FLOOD INSURANCE STUDY

VOLUME 1 OF 3

KITTITAS COUNTY, WASHINGTON
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
CLE ELUM, CITY OF	530096
ELLENSBURG, CITY OF	530234
KITTITAS, CITY OF	530098
KITTITAS COUNTY, UNINCORPORATED AREAS	530095
ROSLYN, CITY OF	530299
SOUTH CLE ELUM, TOWN OF	530263

Kittitas County

EFFECTIVE DATE: SEPTEMBER 24, 2021

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
53037CV001A

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.

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

Old Zone(s)	New Zone
Al through A30	AE
B	X
C	X

Initial Countywide FIS Effective Date: September 24, 2021

TABLE OF CONTENTS – Volume 1 – September 24, 2021

TABLE OF CONTENTS – *Continued* – Volume 1 – September 24, 2021

FIGURES

TABLES

EXHIBITS – Volume 2 – September 24, 2021

TABLE OF CONTENTS – *Continued*

EXHIBITS – *Continued* – Volume 3 – September 24, 2021

FLOOD INSURANCE STUDY
KITTITAS COUNTY, WASHINGTON
AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) report investigates the existence and severity of flood hazards in the geographic area of Kittitas County, Washington, including the Cities of Cle Elum, Ellensburg, Kittitas, and Roslyn; the Town of South Cle Elum; and the Unincorporated Areas of Kittitas County (referred to collectively herein as Kittitas County).

This FIS 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 and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain 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.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

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

This FIS was prepared to include all jurisdictions within Kittitas County into a countywide format FIS. Information on the authority and acknowledgements for each of the previously printed FISs for communities within Kittitas County was compiled, and is shown below.

City of Cle Elum, City of South Cle Elum, City of Ellensburg, Town of Kittitas, Kittitas County, Unincorporated Areas	The hydrologic and hydraulic analyses for the October 15, 1981 study were performed by the U.S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. IAA-H-17-75, Project Order No. 14. This work was completed in September 1978, and covered all major significant flooding sources in Kittitas County (Reference 1).

FIS reports have not previously been published for the City of Roslyn. Therefore, there are no authority and acknowledgements of hydrologic and hydraulic analyses available.

For this countywide FIS, new detailed modeling of the Yakima River and new approximate modeling of Big Creek, Little Creek, Quilomene Creek, Roza Creek, Skookumchuck Creek, Squaw Creek, Taneum Creek, Tekison Creek, Umtanum Creek, Unnamed Tributary 5, Unnamed Tributary 8, Whiskey Dick Creek, and Yakima River were prepared for FEMA by STARR, a joint venture between CDM Smith, Stantec and Atkins under the Joint Venture Contract No. HSFEHQ-09-D-0370, Task Order Number HSFE10-09-J-0002. This work was continued under Joint Venture Contract No. HSFE60-15D-0005, Task Order Number HSFE10-15-J-0050 by STARRII, a joint venture between Atkins, Dewberry, and Stantec.

The digital base map information was provided by Kittitas County. The coordinate system used for the production of the FIRM is Universal Transverse Mercator, North Zone 10, American Datum of 1983, Geodetic Reference System 1980. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on this FIRM.

1.3 Coordination

An initial Consultation Coordination Officer's (CCO) meeting is held typically with representatives of FEMA, the community, and the study contractor to explain the nature and purpose of a FIS and to identify streams to be studied by detailed methods. A final CCO meeting is held typically with the same representatives to review the results of the study. The initial and final meeting dates for the previous FIS reports for Kittitas County and its communities are listed in Table 1, "Initial and Final CCO Meetings".

Table 1 – Initial and Final CCO Meetings

Community Name	Initial Meeting	Final Meeting
Cle Elum, City of	June 5, 1975	February 25, 1980
Ellensburg, City of	June 5, 1975	January 30, 1980
Kittitas, City of	June 5, 1975	May 26, 1981
Kittitas County, Unincorporated Areas	June 5, 1975	April 30, 1979

Table 1 – Initial and Final CCO Meetings - continued

Community Name	Initial Meeting	Final Meeting
South Cle Elum, Town of	June 5, 1975	February 25, 1980

For this countywide revision, the final CCO meeting was held on May 18, 2018 and attended by representatives of FEMA, STARR, Washington Department of Ecology, Kittitas County and community officials. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Kittitas County, Washington, including communities listed in Section 1.1.

Table 2, "Areas Studied by Detailed Methods" lists the streams studied by detailed methods. Limits of Detailed Study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

Table 2 – Areas Studied by Detailed Methods

Stream	Limits of Detailed Study
Caribou Creek	From Badger Pocket Road to the Cascade Canal
Cle Elum River	From its confluence with Yakima River to approximately 1,790 feet upstream of FS 4303 Road
Crystal Creek	From its confluence with Yakima River to approximately 500 feet downstream of Alliance Road
Currier Creek	From University Way to approximately 1,950 feet upstream of Smithson Road
Currier Creek Split	From its confluence with Currier Creek to approximately 5,200 feet upstream of Hungry Junction Road
Kachess River	From its confluence with Yakima River to the Kachess Dam
Left Channel Naneum Creek	From its confluence with Naneum Creek to Wilson Creek Road
Manastash Creek	From the West Side Canal to the crossing Manastash Road, to approximately 3,432 feet upstream of Brown Road
Mercer Creek	From its confluence with Right Channel Wilson Creek to approximately 200 feet upstream of 5th Avenue
Middle Fork Teanaway River	From its confluence with Teanaway River to approximately 13,150 feet upstream of Boondoggle Road

Table 2 – Areas Studied by Detailed Methods - continued

Stream	Limits of Detailed Study
Naneum Creek	From its confluence with Wilson Creek to approximately 43 feet downstream of No 6 Road
North Fork Teanaway River	From its confluence with Teanaway River to approximately 119 feet downstream of confluence with Jungle Creek
Reecer Creek	From University Way to approximately 1,750 feet upstream of Sinclair Road
Right Channel Wilson Creek	From its confluence with Wilson Creek to approximately 200 feet upstream of its confluence with Mercer Creek
Silver Creek	From its confluence with Yakima River to approximately 1,994 feet upstream of Silver Creek
Teanaway River	From its confluence with Yakima River to its confluence with Middle and West Fork Teanaway Rivers
West Fork Teanaway River	From its confluence with Teanaway River to confluence with Corral Creek
Whiskey Creek	From its confluence with Mercer Creek to approximately 400 feet downstream of Dry Creek Road
Wilson Creek	From its confluence with Yakima River to Mountain View Avenue in Ellensburg
	From Sanders Road to Brick Mill Road
Yakima River	From approximately 1,500 feet downstream of its confluence with Wilson Creek to approximately 8,653 feet upstream of confluence with Hudson Creek

Shallow flooding areas studied by detailed methods are Cooke Creek in the City of Kittitas; parts of Mercer Creek, Reecer Creek, Right Channel Wilson Creek, Whiskey Creek, and Wilson Creek in the City of Ellensburg, overflow of the Kachess River, Teanaway River, and Yakima River; and parts of Caribou Creek, Coleman Creek, Cooke Creek, Currier Creek, Mercer Creek, Reecer Creek, Right Channel Wilson Creek, and Whiskey Creek in Kittitas County. Alluvial fan shallow flooding on the downstream portion of Manastash Creek was also studied in detail.

The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction. Approximate analyses were used to study those areas having a low development potential or minimal flooding hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the communities.

