	0.08	Entire Reach	
Fall River Overflow	4.12	4.25	4.2	0.08	Entire Reach	
Fish Creek	4.13	4.17	4.1	0.02	Entire Reach	
Fox Creek	4.01	4.11	4.1	0.05	Entire Reach	
Glade Road Split	2.96	3.43	4.0	0.24	Entire Reach	
Little Thompson River	2.92	3.15	3.0	0.14	Entire Reach	
Little Thompson River – Spill Reach	2.92	3.15	3.0	0.14	Entire Reach	
Long Gulch	3.93	3.93	3.9	0.00	Entire Reach	
Miller Fork	3.95	3.96	4.0	0.01	Entire Reach	
Noel’s Draw	4.04	4.04	4.0	0.00	Entire Reach	
North Fork Big Thompson River	3.69	4.08	3.9	0.22	Entire Reach	
Quillan Gulch	3.43	3.92	3.7	0.25	Entire Reach	
Rabbit Gulch	3.95	3.95	3.9	0.00	Entire Reach	

Table 3 – Datum Conversion Factors (*Continued*)

Stream/Reach	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset	Begin Station	End Station
Redstone Creek	3.25	3.27	3.3	0.01	Entire Reach	
Sherry Drive Overflow	2.93	3.15	3.0	0.11	Entire Reach	
Shields Street Divided Flow Path – Hill Pond Road	2.98	3.12	3.0	0.09	Entire Reach	
Shields Street Divided Flow Path – Shire Court	2.98	3.12	3.0	0.09	Entire Reach	
Shields Street Divided Flow Path – Windtrail Swale	2.98	3.12	3.0	0.09	Entire Reach	
Spring Creek	2.98	3.12	3.0	0.09	Entire Reach	
Tributary BT-1	3.92	4.10	4.0	0.11	Entire Reach	
Tributary BT-2	3.92	4.10	4.0	0.11	Entire Reach	
Tributary BT-3	3.92	4.10	4.0	0.11	Entire Reach	
Tributary BT-4	3.92	4.10	4.0	0.11	Entire Reach	
West Creek	4.00	4.04	4.0	0.02	Entire Reach	

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent annual chance flood elevations and delineations of the 1- and 0.2-percent annual chance floodplain boundaries and 1-percent annual chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles and Floodway Data Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at scales of 1:2,400, 1:1,200, and 1:6,000, with contour intervals of 2 and 4 feet (References 19, 20, 21, 23, 24, 25, 26, and 29).

For the Big Thompson River near Loveland, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps prepared in August 2004 at a scale of 1:2,400 and with a contour interval of 2 feet.

For Dry Creek – BTR, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps prepared in August 2004 at a scale of 1:2,400 and with a contour interval of 2 feet. The Ayres topography was supplemented by ground survey.

For the Big Thompson River near Johnstown, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps.

For Dry Creek in Fort Collins, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800, with 2-foot contour intervals.

On the Little Thompson River, approximate flood boundaries were delineated using aerial photographs at a scale of 1:12,000 (Reference 27). Approximate flood boundaries for the

Cache La Poudre River were delineated from two USACE Flood Plain Information reports (References 6 and 28).

Floodplain boundaries for the Cache La Poudre River were delineated using topographic maps at a scale of 1:1,200, with a contour interval of 2 feet (Reference 42).

The flood boundaries for the 1-, and 0.2-percent annual chance floods, for the revised area of Cache La Poudre River, were delineated using the flood elevations determined at each cross section. The flood boundaries were plotted on 1" = 200'-scale orthophoto maps (Reference 58). There were several low-lying areas protected from flooding from the main channel by gravel banks with minimum freeboard. Because of the potential hazard if these banks fail, these areas are shown as subject to shallow flooding.

For the revised area of the Cache La Poudre River from Wood Street to Watson Lake the 1- and 0.2-percent annual chance floodplain boundaries were delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps prepared for Larimer County with a contour interval of 2 feet.

For each section of Boxelder Creek and Cooper Slough studied by detailed methods, the 1-percent annual chance floodplain boundary were delineated using the flood elevations at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:100, with a contour interval of 2 feet (Reference 75).

Boundaries of the 1-, and 0.2-percent annual chance floods for Boxelder Creek in the vicinity of the Town of Wellington were delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:1,200, with contour intervals of 2 feet (Reference 30).

Boundaries of the 1-percent annual chance flood for Spring Creek were interpolated using topographic maps ranging in scale from 1" = 50' to 1" = 100', with contour intervals 1 and 2 foot (Reference 71).

The 1- and 0.2-percent annual chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE); and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent annual chance floodplain boundary is shown on the FIRM.

Approximate 1-percent annual chance floodplain boundaries in some portions of the study area were taken directly from the Flood Hazard Boundary Map (Reference 31).

4.2 Floodways

Encroachment on flood plains, 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 this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways for this study were divided into two categories based upon the location of the stream. The mountain area criteria were 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. The plains area criteria were based upon the criteria of equal-conveyance reduction from each side of the flood plain with a 0.5-foot limitation on flood height, provided that hazardous velocities are not produced (Figure 1).

The floodways for the Big Thompson River upstream of Lake Estes and Black Canyon Creek were based upon the criteria of equal conveyance reduction from each side of the flood plain with a 1.0-foot limitation of increased flood height, provided that hazardous velocities are not produced (Figure 1). The floodway for the Fall River was based upon the criteria of equal conveyance reduction from each side of the flood plain with a 1.0-foot limitation on increased energy grade line.

The floodway presented in the FIS report and on the FIRM for the Big Thompson River in Loveland was modified from the effective regulatory floodway. The effective floodway for the plains criteria reach of the Big Thompson River was originally developed on the basis of equal conveyance reduction from each side of the floodplain, with a rise limitation of one foot. The revised analysis defined a floodway with a rise limitation of one-half foot. Wherever possible and appropriate, the effective floodway boundary was maintained if it resulted in a base-flood rise of one-half foot or less under the new study. The floodway was widened wherever necessary to keep the rise at or below one-half foot. The floodway was made narrower in some locations because the effective floodway encroachment limit was found to be within ineffective flow areas under the revised study.

The floodway for Dry Creek – BTR was computed on the basis of equal conveyance reduction from each side of the floodplain where feasible.

The floodway for the Big Thompson River near Johnstown was computed on the basis of equal conveyance reduction from each side of the floodplain. Because the Town of Johnstown regulates to the one-foot floodway requirement and the County regulates to the

more stringent half-foot floodway requirement different floodway requirements were used. For the portion of the reach that flows in or near Johnstown the one-foot floodway requirement was used. This section is from cross-section F to cross-section U. For the rest of the reach the half-foot floodway requirement was used.

Computation of portions of the floodway for the Cache La Poudre River in the study reach required nonstandard solutions due to the numerous divided-flow paths. In location of divided flow, it was attempted to channel all of the flow into the mainstream path, limiting the flow to the 1-percent annual chance flood plain. If the water-surface elevation increase was less than the allowable surcharge, the main flow path was encroached by proportional conveyance reduction. If the water-surface elevation increase caused by the additional discharge was greater than the allowable surcharge, then water was allowed to flow both along the main flow path and the involved divided-flow paths. The divided-flow paths were then encroached using proportional conveyance reduction until the allowable surcharge was reached. The floodway was then defined as the outer limits of the two paths.

In areas where divided-flow paths were not present, the floodway was computed using proportional conveyance reduction from each side of the flood plain with adjustments as necessary to obtain a consistent and reasonable floodway.

Floodways for the revised areas of Cache La Poudre River were based on equal reduction in conveyance from both sides of the flood plain. Although both 0.5-foot- and l-foot-rise floodways were computed, the l-foot-rise floodway was mapped.

In the lower reach of the study, divided floodways were developed along the Cache La Poudre River and Cache La Poudre LPATH due to split-flow conditions. Just east of Wastewater Treatment Plant Number 2, the main flow of the Cache La Poudre River leaves its channel during large flood events. The floodway was delineated along the breakout flow path. No floodway was mapped for the Lowflow channel of the Cache La Poudre River.

Just below Taft Hill Road, a flow diversion was modeled by subtracting the left overbank flow from the total discharge and confining the remaining flow to the channel. It was assumed that the confining banks fail for the purpose of computing a floodway.

For the revised area of the Cache La Poudre River from Wood Street to Watson Lake, a 0.5 foot floodway was computed. Wherever possible and appropriate, the effective floodway boundary was maintained if it resulted in a base-flood rise of one-half foot or less under the revised study. The floodway was widened wherever necessary to keep the rise at or below one-half foot. The floodway was made narrower in some locations because the effective floodway encroachment limit was found to be within ineffective flow areas under the revised study.

A 0.5 foot floodway was computed for Boxelder Creek and Cooper Slough based on the equal conveyance method.

It was decided for portions of the Dry Creek floodway to permit encroachment to a point where the maximum rise in the 1-percent annual chance flood water-surface elevation would be no greater than 1.0 foot as computed in the Dry Creek report (Reference 1).

A 0.5 foot floodway was computed for Spring Creek based on a combination of equal conveyance reduction and by setting the encroachment stations at specified locations.

The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 4).

As shown on the FIRM (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 1-percent annual chance flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent annual chance flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

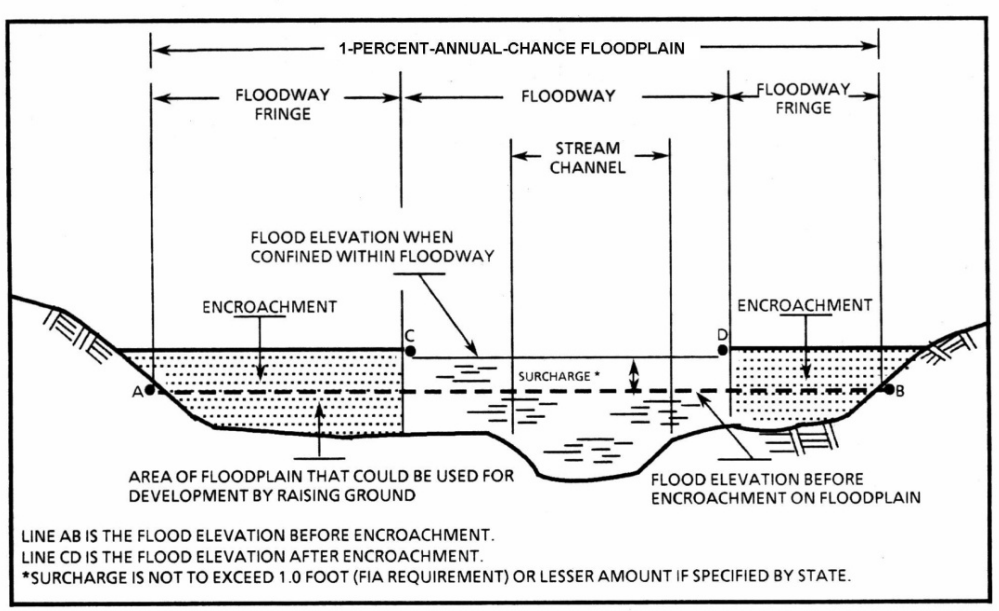

Figure 1 – Floodway Schematic

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
A	83,860	915	2,912	3.9	4,811.7	4,811.7	4,811.9	0.2
B	84,705	820	3,224	3.6	4,812.8	4,812.8	4,813.3	0.5
C	86,140	695	1,859	6.2	4,815.4	4,815.4	4,815.5	0.1
D	86,625	905	2,771	4.2	4,817.6	4,817.6	4,817.6	0.0
E	87,365	825	3,538	3.3	4,819.0	4,819.0	4,819.0	0.0
F	88,175	490[2]	2,215	5.2	4,819.8	4,819.8	4,820.2	0.4
G	88,945	520[2]	2,412	4.8	4,821.0	4,821.0	4,821.8	0.8
H	89,820	685[2]	3,417	3.4	4,822.2	4,822.2	4,823.1	0.9
I	91,965	855[2]	3,755	3.1	4,824.3	4,824.3	4,824.6	0.3
J	92,805	1,128[2]	2,836	4.1	4,825.0	4,825.0	4,825.2	0.2
K	95,555	1,830[2]	4,413	2.6	4,828.2	4,828.2	4,828.3	0.1
L	95,645	1,725[2]	4,503	2.6	4,828.4	4,828.4	4,829.6	0.2
M	96,850	760[2]	2,242	5.1	4,829.4	4,829.4	4,829.6	0.2
N	98,100	960[2]	3,405	3.4	4,831.5	4,831.5	4,832.5	1.0
O	98,850	1,030[2]	3,256	3.5	4,833.2	4,833.2	4,833.8	0.6
P	101,125	905[2]	2,950	3.9	4,836.1	4,836.1	4,836.7	0.6
Q	101,775	625[2]	2,828	4.1	4,837.0	4,837.0	4,837.8	0.8
R	102,655	545[2]	2,656	4.3	4,838.0	4,838.0	4,839.0	1.0
S	103,415	475[2]	2,521	4.6	4,839.3	4,839.3	4,840.3	1.0
T	104,065	580[2]	2,741	4.2	4,840.6	4,840.6	4,841.6	1.0
U	104,910	745[2]	2,701	4.3	4,842.5	4,842.5	4,842.8	0.3
V	105,840	781	2,716	4.2	4,844.1	4,844.1	4,844.1	0.0

[1]Feet Above Confluence with South Platte River
[2]One Foot Floodway Used

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
W	106,565	360	1,404	8.2	4,844.5	4,844.5	4,844.5	0.0
X	107,370	350	1,656	6.9	4,847.6	4,847.6	4,847.7	0.1
Y	107,750	210	1,648	7.0	4,848.7	4,848.7	4,847.7	0.0
Z	107,990	125	1,194	9.6	4,849.6	4,849.6	4,849.7	0.1
AA	108,215	270	2,556	4.5	4,851.7	4,851.7	4,851.8	0.1
AB	108,270	375	3,220	3.6	4,852.0	4,852.0	4,852.1	0.1
AC	123,582	1,675	9,237	2.1	4,884.2	4,884.2	4,884.6	0.4
AD	123,721	1,675	8,826	2.2	4,885.0	4,885.0	4,885.2	0.2
AE	124,489	1,664	9,072	2.1	4,885.5	4,885.5	4,885.9	0.4
AF	125,282	1,350	8,904	2.1	4,885.7	4,885.7	4,886.2	0.5
AG	125,922	1,265	7,953	2.4	4,886.0	4,886.0	4,886.5	0.5
AH	128,049	157[2]	1,258	9.8	4,892.6	4,892.6	4,892.6	0.0
AI	129,512	326[2]	2,255	5.5	4,899.2	4,899.2	4,899.2	0.1
AJ	130,190	810	4,419	4.3	4,900.2	4,900.2	4,900.5	0.3
AK	130,903	913	3,889	4.9	4,900.8	4,900.8	4,901.3	0.5
AL	131,738	1,082	2,718	7.0	4,906.2	4,906.2	4,906.4	0.2
AM	132,315	1,337	2,830	6.7	4,910.3	4,910.3	4,910.5	0.2
AN	132,410	1,498	7,341	2.6	4,912.7	4,912.7	4,912.7	0.0
AO	132,866	1,409	9,586	2.0	4,913.0	4,913.0	4,913.1	0.1
AP	133,279	1,722	7,694	2.5	4,913.1	4,913.1	4,913.2	0.1
AQ	135,882	1,391	5,996	3.2	4,915.5	4,915.5	4,915.5	0.0
AR	136,671	1,242	8,509	2.2	4,919.8	4,919.8	4,920.1	0.3

[1]Feet Above Confluence with South Platte River [2]Width Excludes Width for the Gravel Pit Split

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
AS	137,363	850	4,124	4.6	4,922.1	4,922.1	4,922.4	0.3
AT	137,480	1,324	6,312	3.0	4,924.1	4,924.1	4,924.2	0.1
AU	137,910	1,598	8,373	2.3	4,924.9	4,924.9	4,925.0	0.1
AV	138,659	1,395	4,161	4.6	4,925.9	4,925.9	4,926.0	0.1
AW	139,291	1,112	4,716	4.0	4,927.6	4,927.6	4,927.7	0.1
AX	140,488	1,347	6,014	3.2	4,929.4	4,929.4	4,929.4	0.0
AY	141,229	1,279	2,739	6.9	4,931.0	4,931.0	4,931.4	0.4
AZ	141,365	1,352	4,271	4.5	4,933.9	4,933.9	4,934.2	0.3
BA	141,459	1,452	4,743	4.0	4,934.4	4,934.4	4,934.9	0.5
BB	142,013	1,187	6,161	3.1	4,936.0	4,936.0	4,936.5	0.5
BC	142,969	1,830	3,329	5.7	4,937.5	4,937.5	4,937.9	0.4
BD	145,367	278[2]	1,011	7.5	4,943.8	4,943.8	4,944.1	0.3
BE	145,892	107[2]	924	8.4	4,947.7	4,947.7	4,947.9	0.2
BF	146,027	184[2]	1,762	4.3	4,951.7	4,951.7	4,951.7	0.0
BG	146,439	175[2]	1,396	3.0	4,952.3	4,952.3	4,952.4	0.1
BH	147,542	183	784	9.4	4,951.9	4,951.9	4,952.0	0.2
BI	147,617	270	834	8.8	4,952.3	4,952.3	4,952.4	0.1
BJ	148,351	283	1,784	4.1	4,956.6	4,956.6	4,956.8	0.2
BK	148,910	1,475[2]	6,336	2.6	4,959.4	4,959.4	4,959.8	0.4
BL	149,086	994	3,967	5.0	4,960.6	4,960.6	4,960.8	0.2
BM	149,203	676	3,864	4.2	4,960.9	4,960.9	4,961.2	0.3
BN	150,869	288	2,669	6.1	4,965.3	4,965.3	4,965.4	0.1

[1]Feet Above Confluence with South Platte River [2]Width Excludes Width for the South Spill

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
BO	151,731	244	2,499	6.5	4,967.9	4,967.9	4,968.0	0.1
BP	153,234	445	3,904	4.9	4,970.8	4,970.8	4,970.9	0.1
BQ	153,946	477	3,184	6.0	4,972.5	4,972.5	4,972.6	0.1
BR	154,562	288	1,543	12.3	4,975.0	4,975.0	4,975.0	0.0
BS	155,054	520	2,019	9.4	4,979.2	4,979.2	4,979.2	0.0
BT	155,513	566	2,278	8.3	4,982.6	4,982.6	4,982.6	0.0
BU	155,673	603	3,029	6.3	4,984.9	4,984.9	4,984.9	0.0
BV	156,156	587	3,059	6.2	4,986.2	4,986.2	4,986.2	0.0
BW	156,807	249	1,440	13.2	4,988.9	4,988.9	4,988.9	0.0
BX	156,991	260	2,498	7.6	4,992.4	4,992.4	4,992.4	0.0
BY	157,162	830	4,592	4.1	4,993.4	4,993.4	4,993.4	0.0
BZ	157,959	1,990	6,603	2.9	4,994.7	4,994.7	4,994.7	0.0
CA	159,101	1,556	3,935	4.8	4,996.7	4,996.7	4,996.9	0.2
CB	160,286	1,880	7,157	2.7	5,003.0	5,003.0	5,003.5	0.5
CC	160,551	2,254	5,422	3.5	5,004.3	5,004.3	5,004.8	0.5
CD	160,797	2,515	4,416	4.3	5,005.6	5,005.6	5,006.1	0.5
CE	160,888	2,560	8,126	2.3	5,007.5	5,007.5	5,007.5	0.0
CF	161,073	2,453	8,136	2.3	5,007.6	5,007.6	5,007.6	0.0
CG	161,782	1,018	3,197	5.9	5,010.1	5,010.1	5,010.2	0.1
CH	163,054	400	2,337	8.1	5,015.1	5,015.1	5,015.1	0.0
CI	163,985	626	2,328	8.2	5,019.8	5,019.8	5,019.8	0.0
CJ	165,220	542	2,290	8.3	5,023.3	5,023.3	5,023.3	0.0