Those areas studied by detailed methods were chosen with consideration given to all proposed construction and forecasted development through 1983.

Streams studied by approximate methods are Badger Creek, Big Creek, Cabin Creek, Caribou Creek, Cedar Creek, Cherry Creek, Coleman Creek, Columbia River, Cooke Creek, Currier Creek, Dry Creek, Little Creek, Musser Creek, Naneum Creek, Park Creek, Quilomene Creek, Reecer Creek, Robinson Creek, Roza Creek, Schnebly Creek, Skookumchuck Creek, Squaw Creek, Taneum Creek, Tekison Creek, Tributary to Cedar Creek, Umtanum Creek, Unnamed Tributary 3, Unnamed Tributary 4, Unnamed Tributary 5, Unnamed Tributary 6, Unnamed Tributary 7, Unnamed Tributary 8, Unnamed Tributary 9, Unnamed Tributary 10, Unnamed Tributary 11, Unnamed Tributary 12, Whiskey Creek, Whiskey Dick Creek and Wilson Creek; Yakima River; as well as the Rocky Coulee, Ryegrass Coulee, and Schnebly Coulee.

Redelineation was limited to areas where new, quality topographic data was available and Base Flood Elevations (BFE) were previously defined. Redelineation was completed on detailed study areas of Caribou Creek, Cle Elum River, Crystal Creek, Currier Creek, Kachess River, Left Channel Naneum Creek, Mercer Creek, Manastash Creek, Naneum Creek, North Fork Teanaway River, Reecer Creek, Right Channel Wilson Creek, Silver Creek, Teanaway River, Whiskey Creek, Wilson Creek, and Yakima River.

The approximate study analysis of Rocky Coulee, Ryegrass Coulee, and Schnebly Coulee has determined flood hazards less than 200 feet wide and thus were not delineated on the FIRMs.

During the course of the study, the FEMA developed guidelines for alluvial fan flooding. Dames & Moore reevaluated the flooding situation on the downstream portion of Manastash Creek according to these guidelines. All hydrologic and hydraulic computations were based upon present conditions.

Letters of Map Revision (LOMRs) 91-10-22P and 17-10-1541P were incorporated as part of this study.

2.2 Community Description

Kittitas County is located in central Washington. The County is bordered on the north by Chelan County; to the northeast by Douglas County; to the east by Grant County; to the south by Yakima County; to the west by Pierce County; and to the northwest by King County. Kittitas County is also bounded on the west by the Cascade Range, and bounded on the north by the Wenatchee Mountains. Kittitas County is 2,317 square miles in area. The County seat is located in the City of Ellensburg. In 1970, the population of Kittitas County was 15,796. The 2010 population of Kittitas County was reported to be 40,915 (Reference 2).

Kittitas County is predominantly rural, with residential and commercial development only in the cities. There are recreational areas, however, in the northern portions of the county. The major industries are lumber, wood products, and agriculture.

Due to prevailing westerly winds and the Cascade Mountain Range, the climate of the County varies considerably from west to east. Within 20 miles, annual precipitation decreases from 94 inches at Stampede Pass (elevation 4,000 feet) to 28 inches at the City of Cle Elum and Town of South Cle Elum (elevation 1,900 feet). In the next 22 miles, precipitation decreases to 9 inches at the Cities of Ellensburg and Kittitas (elevation 1,700 feet). Most of the precipitation is snow. The average mean temperature ranges

from 83 degrees Fahrenheit (ºF) in July/August to 19ºF in January. The highest recorded temperature was 110ºF in 1928. The lowest recorded temperature was -31ºF in 1919 (Reference 3).

The soils of the Kittitas valley consist predominantly of loam, silt loam, and clay loam, which were deposited over older gravelly alluvium. Many of the soils in the City of Ellensburg area are poorly drained and have impervious, cemented, gravelly substrata. There may also be low surface-water infiltration rates, particularly during periods of snowmelt runoff when the soil surface is frozen (Reference 4).

The vegetation in the headwater areas is predominantly timber, and agriculture prevails in the flood plain areas.

2.3 Principal Flood Problems

Floods on the Cle Elum, Teanaway, and Yakima Rivers occur as the result of snowmelt in spring and early summer, and occur after heavy rains in November and December. The snowmelt floods are characterized by slow rise and long duration of flow; river stages may be increased by ice and debris jams. The winter flood crests are reduced because of Cle Elum, Kachess, and Keechelus Lakes' reservoir storage as flooding occurs after the irrigation season when storage is available. However, these reservoirs control only a small part of the runoff, and storage may not be available if a second winter flood occurs.

Since 1862, 18 floods have occurred on the Yakima River and its tributaries. Five of the most severe floods occurred in November 1906 (41,000 cubic feet per second (cfs)), December 1933 (32,200 cfs), May 1948 (27,700 cfs), December 1975 (16,600 cfs), and December 1977 (21,500 cfs). These peak discharges were recorded at the USGS gaging station on the Yakima River at Umtanum, Washington, Gage Station No. 12484500 (References 5, 6, and 7). This site is 10 miles south of the City of Ellensburg.

The Cities of Ellensburg and Kittitas are surrounded by a complex irrigation system consisting of the Cascade Canal, North Branch Canal, and Town Canal; Whipple Wasteway; and Caribou Creek, Cooke Creek, Currier Creek, Mercer Creek, Reecer Creek, Whiskey Creek, and Wilson Creek. This system has a decreasing capacity downstream, and, if used to route floodwaters, may be overtaxed. In the 1948 flood, floodwaters diverted from one basin caused problems in another.

Ice and debris have an impact on flood stages when culverts and bridges are obstructed.

Historic high-water elevations and streamflow information were obtained from USGS publications (References 5, 6, and 7). Other high-water marks were obtained from records of the floods of December 1975 and December 1977 by the study contractor.

The December 1975 flood had an estimated recurrence interval of eight years. The December 1977 flood had an estimated recurrence interval of 20 years.

November 1990 reported to be the wettest November on record from SeaTac measuring in at 10.71" causing a major flooding event for the Yakima River. Five years later the second reported wettest November, another Yakima River flood occurred. However, Kittitas valley north side creeks from Swauk east did not flood, due to small snowpack

available for melting in the Wenatchee range east of the Teanaway basin. February 1999 brought about another flood for Yakima River at Elk Meadows. This included water over Reecer Creek Road, Smithson Road, Hungry Junction Road, Tjossem Road, Brown Road, Robbins Road & Dolarway Road (Reference 8).

2.4 Flood Protection Measures

Three reservoirs having a combined storage capacity of 833,700 acre-feet (Cle Elum Lake, 436,900 acre-feet; Kachess Lake 239,000 acre-feet; and Keechelus Lake, 157,800 acre-feet) have been constructed upstream of the City of Ellensburg for irrigation in the Yakima River basin (Reference 9). These reservoirs are also operated for flood control on the basis of runoff forecasts. Storage is usually available to assist in controlling winter floods; however, when late spring floods occur, the reservoirs may be full in order to assure an adequate irrigation water supply.

Some levees have been constructed on the Cle Elum, and Teanaway Rivers, but they are not adequate to protect against the 1-percent-annual-chance floods.

There are many flood protection structures or bank revetments located along the Yakima River. These structures are not adequate to protect against the 1-percent-annual-chance floods, nor offer the appropriate freeboard, as required by FEMA. Some of these structures were built by private landowners. The significant structures are listed below (Reference 10):

- Jeffries levee - 1.2 mi levee along the Yakima River, parallel to Riverbottom Road. Damages, to five non-contiguous areas of the levee, occurred during the January 2009 flood
- Jensen levee – 0.76 mi levee along the Yakima River, just upstream of the Jeffries levee. Damages, to five non-contiguous areas of the levee, occurred during the January 2009 flood. The 2011 inspection rated this levee unacceptable.
- Hansen Pits levee – 2,000 ft long earthen embankment along the Yakima River, built in the 1940's
- Schaake levee – 1.45 mi levee along the Yakima River, immediately upstream of the Hansen Pits
- Reecer levee – 0.78 mi levee along the Yakima River and Reecer Creek. The levee begins at Damman Road (along Yakima River) and ends along Reecer Creek
- Park levee – 0.65 mi levee, immediately upstream of the Reecer levee, in the City of Ellensburg. The levee runs between the Yakima River and Irene Rinehart Riverfront Park
- Reecer Creek levee – 1.02 mi levee along Reecer Creek, in the City of Ellensburg.
- City Well/Klocke levee system – a two segment levee system, 0.27 mi and 0.73 mi respectively, along the Yakima River
- Town Ditch – 0.16 mi levee along the Yakima River, just upstream of the City Well/Klocke levee system. The 2012 inspection rated this levee acceptable.
- Private berm (extending downstream from the Hansen Pits levee) – 1,500 ft long private earthen berm that connects to and extends downstream from the Hansen Pits levee (Reference 11)

- Private berm (opposite Ringer Loop Road) – 400 ft berm on the right (west) floodplain opposite Ringer Loop Road (Reference 11)

Some flood protection is afforded the Cities of Ellensburg and Kittitas because the irrigation systems can be used to divert floodwaters around these communities.

Flooding within the County is generally localized. Therefore, rather than building flood protection structures, the communities have chosen to restrict development to those areas that do not have major flooding potential.

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-, 2-, 1-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 2-, 1-, 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 (100-year) 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 the flooding source studied by detail methods affecting the communities within Kittitas County. Information on the methods used to determine the peak discharge-frequency relationships for each flooding source studied by detailed methods is shown below.

Pre-countywide Analysis

USGS gaging stations on the Cle Elum River (operated since 1903 at cross section CQ), the Kachess River (operated since 1903 at cross section L), the Teanaway River (operated from 1968 to 1974 at cross section EF), the Yakima River (operated since 1906 at cross section KI, and since 1941 at cross section SI), and 21 other adjacent hydrologically similar sites (References 5, 6, and 7) were the principal sources of data for defining the peak-discharge frequency relationships for each stream studied in detail. Values of the 10-, 2-, 1-, and 0.2-percent-annual-chance peak discharges were obtained from a log-Pearson Type III distribution of annual peak-flow data at these sites in accordance with the guidelines set forth in the U.S. Water Resources Council Bulletin 17 (Reference 12). Peak discharges for sites on the Cle Elum River, Kachess River, and Yakima River are affected by regulation, and only non-regulated flows were used to develop these frequency curves.

Regional relationships described in existing publications (References 13 and 14) did not produce satisfactory results for the 10-, 2-, 1-, and 0.2-percent-annual-chance peak discharges in comparison with those obtained for the gaged sites by the log-Pearson Type III distribution (Reference 12). Therefore, new regional relationships of basin characteristics (drainage area and precipitation) to streamflow characteristics (10-, 2-, 1-, and 0.2-percent-annual-chance discharges) were developed for determining peak discharges at all sites in the study on the Cle Elum River, Kachess River, and Yakima River. Between these values peak discharges were prorated by distance, which is approximately proportional to drainage area.

At several locations on Left Channel Naneum Creek, Manastash Creek, Mercer Creek, Naneum Creek, Whiskey Creek, and Wilson Creek, distributaries remove water from the main channel drainage area. At each of these locations field observations and engineering judgment were used to estimate a discharge without computation of a drainage area for the distributary.

Estimates of flood discharges for the alluvial fan shallow flooding analysis were determined from the Manastash Creek detailed riverine analysis.

Peak discharge-drainage area relationships for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods for each stream studied by detailed methods are presented in Table 3, "Summary of Discharges".

Table 3 – Summary of Discharges

		PEAK DISCHARGES (CFS)			
FLOODING SOURCE AND LOCATION	**DRAINAGE AREA (SQ. MILES)**	**10%-ANNUAL-CHANCE**	**2%-ANNUAL-CHANCE**	**1%-ANNUAL-CHANCE**	**0.2%-ANNUAL-CHANCE**
CARIBOU CREEK					
At Badger Pocket Road	36.7	294	417	471	595
CLE ELUM RIVER					
At confluence with Yakima River	222	8,020	11,800	13,600	18,600
At a point approximately 5.8 miles upstream of Bullfrog Road	203	7,540	11,100	12,800	17,400
CRYSTAL CREEK					
At confluence with Yakima River	7.7	150	220	250	320

Table 3 – Summary of Discharges - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGES (CFS) 10%-ANNUAL-CHANCE	2%-ANNUAL-CHANCE	1%-ANNUAL-CHANCE	0.2%-ANNUAL-CHANCE
CURRIER CREEK					
At Downstream Limit of Study, University Way	31.2	400	1,070	1,510	3,020
At KRD Canal	14.6	230	615	865	1,300
KACHESS RIVER[1]					
At confluence with Yakima River	64.0	2,300	3,360	3,860	5,180
LEFT CHANNEL NANEUM CREEK					
At cross section A	__[2]	625	890	1,000	1,300
At cross section I	__[2]	290	420	470	600
MANASTASH CREEK					
At cross section A (Apex of alluvial fan)	__[2]	1,400	2,030	2,310	3,030
At cross section C	__[2]	1,320	1,900	2,200	2,850
At confluence of Manastash Creek and North Fork Manastash Creek	69.7	1,240	1,780	2,040	2,670
At Manastash Road	42.8	967	1,400	1,590	2,100
MERCER CREEK					
At confluence with Right Channel Wilson Creek	15.6	110	150	220[3]	310[3]
At Railroad Avenue	__[2]	110	150	170	210

[1] Discharges reflect regulated conditions
[2] Distributary from main channel
[3] Includes overflow from Reecer Creek

Table 3 – Summary of Discharges - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGES (CFS) 10%-ANNUAL-CHANCE	2%-ANNUAL-CHANCE	1%-ANNUAL-CHANCE	0.2%-ANNUAL-CHANCE
MIDDLE FORK TEANAWAY RIVER					
At confluence with Teanaway River	30.0	1,250	1,570	1,700	2,020
NANEUM CREEK					
At confluence with Wilson Creek	__[1]	920	1,310	1,480	1,890
At cross section I	__[1]	290	420	470	600
NORTH FORK TEANAWAY RIVER					
At confluence with Teanaway River	95.0	2,900	3,700	4,000	4,750
REECER CREEK					
At Downstream Limit of Study, University Way	17.6	260	650	895	1,710
RIGHT CHANNEL WILSON CREEK					
At cross section C[2]	__[1]	1,260	1,610	1,725	2,045
At a point approximately 200 feet upstream of confluence with Mercer Creek	__[1]	243	347	393	501
SILVER CREEK					
At confluence with Yakima River	6.1	260	370	425	560
TEANAWAY RIVER					
At confluence with Yakima River	207	5,300	6,700	7,350	8,700

[1] Distributary from main channel
[2] Includes overflow from Yakima River, Reecer, and Currier Creeks