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
CK	166,009	587	4,139	4.6	5,027.5	5,027.5	5,027.6	0.1
CL	167,546	929	4,398	4.3	5,034.5	5,034.5	5,034.5	0.0
CM	167,718	986	5,517	3.4	5,034.7	5,034.7	5,034.7	0.0
CN	168,381	1,379	5,594	3.4	5,036.0	5,036.0	5,036.0	0.0
CO	169,234	1,228	3,181	6.0	5,037.1	5,037.1	5,037.1	0.0
CP	169,495	1,115	3,811	5.0	5,037.8	5,037.8	5,037.8	0.0
CQ	170,119	686	2,807	6.8	5,040.0	5,040.0	5,040.0	0.0
CR	170,541	870	4,181	4.5	5,042.3	5,042.3	5,042.3	0.0
CS	170,895	821	4,319	4.4	5,042.9	5,042.9	5,042.9	0.0
CT	171,681	916	3,638	5.2	5,044.2	5,044.2	5,044.2	0.0
CU	172,293	1,305	4,288	5.9	5,045.5	5,045.5	5,045.5	0.0
CV	172,865	1,662	5,117	3.7	5,046.6	5,046.6	5,046.6	0.0
CW	173,199	1,684	4,537	4.2	5,046.8	5,046.8	5,046.8	0.0
CX	174,008	620[3]	3,292	5.3	5,054.4	5,054.4	5,054.4	0.0
CY	175,035	924[3]	3,328	4.2	5,057.7	5,057.7	5,057.7	0.0
CZ	175,746	670[3]	3,563	3.8	5,061.0	5,061.0	5,061.1	0.1
DA	176,796	735	3,041	4.1	5,067.3	5,067.3	5,067.8	0.5
DB	177,772	416	1,393	9.0	5,071.4	5,071.4	5,071.4	0.0
DC	178,023	298	1,445	8.7	5,073.7	5,073.7	5,073.8	0.1
DD	178,275	257	2,357	5.3	5,076.7	5,076.7	5,076.7	0.0
DE	178,597	330	2,249	6.6	5,077.1	5,077.1	5,077.1	0.0
DF	179,198	856	3,157	6.0	5,079.5	5,079.5	5,079.5	0.0

[1]Feet Above Confluence with South Platte River [2]Width Excludes Width for Glade Road Split [3]Width Excludes Width for the Shallow Flooding Zone

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
DG	179,516	760	2,889	6.6	5,081.7	5,081.7	5,081.8	0.1
DH	181,676	963	4,431	4.3	5,090.6	5,090.6	5,090.6	0.0
DI	182,988	919	4,443	4.3	5,096.6	5,096.6	5,096.6	0.0
DJ	184,520	489	2,063	6.7	5,102.8	5,102.8	5,102.8	0.0
DK	184,870	440	2,122	6.6	5,104.0	5,104.0	5,104.0	0.0
DL	185,090	660	3,148	4.4	5,105.6	5,105.6	5,105.6	0.0
DM	185,150	480	1,691	8.2	5,106.1	5,106.1	5,106.1	0.0
DN	186,200	670	2,060	6.7	5,111.8	5,111.8	5,111.8	0.0
DO	186,880	440	1,556	8.9	5,116.6	5,116.6	5,116.6	0.0
DP	187,710	185	2,289	6.1	5,127.2	5,127.2	5,127.2	0.0
DQ	188,105	240	1,552	9.0	5,129.2	5,129.2	5,129.2	0.0
DR	188,470	340	1,445	9.6	5,132.7	5,132.7	5,132.7	0.0
DS	189,110	186	1,098	13.2	5,140.7	5,140.7	5,140.7	0.0
DT	189,245	210	1,164	12.5	5,143.4	5,143.4	5,143.4	0.0
DU	189,970	206	1,522	9.5	5,149.0	5,149.0	5,149.0	0.0
DV	190,540	506	2,876	5.0	5,155.2	5,155.2	5,155.2	0.0
DW	190,590	442	3,605	4.0	5,156.5	5,156.5	5,156.5	0.0
DX	190,860	285	2,159	6.7	5,156.5	5,156.5	5,156.5	0.0
DY	191,900	306	1,331	10.9	5,165.2	5,165.2	5,165.2	0.0
DZ	192,630	241	1,600	9.1	5,171.9	5,171.9	5,171.9	0.0
EA	193,370	270	1,362	10.6	5,176.8	5,176.8	5,176.8	0.0
EB	194,390	305	1,619	9.5	5,186.2	5,186.2	5,186.2	0.0

[1]Feet Above Confluence with South Platte River [2]Width Excludes Width for Glade Road Split

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
EC	195,450	260	1,303	11.7	5,195.6	5,195.6	5,195.6	0.0
ED	196,040	190	1,276	12.0	5,202.8	5,202.8	5,202.8	0.0
EE	196,350	40	799	19.1	5,212.7	5,212.7	5,212.7	0.0
EF	196,460	150	1,055	14.5	5,245.4	5,245.4	5,245.4	0.0
EG	196,500	151	1,161	13.2	5,246.6	5,246.6	5,246.6	0.0
EH	197,730	118	1,240	12.3	5,254.1	5,254.1	5,254.1	0.0
EI	198,150	158	1,575	9.7	5,256.6	5,256.6	5,256.6	0.0
EJ	199,050	460	2,752	5.9	5,260.1	5,260.1	5,260.1	0.0
EK	199,370	250	1,192	13.5	5,261.3	5,261.3	5,261.3	0.0
EL	199,780	260	1,261	12.8	5,265.5	5,265.5	5,265.5	0.0
EM	200,080	330	1,543	10.4	5,270.1	5,270.1	5,270.1	0.0
EN	200,440	170	1,176	13.7	5,275.2	5,275.2	5,275.2	0.0
EO	200,920	343	2,536	6.3	5,279.8	5,279.8	5,279.8	0.0
EP	201,000	363	1,578	10.2	5,280.0	5,280.0	5,280.0	0.0
EQ	201,340	230	1,395	11.5	5,282.3	5,282.3	5,282.3	0.0
ER	201,870	150	1,159	13.9	5,289.3	5,289.3	5,289.3	0.0
ES	202,040	111	1,098	14.7	5,290.6	5,290.6	5,290.6	0.0
ET	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

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
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
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

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
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
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

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
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
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

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
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
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

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
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
IO	243,875	290	1,171	6.4	6,159.9	6,159.9	6,159.9	0.0
IP	244,030	325	1,020	7.4	6,162.9	6,162.9	6,162.9	0.0
IQ	244,325	260	897	8.4	6,169.0	6,169.0	6,169.0	0.0
IR	244,805	240	773	9.7	6,181.7	6,181.7	6,181.7	0.0
IS	245,190	135	687	10.9	6,196.6	6,196.6	6,196.6	0.0
IT	245,815	85	467	16.1	6,213.8	6,213.8	6,213.8	0.0
IU	246,405	95	577	13.0	6,232.3	6,232.3	6,232.3	0.0
IV	246,700	120	929	8.1	6,236.5	6,236.5	6,236.5	0.0
IW	246,890	165	722	10.4	6,247.4	6,247.4	6,247.4	0.0
IX	247,390	105	520	14.4	6,256.6	6,256.6	6,256.6	0.0
IY	248,080	105	659	11.4	6,278.0	6,278.0	6,278.0	0.0
IZ	248,270	140	626	12.0	6,283.5	6,283.5	6,283.5	0.0
JA	249,065	97	564	13.3	6,311.3	6,311.3	6,311.3	0.0
JB	249,770	77	507	14.8	6,331.4	6,331.4	6,331.4	0.0
JC	250,690	95	519	14.5	6,375.9	6,375.9	6,375.9	0.0
JD	250,790	135	601	12.0	6,384.2	6,384.2	6,384.2	0.0

[1]Feet Above Confluence with South Platte River [2]Width does not include Confluence with North Fork Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
JE	251,400	120	728	9.9	6,405.0	6,405.0	6,405.0	0.0
JF	252,015	84	531	13.6	6,415.2	6,415.2	6,415.2	0.0
JG	252,420	120	601	12.0	6,431.5	6,431.5	6,431.5	0.0
JH	253,235	85	512	14.1	6,450.0	6,450.0	6,450.0	0.0
JI	253,640	70	545	13.2	6,464.5	6,464.5	6,464.5	0.0
JJ	254,050	255	778	9.3	6,475.2	6,475.2	6,475.2	0.0
JK	254,655	120	597	12.1	6,488.8	6,488.8	6,488.8	0.0
JL	255,360	80	501	14.4	6,501.4	6,501.4	6,501.4	0.0
JM	255,750	100	540	13.3	6,516.2	6,516.2	6,516.2	0.0
JN	256,680	163	648	11.1	6,543.1	6,543.1	6,543.1	0.0
JO	257,420	94	524	13.7	6,566.1	6,566.1	6,566.1	0.0
JP	258,330	86	518	13.9	6,600.7	6,600.7	6,600.7	0.0
JQ	259,580	120	518	13.1	6,671.2	6,671.2	6,671.2	0.0
JR	260,515	126	564	12.1	6,730.3	6,730.3	6,730.3	0.0
JS	261,430	68	457	14.9	6,779.3	6,779.3	6,779.3	0.0
JT	261,735	98	534	12.7	6,810.6	6,810.6	6,810.6	0.0
JU	262,040	129	577	11.8	6,821.1	6,821.1	6,821.1	0.0
JV	263,060	105	623	10.9	6,833.4	6,833.4	6,833.4	0.0
JW	263,780	107	520	13.1	6,844.8	6,844.8	6,844.8	0.0
JX	265,245	90	542	12.5	6,860.2	6,860.2	6,860.2	0.0
JY	265,760	110	626	10.9	6,867.0	6,867.0	6,867.0	0.0
JZ	266,380	86	549	12.4	6,874.3	6,874.3	6,874.3	0.0

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
KA	267,010	116	618	11.0	6,883.2	6,883.2	6,883.2	0.0
KB	267,220	119	591	11.5	6,886.1	6,886.1	6,886.1	0.0
KC	267,840	115	609	10.5	6,895.7	6,895.7	6,895.7	0.0
KD	268,665	101	514	12.5	6,909.1	6,909.1	6,909.1	0.0
KE	269,600	125	603	10.6	6,922.6	6,922.6	6,922.6	0.0
KF	270,310	120	786	8.1	6,928.6	6,928.6	6,928.6	0.0
KG	270,610	115	657	9.7	6,930.2	6,930.2	6,930.2	0.0
KH	271,300	55	409	15.6	6,936.8	6,936.8	6,936.8	0.0
KI	271,800	210	942	6.8	6,943.9	6,943.9	6,943.9	0.0
KJ	272,300	110	566	11.3	6,947.7	6,947.7	6,947.7	0.0
KK	273,000	90	550	11.6	6,955.4	6,955.4	6,955.4	0.0
KL	273,295	140	636	10.1	6,959.1	6,959.1	6,959.1	0.0
KM	273,465	120	693	9.2	6,961.2	6,961.2	6,961.2	0.0
KN	273,500	115	657	9.7	6,961.5	6,961.5	6,961.5	0.0
KO	273,840	184	1,151	5.6	6,964.5	6,964.5	6,964.5	0.0
KP	274,345	110	716	8.9	6,965.9	6,965.9	6,965.9	0.0
KQ	275,040	130	1,343	4.8	6,970.7	6,970.7	6,970.7	0.0
KR	275,445	110	647	9.9	6,973.9	6,973.9	6,973.9	0.0
KS	276,045	85	563	11.4	6,979.5	6,979.5	6,979.5	0.0
KT	276,740	160	496	12.1	6,989.2	6,989.2	6,989.2	0.0
KU	276,890	130	516	11.6	6,995.1	6,995.1	6,995.1	0.0
KV	276,910	140	1,143	5.2	7,000.3	7,000.3	7,000.3	0.0

[1]Feet above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
KW	277,030	174	1,470	4.1	7,000.8	7,000.8	7,000.8	0.0
KX	277,230	167	699	8.6	7,000.8	7,000.8	7,000.8	0.0
KY	278,120	164	864	6.9	7,005.2	7,005.2	7,005.2	0.0
KZ	279,020	221	621	9.7	7,012.0	7,012.0	7,012.0	0.0
LA	279,935	118	656	9.1	7,022.7	7,022.7	7,022.7	0.0
LB	280,830	96	474	12.6	7,037.8	7,037.8	7,037.8	0.0
LC	281,430	125	597	10.1	7,058.9	7,058.9	7,058.9	0.0
LD	282,140	180	439	13.7	7,069.7	7,069.7	7,069.7	0.0
LE	282,540	200	815	7.4	7,079.3	7,079.3	7,079.3	0.0
LF	283,440	86	457	13.1	7,104.4	7,104.4	7,104.4	0.0
LG	283,800	200	783	7.7	7,110.8	7,110.8	7,110.8	0.0
LH	283,875	160	1,047	5.7	7,113.3	7,113.3	7,113.3	0.0
LI	284,230	185	702	8.5	7,115.8	7,115.8	7,115.8	0.0
LJ	284,730	172	663	9.0	7,120.7	7,120.7	7,120.7	0.0
LK	285,235	113	499	12.0	7,131.7	7,131.7	7,131.7	0.0
LL	286,120	115	505	11.9	7,142.0	7,142.0	7,142.0	0.0
LM	286,320	100	492	12.2	7,149.1	7,149.1	7,149.1	0.0
LN	286,810	142	656	8.7	7,154.0	7,154.0	7,154.0	0.0
LO	287,300	95	516	11.0	7,159.8	7,159.8	7,159.8	0.0
LP	287,800	90	449	12.7	7,167.0	7,167.0	7,167.0	0.0
LQ	288,190	127	506	11.3	7,174.8	7,174.8	7,174.8	0.0
LR	288,580	104	468	12.2	7,186.3	7,186.3	7,186.3	0.0

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
LS	289,465	99	479	11.9	7,202.1	7,202.1	7,202.1	0.0
LT	289,755	109	484	11.8	7,211.3	7,211.3	7,211.3	0.0
LU	290,615	180	566	10.7	7,224.5	7,224.5	7,224.5	0.0
LV	291,285	231	731	7.8	7,232.6	7,232.6	7,232.6	0.0
LW	291,885	138	528	10.8	7,238.6	7,238.6	7,238.6	0.0
LX	292,460	149	571	10.0	7,244.8	7,244.8	7,244.8	0.0
LY	292,700	190	656	8.7	7,248.3	7,248.3	7,248.3	0.0
LZ	292,785	203	629	9.1	7,249.4	7,249.4	7,249.4	0.0
MA	293,150	230	664	8.6	7,253.7	7,253.7	7,253.7	0.0
MB	293,520	183	589	9.7	7,258.1	7,258.1	7,258.1	0.0
MC	294,340	70	475	12.0	7,270.9	7,270.9	7,270.9	0.0
MD	294,740	155	481	10.8	7,277.2	7,277.2	7,277.2	0.0
ME	295,045	154	508	10.2	7,283.0	7,283.0	7,283.0	0.0
MF	295,715	120	548	9.5	7,292.7	7,292.7	7,292.7	0.0
MG	296,150	165	617	8.4	7,297.6	7,297.6	7,297.6	0.0
MH	296,550	130	550	9.5	7,302.4	7,302.4	7,302.4	0.0
MI	296,905	75	416	12.5	7,305.5	7,305.5	7,305.5	0.0
MJ	296,945	100	855	6.1	7,308.4	7,308.4	7,308.4	0.0
MK	297,235	131	750	6.9	7,310.4	7,310.4	7,310.4	0.0
ML	297,730	80	487	10.7	7,313.0	7,313.0	7,313.0	0.0
MM	298,070	235	760	6.8	7,316.1	7,316.1	7,316.1	0.0
MN	298,125	200	712	7.3	7,317.1	7,317.1	7,317.1	0.0

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
MO	298,445	180	922	5.6	7,318.6	7,318.6	7,318.6	0.0
MP	299,035	130	626	8.3	7,320.6	7,320.6	7,320.6	0.0
MQ	299,490	130	563	9.2	7,324.5	7,324.5	7,324.5	0.0
MR	300,225	170	553	9.4	7,332.1	7,332.1	7,332.1	0.0
MS	300,705	177	902	5.8	7,336.5	7,336.5	7,336.5	0.0
MT	301,100	110	497	10.5	7,339.1	7,339.1	7,339.1	0.0
MU	301,530	155	500	1.4	7,347.0	7,347.0	7,347.0	0.0
MV	301,560	170	662	7.9	7,349.8	7,349.8	7,349.8	0.0
MW	301,800	285	2,233	2.3	7,350.3	7,350.3	7,350.3	0.0
MX	302,280	190	556	9.4	7,350.3	7,350.3	7,350.3	0.0
MY	302,570	174	584	8.9	7,356.1	7,356.1	7,356.1	0.0
MZ	303,240	138	607	8.2	7,364.1	7,364.1	7,364.1	0.0
NA	303,730	100	432	11.6	7,368.3	7,368.3	7,368.3	0.0
NB	303,900	150	880	5.7	7,371.3	7,371.3	7,371.3	0.0
NC	303,950	120	861	5.8	7,372.3	7,372.3	7,372.3	0.0
ND	304,340	230	1,187	4.2	7,376.1	7,376.1	7,376.1	0.0
NE	305,030	140	494	10.1	7,381.6	7,381.6	7,381.6	0.0
NF	305,620	152	718	7.0	7,388.1	7,388.1	7,388.1	0.0
NG	306,510	100	441	11.3	7,400.6	7,400.6	7,400.6	0.0
NH	307,300	210	720	6.9	7,410.2	7,410.2	7,410.2	0.0
NI	307,915	230/100[2]	1,143	4.4	7,413.8	7,413.8	7,413.8	0.0
NJ	308,210	500/80[2]	1,982	2.5	7,415.0	7,415.0	7,415.0	0.0

[1]Feet Above Confluence with South Platte River [2]Left Channel/Right Channel

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
NK	309,090	680	810	5.9	7,421.6	7,421.6	7,421.6	0.0
NL	309,760	700	345	13.9	7,427.2	7,427.2	7,427.2	0.0
NM	309,800	800	367	13.1	7,430.6	7,430.6	7,430.6	0.0
NN	310,850	710	3,140	1.5	7,430.8	7,430.8	7,430.8	0.0
NO	311,650	110	821	5.8	7,436.0	7,436.0	7,436.0	0.0
NP	317,630	69	397	5.5	7,481.4	7,481.4	7,482.4	1.0
NQ	318,320	62	245	8.9	7,484.3	7,484.3	7,484.3	0.0
NR	318,778	50	214	6.3	7,486.7	7,486.7	7,487.0	0.3
NS	319,409	43	211	6.4	7,492.2	7,492.2	7,493.1	0.9
NT	320,353	48	230	9.5	7,501.4	7,501.4	7,501.4	0.0
NU	320,665	76	413	5.3	7,503.2	7,503.2	7,504.2	1.0
NV	321,025	61	276	7.9	7,509.6	7,509.6	7,509.6	0.0
NW	322,089	50	200	10.9	7,519.1	7,519.1	7,519.1	0.0
NX	322,705	49	266	8.2	7,522.8	7,522.8	7,523.4	0.6
NY	323,020	53	276	5.3	7,527.6	7,527.6	7,528.1	0.5
NZ	323,350	32	199	7.3	7,530.8	7,530.8	7,530.8	0.0
OA	323,748	32	128	11.4	7,533.0	7,533.0	7,533.1	0.1
OB	324,651	58	260	5.6	7,543.2	7,543.2	7,543.2	0.0
OC	325,010	33	129	11.3	7,544.9	7,544.9	7,544.9	0.0
OD	325,981	32	208	7.0	7,551.9	7,551.9	7,552.9	1.0
OE	326,985	42	147	9.9	7,560.9	7,560.9	7,561.1	0.2
OF	327,834	34	169	8.6	7,569.9	7,569.9	7,570.7	0.8