Table 3 – Summary of Discharges - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGES (CFS) 10%-ANNUAL-CHANCE	2%-ANNUAL-CHANCE	1%-ANNUAL-CHANCE	0.2%-ANNUAL-CHANCE
TEANAWAY RIVER (continued)					
At cross section EF	172	4,600	5,950	6,450	7,650
Upstream of confluence with North Fork Teanaway River, at cross section EU	69.0	2,400	3,000	3,300	3,900
WEST FORK TEANAWAY RIVER					
At confluence with Teanaway River	39.3	1,300	1,640	1,780	2,080
At a point approximately 4.2 miles upstream of confluence with Sandstone Creek	19.2	790	1,000	1,080	1,260
WHISKEY CREEK					
At 5th Avenue	__[1]	75	105	175[3]	275[3]
At a point approximately 1.5 miles upstream of 5th Avenue	10.3	75	105	118	147
WILSON CREEK					
At confluence with Yakima River[2]	396	3,100	4,250	4,750	5,900
Upstream of confluence with Cherry Creek, cross section N	__[4]	2,050	2,750	3,000	3,700

[1] Distributary from main channel
[2] Includes overflow from Yakima River, Reecer, and Currier Creeks
[3] Includes overflow from Reecer Creek
[4] Not available

Table 3 – Summary of Discharges - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGES (CFS) 10%-ANNUAL-CHANCE	2%-ANNUAL-CHANCE	1%-ANNUAL-CHANCE	0.2%-ANNUAL-CHANCE
WILSON CREEK (continued)					
Upstream of confluence with Naneum Creek, cross section AB[3]	__[2]	1,550	2,170	2,360	2,950
At cross section BT[5]	__[2]	290	440	475	655
At a point approximately 1.9 miles upstream of Saunders Road	__[2]	475	680	770	986
YAKIMA RIVER[1]					
At downstream study limit	1,586	20,000	29,300	33,900	45,400
Upstream of Wilson Creek, cross section D	1,190	19,000	28,000	32,300	43,600
At confluence with Manastash Creek	1,177	18,900	27,700	32,000	43,200
At confluence with Dry Creek	1,037	18,500	27,100	31,400	42,400
3,875 feet downstream of Burlington Northern Rail Road Bridge near the city of Thorp	965	13,410	22,210	26,830	40,070
At downstream of the confluence with Taneum Creek	948	13,310	22,036	26,625	39,764
At 5,000 feet downstream of the confluence with Teanaway River	740	12,050	19,940	24,100	35,990

[1] Discharges reflect regulated conditions
[2] Distributary from main channel
[3] Includes overflow from Yakima River, Reecer, and Currier Creeks
[4] Not available
[5] Includes overflow from Reecer and Currier Creeks

Table 3 – Summary of Discharges - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGES (CFS) 10%-ANNUAL-CHANCE	2%-ANNUAL-CHANCE	1%-ANNUAL-CHANCE	0.2%-ANNUAL-CHANCE
YAKIMA RIVER[1] (continued)					
At 5,000 feet downstream of the confluence with Teanaway River	740	12,050	19,940	24,100	35,990
At upstream of the confluence with Teanaway River	533	11,040	16,870	19,830	28,060
Upstream of confluence with Crystal Creek, cross section KR	495	14,500	21,400	24,700	33,800
At confluence with Cle Elum River	485	14,200	21,000	24,300	33,200
Upstream of confluence with Cle Elum River	262	7,499	11,461	13,474	19,069
Upstream of confluence with Big Creek	202	6,243	12,136	15,868	18,857
At gaging station at Easton, cross section SI	188	6,580	9,600	11,200	15,200
Upstream of confluence with Kachess River, cross section SP	122	4,900	7,180	8,290	11,300
Upstream of confluence with Cabin Creek, cross section TG	82.1	3,740	5,480	6,300	8,600
At a point approximately 2.4 miles upstream of Cabin Creek Road	74.8	3,460	5,060	5,840	7,900

[1] Discharges reflect regulated conditions

Countywide Analysis

Hydrologic analyses were performed to determine peak discharges for recurrence intervals of 10-, 2-, 1-, and 0.2-percent-annual-chance events in the Yakima River detailed study area. The limits of study for this detailed study extend to two river segments on the Yakima River. Initially PeakFQ version 5.2 (PKFQWin) (Reference 15), a USGS computer program using Bulletin 17B, Guidelines for Determining Flood Flow Frequency (Reference 16), was used for the gage analysis. Data available for all three gages were collected after the construction of three reservoirs (Keechelus Lake, Kachess Lake and Cle Elum Lake) upstream of Ellensburg for irrigation in the Yakima River Basin (Reference 1). This regulation affects the discharge of Yakima River and the data used in the PeakFQ analysis were flagged as regulated, resulting in no output from the computer program.

HEC-SSP (Reference 17), a statistical software package developed by the Hydrologic Engineering Center, was used to perform the flood flow frequency analysis for the three gages based on Bulletin 17B guidelines. The post-1933 regulated data was the only data used for the analysis.

Discharges for ungaged sites were computed according to Equation 5 of the "Magnitude and Frequency of Floods in Washington" report (Reference 18). USGS gaging stations No. 12477000 at Easton, No. 12479500 at Cle Elum and No. 12484500 at Umtanum on the Yakima River were used as the main sources of data in the computations.

Four major tributaries flow into Yakima River within the study area, namely Big Creek, Cle Elum River, Teanaway River and Taneum Creek and confluences of these streams with Yakima River were identified as flow change locations. The downstream ends of the two separate Yakima River reaches within the study limits were also considered flow change locations. To estimate the discharges at these six identified ungaged sites, Water-Resources Investigations Report 97-4277 equation (5) was used (Reference 19). Peak flows were computed utilizing a drainage area ratio such that:

$$Q_u = Q_g \left(\frac{A_u}{A_g} \right)^{\alpha}$$

Where:
Q_u = the estimated discharge for the ungaged watershed,
Q_g = the weighted discharge (W) from Appendix D for the gaging station,
A_u = the area of the ungaged watershed,
A_g = the area of the gaged watershed, and
a = the exponent for each regression region

For flooding sources studied with approximate methods, the 1-percent-annual-chance flood discharge rates were determined using the USGS StreamStats website https://streamstatsags.cr.usgs.gov, and is based on the USGS Regression Equations described in USGS Fact Sheet 016-01, titled *The National Flood-Frequency Program – Methods for Estimating Flood Magnitude and Frequency in Washington, 2001*.

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 FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables 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 in conjunction with the data shown on the FIRM.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5-foot for floods of the selected recurrence intervals. 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 is computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2). Unless specified otherwise, the hydraulic analyses for these studies were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations shown on the Flood Profiles and FIRM (Exhibits 1 and 2) are referenced to the North American Vertical Datum of 1988 (NAVD88).

Pre-countywide Analysis

Water-surface elevations of floods were computed through use of a combination of the USGS's step-backwater computer program (Reference 20), culvert rating analyses (Reference 21), and computations of flow over roads (Reference 22).

Starting water surface elevations for the first cross-section of all streams were computed either by profile convergence from downstream cross sections or culvert ratings where an approach section was the section farthest downstream.

All cross-section data for the backwater analyses were obtained from aerial photographs (Reference 23). These data were supplemented by field measurement of the underwater portions. Elevation data and geometry for bridges, culverts, road overflow, and a few additional channel cross sections were obtained by field survey.