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER								
OG	328,488	43	170	8.6	7,576.6	7,576.6	7,576.6	0.0
OH	329,900	39	159	9.2	7,598.4	7,598.4	7,599.0	0.6
OI	330,444	55	216	6.8	7,603.9	7,603.9	7,604.3	0.4
OJ	331,430	52	159	9.2	7,614.9	7,614.9	7,614.9	0.0
OK	332,155	64	173	8.4	7,624.6	7,624.6	7,625.2	0.6
OL	332,590	52	159	9.2	7,630.3	7,630.3	7,630.5	0.2
OM	333,131	95	264	5.5	7,633.2	7,633.2	7,633.6	0.4
ON	333,548	47	145	10.1	7,636.7	7,636.7	7,636.8	0.1
OO	334,010	48	165	8.9	7,643.6	7,643.6	7,644.1	0.5
OP	334,447	44	179	8.1	7,648.2	7,648.2	7,648.9	0.7
OQ	334,910	71	178	8.2	7,653.6	7,653.6	7,653.6	0.0
OR	335,353	50	164	8.9	7,658.9	7,658.9	7,659.9	1.0
OS	335,890	60	179	8.2	7,666.2	7,666.2	7,666.5	0.3
OT	336,850	74	243	6.0	7,678.9	7,678.9	7,679.5	0.6
OU	337,660	73	179	8.2	7,691.4	7,691.4	7,691.6	0.2
OV	338,349	32	145	10.1	7,699.0	7,699.0	7,699.5	0.5
OW	339,659	36	141	10.3	7,714.9	7,714.9	7,715.8	0.9
OX	340,364	48	146	10.0	7,728.3	7,728.3	7,728.3	0.0
OY	340,785	57	223	6.5	7,734.1	7,734.1	7,734.1	0.0
OZ	341,565	26	135	10.8	7,747.4	7,747.4	7,747.5	0.1
PA	342,490	52	150	9.7	7,765.6	7,765.6	7,765.6	0.0
PB	343,050	42	138	6.8	7,777.2	7,777.2	7,777.2	0.0
PC	344,050	36	99	9.5	7,807.3	7,807.3	7,807.4	0.1

[1]Feet Above Confluence with South Platte River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET) [2]	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER – GRAVEL PIT SPLIT								
A	524	1,085	3,849	1.7	4,888.3	4,888.3	4,888.6	0.3
B	753	1,380	15,669	0.4	4,893.7	4,893.7	4,893.9	0.1
C	2,073	881	814	8.2	4,893.6	4,893.6	4,893.8	0.3
D	2,440	703	1,814	3.7	4,899.5	4,899.5	4,899.6	0.1

[1]Feet Above Confluence with the Big Thompson River

[2]Width Excludes Width for the Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER – GRAVEL PIT SPLIT

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER OVERFLOW								
A	310	35	113	7.3	7,488.8	7,488.8	7,489.3	0.5
B	782	57	240	3.5	7,490.5	7,490.5	7,491.5	1.0
C	1,528	15	100	8.3	7,493.0	7,493.0	7,493.7	0.7

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER OVERFLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BIG THOMPSON RIVER – SOUTH SPILL								
A	217	397[2]	1,168	6.1	4,940.1	4,940.1	4,940.4	0.3
B	923	2,353[2]	4,498	3.8	4,943.0	4,943.0	4,943.1	0.1
C	1,028	2,160[2]	3,893	3.9	4,943.1	4,943.1	4,943.2	0.1
D	1,130	2,162	1,984	6.0	4,943.1	4,943.1	4,943.2	0.1
E	1,292	2,170[2]	15,674	0.7	4,950.2	4,950.2	4,950.4	0.2
F	1,627	1,760[2]	13,081	1.1	4,950.2	4,950.2	4,950.4	0.2
G	2,350	1,201[2]	5,721	2.6	4,950.3	4,950.3	4,950.5	0.2
H	2,841	1,438	2,478	4.7	4,950.9	4,950.9	4,950.9	0.0
I	3,308	1,095	2,254	5.2	4,952.6	4,952.6	4,952.6	0.0
J	4,050	1,218	2,467	4.7	4,955.0	4,955.0	4,955.3	0.3
K	4,832	815[2]	556	5.1	4,958.3	4,958.3	4,958.4	0.1
L	5,280	1,115	1,885	1.5	4,959.1	4,959.1	4,959.1	0.0
M	5,667	402	1,251	2.3	4,959.2	4,959.2	4,959.2	0.0
N	5,885	381	458	6.2	4,961.2	4,961.2	4,961.2	0.0

[1]Feet Above Confluence with Big Thompson River

[2]Width Excludes Width for the Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BIG THOMPSON RIVER – SOUTH SPILL

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BLACK CANYON CREEK								
A	113	20	42	5.5	7,511.4	7,511.4	7,511.6	0.2
B	313	9	25	9.2	7,513.1	7,513.1	7,513.1	0.0
C	485	51	67	2.5	7,516.1	7,516.1	7,516.9	0.8
D	640	10	27	6.7	7,517.8	7,517.8	7,518.3	0.5
E	1,090	30	36	5.0	7,523.3	7,523.3	7,523.5	0.2
F	1,573	20	33	6.9	7,528.2	7,528.2	7,528.2	0.0
G	1,880	19	35	6.6	7,533.6	7,533.6	7,533.7	0.1
H	2,323	4	20	11.5	7,546.5	7,546.5	7,546.8	0.3
I	2,970	14	28	8.1	7,554.3	7,554.3	7,554.7	0.4
J	3,205	37	34	4.1	7,564.8	7,564.8	7,564.8	0.0
K	3,554	15	49	4.7	7,574.1	7,574.1	7,574.1	0.0
L	4,025	14	32	7.3	7,577.2	7,577.2	7,577.4	0.2
M	4,390	9	54	4.2	7,585.6	7,585.6	7,585.6	0.0
N	4,735	45	119	1.9	7,586.4	7,586.4	7,586.9	0.5
O	5,179	19	164	1.4	7,594.1	7,594.1	7,594.7	0.6
P	5,300	50	220	1.0	7,594.2	7,594.2	7,594.9	0.7
Q	5,575	9	29	7.9	7,594.4	7,591.9	7,594.4	0.5
R	6,182	15	45	5.1	7,600.6	7,600.6	7,600.8	0.2
S	6,550	22	56	4.1	7,603.0	7,603.0	7,603.3	0.3
T	6,740	17	30	7.6	7,605.4	7,605.4	7,605.4	0.0
U	7,215	10	37	6.2	7,611.1	7,611.1	7,611.7	0.6
V	7,525	6	21	10.7	7,614.9	7,614.9	7,614.9	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BLACK CANYON CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOBCAT GULCH								
A	172	226	364	5.6	6,219.0	6,219.0	6,219.0	0.0
B	320	117	249	8.2	6,224.2	6,224.2	6,224.2	0.0
C	860	110	266	7.7	6,254.5	6,254.5	6,254.5	0.0

[1]Feet above confluence with North Fork Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOBCAT GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK								
A	212	184	360	5.5	4,867.5	4,867.5	4,867.5	0.0
B	431	43	201	9.9	4,869.8	4,869.8	4,870.2	0.4
C	820	120	474	4.2	4,873.1	4,873.1	4,873.4	0.3
D	1,039	188	955	2.1	4,876.6	4,876.6	4,876.8	0.2
E	1,548	155	610	3.3	4,876.7	4,876.7	4,877.1	0.4
F	1,983	120	331	6.0	4,878.1	4,878.1	4,878.1	0.0
G	2,638	114	713	2.8	4,881.4	4,881.4	4,881.9	0.5
H	3,288	35	199	10.0	4,885.0	4,885.0	4,885.1	0.1
I	3,949	31	289	6.9	4,888.6	4,888.6	4,888.7	0.1
J	4,093	80	525	3.8	4,892.8	4,892.8	4,892.9	0.1
K	4,553	90	419	4.7	4,893.1	4,893.1	4,893.4	0.3
L	4,898	165	513	3.9	4,893.9	4,893.9	4,894.2	0.3
M	5,670	128	479	4.1	4,897.4	4,897.4	4,897.4	0.0
N	6,243	231	684	3.6	4,899.5	4,899.5	4,899.5	0.0
O	6,391	161	487	5.1	4,899.7	4,899.7	4,899.7	0.0
P	6,506	187	422	5.9	4,900.1	4,900.1	4,900.1	0.0
Q	6,953	2,659	7,074	1.2	4,905.3	4,905.3	4,905.3	0.0
R	7,256	1,240	3,009	1.3	4,905.4	4,905.4	4,905.4	0.0
S	7,663	243	654	6.1	4,905.0	4,905.0	4,905.2	0.2
T	8,678	220	904	4.4	4,909.7	4,909.7	4,910.1	0.4
U	10,143	244	1,140	3.4	4,912.5	4,912.5	4,912.9	0.4
V	10,968	295	1,091	3.6	4,913.6	4,913.6	4,913.9	0.3

[1]Feet above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK								
W	11,423	168	482	8.0	4,916.4	4,916.4	4,916.4	0.0
X	11,527	943	2,756	0.5	4,918.4	4,918.4	4,918.4	0.0
Y	11,797	30	3,223	4.9	4,921.2	4,921.2	4,921.2	0.0
Z	12,525	637	3,412	1.7	4,921.8	4,921.8	4,921.8	0.0
AA	13,700	238	1,088	5.2	4,923.7	4,923.7	4,923.7	0.0
AB	14,127	211	748	7.6	4,925.4	4,925.4	4,925.4	0.0
AC	14,564	524	2,474	2.3	4,927.5	4,927.5	4,927.5	0.0
AD	15,107	434	2,608	2.2	4,927.8	4,927.8	4,927.8	0.0
AE	16,627	306	1,492	3.8	4,931.2	4,931.2	4,931.3	0.1
AF	17,752	132	1,534	5.0	4,934.7	4,934.7	4,934.7	0.0
AG	18,122	214	1,136	3.3	4,935.7	4,935.7	4,935.7	0.0
AH	18,531	109	544	6.9	4,935.9	4,935.9	4,936.0	0.1
AI	19,614	412	1,556	2.4	4,940.3	4,940.3	4,940.7	0.4
AJ	20,753	155	821	4.0	4,941.1	4,941.1	4,941.6	0.5
AK	21,273	118	641	5.1	4,942.5	4,942.5	4,942.8	0.3
AL	22,122	170	828	3.9	4,944.6	4,944.6	4,945.0	0.4
AM	23,235	275	2,367	1.4	4,953.8	4,953.8	4,953.8	0.0
AN	23,987	226	1,898	1.5	4,953.8	4,953.8	4,953.9	0.1
AO	24,412	172	1,112	2.5	4,953.9	4,953.9	4,953.9	0.0
AP	24,907	54	237	11.7	4,955.4	4,955.4	4,955.4	0.0
AQ	25,605	81	352	7.9	4,961.5	4,961.5	4,961.5	0.0
AR	26,430	128	676	4.1	4,964.6	4,964.6	4,964.9	0.3

[1]Feet above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK								
AS	27,304	140	639	4.4	4,966.9	4,966.9	4,967.3	0.4
AT	28,373	387	1,129	2.5	4,968.9	4,968.9	4,969.0	0.1
AU	28,436	459	2,532	1.3	4,972.3	4,972.3	4,972.7	0.4
AV	28,856	124	687	4.0	4,972.3	4,972.3	4,972.7	0.4
AW	29,351	145	684	4.1	4,972.9	4,972.9	4,973.4	0.5
AX	29,609	186	710	3.9	4,973.2	4,973.2	4,973.7	0.5
AY	30,600	119	555	5.0	4,974.8	4,974.8	4,975.3	0.5
AZ	31,117	305	456	6.9	4,978.1	4,978.1	4,978.5	0.4
BA	31,700	315	1,437	2.2	4,979.7	4,979.7	4,980.2	0.5
BB	32,700	342	1,139	2.8	4,981.0	4,981.0	4,981.5	0.5
BC	33,400	405	672	4.7	4,984.7	4,984.7	4,984.7	0.0
BD	33,900	380	733	4.3	4,987.0	4,987.0	4,987.0	0.0
BE	35,500	225	818	3.8	4,989.7	4,989.7	4,990.1	0.4
BF	35,725	307	622	5.2	4,990.9	4,990.9	4,990.9	0.0
BG	35,791	314	621	5.1	4,992.6	4,992.6	4,992.8	0.2
BH	36,303	307	1,155	2.7	4,994.0	4,994.0	4,994.5	0.5
BI	36,879	203	513	6.1	4,995.1	4,995.1	4,995.2	0.1
BJ	37,227	294	781	4.0	4,996.8	4,996.8	4,997.3	0.5
BK	37,271	378	1,065	3.0	4,998.7	4,998.7	4,998.7	0.0
BL	38,300	566	1,370	2.3	4,999.6	4,999.6	5,000.0	0.4
BM	38,737	368	1,597	2.0	5,002.3	5,002.3	5,002.3	0.0
BN	39,211	300	646	4.9	5,004.2	5,004.2	5,004.3	0.1

[1]Feet above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK								
BO	40,296	247	665	4.4	5,009.4	5,009.4	5,009.4	0.0
BP	41,228	56	269	10.8	5,014.1	5,014.1	5,014.5	0.4
BQ	41,656	70	290	10.0	5,018.3	5,018.3	5,018.3	0.0
BR	42,040	1,019	918	3.2	5,021.5	5,021.5	5,021.5	0.0
BS	42,109	2,638	5,923	1.2	5,024.4	5,024.4	5,024.4	0.0
BT	42,557	749	1,174	0.9	5,024.5	5,024.5	5,024.5	0.0
BU	42,834	226	484	4.2	5,027.8	5,027.8	5,027.8	0.0
BV	43,643	64	253	7.5	5,032.6	5,032.6	5,032.6	0.0
BW	44,151	185	329	5.8	5,036.9	5,036.9	5,036.9	0.0
BX	44,677	324	725	2.6	5,039.0	5,039.0	5,039.0	0.0
BY	45,162	1,129	2,618	2.7	5,039.8	5,039.8	5,039.9	0.1
BZ	46,205	1,030	1,921	3.6	5,042.3	5,042.3	5,042.7	0.4
CA	46,718	900	1,877	3.7	5,044.7	5,044.7	5,044.8	0.1
CB	47,292	322	967	7.2	5,047.6	5,047.6	5,047.6	0.0
CC	48,698	1,020	1,622	4.3	5,051.0	5,051.0	5,051.2	0.2
CD	48,835	782	1,577	4.4	5,054.1	5,054.1	5,054.3	0.2

[1]Feet above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK I-25 SPLIT								
A	500	254	784	5.4	4,874.7	4,874.7	4,875.0	0.3
B	1,500	639	2,012	2.1	4,876.4	4,876.4	4,876.9	0.5
C	3,100	1,340	2,141	2.0	4,880.2	4,880.2	4,880.5	0.3
D	4,714	1,700	2,335	1.8	4,886.3	4,886.3	4,886.7	0.4
E	5,956	1,420	1,545	2.7	4,888.6	4,888.6	4,888.9	0.3
F	6,799	1,174	2,116	2.0	4,890.5	4,890.5	4,890.6	0.1
G	7,794	450	1,222	3.3	4,893.6	4,893.6	4,893.8	0.2
H	8,790	525	1,501	2.7	4,896.2	4,896.2	4,896.7	0.5
I	9,854	378	1,093	3.7	4,899.4	4,899.4	4,899.8	0.4
J	10,347	169	388	7.1	4,904.5	4,904.5	4,904.5	0.0
K	11,181	981	4,990	0.7	4,905.8	4,905.8	4,905.8	0.0
L	11,845	695	1,115	3.8	4,905.8	4,905.8	4,905.8	0.0
M	12,589	200	807	5.2	4,906.8	4,906.8	4,907.3	0.5
N	13,410	250	520	8.1	4,911.3	4,911.3	4,911.6	0.3
O	13,977	830	1,835	2.3	4,912.7	4,912.7	4,913.2	0.5
P	14,426	550	677	6.2	4,913.9	4,913.9	4,914.2	0.3
Q	15,782	1,227	2,426	1.7	4,918.2	4,918.2	4,918.7	0.5
R	16,452	446	635	6.6	4,920.9	4,920.9	4,920.9	0.0

[1]Feet above Larimer County Road 5

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK I-25 SPLIT

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK I-25 SPLIT OVERFLOW								
A	544	547	947	1.6	4,900.3	4,900.3	4,900.8	0.5
B	1,504	155	145	5.5	4,904.1	4,904.1	4,904.1	0.0

[1]Feet above confluence with Boxelder Creek I-25 Split

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK I-25 SPLIT OVERFLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK OVERFLOW - DOWNSTREAM								
A	982	134	78	4.3	4,936.8	4,936.8	4,936.9	0.1
B	2,141	529	311	4.3	4,938.3	4,938.3	4,938.3	0.0
C	3,994	675	2,704	0.7	4,938.6	4,938.6	4,938.6	0.0
D	4,996	200	400	5.0	4,943.0	4,943.0	4,943.1	0.1
E	6,014	308	1,112	2.1	4,950.3	4,950.3	4,950.8	0.5
F	6,993	254	553	4.2	4,956.7	4,956.7	4,957.2	0.5
G	7,924	195	513	3.6	4,961.1	4,961.1	4,961.6	0.5
H	8,482	452	385	4.8	4,970.2	4,970.2	4,970.2	0.0
I	10,558	308	1,163	2.1	4,973.5	4,973.5	4,974.0	0.5
J	11,263	484	841	2.9	4,974.6	4,974.6	4,974.9	0.3

[1]Feet above confluence with Boxelder Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK OVERFLOW - DOWNSTREAM

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOXELDER CREEK OVERFLOW - UPSTREAM								
A	0	700	645	5.4	4,981.7	4,981.7	4,981.9	0.2
B	178	820	2,102	1.6	4,982.5	4,982.5	4,982.8	0.3
C	600	520	593	5.8	4,984.1	4,984.1	4,984.3	0.2
D	1,375	750	1,444	2.4	4,990.6	4,990.6	4,990.9	0.3
E	2,368	470	1,091	3.2	4,997.5	4,997.5	4,997.9	0.4
F	2,562	739	3,599	1.0	5,000.6	5,000.6	5,000.9	0.3
G	3,042	800	2,463	1.4	5,000.7	5,000.7	5,001.1	0.4
H	3,357	890	3,200	1.3	5,000.9	5,000.9	5,001.2	0.3
I	4,225	1,105	2,470	1.6	5,001.2	5,001.2	5,001.4	0.2
J	5,086	600	679	6.0	5,003.9	5,003.9	5,004.1	0.2
K	5,405	860	1,055	3.9	5,007.3	5,007.3	5,007.5	0.2
L	6,268	636	964	4.2	5,011.9	5,011.9	5,012.3	0.4
M	6,972	680	972	4.2	5,015.6	5,015.6	5,016.0	0.4
N	8,082	1,300	1,155	3.5	5,021.9	5,021.9	5,021.9	0.0
O	8,721	1,082	1,535	3.9	5,024.8	5,024.8	5,024.8	0.0
P	9,265	1,179	1,336	4.4	5,026.7	5,026.7	5,026.7	0.0
Q	9,765	1,214	2,115	2.4	5,029.4	5,029.4	5,029.4	0.0
R	10,655	1,102	1,885	2.7	5,033.5	5,033.5	5,033.5	0.0
S	11,096	1,226	1,184	4.3	5,038.0	5,038.0	5,038.0	0.0

[1]Feet above Larimer and Weld Canal

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BOXELDER CREEK OVERFLOW - UPSTREAM

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BUCKHORN CREEK								
A	350	985	3,103	6.5	5,098.5	5,098.5	5,098.5	0.0
B	465	948	3,417	5.9	5,099.4	5,099.4	5,099.4	0.0
C	515	710	3,823	5.3	5,099.9	5,099.9	5,099.9	0.0
D	545	995	7,621	2.7	5,103.8	5,103.8	5,103.8	0.0
E	595	1,048	7,038	2.9	5,103.8	5,103.8	5,103.8	0.0
F	1,120	750	3,911	5.2	5,104.0	5,104.0	5,104.0	0.0
G	2,180	670	2,680	7.6	5,110.9	5,110.9	5,110.9	0.0
H	3,210	425	2,153	9.4	5,118.5	5,118.5	5,118.5	0.0
I	4,190	432	2,294	8.7	5,125.7	5,125.7	5,125.7	0.0
J	4,440	410	2,125	9.4	5,128.6	5,128.6	5,128.6	0.0
K	4,450	410	2,255	8.8	5,128.8	5,128.8	5,128.8	0.0
L	4,665	410	2,219	9.0	5,130.7	5,130.7	5,130.7	0.0
M	5,475	420	2,223	9.0	5,135.8	5,135.8	5,135.8	0.0
N	5,965	300	1,954	10.2	5,139.8	5,139.8	5,139.8	0.0
O	6,015	225	2,719	7.3	5,141.3	5,141.3	5,141.3	0.0
P	6,040	390	4,652	4.3	5,144.5	5,144.5	5,144.5	0.0
Q	6,090	445	3,848	4.2	5,144.5	5,144.5	5,144.5	0.0
R	6,670	145	1,363	14.6	5,146.8	5,146.8	5,146.8	0.0
S	7,180	440	2,725	7.3	5,152.3	5,152.3	5,152.3	0.0
T	7,685	185	1,465	13.6	5,152.7	5,152.7	5,152.7	0.0
U	9,265	140	1,442	13.5	5,168.3	5,168.3	5,168.3	0.0
V	10,565	275	2,445	8.0	5,175.4	5,175.4	5,175.4	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BUCKHORN CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BUCKHORN CREEK								
W	11,340	515	2,933	6.7	5,181.6	5,181.6	5,181.6	0.0
X	13,175	870	4,336	4.5	5,192.9	5,192.9	5,192.9	0.0
Y	14,160	710	2,686	7.1	5,199.0	5,199.0	5,199.0	0.0
Z	15,210	470	2,369	8.1	5,205.5	5,205.5	5,205.5	0.0
AA	16,600	420	2,059	9.3	5,214.0	5,214.0	5,214.0	0.0
AB	18,110	645	2,360	8.1	5,226.0	5,226.0	5,226.0	0.0
AC	19,635	505	2,204	8.7	5,235.6	5,235.6	5,235.6	0.0
AD	20,875	370	2,018	9.2	5,243.6	5,243.6	5,243.6	0.0
AE	22,410	435	1,947	9.5	5,255.2	5,255.2	5,255.2	0.0
AF	24,225	525	2,390	7.8	5,270.7	5,270.7	5,270.7	0.0
AG	25,570	385	2,033	9.1	5,282.8	5,282.8	5,282.8	0.0
AH	27,140	845	2,975	6.2	5,294.3	5,294.3	5,294.3	0.0
AI	27,610	655	2,552	7.3	5,297.7	5,297.7	5,297.7	0.0
AJ	28,250	630	2,503	5.5	5,302.1	5,302.1	5,302.1	0.0
AK	28,300	435	2,806	4.9	5,302.6	5,302.6	5,302.6	0.0
AL	28,325	630	5,190	2.3	5,305.9	5,305.9	5,305.9	0.0
AM	28,375	740	4,337	3.2	5,305.9	5,305.9	5,305.9	0.0
AN	29,140	585	1,980	7.0	5,310.0	5,310.0	5,310.0	0.0
AO	30,530	495	1,763	7.9	5,322.7	5,322.7	5,322.7	0.0
AP	31,810	605	2,038	6.8	5,333.8	5,333.8	5,333.8	0.0
AQ	33,070	490	1,678	8.3	5,348.7	5,348.7	5,348.7	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BUCKHORN CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER LPATH								
A	445	432	1,506	2.6	4,883.0	4,883.0	4,883.0	0.0
B	810	377	1,405	2.8	4,883.1	4,883.1	4,883.4	0.3
C	1,210	445	1,995	2.0	4,883.2	4,883.2	4,883.7	0.5
D	1,785	439[2]	1,490	2.7	4,883.5	4,883.5	4,884.0	0.5
E	2,145	357	1,752	2.3	4,884.0	4,884.0	4,884.5	0.5
F	2,645	163	732	5.4	4,885.2	4,885.2	4,885.4	0.2
G	2,910	183	896	4.4	4,886.7	4,886.7	4,886.8	0.1
H	3,255	150	553	7.2	4,890.9	4,890.9	4,891.7	0.8
I	3,350	216	1,547	2.6	4,892.4	4,892.4	4,892.7	0.3
J	4,330	428	926	4.3	4,893.1	4,893.1	4,893.6	0.5
K	5,060	2,030	2,135	1.9	4,895.2	4,895.2	4,895.4	0.2
L	6,780	1,269	1,325	2.0	4,896.8	4,896.8	4,897.0	0.2
M	6,955	476	470	5.6	4,908.0	4,908.0	4,908.1	0.1
N	7,780	990	2,290	1.2	4,909.3	4,909.3	4,909.4	0.1
O	9,027	261	997	2.7	4,909.6	4,909.6	4,909.7	0.1

[1] Stream distance in feet above confluence with Cache La Poudre River along profile baseline

2 Width includes area in Zone X

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER LPATH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER								
A	50	270[2]	9,231	1.2	4,790.7	4,790.7	4,790.7	0.0
B	1,175	700[2]	2,550	4.2	4,790.8	4,790.8	4,790.8	0.0
C	2,145	1,870[2]	5,057	2.1	4,792.1	4,792.1	4,792.2	0.1
D	3,255	2,500[3]	4,594	2.4	4,793.3	4,793.3	4,793.3	0.0
E	4,500	2,680[3]	975	11.1	4,796.3	4,796.3	4,796.3	0.0
F	4,630	2,740[3]	2,499	4.3	4,798.2	4,798.2	4,798.3	0.1
G	5,380	3,290[3]	6,787	2.0	4,799.6	4,799.6	4,799.9	0.3
H	6,660	3,770[3]	7,919	1.8	4,800.4	4,800.4	4,800.9	0.5
I	7,465	4,420[2]	15,234	1.0	4,800.8	4,800.8	4,801.1	0.3
J	7,835	5,020[2]	2,867	5.4	4,801.0	4,801.0	4,801.2	0.2
K	8,015	5,070	7,671	2.0	4,802.7	4,802.7	4,802.7	0.0
L	9,225	1,833	4,074	3.8	4,804.6	4,804.6	4,804.6	0.0
M	10,465	1,036	3,019	5.1	4,808.4	4,808.4	4,808.8	0.4
N	11,205	1,312	4,585	3.4	4,809.9	4,809.9	4,810.8	0.9
O	11,995	1,472	2,117	7.4	4,812.7	4,812.7	4,813.1	0.4
P	12,935	3,779	7,481	2.1	4,817.3	4,817.3	4,817.3	0.0
Q	13,053	2,400	10,094	1.6	4,818.1	4,818.1	4,818.9	0.8
R	13,673	3,190	7,329	2.2	4,818.6	4,818.6	4,819.3	0.7
S	13,728	3,190	8,665	1.8	4,819.7	4,819.7	4,820.6	0.9
T	14,428	3,600	11,992	1.3	4,820.7	4,820.7	4,821.4	0.7
U	15,578	1,610	2,799	4.1	4,821.3	4,821.3	4,822.1	0.8
V	16,718	928	3,086	3.8	4,824.2	4,824.2	4,824.7	0.5

[1]Feet above Larimer-Weld County Line Road
[2]Width excludes portion of floodway outside Larimer County
[3]Width includes portion of State Highway 392 Divided Flow Floodway from Weld County affecting Larimer County

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER								
W	17,143[1]	985	2,890	4.0	4,824.4	4,824.4	4,825.2	0.8
X	18,158[1]	800	2,404	4.8	4,827.3	4,827.3	4,827.3	0.0
Y	18,658[1]	700	1,853	6.2	4,828.9	4,828.9	4,828.9	0.0
Z	19,858[1]	1,400	2,573	4.6	4,832.4	4,832.4	4,833.3	0.9
AA	20,738[1]	500	2,218	5.3	4,835.0	4,835.0	4,835.4	0.4
AB	21,688[1]	1,350	2,010	5.9	4,837.3	4,837.3	4,837.9	0.6
AC	21,858[1]	124	1,278	9.2	4,838.8	4,838.8	4,838.8	0.0
AD	21,988[1]	1,625	2,969	4.0	4,839.7	4,839.7	4,839.7	0.0
AE	22,368[1]	2,626	6,048	1.9	4,840.1	4,840.1	4,840.1	0.0
AF	23,373[1]	107	748	15.1	4,840.4	4,840.4	4,840.4	0.0
AG	23,503[1]	1,000	1,790	6.3	4,844.8	4,844.8	4,844.8	0.0
AH	24,428[1]	800	3,674	3.1	4,846.1	4,846.1	4,846.3	0.2
AI	25,658[1]	875	3,190	3.8	4,846.9	4,846.9	4,847.4	0.5
AJ	26,823[1]	790	3,512	3.4	4,847.8	4,847.8	4,848.7	0.8
AK	28,383[1]	460	1,872	6.5	4,849.8	4,849.8	4,850.7	0.9
AL	29,393[1]	666	4,167	3.6	4,854.7	4,854.7	4,855.0	0.3
AM	29,563[1]	855	3,465	4.4	4,854.7	4,854.7	4,855.1	0.4
AN	30,593[1]	1,599	6,043	2.8	4,856.6	4,856.6	4,856.7	0.1
AO	31,003[1]	900	3,876	4.4	4,857.0	4,857.0	4,857.0	0.0
AP	32,193[1]	900	4,550	3.7	4,858.5	4,858.5	4,859.2	0.7
AQ	192,877[2]	900	3,801	4.6	4,859.2	4,859.2	4,859.9	0.7
AR	194,937[2]	761	4,319	4.0	4,864.9	4,864.9	4,865.8	0.9

[1]Feet above Larimer-Weld County Line Road
[2]Feet above mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER								
AS	196,377	1,124	6,105	2.9	4,867.0	4,867.0	4,867.9	0.9
AT	197,517	1,075	3,552	4.9	4,868.4	4,868.4	4,868.9	0.5
AU	199,407	680	3,392	4.4	4,873.3	4,873.3	4,874.0	0.7
AV	200,017	1,150	6,525	2.3	4,874.4	4,874.4	4,875.3	0.9
AW	200,797	890	3,246	4.7	4,875.1	4,875.1	4,875.9	0.8
AX	201,202	700	2,920	5.3	4,875.9	4,875.9	4,876.7	0.8
AY	202,347	579	4,386	3.5	4,878.1	4,878.1	4,878.6	0.5
AZ	202,877	712	4,877	3.2	4,878.4	4,878.4	4,878.9	0.5
BA	203,557	865	5,889	2.6	4,878.8	4,878.8	4,879.3	0.5
BB	205,242	600	1,800	6.7	4,887.6	4,887.6	4,887.6	0.0
BC	205,507	807	3,408	3.5	4,889.4	4,889.4	4,889.4	0.0
BD	206,177	1,378	3,968	3.1	4,890.9	4,890.9	4,890.9	0.0
BE	206,657	1,070	2,571	4.8	4,891.6	4,891.6	4,891.6	0.0
BF	207,232	1,015	3,996	3.1	4,893.4	4,893.4	4,893.4	0.0
BG	207,607	1,026	4,243	2.9	4,893.8	4,893.8	4,893.8	0.0
BH	207,807	1,075	2,551	4.9	4,895.2	4,895.2	4,895.2	0.0
BI	208,567	811	2,171	5.8	4,900.0	4,900.0	4,900.0	0.0
BJ	209,210	190	1,476	8.1	4,901.8	4,901.8	4,901.8	0.0
BK	209,470	249	1,888	6.4	4,902.8	4,902.8	4,902.8	0.0
BL	211,250	306	1,606	8.2	4,906.7	4,906.7	4,906.7	0.0
BM	212,317	270	1,487	9.1	4,910.6	4,910.6	4,910.6	0.0
BN	213,847	322	2,135	7.8	4,915.1	4,915.1	4,915.1	0.0

[1]Feet above mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER								
BO	215,208	230	1,445	9.2	4,919.4	4,919.4	4,919.4	0.0
BP	217,200	521	1,674	7.9	4,924.8	4,924.8	4,924.8	0.0
BQ	218,017	888	2,160	6.2	4,927.5	4,927.5	4,927.9	0.4
BR	219,777	589	2,455	5.4	4,930.9	4,930.9	4,931.3	0.4
BS	220,627	435	3,132	4.2	4,933.3	4,933.3	4,933.9	0.6
BT	221,637	201	1,412	9.4	4,934.9	4,934.9	4,935.4	0.5
BU	222,452	315	2,745	4.8	4,937.4	4,937.4	4,937.7	0.3
BV	223,617	520	2,053	6.5	4,939.7	4,939.7	4,939.9	0.2
BW	224,597	584	2,204	6.0	4,942.9	4,942.9	4,943.7	0.8
BX	226,167	300	2,009	6.6	4,946.5	4,946.5	4,947.0	0.5
BY	227,397	136	1,000	13.3	4,949.8	4,949.8	4,949.9	0.1
BZ	228,117	172	1,492	9.2	4,954.7	4,954.7	4,954.9	0.2
CA	228,687	200	2,018	6.8	4,956.6	4,956.6	4,956.8	0.2
CB	229,322	260	1,664	8.2	4,957.5	4,957.5	4,957.5	0.0
CC	230,193	282	1,458	9.4	4,961.5	4,961.5	4,961.6	0.1
CD	230,467	505	1,591	8.6	4,965.6	4,965.6	4,965.7	0.1
CE	230,897	715	3,783	3.6	4,968.0	4,968.0	4,968.9	0.9
CF	231,022	730	4,281	3.2	4,968.3	4,968.3	4,969.3	1.0
CG	232,227	535	1,800	7.6	4,968.9	4,968.9	4,969.4	0.5
CH	233,367	690	3,284	4.2	4,972.8	4,972.8	4,973.7	0.9
CI	234,557	850	2,300	6.0	4,976.3	4,976.3	4,976.4	0.1
CJ	235,947	196	1,435	9.7	4,981.3	4,981.3	4,981.8	0.5

[1]Feet above mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER								
CK	237,158	192	1,461	9.5	4,988.4	4,988.4	4,988.6	0.2
CL	237,485	550	1,637	8.5	4,989.8	4,989.8	4,990.1	0.3
CM	238,183	1,363	7,148	1.9	4,994.7	4,994.7	4,994.8	0.1
CN	238,974	736	3,039	4.6	4,994.7	4,994.6	4,994.9	0.3
CO	240,553	292	2,387	5.9	5,002.7	5,002.7	5,002.7	0.0
CP	241,276	108	1,263	7.7	5,004.8[2] 5,004.8[3]	5,004.8	5,004.8	0.0
CQ	242,255	1,153	4,349	3.2	5,007.9[2] 5,010.1[3]	5,007.9	5,007.9	0.0
CR	242,685	609	2,616	5.4	5,008.5[2] 5,014.9[3]	5,008.5	5,008.5	0.0
CS	243,225	286	1,388	10.2	5,009.1[2] 5,016.6[3]	5,009.1	5,009.1	0.0
CT	244,123	845	4,582	3.1	5,017.7[2] 5,017.0[3]	5,017.7	5,017.7	0.0
CU	244,143	745	4,276	3.3	5,017.7[2] 5,020.7[3]	5,017.7	5,017.7	0.0
CV	244,551	713	2,736	5.2	5,020.1[2] 5,021.6[3]	5,020.1	5,020.5	0.4
CW	246,128	1,065	5,962	2.4	5,022.7[2] 5,025.2[3]	5,022.7	5,023.0	0.3

[1]Feet above mouth [2]Levees Failed [3]Levees Intact

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER								
CX	247,787	242	1,240	11.5	5,027.1[2] 5,027.2[3]	5,027.1	5,027.3	0.2
CY	248,897	185	1,265	11.3	5,033.2	5,033.2	5,033.2	0.0
CZ	249,797	174	1,308	10.9	5,038.4	5,038.4	5,038.4	0.0
DA	251,777	258	1,717	8.4	5,047.7	5,047.7	5,047.7	0.0
DB	252,327	212	1,235	11.9	5,050.5	5,050.5	5,050.5	0.0
DC	253,541	124	1,042	13.8	5,057.6	5,057.6	5,057.6	0.0
DD	254,560	277	1,581	9.1	5,062.4	5,062.4	5,062.4	0.0
DE	255,598	270	1,767	8.2	5,069.1	5,069.1	5,069.3	0.2
DF	256,927	809	2,923	4.9	5,074.3	5,074.3	5,074.5	0.2
DG	257,969	161	2,028	14.2	5,080.4	5,080.4	5,080.4	0.0
DH	259,082	570	4,303	4.6	5,088.6	5,088.6	5,088.6	0.0
DI	260,703	1,687	4,796	3.1	5,093.0	5,093.0	5,093.5	0.5
DJ	261,610	985	3,595	3.7	5,098.0	5,098.0	5,098.4	0.4
DK	262,380	1,150	3,752	3.9	5,100.6	5,100.6	5,101.0	0.4
DL	263,459	351	1,506	10.4	5,104.7	5,104.7	5,104.7	0.0
DM	263,564	386	3,633	4.8	5,110.4	5,110.4	5,110.4	0.0
DN	263,971	328	1,881	7.8	5,110.9	5,110.9	5,111.0	0.1
DO	265,046	332	2,197	6.7	5,118.0	5,118.0	5,118.1	0.1
DP	265,297	259	1,719	8.6	5,118.9	5,118.9	5,119.0	0.1

[1]Feet above mouth [2]Levees Failed [3]Levees Intact

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER – I-25 DIVIDED FLOW								
A	14,428	3,600	11,992	1.3	4,820.7	4,820.7	4,821.4	0.7
B	18,988	901	2,871	1.6	4,826.7	4,826.7	4,827.6	0.9
C	23,278	1,004	4,622	1.0	4,837.1	4,837.1	4,838.0	0.9
D	24,268	1,000	3,848	1.2	4,837.3	4,837.3	4,838.2	0.9
E	24,993	900	890	5.3	4,841.1	4,841.1	4,841.3	0.2
F	25,893	1,000	3,163	1.5	4,842.2	4,842.2	4,843.2	1.0
G	27,193	700	1,154	4.1	4,843.9	4,843.9	4,844.7	0.8
H	27,903	600	726	6.5	4,849.9	4,849.9	4,850.4	0.5
I	29,603	796	3,402	1.4	4,850.3	4,850.3	4,851.3	1.0
J	30,103	451	692	6.8	4,853.3	4,853.3	4,853.6	0.3

[1]Feet above Larimer-Weld County Line Road

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER – INTERSTATE HIGHWAY 25 DIVIDED FLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER SPLIT LPATH								
A	2,600	442	591	0.8	4,895.9	4,895.9	4,896.4	0.5
B	3,065	485	159	3.1	4,897.3	4,897.3	4,897.3	0.0
C	3,265	293	339	1.5	4,898.3	4,898.3	4,898.3	0.0