Due to excess meandering of the Cle Elum and Yakima Rivers and Wilson Creek, the distance between cross sections, in some areas, is measured along a profile baseline, rather than the actual stream channel. This procedure was followed for Cle Elum River cross sections BP to BT; Yakima River cross sections AH to AL, OR to OV, OJ to OK, OM to QO, and QZ to RA; and Wilson Creek cross section BP to BQ.

Downstream of cross section A on Manastash Creek, profiles are not applicable for the alluvial fan shallow flooding analysis.

Shallow flooding delineations were determined by field investigations and interpretation of aerial photographs (Reference 23).

Shallow flooding depths for Coleman creek at Kittitas Highway and both Caribou and Cooke Creeks at Ferguson and Tjossem Roads were determined by field investigations and historical flooding information for these immediate areas. These roads are constructed approximately two feet above the ground elevation, and as culvert capacities are surpassed, have a damming effect until the flood flow peaks and flows over the roads. These shallow flooding areas have an average depth of one foot.

The acceptability of all assumed hydraulic factors, cross sections, and hydraulic structure data was verified by computations that duplicated the profile of the December 1975 flood from the Yakima River.

Statistical analyses were used to compute flood depths and velocities for the area subject to alluvial fan flooding. Channel systems on alluvial fans are unstable, and flow may occur on separate parts of an alluvial fan during subsequent flood events. The depths of flooding on the alluvial fan presented in this report were computed according to the guidelines issued by FEMA (Reference 24).

Channel and overbank roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and flood plain areas. Main channel roughness values ranged from 0.032 to 0.055, and roughness values for the flood plain ranged from 0.050 to 0.090 for all flooding sources.

For streams studied by approximate methods, water-surface elevations were determined by normal depth calculations.

Countywide Analyses

New detailed hydraulic analysis was performed on two reaches of the Yakima River: From 33.4 miles upstream of the County boundary to 38.8 miles upstream, and from 50.0 miles upstream of the County boundary to 70.0 miles upstream, for a total of 25.4 miles. Water-surface elevations for floods of the selected recurrence intervals within the study reaches were computed using the HEC-RAS USACE software program (Reference 25). A steady state flow analysis was carried out for each of the reaches.

The starting water-surface elevations used at the downstream boundary condition for the upstream Yakima River reach are taken from the effective FIS.

Channel and overbank roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and flood plain areas, as well as aerial photographs. Main channel roughness values ranged from 0.025-0.100, and roughness values for the flood plain ranged from 0.016-0.120 for all flooding sources.

Cross-Section data was determined based on field surveys and supplemented by LiDAR Data.

Ineffective flow area placements reflect field observations as well as engineering judgments.

Sources of data used for the hydraulic analyses include the following:

- Channel and overbank field surveyed section data completed in January 2012
- Digitized cross-sectional data

For flooding sources studied with approximate methods, the 1-percent-annual-chance flood elevations were determined using the HEC-RAS USACE software program (Reference 25). The peak flood discharges from the regression equations were input into a HEC-RAS model that included cross sections extracted from DEMs derived from LiDAR with a 6-foot cell size. Because this cross-section information was not supplemented with field survey data and the models did not include bridge and culvert information, the resulting floodplain boundaries are considered approximate.

All qualifying benchmarks within a given jurisdiction that are catalogued by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Benchmarks catalogued by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation (e.g. mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation (e.g. concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g. concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g. concrete monument above frost line, or steel witness post)

In addition to NSRS benchmarks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for benchmarks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at www.ngs.noaa.gov.

It is important to note that 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 these data.

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 used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of

1929 (NGVD29). With the completion of the NAVD88, many FIS reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88.

To accurately covert flood elevations from the current NGVD29 datum to the newer NAVD88 datum, the following procedure was implemented. Locations at the upstream and downstream ends of each study stream, as well as a point to represent the intermediate point between the two end points, were evaluated using the USACE's CORPSCON datum conversion software (Reference 26). The resulting values for each of the three points were the computed difference between the NGVD29 and NAVD88 elevations. Individual conversion factors at the upstream end, the downstream end, and intermediate point were averaged to determine a conversion factor for the stream. The NAVD88 elevations provided for each stream were computed by adding the calculated conversion factor to the existing NGVD29 data.

The data points used to determine the conversion are listed in Table 4, "Vertical Datum Conversion Values".

Table 4 – Vertical Datum Conversion Values

Stream Name	Conversion from NGVD29 to NAVD88 (feet)
Caribou Creek	3.643
Cle Elum River	3.812
Crystal Creek	3.791
Currier Creek	3.619
Kachess River	3.864
Left Channel Naneum Creek	3.600
Manastash Creek	3.737
Mercer Creek	3.625
Middle Fork Teanaway River	3.831
Naneum Creek	3.606
North Fork Teanaway River	3.806
Reecer Creek	3.619
Right Channel Wilson Creek	3.635
Silver Creek	3.869
Teanaway River	3.753
West Fork Teanaway River	3.827
Whiskey Creek	3.622
Wilson Creek	3.623
Yakima River	3.735

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, users that wish to convert the elevations in this FIS to NGVD29 should apply the conversion factor to elevations shown on the Flood Profiles and supporting data tables in this FIS report, which are shown at a minimum to the nearest 0.1 foot.

NAVD88 = NGVD29 + conversion factor

For additional information regarding conversion between the NGVD29 and NAVD88, visit the National Geodetic Survey website at http://www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

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 these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at http://www.ngs.noaa.gov.

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 (100-year) flood elevations and delineations of the 1- and 0.2-percent-annual-chance (500-year) 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 Floodplain 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 in detail, the boundaries of the 1- and 0.2-percent-annual-chance flood have been delineated using the flood elevations determined at each cross-section. Between cross-sections, the boundaries were interpolated using available topographic data. For those areas delineated in the Pre-Countywide, analysis boundaries were developed photogrammetrically, using aerial photographs at a scale of 1:9,600 (Reference 23). For those areas delineated in the countywide analysis boundaries were developed using Bare Earth Digital Elevation Models (DEMs) derived from LiDAR with a 6 foot cell size.

Alluvial fan boundaries were delineated using topographic maps at a scale of 1:62,500 with a contour interval of 80 feet (Reference 27).

Shallow flooding boundaries for Caribou, Coleman, and Cooke Creeks were delineated using topographic maps at a scale of 1:24,000 with a contour interval of 20 feet (Reference 28).

Shallow flooding boundaries, for all other streams studied by detailed methods, were determined by field investigations and interpretation of aerial photographs (Reference 23).

For streams studied by approximate methods in the pre-countywide analysis, the boundary of the 1-percent-annual-chance flood was delineated using topographic maps (References 27, 28, and 29).

For streams studied by approximate methods in the countywide analysis, the boundary of the 1-percent-annual-chance flood was delineated using DEMs derived from LiDAR with a 6 foot cell size.

Approximate flood boundaries in some portions of the study area were taken from the Flood Hazard Boundary map (Reference 30).

For these streams whose floodplain boundary was redelineated in this countywide analysis, DEMs derived from LiDAR with a 6 foot cell size were used. The LiDAR data used was found to be more accurate and higher resolution than the topographic information used in the previous study.

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.

4.2 Floodways

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

economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in 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 base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1-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 presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 5, "Floodway Data Table"). The computed floodways are shown on the FIRM. In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage and heightens potentials flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 5, "Floodway Data Table". To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

Where channel velocity is high (at or near critical) and/or the flow is confined to the channel, and in certain areas designated as wetlands by Kittitas County, the floodway is coincident with the 1-percent-annual-chance boundary. Therefore, Kittitas County is enabled to restrict development in the 1-percent-annual-chance flood plain. The streams and stream reaches, which would be affected, are Crystal Creek, Kachess River, Manastash Creek, Middle Fork Teanaway River, North Fork Teanaway River, Teanaway River (cross section FG to FI), Silver Creek, West Fork Teanaway River, and Yakima River (cross section KK to LB).

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 (WSEL) of the 1-percent-annual-chance flood more than 1-foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1, "Floodway Schematic".

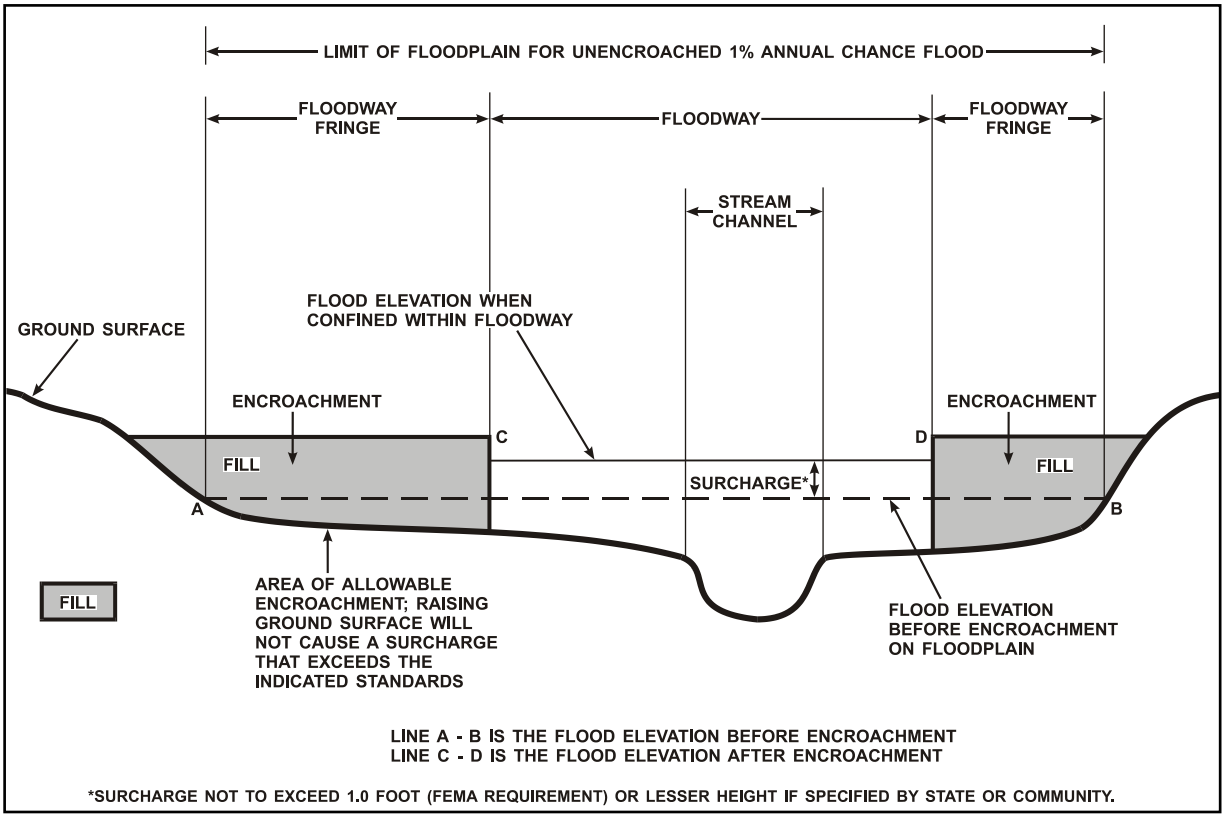

Figure 1 - Floodway Schematic

The floodways were computed on the basis of equal-conveyance reduction except for cross sections BF to BK of the Yakima River where the county designated the left (north) floodway boundary.

Some streams have shifting channels, alluvial fans, shallow flooding, and/or ponding for which the floodway concept is not applicable. These streams are the downstream portion of Naneum, and Manastash Creek; Caribou, Currier, Left Channel Naneum, Mercer, Reecer, Right Channel Wilson, Whiskey, and Wilson Creeks.

No floodways were computed for Caribou Creek, Left Channel Naneum Creek, Mercer Creek, Naneum Creek, Right Channel Wilson Creek, Whiskey Creek, and Wilson 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Cle Elum River								
A	410	890	4,155	3.27	1,963.3	1,963.3	1,963.7	0.4
B	781	990	2,721	5.00	1,964.5	1,964.5	1,964.7	0.2
C	1,113	1,020	2,155	6.31	1,966.2	1,966.2	1,966.6	0.4
D	1,654	850	2,195	4.26	1,968.1	1,968.1	1,969.2	1.1
E	1,909	450	2,554	5.33	1,968.8	1,968.8	1,969.8	1.0
F	2,194	920	6,662	2.04	1,973.4	1,973.4	1,973.6	0.2
G	2,562	1,090	3,729	3.65	1,973.5	1,973.5	1,973.8	0.3
H	2,981	1,150	3,504	3.88	1,974.0	1,974.0	1,974.9	0.9
I	3,314	285[2]	1,854	7.33	1,976.1	1,976.1	1,976.6	0.5
J	3,541	819	5,014	2.71	1,983.4	1,983.4	1,983.5	0.1
K	3,849	856	4,861	2.80	1,983.4	1,983.4	1,983.6	0.2
L	4,087	1,158	6,298	2.16	1,983.6	1,983.6	1,983.9	0.3
M	4,382	1,386	5,589	2.43	1,983.7	1,983.7	1,984.0	0.3
N	4,800	1,805	3,994	3.41	1,984.2	1,984.2	1,984.6	0.4
O	5,311	2,120	4,351	3.13	1,985.3	1,985.3	1,986.2	0.9
P	5,724	2,100	6,859	1.98	1,986.2	1,986.2	1,987.1	0.9
Q	6,293	1,750	4,340	3.13	1,987.6	1,987.6	1,988.0	0.4
R	6,699	1,310	2,848	4.78	1,990.0	1,990.0	1,990.5	0.5
S	7,122	950	3,368	4.04	1,992.5	1,992.5	1,993.3	0.8

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CLE ELUM 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Cle Elum River (Continued)								
T	7,540	767	2,784	4.89	1,994.3	1,994.3	1,995.0	0.7
U	7,940	617[2]	2,550	5.33	1,995.9	1,995.9	1,996.8	0.9
V	8,257	567	4,083	3.33	2,001.0	2,001.0	2,001.0	0.0
W	8,399	610	3,525	3.86	2,001.1	2,001.1	2,001.1	0.0
X	8,581	598	3,653	2.41	2,004.2	2,004.2	2,004.3	0.1
Y	8,974	418	3,951	3.44	2,004.2	2,004.2	2,004.4	0.2
Z	9,455	312	3,006	4.52	2,004.3	2,004.3	2,004.6	0.3
AA	9,851	302	2,478	5.33	2,004.5	2,004.5	2,005.0	0.5
AB	10,334	385	2,328	5.67	2,005.2	2,005.2	2,006.0	0.8
AC	10,822	670	2,589	5.10	2,006.5	2,006.5	2,007.5	1.0
AD	11,272	810	2,446	5.40	2,008.4	2,008.4	2,009.3	0.9
AE	11,694	739	2,835	4.66	2,010.6	2,010.6	2,011.3	0.7
AF	12,141	655	3,088	4.27	2,012.3	2,012.3	2,013.0	0.7
AG	12,441	680	3,008	6.57	2,014.0	2,014.0	2,014.6	0.6
AH	12,707	620	2,770	4.77	2,015.6	2,015.6	2,016.6	1.0
AI	13,131	430	2,567	5.14	2,016.9	2,016.9	2,017.8	0.9
AJ	13,546	184	1,598	8.26	2,018.0	2,018.0	2,018.7	0.7
AK	13,977	285	1,749	7.55	2,019.9	2,019.9	2,020.5	0.6
AL	14,366	407	1,898	6.95	2,021.7	2,021.7	2,022.2	0.5