[1]Feet above Confluence with Cache La Poudre River Split RPATH

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER SPLIT – LPATH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CACHE LA POUDRE RIVER SPLIT RPATH								
A	0	340	357	5.7	4,884.0	4,884.0	4,884.1	0.1
B	1,455	295	702	2.9	4,885.4	4,885.4	4,885.8	0.4
C	2,085	331	458	4.4	4,893.8	4,893.8	4,894.2	0.4
D	2,450	251	483	3.2	4,895.6	4,895.6	4,896.0	0.4
E	2,920	256	414	3.7	4,897.4	4,897.4	4,897.4	0.0
F	3,815	489	610	2.5	4,899.7	4,899.7	4,899.7	0.0

[1]Feet above Gravel Pit Access Road

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CACHE LA POUDRE RIVER SPLIT – RPATH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CEDAR CREEK								
A	370	165	682	13.8	5,606.2	5,606.2	5,606.2	0.0
B	580	125	661	14.2	5,608.9	5,608.9	5,608.9	0.0
C	780	100	885	10.6	5,612.1	5,612.1	5,612.1	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

CEDAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COOPER SLOUGH								
A	1,020	73	238	4.1	4,922.2	4,922.2	4,922.2	0.0
B	1,350	65	135	1.5	4,923.3	4,923.3	4,923.5	0.2
C	1,600	12	62	4.7	4,923.6	4,923.6	4,923.8	0.2
D	2,750	426	1,102	2.0	4,931.0	4,931.0	4,931.2	0.2
E	3,200	256	678	3.3	4,932.1	4,932.1	4,932.1	0.0
F	4,090	900	895	2.5	4,936.0	4,936.0	4,936.0	0.0
G	4,399	876	935	2.4	4,938.0	4,938.0	4,938.0	0.0
H	5,092	912	1,123	2.0	4,939.4	4,939.4	4,939.4	0.0
I	5,690	213	2,203	4.3	4,943.5	4,943.5	4,943.5	0.0
J	5,745	850	3,143	0.8	4,946.1	4,946.1	4,946.6	0.5
K	6,350	360	1,042	2.4	4,946.2	4,946.2	4,946.7	0.5
L	8,114	416	693	3.0	4,954.1	4,954.1	4,954.5	0.4
M	8,726	406	636	3.3	4,956.3	4,956.3	4,956.6	0.3
N	8,844	480	995	2.1	4,960.1	4,960.1	4,960.6	0.5
O	10,344	100	268	7.8	4,963.5	4,963.5	4,963.5	0.0
P	11,144	225	339	6.1	4,970.3	4,970.3	4,970.5	0.2
Q	11,384	130	314	6.6	4,973.4	4,973.4	4,973.4	0.0
R	11,456	220	1,389	1.5	4,976.4	4,976.4	4,976.9	0.5
S	11,744	520	2,116	1.0	4,976.5	4,976.5	4,977.0	0.5

[1]Feet above confluence with Lake Canal

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COOPER SLOUGH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COOPER SLOUGH OVERFLOW								
A	0	758	671	3.4	4,917.1	4,917.1	4,917.1	0.0
B	585	694	865	4.0	4,919.5	4,919.5	4,919.5	0.0
C	1,885	376	399	5.8	4,924.0	4,924.0	4,924.0	0.0
D	2,575	594	465	5.0	4,929.1	4,929.1	4,929.1	0.0
E	4,145	176	290	1.0	4,931.1	4,931.1	4,931.1	0.0
F	4,631	230	135	2.2	4,931.6	4,931.6	4,931.6	0.0
G	4,929	47	51	5.9	4,933.6	4,933.6	4,933.6	0.0
H	5,120	178	122	2.5	4,936.2	4,936.2	4,936.2	0.0

[1]Feet above confluence with Lake Canal

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

COOPER SLOUGH OVERFLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DARK GULCH								
A	90	78	156	8.0	7,173.0	7,173.0	7,173.0	0.0
B	145	75	174	7.2	7,179.2	7,179.2	7,179.2	0.0
C	190	80	184	6.8	7,183.0	7,183.0	7,183.0	0.0
D	340	34	118	10.6	7,190.9	7,190.9	7,190.9	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DARK GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DEVILS GULCH								
A	50	70	160	7.5	7,337.6	7,337.6	7,337.6	0.0
B	540	110	179	6.7	7,366.9	7,366.9	7,366.9	0.0
C	650	120	183	11.5	7,374.1	7,374.1	7,374.1	0.0
D	1,145	80	156	7.7	7,400.0	7,400.0	7,400.0	0.0

[1]Feet above confluence with West Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DEVILS GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DICKSON GULCH								
A	180	140	334	5.7	5,553.9	5,553.9	5,553.9	0.0
B	260	55	201	9.5	5,555.2	5,555.2	5,555.2	0.0
C	310	38	274	6.9	5,556.8	5,556.8	5,556.8	0.0
D	380	50	285	6.7	5,557.4	5,557.4	5,557.4	0.0
E	490	50	189	10.1	5,559.5	5,559.5	5,559.5	0.0
F	800	49	174	10.9	5,567.2	5,567.2	5,567.2	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DICKSON GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK - BTR								
A	1,253	224	1,054	9.6	5,048.8	5,048.8	5,048.9	0.0
B	1,412	142	915	11.0	5,052.6	5,052.6	5,052.6	0.0
C	1,486	125	709	14.2	5,054.8	5,054.8	5,054.8	0.0
D	1,574	142	1,747	5.8	5,064.1	5,064.1	5,064.1	0.0
E	1,664	112	1,515	6.7	5,064.0	5,064.0	5,064.1	0.1
F	2,170	390	3,283	3.1	5,065.0	5,065.0	5,065.0	0.0
G	2,405	420	3,872	2.6	5,065.0	5,065.0	5,065.1	0.1

[1]Feet Above Confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK AT BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK (NORTH OF CANAL)								
A	40	727	457.1	2.4	4993.0	4993.0	4993.5	0.5
B	270	342	682.5	1.6	4993.4	4993.4	4993.8	0.4
C	744	340	500.8	2.2	4994.1	4994.1	4994.4	0.3
D	1148	155	270.3	4.1	4995.6	4995.6	4995.8	0.2
E	1392	103	272.6	4.0	4996.2	4996.2	4996.7	0.5
F	1713	80	214.6	5.1	4997.9	4997.9	4998.1	0.2
G	1964	79	285.5	3.9	4998.9	4998.9	4999.3	0.4
H	2318	135	319.8	3.4	5000.0	5000.0	5000.2	0.2
I	2631	64	277.0	4.0	5000.6	5000.6	5000.7	0.1
J	2973	35	168.2	6.5	5001.3	5001.3	5001.5	0.2
K	3502	65	258.4	4.3	5002.9	5002.9	5003.4	0.5
L	3827	60	226.2	4.9	5003.6	5003.6	5004.0	0.4
M	4339	72	296.0	3.7	5004.8	5004.8	5005.0	0.2
N	4475	72	282.5	3.9	5005.0	5005.0	5005.2	0.2
O	4581	72	258.5	4.3	5005.1	5005.1	5005.3	0.2
P	4673	104	272.9	4.0	5005.4	5005.4	5005.5	0.1
Q	4766	125	347.7	3.2	5005.7	5005.7	5005.8	0.1
R	4913	242	940.0	1.2	5010.0	5010.0	5010.4	0.4
S	5365	258	767.8	1.7	5010.1	5010.1	5010.5	0.4
T	5578	102	533.7	2.3	5010.2	5010.2	5010.6	0.4

[1]Feet above confluence with the Larimer and Weld Canal

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK (NORTH OF CANAL)

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK (NORTH OF CANAL)								
U	5642	154	630.8	2.2	5010.2	5010.2	5010.6	0.4
V	5843	94	306.8	3.6	5010.5	5010.5	5010.8	0.3
W	5943	62	372.6	3.0	5010.6	5010.6	5010.9	0.3
X	6097	163	722.0	1.5	5010.7	5010.7	5011.1	0.4
Y	6305	68	341.3	3.2	5010.7	5010.7	5011.1	0.4
Z	6646	93	409.9	2.7	5011.0	5011.0	5011.4	0.4
AA	6730	49	238.4	4.6	5011.0	5011.0	5011.4	0.4
AB	7002	54	256.3	4.3	5011.6	5011.6	5011.9	0.3
AC	7128	75	330.2	3.3	5011.9	5011.9	5012.1	0.2
AD	7765	64	259.5	4.2	5012.7	5012.7	5012.9	0.2
AE	8453	85	331.9	3.3	5013.7	5013.7	5013.8	0.1
AF	9011	83	177.6	6.2	5015.1	5015.1	5015.1	0.0
AG	9222	63	187.8	5.9	5016.1	5016.1	5016.1	0.0

[1]Feet above confluence with the Larimer and Weld Canal

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK (NORTH OF CANAL)

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK (SOUTH OF CANAL)								
A	551	114	178.3	4.9	4916.0	4913.2[2]	4913.3[2]	0.1
B	941	100	217.7	4.0	4916.0	4914.9[2]	4914.9[2]	0.0
C	1114	81	191.0	4.6	4916.0	4915.4[2]	4915.4[2]	0.0
D	1344	95	180.4	4.9	4916.8	4916.8	4916.8	0.0
E	1490	105	225.4	3.9	4917.5	4917.5	4917.5	0.0
F	1589	136	250.8	3.4	4917.7	4917.7	4917.7	0.0
G	1717	95	167.2	5.1	4918.0	4918.0	4918.0	0.0
H	2051	115	215.7	3.9	4919.5	4919.5	4919.5	0.0
I	2491	72	190.2	4.5	4921.1	4921.1	4921.1	0.0
J	3763	180	310.0	2.4	4925.4	4925.4	4925.8	0.4
K	4232	182	307.7	2.5	4926.8	4926.8	4927.3	0.5
L	4294	178	310.7	2.4	4927.0	4927.0	4927.5	0.5
M	4527	176	269.8	2.8	4928.0	4928.0	4928.3	0.3
N	4612	174	290.9	2.6	4928.5	4928.5	4928.7	0.2
O	4744	174	274.2	2.7	4929.1	4929.1	4929.2	0.1
P	4917	181	235.6	3.1	4929.9	4929.9	4930.0	0.1
Q	5937	400	443.1	1.7	4934.5	4934.5	4935.0	0.5
R	7205	403	651.3	1.4	4937.4	4937.4	4937.8	0.4
S	7495	397	528.7	1.8	4938.0	4938.0	4938.4	0.4

[1]Feet above confluence with Cache La Poudre River

[2]Elevations computed without consideration of backwater from Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK (SOUTH OF CANAL)

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK (SOUTH OF CANAL)								
T	7878	388	460.3	2.0	4938.5	4938.5	4938.9	0.4
U	8525	1007	697.3	1.4	4939.4	4939.4	4939.9	0.5
V	8841	905	661.1	1.4	4940.6	4940.6	4941.0	0.4
W	9635	279	251.9	5.6	4942.8	4942.8	4942.9	0.1
X	9787	249	103.0	9.1	4942.7	4942.7	4942.6	0.0
Y	10456	47	110.8	4.4	4945.7	4945.7	4945.7	0.0
Z	10613	84	155.0	3.1	4946.4	4946.4	4946.4	0.0
AA	10851	69	148.1	3.3	4947.1	4947.1	4947.1	0.0
AB	10962	54	119.6	4.1	4947.4	4947.4	4947.4	0.0
AC	11540	71	130.9	3.7	4949.8	4949.8	4949.8	0.0
AD	11629	73	241.4	2.0	4950.1	4950.1	4950.1	0.0
AE	11801	337	132.9	3.7	4951.7	4951.7	4951.8	0.1
AF	12237	227	371.1	1.0	4952.8	4952.8	4953.1	0.3
AG	12780	50	119.4	3.0	4953.9	4953.9	4954.2	0.3
AH	13911	164	169.7	1.5	4956.2	4956.2	4956.2	0.0
AI	14491	164	76.0	3.4	4960.3	4960.3	4960.3	0.0
AJ	14732	378	230.6	1.1	4960.6	4960.6	4961.0	0.4
AK	14948	145	119.8	2.1	4961.1	4961.1	4961.4	0.3
AL	15191	57	76.8	3.3	4962.0	4962.0	4962.1	0.1
AM	15537	51	62.8	4.1	4964.1	4964.1	4964.1	0.0

[1]Feet above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK (SOUTH OF CANAL)

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
EAST VINE DIVERSION								
A	323	34	67.9	1.2	4944.6	4944.6	4944.6	0.0
B	530	31	71.5	1.2	4944.8	4944.8	4944.8	0.0
C	864	43	81.1	2.8	4945.6	4945.6	4945.6	0.0
D	1169	29	94.2	2.9	4946.9	4946.9	4946.9	0.0
E	1640	50	129.6	1.6	4947.9	4947.9	4948.0	0.1
F	1877	35	89.6	2.3	4948.4	4948.4	4948.4	0.0
G	2149	36	108.6	1.9	4949.0	4949.0	4949.0	0.0
H	2352	33	100.6	2.1	4949.3	4949.3	4949.3	0.0
I	2663	50	110.2	3.5	4950.7	4950.7	4950.7	0.0
J	2784	41	115.4	3.1	4953.4	4953.4	4953.4	0.0
K	2896	55	111.9	3.2	4953.6	4953.6	4953.6	0.0
L	3209	49	63.1	5.7	4954.7	4954.7	4954.7	0.0
M	3504	49	84.0	4.3	4956.3	4956.3	4956.3	0.0
N	3900	42	83.7	4.3	4957.5	4957.5	4957.5	0.0
O	4196	81	115.2	2.9	4958.5	4958.5	4958.5	0.0
P	4411	56	96.0	3.4	4958.9	4958.9	4958.9	0.0
Q	4611	55	96.0	3.4	4959.5	4959.5	4959.5	0.0
R	4812	58	109.0	3.0	4960.0	4960.0	4960.0	0.0
S	5007	57	100.9	3.3	4960.4	4960.4	4960.4	0.0
T	5311	49	80.9	4.1	4961.1	4961.1	4961.1	0.0

[1]Feet above confluence with Dry Creek (South of Canal)

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

EAST VINE DIVERSION

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
EAST VINE DIVERSION								
U	5489	48	66.1	5.0	4962.2	4962.2	4962.2	0.0
V	5582	48	70.3	4.7	4963.9	4963.9	4963.9	0.0
W	5735	48	80.9	4.1	4966.2	4966.2	4966.2	0.0
X	5905	43	65.5	5.0	4968.9	4968.9	4968.9	0.0
Y	6027	42	69.9	4.7	4972.2	4972.2	4972.2	0.0
Z	6116	72	63.4	5.2	4982.9	4982.9	4983.4	0.5
EAST VINE DIVERSION - LEFT OVERBANK FLOWPATH								
A	323	792	2699.6	0.4	4944.6	4944.6	4945.1	0.5
B	559	792	2677.1	0.4	4944.7	4944.7	4945.1	0.4
C	881	785	1874.8	0.1	4944.7	4944.7	4945.1	0.4
D	1174	550	987.9	0.2	4944.7	4944.7	4945.1	0.4
E	1368	500	911.4	0.2	4944.7	4944.7	4945.2	0.5
F	1434	410	690.9	0.3	4944.7	4944.7	4945.2	0.5
G	1528	296	421.5	0.4	4944.7	4944.7	4945.2	0.5
H	1748	422	366.3	0.5	4944.7	4944.7	4945.2	0.5

[1]Feet above confluence with Dry Creek (South of Canal)

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

EAST VINE DIVERSION AND EAST VINE DIVERSION – LEFT OVERBANK FLOWPATH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FALL RIVER								
A	36	18	110	6.2	7,526.3	7,526.3	7,527.3	1.0
B	464	22	105	6.5	7,530.2	7,530.2	7,530.2	0.0
C	959	16	75	9.0	7,537.7	7,537.7	7,537.8	0.1
D	1,505	17	69	9.9	7,545.9	7,545.9	7,545.8	0.0
E	1,920	22	92	7.4	7,552.6	7,552.6	7,553.4	0.8
F	2,475	25	88	7.8	7,562.9	7,562.9	7,563.0	0.1
G	3,038	53	178	3.8	7,567.8	7,567.8	7,568.7	0.9
H	3,504	27	136	5.0	7,574.0	7,574.0	7,575.0	1.0
I	3,765	33	102	6.7	7,577.3	7,577.3	7,577.3	0.0
J	3,923	33	78	8.7	7,583.3	7,583.3	7,583.3	0.0
K	4,641	30	143	4.8	7,589.9	7,589.9	7,590.9	1.0
L	5,219	31	99	6.9	7,598.5	7,598.5	7,598.5	0.0
M	5,875	32	104	6.6	7,603.9	7,603.9	7,604.4	0.5
N	6,498	39	82	8.3	7,620.5	7,620.5	7,620.5	0.0
O	7,337	32	87	7.8	7,634.6	7,634.6	7,634.9	0.3
P	7,929	23	68	10.0	7,643.8	7,643.8	7,643.8	0.0
Q	8,275	31	76	8.9	7,653.3	7,653.3	7,653.4	0.1
R	8,939	29	100	6.8	7,663.3	7,663.3	7,663.5	0.2
S	9,607	25	92	7.4	7,677.9	7,677.9	7,677.9	0.0
T	10,465	23	95	7.2	7,696.9	7,696.9	7,696.9	0.0
U	11,029	20	90	7.6	7,711.6	7,711.6	7,711.6	0.0
V	11,509	21	67	10.2	7,723.8	7,723.8	7,723.8	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

FALL RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FALL RIVER								
W	11,870	22	68	10.0	7,730.0	7,730.0	7,730.0	0.0
X	12,285	24	108	6.3	7,736.2	7,736.2	7,736.2	0.0
Y	12,782	27	86	7.9	7,748.7	7,748.7	7,748.7	0.0
Z	13,588	17	62	10.9	7,761.6	7,761.6	7,761.6	0.0
AA	14,738	35	79	8.6	7,787.8	7,787.8	7,787.8	0.0
AB	15,627	28	101	6.8	7,805.9	7,805.9	7,805.9	0.0
AC	15,785	42	84	8.1	7,816.3	7,816.3	7,816.3	0.0
AD	16,498	29	101	6.7	7,823.1	7,823.1	7,823.8	0.7
AE	17,554	39	92	7.4	7,842.1	7,842.1	7,842.2	0.1
AF	18,698	17	62	10.9	7,869.4	7,869.4	7,869.4	0.0
AG	19,757	23	70	9.7	7,891.4	7,891.4	7,891.4	0.0
AH	20,380	27	73	9.3	7,908.2	7,908.2	7,908.2	0.0
AI	21,158	34	81	8.4	7,925.3	7,925.3	7,925.3	0.0
AJ	21,508	22	73	9.3	7,930.6	7,930.6	7,930.8	0.2
AK	22,028	27	73	9.4	7,944.5	7,944.5	7,944.5	0.0
AL	22,452	30	75	9.0	7,954.3	7,954.3	7,954.3	0.0
AM	22,888	28	73	9.3	7,966.1	7,966.1	7,966.1	0.0
AN	23,635	23	69	9.9	7,983.5	7,983.5	7,983.6	0.1
AO	24,205	20	67	10.2	8,001.4	8,001.4	8,001.6	0.2
AP	24,612	22	68	10.0	8,011.8	8,011.8	8,011.8	0.0
AQ	25,223	38	82	8.3	8,036.3	8,036.3	8,036.6	0.3
AR	25,950	24	70	9.7	8,064.4	8,064.4	8,064.5	0.1
AS	26,580	24	87	7.9	8,097.4	8,097.4	8,097.4	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

FALL RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FALL RIVER OVERFLOW								
A	45	4	21	7.5	7,564.2	7,564.2	7,564.2	0.0
B	176	4	18	8.4	7,566.6	7,566.6	7,567.1	0.5
C	244	22	60	2.6	7,567.6	7,567.6	7,567.9	0.3

[1]Feet above confluence with Fall River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