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CLE ELUM 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Cle Elum River (Continued)								
AM	15,016	630	2,575	5.13	2,024.8	2,024.8	2,025.5	0.7
AN	15,702	950	3,474	3.80	2,027.0	2,027.0	2,027.8	0.8
AO	16,248	820	2,830	4.66	2,028.9	2,028.9	2,029.7	0.8
AP	17,080	400	2,226	5.93	2,031.7	2,031.7	2,032.5	0.8
AQ	17,330	300	1,257	10.50	2,032.3	2,032.3	2,033.0	0.7
AR	17,722	240	1,762	7.49	2,035.4	2,035.4	2,035.9	0.5
AS	18,199	211	1,550	8.52	2,037.2	2,037.2	2,037.9	0.7
AT	18,609	165	1,431	9.22	2,038.8	2,038.8	2,039.7	0.9
AU	18,951	198	1,760	7.50	2,040.4	2,040.4	2,041.2	0.8
AV	19,322	191	1,592	8.29	2,041.3	2,041.3	2,050.3	9.0
AW	19,753	270	2,150	6.14	2,043.2	2,043.2	2,043.8	0.6
AX	20,230	440	2,017	6.54	2,044.3	2,044.3	2,044.9	0.6
AY	20,634	372	2,289	5.77	2,045.5	2,045.5	2,046.2	0.7
AZ	20,952	430	2,537	5.20	2,046.2	2,046.2	2,046.8	0.6
BA	21,792	955	4,185	3.15	2,048.4	2,048.4	2,048.9	0.5
BB	22,322	850	3,428	3.85	2,049.5	2,049.5	2,050.1	0.6
BC	22,841	700	3,405	3.88	2,050.8	2,050.8	2,051.7	0.9
BD	23,139	565	2,765	4.77	2,051.8	2,051.8	2,052.5	0.7
BE	23,505	480	2,340	5.64	2,053.3	2,053.3	2,054.1	0.8

[1] Feet above confluence with Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CLE ELUM 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Cle Elum River (Continued)								
BF	23,945	420	2,646	4.99	2,054.6	2,054.6	2055.6	1.0
BG	24,393	606	3,578	3.69	2,055.7	2,055.7	2,056.5	0.8
BH	24,715	654	2,946	4.48	2,056.3	2,056.3	2,056.9	0.6
BI	25,155	400	1,985	6.65	2,057.7	2,057.7	2,058.1	0.4
BJ	25,551	565	1,382	9.55	2,060.4	2,060.4	2,060.8	0.4
BK	26,103	1,070	2,690	4.91	2,066.8	2,066.8	2,067.4	0.6
BL	26,395	970	2,621	5.19	2,068.5	2,068.5	2,069.1	0.6
BM	26,730	974	2,427	5.60	2,071.2	2,071.2	2,071.6	0.4
BN	26,986	1,000	2,315	5.87	2,073.4	2,073.4	2,073.9	0.5
BO	27,429	750	2,139	6.36	2,076.3	2,076.3	2,077.3	1.0
BP	27,771	840	3,778	3.60	2,079.4	2,079.4	2,079.8	0.4
BQ	28,111	960	2,142	6.35	2,081.4	2,081.4	2,081.7	0.3
BR	28,311	1,050	3,333	4.08	2,083.6	2,083.6	2,084.4	0.8
BS	28,611	1,390	2,449	5.55	2,086.2	2,086.2	2,086.6	0.4
BT	28,891	1,500	2,531	5.37	2,089.8	2,089.8	2,090.3	0.5
BU	29,162	1,180	3,214	5.23	2,092.6	2,092.6	2,093.6	1.0
BV	29,534	830	3,114	5.37	2,095.4	2,095.4	2,096.0	0.6
BW	29,884	735	3,451	3.94	2,096.5	2,096.5	2,097.5	1.0
BX	30,290	700	3,135	4.34	2,097.7	2,097.7	2,098.6	0.9

[1] Feet above confluence with Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

CLE ELUM 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Cle Elum River (Continued)								
BY	30,716	840	3,718	3.55	2,098.9	2,098.9	2,099.8	0.9
BZ	31,081	940	3,126	4.22	2,100.1	2,100.1	2,100.9	0.8
CA	31,453	820	4,209	3.04	2,101.2	2,101.2	2,102.2	1.0
CB	31,825	750	3,372	3.80	2,101.8	2,101.8	2,102.7	0.9
CC	32,160	740	3,535	3.62	2,102.5	2,102.5	2,103.5	1.0
CD	32,327	720	2,975	4.30	2,102.9	2,102.9	2,103.8	0.9
CE	33,260	189	1,209	10.59	2,107.3	2,107.3	2,108.3	1.0
CF	33,479	190	1,260	10.16	2,109.4	2,109.4	2,110.3	0.9
CG	34,145	150	1,410	9.08	2,114.7	2,114.7	2,114.8	0.1
CH	34,532	180	1,708	7.50	2,115.9	2,115.9	2,116.8	0.9
CI	34,963	174	1,796	7.13	2,117.0	2,117.0	2,117.8	0.8
CJ	35,344	190	1,921	6.66	2,117.9	2,117.9	2,118.6	0.7
CK	35,739	180	1,908	6.71	2,118.6	2,118.6	2,119.1	0.5
CL	36,137	178	2,059	6.22	2,119.3	2,119.3	2,119.7	0.4
CM	36,569	175	1,940	6.60	2,119.9	2,119.9	2,120.3	0.4
CN	37,476	157	1,939	6.60	2,121.1	2,121.1	2,121.4	0.3
CO	37,976	161	2,009	6.37	2,121.8	2,121.8	2,122.1	0.3
CP	38,360	174	2,077	6.16	2,122.3	2,122.3	2,122.6	0.3
CQ	38,783	180	2,434	5.26	2,122.8	2,122.8	2,123.0	0.2

[1] Feet above confluence with Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

CLE ELUM 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Cle Elum River (Continued)								
CR	39,100	208	2,750	4.65	2,123.1	2,123.1	2,123.3	0.2

[1] Feet above confluence with Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

CLE ELUM RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)[2]	SECTION AREA (SQUARE FEET)[4]	MEAN VELOCITY (FEET PER SECOND)[4]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[4]	WITH FLOODWAY (FEET NAVD88)[4]	INCREASE (FEET)[4]
Crystal Creek								
A	720	211			1,918.7[3]			
B	1,072	362			1,918.7[3]			
C	1,446	296			1,920.6			
D	1,708	106			1,923.4			
E	1,765	79			1,924.0			
F	1,840	61			1,924.7			
G	1,890	53			1,924.9			
H	1,969	50			1,926.4			
I	2,080	80			1,927.7			
J	2,140	95			1,930.2			
K	2,220	75			1,931.1			
L	2,320	59			1,931.8			
M	2,356	33			1,932.5			
N	2,726	72			1,936.9			
O	3,105	56			1,945.2			
P	3,401	21			1,948.2			
Q	3,814	36			1,960.3			
R	4,268	39			1,970.3			
S	4,714	95			1,981.7			