FALL RIVER OVERFLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FISH CREEK								
A	580	20	50	8.0	7,480.1	7,480.1	7,480.5	0.4
B	970	25	75	5.3	7,483.9	7,483.9	7,484.4	0.5
C	1,150	18	47	8.5	7,486.9	7,486.9	7,486.9	0.0
D	1,450	20	47	8.5	7,492.2	7,492.2	7,492.2	0.0
E	1,540	35	364	1.1	7,502.7	7,502.7	7,503.7	1.0
F	1,780	40	204	2.0	7,502.8	7,502.8	7,503.8	1.0
G	2,365	27	51	7.8	7,508.9	7,508.9	7,508.9	0.0
H	2,955	20	54	7.4	7,518.4	7,518.4	7,518.8	0.4
I	3,165	23	49	8.2	7,523.8	7,523.8	7,523.8	0.0
J	3,205	29	58	6.9	7,525.8	7,525.8	7,525.8	0.0
K	3,510	30	83	4.8	7,528.2	7,528.2	7,528.3	0.1
L	4,145	37	65	6.2	7,539.0	7,539.0	7,539.3	0.3
M	4,610	33	66	6.1	7,545.1	7,545.1	7,545.9	0.8
N	5,130	20	57	7.1	7,549.3	7,549.3	7,550.3	1.0
O	5,800	20	49	8.2	7,556.1	7,556.1	7,556.4	0.3
P	6,435	20	46	8.7	7,566.0	7,566.0	7,566.1	0.1
Q	7,140	32	68	5.9	7,573.9	7,573.9	7,574.1	0.2
R	7,210	32	53	7.5	7,576.8	7,576.8	7,576.8	0.0
S	7,250	25	202	2.0	7,581.4	7,581.4	7,582.4	1.0
T	7,405	95	348	1.1	7,581.4	7,581.4	7,581.9	0.5
U	8,415	75	72	5.5	7,592.2	7,592.2	7,592.4	0.2
V	8,600	20	48	8.3	7,594.2	7,594.2	7,594.6	0.4

[1]Feet above mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

FISH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FISH CREEK								
W	8,650	45	196	2.0	7,597.9	7,597.9	7,597.9	0.0
X	8,825	55	187	2.1	7,597.9	7,597.9	7,597.9	0.0
Y	9,530	15	66	6.0	7,604.9	7,604.9	7,604.9	0.0
Z	10,215	40	71	5.6	7,617.6	7,617.6	7,618.0	0.4
AA	10,430	20	46	8.6	7,620.6	7,620.6	7,620.9	0.3
AB	10,470	110	308	1.3	7,624.0	7,624.0	7,624.3	0.3
AC	10,680	20	48	8.3	7,625.2	7,625.2	7,625.7	0.5
AD	11,030	30	43	7.6	7,632.6	7,632.6	7,632.8	0.2

[1]Feet above mouth

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

FISH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FOX CREEK								
A	160	150	312	8.8	7,256.7	7,256.7	7,256.7	0.0
B	530	90	275	10.0	7,268.3	7,268.3	7,268.3	0.0
C	915	80	252	10.9	7,280.7	7,280.7	7,280.7	0.0
D	1,330	50	256	10.7	7,292.1	7,292.1	7,292.1	0.0
E	1,770	80	319	8.6	7,307.2	7,307.2	7,307.2	0.0
F	2,280	70	275	10.0	7,319.3	7,319.3	7,319.3	0.0
G	2,760	70	287	9.6	7,331.9	7,331.9	7,331.9	0.0
H	3,260	80	289	9.5	7,345.4	7,345.4	7,345.4	0.0
I	3,775	85	301	9.1	7,363.6	7,363.6	7,363.6	0.0
J	4,260	100	328	7.3	7,376.3	7,376.3	7,376.3	0.0
K	4,750	90	307	9.0	7,391.4	7,391.4	7,391.4	0.0
L	5,615	50	232	11.9	7,421.4	7,421.4	7,421.4	0.0
M	5,980	140	303	9.1	7,434.7	7,434.7	7,434.7	0.0
N	6,650	100	259	10.6	7,460.9	7,460.9	7,460.9	0.0
O	7,010	105	295	9.3	7,472.5	7,472.5	7,472.5	0.0
P	7,950	78	261	10.3	7,502.2	7,502.2	7,502.2	0.0

[1]Feet above confluence with North Fork Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

FOX CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
GLADE ROAD SPLIT								
A	160	67	354	4.1	5,047.0	5,047.0	5,047.0	0.0
B	442	70	637	2.3	5,052.4	5,052.4	5,052.4	0.0
C	620	119	200	7.3	5,055.9	5,055.9	5,055.9	0.0
D	901	193	468	3.4	5,060.0	5,060.0	5,060.0	0.0
E	1,423	499	1,422	2.9	5,063.7	5,063.7	5,063.7	0.0
F	1,740	562	2,266	2.5	5,065.0	5,065.0	5,065.0	0.0
G	2,216	744	2,097	3.1	5,066.6	5,066.6	5,066.6	0.0
H	2,681	892	2,838	2.3	5,068.2	5,068.2	5,068.2	0.0
I	3,141	804	2,051	3.1	5,069.7	5,069.7	5,069.7	0.0
J	3,875	925	1,712	3.8	5,073.3	5,073.3	5,073.3	0.0
K	4,284	834	2,144	2.0	5,076.4	5,076.4	5,076.4	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

GLADE ROAD SPLIT

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
LARIMER AND WELD CANAL								
A	25281	60	319.5	4.5	4983.6	4983.6	4983.6	0.0
B	26001	68	361.3	3.9	4984.3	4984.3	4984.3	0.0
C	26801	71	414.4	3.3	4985.1	4985.1	4985.1	0.0
D	28051	73	469.5	2.9	4985.8	4985.8	4985.8	0.0
E	29501	75	516.5	2.6	4986.3	4986.3	4986.3	0.0
F	29764	47	270.6	4.9	4986.3	4986.3	4986.3	0.0
G	30964	77	645.6	2.0	4987.5	4987.5	4987.5	0.0
H	31024	77	646.5	2.0	4987.5	4987.5	4987.5	0.0
I	31574	78	656.0	2.0	4987.6	4987.6	4987.6	0.0
J	32134	76	558.3	2.3	4987.8	4987.8	4987.8	0.0
K	33264	76	455.1	2.7	4988.2	4988.2	4988.2	0.0
L	34114	77	483.0	2.6	4988.6	4988.6	4988.6	0.0
M	35714	50	273.9	4.7	4990.2	4990.2	4990.2	0.0
N	36769	75	520.7	2.1	4991.6	4991.6	4991.6	0.0
O	37639	74	450.7	2.4	4991.8	4991.8	4991.8	0.0
P	37719	74	453.9	2.4	4991.9	4991.9	4991.9	0.0
Q	39544	57	295.3	3.7	4992.7	4992.7	4992.7	0.0
R	39644	58	301.9	3.6	4992.8	4992.8	4992.8	0.0

[1]Feet from approximate downstream face of Mulberry Street Bridge

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

LARIMER AND WELD CANAL

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	**DISTANCE[1]**	**WIDTH (FEET)**	**SECTION AREA (SQUARE FEET)**	**MEAN VELOCITY (FEET PER SECOND)**	**REGULATORY (FEET NAVD)**	**WITHOUT FLOODWAY (FEET NAVD)**	**WITH FLOODWAY (FEET NAVD)**	**INCREASE (FEET)**
LITTLE THOMPSON RIVER								
A	74,878	236	2,865	3.3	4,942.1	4,942.1	4,942.2	0.1
B	75,725	468	5,448	1.7	4,942.3	4,942.3	4,942.5	0.2
C	76,565	652	3,786	2.5	4,942.4	4,942.4	4,942.8	0.4
D	77,283	511	2,604	3.7	4,942.7	4,942.7	4,943.2	0.5
E	78,274	306	1,340	6.9	4,945.5	4,945.5	4,946.0	0.5
F	79,562	491	2,762	3.3	4,950.7	4,950.7	4,950.8	0.1
G	80,647	350	2,160	4.3	4,953.9	4,953.9	4,954.4	0.5
H	81,982	715	8,983	1.0	4,964.4	4,964.4	4,964.7	0.3
I	83,969	232	1,944	4.4	4,964.8	4,964.8	4,965.2	0.4
J	84,527	377	2,149	4.0	4,965.7	4,965.7	4,966.2	0.5
K	85,758	470	4,376	2.0	4,971.4	4,971.4	4,971.9	0.5
L	86,540	298	2,263	3.8	4,971.8	4,971.8	4,972.3	0.5
M	87,414	221	1,813	4.7	4,973.3	4,973.3	4,973.8	0.5
N	88,519	286	871	9.9	4,979.9	4,979.9	4,980.2	0.3
O	89,678	395	3,470	2.5	4,988.1	4,988.1	4,988.4	0.3
P	90,886	283	2,076	4.0	4,989.0	4,989.0	4,989.5	0.5
Q	91,888	138	1,485	5.6	4,996.6	4,996.6	4,996.9	0.3
R	92,984	381	2,618	3.2	4,997.8	4,997.8	4,998.2	0.4
S	94,130	230	1,484	5.6	4,999.6	4,999.6	4,999.9	0.3
T	95,137	108	735	11.3	5,001.6	5,001.6	5,002.0	0.4
U	96,766	119	1,072	3.9	5,011.0	5,011.0	5,011.1	0.1
V	98,387	318	2,151	3.5	5,018.3	5,018.3	5,018.7	0.4
W	99,250	539	2,757	3.0	5,019.7	5,019.7	5,020.1	0.4
X	100,061	371	1,950	4.3	5,023.2	5,023.2	5,023.6	0.4
Y	101,285	250	1,245	6.7	5,029.2	5,029.2	5,029.7	0.5

[1] Stream distance in feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	**DISTANCE[1]**	**WIDTH (FEET)**	**SECTION AREA (SQUARE FEET)**	**MEAN VELOCITY (FEET PER SECOND)**	**REGULATORY (FEET NAVD)**	**WITHOUT FLOODWAY (FEET NAVD)**	**WITH FLOODWAY (FEET NAVD)**	**INCREASE (FEET)**
LITTLE THOMPSON RIVER								
Z	102,171	428	2,536	3.3	5,035.1	5,035.1	5,035.5	0.4
AA	103,115	373	3,320	2.5	5,043.9	5,043.9	5,044.1	0.2
AB	104,250	142	1,070	7.5	5,048.2	5,048.2	5,048.7	0.5
AC	105,307	366	1,754	4.6	5,052.7	5,052.7	5,053.2	0.5
AD	106,541	104	940	8.5	5,060.7	5,060.7	5,061.0	0.3
AE	107,570	94	679	11.8	5,067.1	5,067.1	5,067.4	0.3
AF	108,420	491	1,321	6.1	5,073.6	5,073.6	5,073.7	0.1
AG	109,148	279	1,234	6.5	5,078.4	5,078.4	5,078.6	0.2
AH	109,613	201	1,430	5.6	5,082.0	5,082.0	5,082.1	0.1
AI	110,348	236	927	8.6	5,084.8	5,084.8	5,085.2	0.4
AJ	111,200	373	1,849	4.3	5,093.4	5,093.4	5,093.9	0.5

[1] Stream distance in feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	**DISTANCE[1]**	**WIDTH (FEET)**	**SECTION AREA (SQUARE FEET)**	**MEAN VELOCITY (FEET PER SECOND)**	**REGULATORY (FEET NAVD)**	**WITHOUT FLOODWAY (FEET NAVD)**	**WITH FLOODWAY (FEET NAVD)**	**INCREASE (FEET)**
LITTLE THOMPSON SPILL REACH								
A	284	490	902	4.6	5,009.0	5,009.0	5,009.5	0.5
B	768	380	608	5.5	5,012.1	5,012.1	5,012.6	0.5
C	1,455	85	125	6.8	5,014.8	5,014.8	5,015.3	0.5

[1] Stream distance in feet above confluence with Little Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE THOMPSON RIVER - SPILL REACH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
LONG GULCH								
A	90	139	259	7.7	6,920.0	6,920.0	6,920.0	0.0
B	320	50	182	11.0	6,943.2	6,943.2	6,943.2	0.0
C	690	34	160	12.5	6,973.5	6,973.5	6,973.5	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

LONG GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MILLER FORK								
A	210	135	461	7.3	6,901.7	6,901.7	6,901.7	0.0
B	450	110	326	10.3	6,911.0	6,911.0	6,911.0	0.0
C	500	140	701	4.8	6,915.3	6,915.3	6,915.3	0.0
D	600	113	515	6.5	6,915.4	6,915.4	6,915.4	0.0

[1]Feet above confluence with North Fork Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

MILLER FORK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NOEL'S DRAW								
A	80	65	221	10.0	7,152.2	7,152.2	7,152.2	0.0
B	290	40	183	12.0	7,167.5	7,167.5	7,167.5	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NOEL'S DRAW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
A	150	200	597	10.4	6,156.6	6,156.6	6,156.6	0.0
B	350	290	844	7.2	6,160.7	6,160.7	6,160.7	0.0
C	850	250	785	7.8	6,166.3	6,166.3	6,166.3	0.0
D	1,200	210	822	7.4	6,170.5	6,170.5	6,170.5	0.0
E	1,930	300	869	7.0	6,189.6	6,189.6	6,189.6	0.0
F	2,370	55	596	10.4	6,201.2	6,201.2	6,201.2	0.0
G	2,540	110	829	11.7	6,207.7	6,207.7	6,207.7	0.0
H	2,670	100	869	10.9	6,211.3	6,211.3	6,211.3	0.0
I	2,800	345	582	10.7	6,213.7	6,213.7	6,213.7	0.0
J	3,060	176	620	10.0	6,219.7	6,219.7	6,219.7	0.0
K	3,560	465	992	6.3	6,226.8	6,226.8	6,226.8	0.0
L	4,300	380	940	6.6	6,236.3	6,236.3	6,236.3	0.0
M	4,600	225	787	7.9	6,241.0	6,241.0	6,241.0	0.0
N	5,500	340	825	7.5	6,253.4	6,253.4	6,253.4	0.0
O	6,030	310	916	6.8	6,261.0	6,261.0	6,261.0	0.0
P	6,550	270	881	7.0	6,268.1	6,268.1	6,268.1	0.0
Q	6,980	320	510	12.2	6,275.9	6,275.9	6,275.9	0.0
R	7,640	570	534	11.6	6,287.6	6,287.6	6,287.6	0.0
S	8,200	349	897	7.0	6,295.2	6,295.2	6,295.2	0.0
T	8,500	350	987	6.3	6,301.8	6,301.8	6,301.8	0.0
U	8,600	310	637	9.7	6,302.5	6,302.5	6,302.5	0.0
V	9,050	180	553	10.5	6,310.7	6,310.7	6,310.7	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
W	9,350	160	580	10.0	6,314.0	6,314.0	6,314.0	0.0
X	9,570	107	494	11.7	6,318.3	6,318.3	6,318.3	0.0
Y	9,930	97	454	12.8	6,326.1	6,326.1	6,326.1	0.0
Z	10,620	80	482	12.0	6,339.2	6,339.2	6,339.2	0.0
AA	10,970	90	514	11.3	6,345.3	6,345.3	6,345.3	0.0
AB	11,280	135	610	9.5	6,351.0	6,351.0	6,351.0	0.0
AC	11,880	200	715	8.1	6,359.8	6,359.8	6,359.8	0.0
AD	12,190	190	653	8.9	6,363.2	6,363.2	6,363.2	0.0
AE	12,670	286	820	7.1	6,374.1	6,374.1	6,374.1	0.0
AF	12,935	242	742	7.8	6,378.9	6,378.9	6,378.9	0.0
AG	13,245	280	728	8.0	6,383.7	6,383.7	6,383.7	0.0
AH	13,815	154	647	9.0	6,392.1	6,392.1	6,392.1	0.0
AI	14,510	160	636	9.1	6,405.6	6,405.6	6,405.6	0.0
AJ	15,406	100	509	11.4	6,424.5	6,424.5	6,424.5	0.0
AK	15,630	201	670	8.7	6,428.9	6,428.9	6,428.9	0.0
AL	16,015	130	574	10.1	6,437.7	6,437.7	6,437.7	0.0
AM	16,430	253	709	8.2	6,448.4	6,448.4	6,448.4	0.0
AN	16,680	150	589	9.8	6,455.8	6,455.8	6,455.8	0.0
AO	16,700	160	1,040	5.6	6,458.6	6,458.6	6,458.6	0.0
AP	17,835	205	633	9.2	6,478.5	6,478.5	6,478.5	0.0
AQ	17,900	210	650	8.9	6,480.3	6,480.3	6,480.3	0.0
AR	18,500	130	525	10.5	6,495.1	6,495.1	6,495.1	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
AS	18,520	140	586	9.4	6,499.1	6,499.1	6,499.1	0.0
AT	18,980	110	515	10.7	6,512.4	6,512.4	6,512.4	0.0
AU	19,370	169	626	8.8	6,530.1	6,530.1	6,530.1	0.0
AV	19,600	126	562	9.8	6,538.4	6,538.4	6,538.4	0.0
AW	19,630	135	723	7.6	6,539.7	6,539.7	6,539.7	0.0
AX	19,860	83	450	12.2	6,547.8	6,547.8	6,547.8	0.0
AY	19,950	81	417	13.2	6,555.2	6,555.2	6,555.2	0.0
AZ	20,590	78	410	13.4	6,567.5	6,567.5	6,567.5	0.0
BA	21,810	89	458	12.0	6,595.4	6,595.4	6,595.4	0.0
BB	22,550	90	475	11.6	6,626.0	6,626.0	6,626.0	0.0
BC	22,580	80	400	13.8	6,628.3	6,628.3	6,628.3	0.0
BD	23,090	148	551	10.0	6,643.9	6,643.9	6,643.9	0.0
BE	23,615	93	460	12.0	6,663.5	6,663.5	6,663.5	0.0
BF	23,650	93	477	11.5	6,664.8	6,664.8	6,664.8	0.0
BG	24,050	76	414	13.3	6,679.0	6,679.0	6,679.0	0.0
BH	24,530	89	441	12.5	6,699.8	6,699.8	6,699.8	0.0
BI	25,090	53	379	14.5	6,728.1	6,728.1	6,728.1	0.0
BJ	26,090	87	443	12.4	6,764.6	6,764.6	6,764.6	0.0
BK	26,600	76	412	13.3	6,791.6	6,791.6	6,791.6	0.0
BL	26,825	79	419	13.1	6,812.4	6,812.4	6,812.4	0.0
BM	27,305	90	455	12.1	6,831.5	6,831.5	6,831.5	0.0
BN	27,985	117	544	10.1	6,848.8	6,848.8	6,848.8	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
BO	28,260	234	1,056	5.2	6,852.2	6,852.2	6,852.2	0.0
BP	28,780	250	724	7.6	6,861.0	6,861.0	6,861.0	0.0
BQ	28,845	270	764	7.2	6,863.8	6,863.8	6,863.8	0.0
BR	29,225	100	531	10.4	6,870.0	6,870.0	6,870.0	0.0
BS	29,495	86	444	12.4	6,873.2	6,873.2	6,873.2	0.0
BT	29,700	115	518	1.6	6,881.2	6,881.2	6,881.2	0.0
BU	30,190	140	553	9.9	6,891.8	6,891.8	6,891.8	0.0
BV	30,615	232	705	6.8	6,900.4	6,900.4	6,900.4	0.0
BW	31,150	257	662	7.3	6,908.5	6,908.5	6,908.5	0.0
BX	31,700	230	511	9.4	6,914.7	6,914.7	6,914.7	0.0
BY	32,410	185	622	7.8	6,925.9	6,925.9	6,925.9	0.0
BZ	32,830	252	833	5.8	6,934.4	6,934.4	6,934.4	0.0
CA	32,875	270	639	7.5	6,934.5	6,934.5	6,934.5	0.0
CB	33,480	240	776	6.2	6,947.6	6,947.6	6,947.6	0.0
CC	33,905	95	422	11.4	6,951.3	6,951.3	6,951.3	0.0
CD	34,840	186	592	8.1	6,973.2	6,973.2	6,973.2	0.0
CE	34,880	195	641	7.5	6,974.4	6,974.4	6,974.4	0.0
CF	35,950	95	390	12.3	6,996.3	6,996.3	6,996.3	0.0
CG	36,380	130	473	10.1	7,003.4	7,003.4	7,003.4	0.0
CH	36,715	88	409	11.7	7,010.1	7,010.1	7,010.1	0.0
CI	36,990	115	473	10.1	7,017.4	7,017.4	7,017.4	0.0
CJ	37,030	101	432	11.1	7,019.5	7,019.5	7,019.5	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
CK	37,710	119	488	9.8	7,036.5	7,036.5	7,036.5	0.0
CL	37,730	129	500	9.6	7,037.7	7,037.7	7,037.7	0.0
CM	38,140	175	539	8.9	7,046.0	7,046.0	7,046.0	0.0
CN	38,160	142	805	6.0	7,048.3	7,048.3	7,048.3	0.0
CO	38,605	99	464	10.3	7,059.1	7,059.1	7,059.1	0.0
CP	38,815	116	480	10.0	7,068.0	7,068.0	7,068.0	0.0
CQ	39,035	175	560	8.6	7,072.7	7,072.7	7,072.7	0.0
CR	40,195	86	418	11.5	7,094.2	7,094.2	7,094.2	0.0
CS	40,970	70	388	12.4	7,117.0	7,117.0	7,117.0	0.0
CT	41,115	110	479	10.0	7,119.5	7,119.5	7,119.5	0.0
CU	41,140	155	721	6.7	7,123.5	7,123.5	7,123.5	0.0
CV	41,425	109	452	10.6	7,133.8	7,133.8	7,133.8	0.0
CW	41,665	75	388	12.4	7,143.7	7,143.7	7,143.7	0.0
CX	41,865	124	479	9.9	7,156.0	7,156.0	7,156.0	0.0
CY	42,470	97	721	11.6	7,170.3	7,170.3	7,170.3	0.0
CZ	42,590	95	452	11.2	7,176.5	7,176.5	7,176.5	0.0
DA	43,010	81	388	11.8	7,182.5	7,182.5	7,182.5	0.0
DB	43,785	65	444	9.9	7,199.3	7,199.3	7,199.3	0.0
DC	43,860	105	493	8.9	7,204.0	7,204.0	7,204.0	0.0
DD	43,900	121	654	6.7	7,205.3	7,205.3	7,205.3	0.0
DE	43,945	126	646	6.8	7,205.6	7,205.6	7,205.6	0.0
DF	44,370	124	486	9.1	7,215.5	7,215.5	7,215.5	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
DG	44,455	92	375	11.7	7,216.3	7,216.3	7,216.3	0.0
DH	44,555	166	742	5.9	7,220.5	7,220.5	7,220.5	0.0
DI	44,650	197	685	6.4	7,220.7	7,220.7	7,220.7	0.0
DJ	44,865	114	472	9.3	7,223.7	7,223.7	7,223.7	0.0
DK	45,175	102	383	10.4	7,232.1	7,232.1	7,232.1	0.0
DL	45,470	140	446	9.0	7,239.8	7,239.8	7,239.8	0.0
DM	45,560	130	472	8.5	7,242.2	7,242.2	7,242.2	0.0
DN	45,580	119	444	9.0	7,242.4	7,242.4	7,242.4	0.0
DO	45,620	103	551	7.3	7,243.9	7,243.9	7,243.9	0.0
DP	45,930	150	447	8.9	7,251.2	7,251.2	7,251.2	0.0
DQ	46,080	105	448	8.3	7,254.8	7,254.8	7,254.8	0.0
DR	46,090	110	327	11.3	7,255.2	7,255.2	7,255.2	0.0
DS	46,200	115	446	8.3	7,259.2	7,259.2	7,259.2	0.0
DT	46,385	121	401	9.2	7,265.2	7,265.2	7,265.2	0.0
DU	46,765	64	336	11.0	7,279.4	7,279.4	7,279.4	0.0
DV	46,780	62	338	10.9	7,280.7	7,280.7	7,280.7	0.0
DW	47,420	95	403	9.2	7,299.7	7,299.7	7,299.7	0.0
DX	48,165	82	354	10.5	7,227.1	7,227.1	7,227.1	0.0
DY	48,190	86	366	10.1	7,329.4	7,329.4	7,329.4	0.0
DZ	48,360	89	365	10.1	7,332.9	7,332.9	7,332.9	0.0
EA	48,865	130	392	9.4	7,353.4	7,353.4	7,353.4	0.0
EB	49,750	87	356	10.4	7,379.1	7,379.1	7,379.1	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NORTH FORK BIG THOMPSON RIVER								
EC	50,015	70	336	11.0	7,384.9	7,384.9	7,384.9	0.0
ED	50,715	95	376	9.8	7,409.3	7,409.3	7,409.3	0.0
EE	51,210	85	312	11.9	7,422.1	7,422.1	7,422.1	0.0
EF	51,370	105	339	10.9	7,430.2	7,430.2	7,430.2	0.0
EG	52,020	118	414	8.9	7,450.6	7,450.6	7,450.6	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK BIG THOMPSON RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
OLD DRY CREEK (HISTORIC CHANNEL)								
A	50	29	106.7	1.2	4919.4	4915.3[2]	4915.3[2]	0.0
B	281	57	68.7	1.8	4919.4	4915.4[2]	4915.4[2]	0.0
C	418	28	32.7	3.8	4919.4	4915.8[2]	4915.8[2]	0.0
D	562	36	53.4	2.3	4919.4	4916.6[2]	4916.6[2]	0.0
E	779	73	49.7	2.5	4919.4	4916.8[2]	4916.8[2]	0.0
F	827	31	18.5	6.8	4919.4	4917.6[2]	4917.6[2]	0.0
G	869	90	86.2	1.5	4919.4	4918.5[2]	4918.5[2]	0.0
H	936	71	85.1	1.5	4919.4	4918.5[2]	4918.5[2]	0.0
I	1151	34	28.4	4.4	4919.5	4919.5	4919.5	0.0
J	1277	23	31.8	3.9	4920.6	4920.6	4920.6	0.0
K	1486	173	184.9	0.7	4922.1	4922.1	4922.3	0.2
L	2109	35	63.5	2.0	4923.4	4923.4	4923.4	0.0
M	2719	77	59.0	2.1	4924.3	4924.3	4924.3	0.0
N	2900[1]	58	110.0	1.1	4924.4	4924.4	4924.4	0.0
O	2956[1]	31	22.2	5.6	4924.6	4924.6	4924.6	0.0
P	3173[1]	40	47.0	2.7	4926.0	4926.0	4926.0	0.0
Q	3653[1]	44	45.8	2.7	4927.3	4927.3	4927.3	0.0
R	3914[1]	35	51.9	2.4	4927.9	4927.9	4927.9	0.0

[1]Feet above confluence with Cache La Poudre River

[2]Elevations computed without consideration of backwater from Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

OLD DRY CREEK (HISTORIC CHANNEL)

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
QUILLAN GULCH								
A	50	50/40[2]	70	16.9	6,493.0	6,493.0	6,493.0	0.0
B	220	50/30[2]	75	9.1	6,507.3	6,507.3	6,507.3	0.0
C	400	20/80[2]	105	10.6	6,520.2	6,520.2	6,520.2	0.0
D	500	50	30	20.8	6,526.9	6,526.9	6,526.9	0.0
E	610	40	30	12.4	6,537.7	6,537.7	6,537.7	0.0
F	690	30	30	11.9	6,538.3	6,538.3	6,538.3	0.0
G	796	70	50	16.7	6,546.7	6,546.7	6,546.7	0.0
H	890	70	60	11.6	6,558.8	6,558.8	6,558.8	0.0

[1]Feet above confluence with Big Thompson River [2]Left Channel/Right Channel

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

QUILLAN GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
RABBIT GULCH								
A	110	116	286	7.7	6,949.2	6,949.2	6,949.2	0.0
B	240	52	211	10.4	6,954.9	6,954.9	6,954.9	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

RABBIT GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
REDSTONE CREEK								
A	400	253	1,301	9.8	5,301.4	5,301.4	5,301.4	0.0
B	530	290	1,543	8.0	5,304.3	5,304.3	5,304.3	0.0
C	580	337	2,574	4.8	5,306.5	5,306.5	5,306.5	0.0
D	610	450	3,487	3.5	5,308.2	5,308.2	5,308.2	0.0
E	660	395	2,351	5.3	5,308.2	5,308.2	5,308.2	0.0
F	1,045	190	1,156	10.7	5,309.4	5,309.4	5,309.4	0.0
G	1,500	178	1,148	10.8	5,315.2	5,315.2	5,315.2	0.0
H	2,405	410	2,368	5.2	5,322.2	5,322.2	5,322.2	0.0
I	3,600	155	1,129	11.0	5,336.3	5,336.3	5,336.3	0.0
J	4,530	169	1,235	10.0	5,350.0	5,350.0	5,350.0	0.0
K	4,900	305	2,135	5.8	5,353.7	5,353.7	5,353.7	0.0
L	5,400	270	1,367	9.0	5,357.2	5,357.2	5,357.2	0.0
M	6,070	460	1,713	7.2	5,366.9	5,366.9	5,366.9	0.0
N	6,120	360	2,631	4.7	5,368.3	5,368.3	5,368.3	0.0
O	6,150	550	4,272	2.9	5,370.7	5,370.7	5,370.7	0.0
P	6,200	400	2,789	4.4	5,370.7	5,370.7	5,370.7	0.0

[1]Feet above confluence with Buckhorn Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

REDSTONE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SHERRY DRIVE OVERFLOW								
A	1,000	459	92	2.4	4,917.5	4,917.5	4,917.5	0.0
B	1,448	110	135	1.7	4,918.6	4,918.6	4,919.0	0.4
C	1,760	172	94	2.4	4,919.5	4,919.5	4,919.8	0.3

[1]Feet above confluence with the Cache La Poudre Reservoir Inlet Ditch

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SHERRY DRIVE OVERFLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SHIELDS STREET OVERFLOW								
A	169	43	18	2.8	5,020.2	5,020.2	5,020.2	0.0
B	442	41	16	3.2	5,021.1	5,021.1	5,021.1	0.0
C	811	37	15	3.4	5,024.0	5,024.0	5,024.0	0.0
SPRING CANYON PARK DIVERSION								
A	582	673	3,786	0.2	5,121.8	5,121.8	5,121.8	0.0
B	1,075	735	1,954	0.7	5,121.8	5,121.8	5,121.8	0.0

[1] Feet Above confluence with Spring Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO AND INCORPORATED AREAS

FLOODWAY DATA

SHIELDS STREET OVERFLOW AND SPRING CANYON PARK DIVERSION

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SPRING CREEK								
A	113	1,056	1,053	2.4	4,902.7	4,902.7	4,902.9	0.2
B	1,335	1,536	705	3.9	4,905.8	4,905.8	4,905.8	0.0
C	2,330	83	406	6.3	4,908.9	4,908.9	4,909.3	0.4
D	2,434	85	440	5.8	4,910.1	4,910.1	4,910.4	0.3
E	3,116	96	463	5.5	4,912.5	4,912.5	4,912.6	0.1
F	3,297	110	592	4.3	4,913.6	4,913.6	4,913.6	0.0
G	3,412	77	303	8.4	4,913.6	4,913.6	4,913.6	0.0
H	3,642	485	4,116	0.6	4,922.8	4,922.8	4,922.8	0.0
I	4,186	285	1,999	2.3	4,922.9	4,922.9	4,922.9	0.0
J	5,154	364	866	4.9	4,923.9	4,923.9	4,923.9	0.0
K	5,218	459	1,805	2.7	4,926.9	4,926.9	4,926.9	0.0
L	5,729	161	719	5.5	4,927.6	4,927.6	4,927.6	0.0
M	6,348	175	1,052	3.6	4,932.2	4,932.2	4,932.2	0.0
N	7,234	160	721	5.1	4,933.9	4,933.9	4,933.9	0.0
O	7,662	30	234	15.8	4,934.2	4,934.2	4,934.3	0.1
P	7,744	116	727	10.1	4,939.1	4,939.1	4,939.6	0.5
Q	8,474	121	782	4.6	4,942.6	4,942.6	4,942.8	0.2
R	9,188	81	357	9.9	4,945.1	4,945.1	4,945.3	0.2
S	9,278	84	498	7.1	4,947.4	4,947.4	4,947.7	0.3
T	9,777	334	1,147	2.0	4,950.1	4,950.1	4,950.1	0.0
U	10,535	303	898	2.6	4,954.9	4,954.9	4,954.9	0.0
V	11,375	266	648	3.6	4,957.6	4,957.6	4,957.6	0.0
W	12,330	318	596	3.9	4,962.1	4,962.1	4,962.2	0.1
X	12,793	46	316	6.5	4,964.3	4,964.3	4,964.4	0.1
Y	12,860	84	357	7.0	4,965.1	4,965.1	4,965.3	0.2
Z	13,138	69	258	8.0	4,966.9	4,966.9	4,966.9	0.0

[1] Feet Above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SPRING CREEK (continued)								
AA	13,455	58	341	6.0	4,969.6	4,969.6	4,969.8	0.2
AB	13,535	56	394	5.2	4,970.9	4,970.9	4,970.9	0.0
AC	14,438	215	461	4.4	4,974.6	4,974.6	4,974.6	0.0
AD	15,059	180	491	4.2	4,980.2	4,980.2	4,980.7	0.5
AE	15,721	66	376	5.2	4,983.4	4,983.4	4,983.7	0.3
AF	15,947	148	631	3.1	4,984.8	4,984.8	4,985.0	0.2
AG	16,451	73	290	8.6	4,987.8	4,987.8	4,987.8	0.0
AH	16,565	1,637	13,668	0.1	4,998.0	4,998.0	4,998.0	0.0
AI	18,198	1,988	9,464	0.3	4,998.0	4,998.0	4,998.0	0.0
AJ	19,392	1,288	4,375	0.7	4,998.2	4,998.2	4,998.2	0.0
AK	20,390	194	1,096	2.6	5,001.7	5,001.7	5,001.8	0.1
AL	21,335	158	510	5.5	5,007.2	5,007.2	5,007.3	0.1
AM	22,186	104	539	4.3	5,014.4	5,014.4	5,014.5	0.1
AN	23,338	83	519	4.5	5,019.8	5,019.8	5,019.9	0.1
AO	25,001	1,018	621	5.4	5,031.0	5,031.0	5,031.0	0.0
AP	25,705	697	866	2.8	5,033.8	5,033.8	5,033.8	0.0
AQ	25,757	654	1,764	2.1	5,034.6	5,034.6	5,034.8	0.2
AR	26,264	475	744	3.3	5,040.3	5,040.3	5,040.3	0.0
AS	27,581	243	406	3.8	5,049.6	5,049.6	5,049.9	0.3
AT	27,816	188	429	3.6	5,051.3	5,051.3	5,051.4	0.1
AU	28,295	43	178	8.6	5,053.5	5,053.5	5,053.5	0.0
AV	28,435	44	249	6.2	5,055.5	5,055.5	5,055.5	0.0
AW	29,046	65	168	8.5	5,058.2	5,058.2	5,058.2	0.0
AX	29,714	110	329	2.9	5,066.6	5,066.6	5,066.9	0.3
AY	30,694	34	95	8.9	5,071.8	5,071.8	5,071.8	0.0
AZ	30,960	246	2,519	0.3	5,087.5	5,087.5	5,087.5	0.0

[1] Feet Above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SPRING CREEK (continued)								
BA	31,822	208	736	2.1	5,087.5	5,087.5	5,087.5	0.0
BB	32,862	130	553	2.7	5,095.5	5,095.5	5,095.9	0.4
BC	33,890	56	237	5.8	5,101.6	5,101.6	5,101.7	0.1
BD	34,694	184	348	3.3	5,107.1	5,107.1	5,107.5	0.4
BE	35,400	536	581	1.9	5,112.5	5,112.5	5,112.5	0.0
BF	37,373	199	514	2.9	5,125.1	5,125.1	5,125.1	0.0
BG	38,061	140	325	4.3	5,131.7	5,131.7	5,131.7	0.0
BH	39,593	153	298	4.7	5,149.8	5,149.8	5,149.9	0.1
BI	40,338	69	433	2.7	5,158.9	5,158.9	5,159.4	0.5
BJ	41,434	109	141	5.0	5,172.7	5,172.7	5,172.8	0.1

[1] Feet Above confluence with Cache La Poudre River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TRIBUTARY BT-1								
A	90	30	78	7.3	7,306.0	7,306.0	7,306.0	0.0
B	260	40	63	9.0	7,331.0	7,331.0	7,331.0	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

TRIBUTARY BT-1

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TRIBUTARY BT-2								
A	130	40	184	9.0	7,298.8	7,298.8	7,298.8	0.0
B	280	60	213	7.7	7,310.5	7,310.5	7,310.5	0.0
C	690	57	167	9.9	7,341.8	7,341.8	7,341.8	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

TRIBUTARY BT-2

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TRIBUTARY BT-3								
A	60	131	213	7.3	7,103.7	7,103.7	7,103.7	0.0
B	160	60	179	8.7	7,117.1	7,117.1	7,117.1	0.0
C	250	48	154	10.1	7,136.9	7,136.9	7,136.9	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

TRIBUTARY BT-3

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
TRIBUTARY BT-4								
A	140	33	62	8.1	7,013.8	7,013.8	7,013.8	0.0
B	220	21	54	9.3	7,039.2	7,039.2	7,039.2	0.0

[1]Feet above confluence with Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

TRIBUTARY BT-4

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
WEST CREEK								
A	260	135	454	8.8	7,229.2	7,229.2	7,229.2	0.0
B	440	142	450	8.9	7,231.9	7,231.9	7,231.9	0.0
C	550	172	506	7.9	7,234.8	7,234.8	7,234.8	0.0
D	600	170	470	8.5	7,237.0	7,237.0	7,237.0	0.0
E	1,130	168	481	8.3	7,245.9	7,245.9	7,245.9	0.0
F	1,715	80	411	9.7	7,252.7	7,252.7	7,252.7	0.0
G	2,555	100	418	9.6	7,268.3	7,268.3	7,268.3	0.0
H	2,630	105	454	8.8	7,270.2	7,270.2	7,270.2	0.0
I	3,250	160	462	8.7	7,278.1	7,278.1	7,278.1	0.0
J	3,775	100	401	10.0	7,288.6	7,288.6	7,288.6	0.0
K	4,465	110	387	10.3	7,301.1	7,301.1	7,301.1	0.0
L	4,550	125	642	6.2	7,302.7	7,302.7	7,302.7	0.0
M	4,945	135	452	8.8	7,312.5	7,312.5	7,312.5	0.0
N	5,270	130	565	7.1	7,315.0	7,315.0	7,315.0	0.0
O	5,925	120	386	10.4	7,323.7	7,323.7	7,323.7	0.0
P	6,220	137	463	9.0	7,330.1	7,330.1	7,330.1	0.0
Q	6,270	202	976	4.1	7,331.8	7,331.8	7,331.8	0.0
R	6,380	105	406	9.9	7,332.6	7,332.6	7,332.6	0.0
S	6,740	128	392	10.2	7,339.7	7,339.7	7,339.7	0.0
T	6,860	57	301	13.3	7,343.3	7,343.3	7,343.3	0.0
U	6,960	72	329	12.2	7,347.0	7,347.0	7,347.0	0.0
V	7,100	110	847	4.2	7,353.2	7,353.2	7,353.2	0.0
W	7,520	59	301	13.3	7,358.2	7,358.2	7,358.2	0.0

[1]Feet above confluence with North Fork Big Thompson River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

WEST CREEK

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-anuual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent annual chance flood by levees. No BFEs or base flood depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent annual chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Larimer County. Previously, separate FIRMs were prepared for each identified flood prone incorporated community and for the unincorporated areas of the county. Historical data relating to the maps prepared for each community are presented in Table 5.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	INITIAL FIRM EFFECTIVE DATE	FIRM REVISION DATE
Berthoud, Town of	December 19, 2006	None	December 19, 2006	
Estes Park, Town of	September 19, 1975	None	January 17, 1979	May 4, 1987
Fort Collins, City of	June 28, 1974	None	July 16, 1979	February 15, 1984 March 18, 1996
Johnstown, Town of	December 19, 2006	None	December 19, 2006	None
Larimer County (Unincorporated Areas)	December 27, 1974	March 11, 1977	April 2, 1979	March 18, 1986 March 4, 1987 November 17, 1993 March 18, 1996 July 17, 1997 March 23, 1999
Loveland, City of	March 1, 1974	December 17, 1976	September 1, 1978	January 18, 1984 March 23, 1999
Timnath, Town of	December 19, 2006	None	December 19, 2006	None
Wellington, Town of	March 22, 1974	January 17, 1975	February 15, 1979	December 3, 1993 October 20, 1998

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

LARIMER COUNTY, CO

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

The USACE completed a Floodplain Information Report on the Big Thompson River in December 1971, which included delineation of the 1-, and 0.2-percent annual chance floodplains and profiles in the vicinity of Loveland (Reference 13). The hydrologic and hydraulic data developed by the USACE were used in the original FIS. This Floodplain Information Report is now superseded by the 2005 Ayres Associates restudy.

In March 2005, Anderson Consulting Engineers, Inc. completed the Hydraulic Analysis for the Big Thompson River between Interstate 25 and the Larimer/Weld County Line (Reference 69). All information found was incorporated into this FIS.

In August 2005, Ayres and Associates completed a Flood Insurance Report for the Big Thompson River near Loveland (Reference 70). This report was fully incorporated into this FIS.

In May 1970, the SCS published a Floodplain Information Report for the Boxelder Creek Watershed (Reference 32). The report presented flood plains and profiles for the watershed with no flood detention structures and with all structures constructed. Because this study is based upon existing conditions with some structures completed, no agreement between profiles or flood boundaries can be expected. This Floodplain Information Report is now superseded by the 2003 Anderson Consulting Engineers, Inc. restudy of the Boxelder Creek/Cooper Slough area.

In February 1971, the SCS published a Watershed Work Plan for the Boxelder Creek Watershed (Reference 8). The discharges developed for the work plan were used in the original FIS. There were no profiles developed for the work plan. This work plan is now superseded by the 2003 Anderson Consulting Engineers, Inc. restudy of the Boxelder Creek/Cooper Slough area.

In August 1981, SLA completed a Master Drainageway Planning Study for Boxelder Creek and Cooper Slough in the vicinity of Fort Collins (Reference 9). The approximate flood boundaries for both creeks in this area were taken from the 1-percent annual chance flood plain boundaries presented in the original FIS. This study is now superseded by the 2003 Anderson Consulting Engineers, Inc. restudy of the Boxelder Creek/Cooper Slough area.

SLA prepared a report entitled "Cooper Slough, Boxelder Creek, Master Drainageway Planning Study" (Reference 44). The data in this report were reviewed and modified by the NRCS in cooperation with the CWCB to produce the "Flood Plain Management Study, Boxelder Creek in the Vicinity of Town of Wellington, CO"(Reference 43), in September 1983. The flood plain mapping from this NRCS study was refined by The Sear-Brown Group in 1997 for the Town of Wellington (Reference 59).

In February 1992, the USBR completed a hydraulic analysis of Boxelder Creek downstream of County Road 50. The discharges developed were used in the previous FIS. This analysis is now superseded by the 2003 Anderson Consulting Engineers, Inc. restudy of the Boxelder Creek/Cooper Slough area.

Anderson Consulting Engineers, Inc. completed a revised hydraulic analysis of Boxelder Creek downstream from County Road 54, Cooper Slough, and their split flows in June 2003 (Reference 75). The results of this study are included in this FIS.

The USACE completed Floodplain Information Reports on the Cache La Poudre River in the study area in October 1973 (Reference 6) and October 1975 (Reference 28). The discharges and water-surface elevations used in the original FIS were taken from the USACE reports.

In August 1990, SLA completed a hydraulic analysis of the Cache La Poudre River, affecting Larimer County downstream of the City of Fort Collins, and Boxelder Creek, from upstream of the confluence with Cooper Slough to just north of the Town of Wellington. The hydrologic flood-frequency relationships used in the study were prepared by the USACE (Reference 38).

The hydrologic and hydraulic analyses for the restudy of the Cache La Poudre River from Horsetooth Road to Watson Lake were performed by the USACE, Omaha District (Reference 38) in 1993 and 1994. SLA revised the USACE's hydraulic study to depict cross-section stationing for consistency with downstream studies and to replot the water surface profiles in accordance with requirements of FEMA. The hydraulic analysis is now superseded by the 2005 Ayres Associates Inc. restudy.

In October 2005, Ayres Associates Inc. completed a revised hydraulic analysis of the Cache La Poudre River from Wood Street to Watson Lake (Reference 74) for Larimer County. The hydraulic data presented in this report was used in this study to update detailed flooding information on the Cache La Poudre River.

The hydrologic and hydraulic analyses for the restudy along Coal Creek immediately upstream and downstream of the Town of Wellington were performed through separate, but related, efforts by SLA, the NRCS (formerly the SCSI), the CWCB, and The Sear-Brown Group. The data used in this restudy were originally prepared for purposes other than the NFIP. FEMA did not perform a technical review of the data, but does accept it as valid for purposes of this restudy and the NFIP.

Cooper Slough was revised by Love & Associates under the LMMP, in November 1993, for FEMA. The limit of study for Cooper Slough was initially from its confluence with Boxe1der Creek to East Vine Drive. However, the Cooper Slough channel does not tie directly into Boxelder Creek. The LMMP project also included analyses of the Sherry Drive Overflow and State Highway 14 Overflow. This revision is now superseded by the 2003 Anderson Consulting Engineers, Inc. restudy of the Boxelder Creek/Cooper Slough area.

Gingery Associates, Inc., completed a Major Drainageway Planning report for Dry Creek for the City of Fort Collins and Larimer County in April 1980 (Reference 1). The hydrologic and hydraulic data presented in this report were used in this FIS to update detailed flooding information on Dry Creek.

The USACE completed a Floodplain Information Report on the Little Thompson River through Larimer County in June 1977 (Reference 27). The approximate flood boundaries for the Little Thompson River were taken from the 1-percent annual chance floodplain boundaries developed by the USACE, and are in agreement with this FIS.

Spring Creek was revised by Foothills Engineering Consultants, Inc., as a LMMP project in 1993, for FEMA. Revised hydrologic and hydraulic data were developed for the entire stream study reach based on new basin development and improvements to the Spring Creek Channel. The hydrologic and hydraulic analyses were completed for the City of Fort Collins by various engineering consultants and compiled by Greenhorne & 0'Mara. The flood plain boundaries along Spring Creek were updated based on construction of improvements through 1993. This study is now superseded by the 2005 Anderson Consulting Engineers, Inc. restudy of Spring Creek.

In October 2005, Anderson Consulting Engineers, Inc. completed a restudy of Spring Creek for the City of Fort Collins (Reference 73). The hydrologic and hydraulic data presented in this report were used in this FIS to update detailed flooding information on Spring Creek.

Flood Insurance Studies have been completed for the Cities of Fort Collins and Loveland and for the Towns of Estes Park and Wellington (References 33, 34, 35, and 36, respectively). This FIS supersedes the previous individual Flood Insurance Studies.

A Flood Hazard Boundary Map was previously published for unincorporated areas of Larimer County (Reference 31). This FIS supersedes the previous Flood Hazard Boundary Map.

A FIS was previously published in 1979 for unincorporated areas of Larimer County (Reference 37). This study supersedes the previous FIS.

This FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

Table 6 contains all Letters of Map Revision (LOMRs) that have been incorporated into the FIS since the previous effective date.

Table 6 – Summary of LOMRs

Type of LOMC	Case Number	Effective Date	Project Identifier
LOMR	95-08-104P	May 22, 1995	Fall River Estates, Block 5, Lot 2
LOMR	99-08-307P	December 22, 1999	Timberline Road Extension
LOMR	01-08-184P	July 6, 2001	Cottonwood Farms Floodplain Revision
LOMR	01-08-349P	November 29, 2001	Power Plant Drop Structure
LOMR	01-08-411P	October 3, 2001	Coachlight Plaza
LOMR	04-08-0564P	December 14, 2005	Big Thompson River – Sharliss Properties
LOMR	05-08-0379P	March 30, 2006	Coal Creek Channel
LOMR	05-08-0587P	July 27, 2006	Overland Trail Road
LOMR	06-08-B336P	April 19, 2007	Oxbow Levee
LOMR	08-08-0893P	February 22, 2010	Boxelder Creek at Mulberry Avenue
LOMR	09-08-0465P	February 24, 2010	Prospect Road and LPath Improvements Project

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Flood Insurance and Mitigation Division, FEMA, Denver Federal Center, Building 710, Box 25267, Denver, Colorado 80225-0267.

9.0 BIBLIOGRAPHY AND REFERENCES

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10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To ensure that any user is aware of all revisions, it is advisable to contact the community repository of flood hazard data.

10.1 First Revision

This study was revised on June 17, 2008, to incorporate a Physical Map Revision (PMR) for the Dry Creek Drainage Improvement Project. The project impacted Dry Creek from its confluence with the Cache La Poudre River to approximately 1,000 feet downstream of Shields Street. The flooding sources impacted by the PMR were Dry Creek (North of

Canal), Dry Creek (South of Canal), East Vine Diversion, East Vine Diversion – Left Overbank Flowpath, the Larimer and Weld Canal, and Old Dry Creek (Historic Channel). The PMR was based on the data provided in the engineering report entitled "Dry Creek Physical Map Revision, PMR Report," Volumes I through V, prepared by URS Corporation, dated March 6, 2007 (Reference 76).

The hydrologic analysis for the PMR was split into three basins: Upper, Middle, and Lower. The Upper and Middle basins were modeled using the USACE HEC-1 Flood Hydrograph Package (Reference 39). An EPA-SWMM model (Reference 77) was also used for the Middle Basin. The Lower Basin was modeled utilizing MODSWMM (Reference 78).

Hydraulic analyses for the revision were carried out using the USACE HEC-RAS River Analysis System, Version 3.1.3 (Reference 79). Flood profiles were drawn showing computed water-surface elevations for the floods having a 1-, 2-, and 10-percent chance of occurring in any given year. Flood profiles for the 0.2-percent annual chance flood were not computed for the PMR.

Floodplain boundaries were delineated using two sources of topographic mapping obtained from the City of Fort Collins. The first source was prepared in 1999 with 2-foot contour intervals (Reference 80), and the second was prepared in 2004 with 1-foot contour intervals (Reference 81). Both sources of topographic mapping were originally in CAD format and converted to GIS by URS Corporation.

In addition, this revision incorporated the Letter of Map Revision based on Fill (LOMR-F) issued on October 6, 2005, (Case No. 05-08-0658A) for a portion of the Cache La Poudre River located in the City of Fort Collins.

This revision also incorporated the Letter of Map Revision (LOMR) issued on December 12, 2006, (Case No. 06-08-B336P), for both the City of Fort Collins and the unincorporated areas of Larimer County. The LOMR was issued to show the effects of a levee constructed along the left overbank of the Cache La Poudre River from just upstream of Lincoln Avenue to just downstream of Linden Street. The levee, known as the "Oxbow Levee," prevented the breakout of the Cache La Poudre Linc. Therefore, as a result of the LOMR, the Cache La Poudre Linc was removed as a flooding source in the Flood Insurance Study (FIS).

10.2 Second Revision

This study was revised on May 2, 2012, to incorporate a Physical Map Revision (PMR) for five drainage improvements along Spring Creek. The drainage improvements included construction of the Rolland Moore Park Detention Pond, improvements to the Taft Hill Road Detention Pond, the Spring Canyon Park Detention Pond, the C&SRR Detention Pond, and Timberline Road improvements. The projects were funded by FEMA through a Pre-Disaster Mitigation Grant (FEMA Case #06-08-B222B). The projects impacted Spring Creek from approximately 100 feet upstream of its confluence with the Cache La Poudre River to approximately 10,500 feet upstream of Taft Hill Road.

The flooding sources impacted by the PMR were Spring Creek, Shields Street Divided Flow Path Hill Pond Road, Shields Street Divided Flow Path Shire Court, Shields Street Divided Flow Path Windtrail Swale, Spring Canyon Park Diversion, and Shields Street Overflow. The PMR was based on the data provided in the engineering report entitled "Spring Creek Letter of Map Revision, Cache La Poudre River to Horsetooth Road," Volumes I through III, prepared by Anderson Consulting Engineers, Inc., dated February 9, 2010 (revised April 7, 2010) (Reference 82).

The hydrologic analysis for the PMR was modeled using UDSWMM2000 version 1.4 (Reference 78). New and updated stage-storage-discharge rating curves for Rolland Moore Park Detention Pond, the Taft Hill Road Detention Pond, the Spring Canyon Park Detention Pond, and the C&SRR Detention Pond were determined based on as-built survey information. Stage-discharge calculations were computed using a combination of the USACE HEC-RAS River Analysis System, Version 3.1.3 (Reference 79) and the Federal Highways Administration Culvert Analysis program HY-8, Version 6.0 (Reference 83).

Hydraulic analyses for the revision were carried out using the USACE HEC-RAS River Analysis System, Version 3.1.3 (Reference 79). Flood profiles were drawn showing computed water-surface elevations for the floods having a 1-, and 10-percent chance of occurring in any given year. Flood profiles for the 2-, and 0.2-percent annual chance floods were not computed for the PMR. The Shields Street Overflow only has the 1-percent annual chance flood profile because it is not engaged in the 10-precent annual chance flood event.

The PMR includes the removal of the detailed splitflow path east of Shields Street (Shields Street Divided Flow Path) that was identified and analyzed by Anderson Consulting Engineers in 2005 (Reference 71) and was previously reported in this Flood Insurance Study (FIS). This path consisted of several subreaches through the Hill Pond and Windtrail neighborhoods and along Shire Court. As a result of the drainage improvements along Spring Creek, the Shields Street Divided Flow Path is not engaged during the 1-precent annual chance flood event. Therefore, as a result of this PMR, Shields Street Divided Flow Path Hill Pond Road, Shields Street Divided Flow Path Shire Court, Shields Street Divided Flow Path Windtrail Swale were removed as flooding sources in the FIS.

Floodplain boundaries were delineated on a combination of field survey data and ortho-photo based topographic mapping, as was used by Anderson Consulting Engineers in 2005 (Reference 71) with the addition of field surveyed as-built information for the five projects.

This revision also incorporated Letter of Map Revision (LOMR) (Case No. 08-08-0893P), effective February 22, 2010, for both the City of Fort Collins and the unincorporated areas of Larimer County. The LOMR was issued to incorporate new topographic data and updated hydrologic, hydraulic and floodway analyses. The flooding sources impacted by the LOMR were Boxelder Creek, Boxelder Creek Overflow-Downstream, Boxelder Overflow West, Business Park Denrose, Business Park Middle, Business Park South, and Business Park West.

This revision also incorporated Letter of Map Revision (LOMR) (Case No. 09-08-0465P), effective February 24, 2010, for both the City of Fort Collins and the unincorporated areas of Larimer County. This LOMR incorporated an 84 foot span bridge where Lpath crosses Prospect Road, widening of Prospect Road, modifications to the Prospect Road profile, stabilization measures to control two existing spills along the left bank of Cache la Poudre and riprap toe protection placement. It included new topographic data and updated hydraulic and floodway analyses. The flooding sources impacted by the LOMR were Cache la Poudre River and Cache la Poudre River Lpath.

10.3 Third Revision

This study was revised on February 6, 2013, to incorporate a Physical Map Revision (PMR) for the detailed hydrologic and hydraulic study of Little Thompson River. The study reach encompassed approximately 7.5 miles of the Little Thompson River extending from approximately 260 feet downstream of Weld County Road 1 to approximately 600 feet upstream of Boulder County Road 23E. Updates to this study were limited to the unincorporated areas of Larimer County and the Town of Berthoud. The PMR was based on data provided in the engineering report entitled "Technical Support Data Notebook, Little Thompson River, Larimer County, Colorado", prepared by Ayres Associates dated November 19, 2009 and revised on January 29, 2010 (Reference 84).

Ayres Associates Inc performed the hydrologic and hydraulic analyses and floodplain mapping for the study of the Little Thompson River in Larimer County, Colorado under contract with Larimer County and the Colorado Water Conservation Board.

The hydrology for the Little Thompson River was evaluated using USGS Water Resources Investigation Report (WRIR) 99-4190 (Reference 85). The Little Thompson River basin covers approximately 138 square miles of drainage area and lies within two physiographic regions delineated in WRIR 99-4190. Approximately 57 square miles are within the mountain region and 81 square miles are within the plains region where, the topographic line denoting an elevation of 7,500 feet defines the boundary between the mountain region and plains region along the Eastern side of the Continental Divide. The calculated discharges were limited to the 1- and 0.2-percent annual chance floods for this PMR and discharge values can be found in Table 2, Summary of Discharges.

Cross sections for the backwater analyses of the Little Thompson River were obtained from photogrammetric topographic maps obtained from the Flood Plain Information Report for the Big and Little Thompson performed by the USACE Omaha District in 1975 (Reference 27). Bridges, culverts, and diversion structures were surveyed by Ayres Associates in 2005 to obtain elevation data and structural geometry (Reference 84). Below-water sections were also obtained in the vicinity of bridges, culverts, and diversion structures and average depth of flow and channel shape assumptions were applied at each section throughout the study to account for channel conveyance not accounted for using photogrammetric methods (Reference 84).

Water-surface elevations on the Little Thompson River in Larimer County for floods of the selected recurrence intervals were computed using the USACE HEC-RAS version 4.0 step-backwater computer program (Reference 86). Starting water-surface elevations for the Little Thompson River were determined assuming normal depth and a slope of 0.0025 at the Larimer and Weld county line. Flood profiles were drawn showing computed water-surface elevations for the floods having a 1- and 0.2-percent chance of occurring in any given year. Flood profiles for the 2-and 10-percent annual chance flood were not computed for this PMR.

Channel and overbank roughness factors (Manning's "n" values) used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the stream and floodplain areas. No reliable calibration data was available for the Little Thompson River. Horizontal variation was applied to the "n" values in the overbanks and main channels throughout the study reaches. Overbank "n" values varied from 0.06 to 0.09. Main channel bank "n" values ranged from 0.04 to 0.06, and main channel bed "n" values were set to 0.035.

The hydraulic analyses for the study of the Little Thompson River in Larimer County were based on unobstructed flow. The flood elevations shown on the Flood Profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Base mapping, which was obtained from aerial photogrammetry flown in 1975 obtained from the Flood Plain Information Report for the Big and Little Thompson performed by the USACE Omaha District (Reference 27). Mapping was prepared in the North American Datum of 1983 (NAD 83) State Plane Coordinates, Colorado North Zone, and in the National Geodetic Vertical Datum of 1929 (NGVD 29) vertical datum. A datum shift of 3.0 feet was used to convert the submitted study to the North American Vertical Datum of 1988 (NAVD 88).

For the Little Thompson River, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using 1975 aerial photogrammetry prepared by the USACE Omaha District with a contour interval of 2 feet (Reference 27).

The floodway presented in this FIS report and on the FIRM for the Little Thompson River in Larimer defines a floodway with a rise limitation of one-half foot. Floodway widths were computed at each cross section. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections. 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.