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Backwater effects from Yakima River

[4] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)[2]	SECTION AREA (SQUARE FEET)[3]	MEAN VELOCITY (FEET PER SECOND)[3]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[3]	WITH FLOODWAY (FEET NAVD88)[3]	INCREASE (FEET)[3]
Crystal Creek (Continued)								
T	5,176	80			1,995.2			
U	5,643	81			2,006.9			
V	6,090	99			2,017.5			
W	6,455	108			2,022.0			
X	6,909	101			2,032.0			
Y	7,228	83			2,038.7			
Z	7,572	26			2,045.1			
AA	7,957	69			2,052.5			
AB	8,387	35			2,060.2			
AC	8,712	87			2,067.5			
AD	9,100	81			2,072.5			
AE	9,449	24			2,076.3			
AF	9,868	16			2,083.0			

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CRYSTAL 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Currier Creek								
A	69	687	2,162	0.9	1,540.6	1,540.6	1,541.4	0.8
B	1,222	428	583	2.6	1,543.0	1,543.0	1,543.6	0.6
C	1,848	125	319	4.1	1,547.1	1,547.1	1,547.9	0.8
D	2,576	86	409	4.2	1,553.2	1,553.2	1,553.7	0.5
E	3,458	388	651	2.6	1,555.3	1,555.3	1,556.1	0.8
F	4,731	320	487	3.1	1,565.1	1,565.1	1,565.7	0.6
G	5,726	113	315	3.4	1,575.5	1,575.5	1,576.2	0.7
H	6,791	665	719	2.7	1,586.2	1,586.2	1,586.4	0.2
I	7,555	351	464	2.5	1,595.1	1,595.1	1,595.5	0.4
J	8,448	269	487	2.6	1,601.1	1,601.1	1,601.5	0.4
K	9,423	230	516	2.6	1,607.2	1,607.2	1,607.9	0.7
L	9,954	296	480	2.6	1,610.2	1,610.2	1,610.8	0.6
M	10,679	188	233	2.7	1,615.0	1,615.0	1,615.8	0.8
N	11,388	194	211	3.1	1,621.0	1,621.0	1,621.6	0.6
O	12,437	176	316	2.3	1,629.0	1,629.0	1,629.9	0.9
P	13,443	120	189	3.1	1,637.1	1,637.1	1,637.8	0.7
Q	14,656	62	180	3.3	1,647.7	1,647.7	1,648.4	0.7
R	15,726	101	147	2.6	1,656.2	1,656.2	1,656.3	0.1
S	16,390	78	80	2.5	1,662.9	1,662.9	1,663.5	0.6

[1] Feet above University Way

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CURRIER 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Currier Creek (Continued)								
T	17,539	67	94	3.0	1,675.0	1,675.0	1,675.6	0.6
U	18,502	262	249	3.0	1,684.1	1,684.1	1,684.2	0.1
V	19,540	160	222	3.0	1,695.1	1,695.1	1,695.6	0.5
W	20,281	250	472	3.3	1,703.4	1,703.4	1,703.9	0.5
X	21,269	229	360	3.7	1,714.1	1,713.6	1,714.7	0.6
Y	21,972	228	369	3.3	1,723.1	1,722.6	1,723.8	0.7
Z	23,236	111	243	4.8	1,739.4	1,739.6	1,739.9	0.5
AA	24,633	128	254	4.4	1,758.1	1,758.1	1,758.9	0.8
AB	25,301	169	263	4.2	1,767.4	1,767.4	1,767.8	0.4
AC	26,639	154	263	4.7	1,785.2	1,785.2	1,785.7	0.5
AD	27,530	104	226	4.9	1,797.2	1,797.2	1,797.8	0.6
AE	28,906	168	216	3.5	1,815.1	1,815.1	1,815.9	0.8
AF	29,869	98	167	4.6	1,829.2	1,829.2	1,829.7	0.5
AG	30,905	181	275	3.5	1,844.3	1,844.3	1,845.0	0.7
AH	32,245	70	164	5.5	1,864.3	1,864.3	1,864.8	0.5
AI	33,555	74	130	5.8	1,886.1	1,886.1	1,886.6	0.5
AJ	34,524	88	181	4.9	1,902.3	1,902.3	1,902.6	0.3
AK	35,284	40	127	6.1	1,916.4	1,916.4	1,916.9	0.5
AL	36,479	74	152	5.7	1,939.2	1,939.2	1,939.9	0.7

[1] Feet above University Way

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CURRIER 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Currier Creek (Continued)								
AM	37,573	138	175	3.8	1,964.1	1,964.1	1,964.8	0.7
AN	38,363	39	110	6.3	1,980.2	1,980.2	1,980.5	0.3
AO	39,280	48	242	7.4	1,998.1	1,998.1	1,998.1	0.0
AP	40,897	42	99	7.9	2,031.2	2,031.2	2,031.7	0.5
AQ	41,595	39	111	8.3	2,047.3	2,047.3	2,048.2	0.9
AR	42,388	42	182	5.3	2,065.7	2,065.7	2,065.7	0.0

[1] Feet above University Way

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CURRIER 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Currier Creek Split								
A	695	315	374	2.2	1,615.2	1,615.2	1,615.8	0.6
B	1,680	157	279	2.9	1,621.2	1,621.2	1,621.7	0.5
C	2,999	222	284	2.8	1,630.1	1,630.1	1,630.6	0.5
D	3,800	182	281	2.8	1,637.3	1,637.3	1,638.1	0.8
E	4,865	184	241	2.7	1,647.2	1,647.2	1,647.3	0.1
F	5,794	282	375	2.7	1,656.1	1,656.1	1,656.6	0.5
G	6,683	208	329	3.3	1,664.1	1,664.1	1,664.7	0.6
H	7,795	229	348	3.1	1,675.1	1,675.1	1,675.5	0.4
I	8,686	201	297	3.4	1,684.2	1,684.2	1,684.8	0.6
J	9,760	138	267	2.7	1,695.1	1,695.1	1,696.0	0.9

[1] Feet above confluence with Currier Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

CURRIER CREEK SPLIT

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Kachess River								
A	3,149	397			2,184.2[3]			
B	3,427	282			2,184.2[3]			
C	4,036	600			2,185.2			
D	4,372	352			2,186.8			
E	4,733	237			2188.8			
F	5,096	127			2,190.8			
G	5,444	160			2,194.0			
H	6,452	521			2,195.9			
I	6,865	352			2,196.2			
J	7,316	177			2,198.3			
K	7,662	154			2,199.3			
L	8,087	385			2,200.2			
M	8,375	134			2,201.1			

[1] Feet above confluence with Yakima River

[2] Data not available

[3] Elevation Computed With Consideration of Backwater Effects From Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

KACHESS RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND) [2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Manastash Creek								
A	29,133	187			2,042.8			
B	29,649	244			2,050.8			
C	30,078	305			2,060.2			
D	30,504	202			2,067.7			
E	30,873	99			2,073.8			
F	31,167	43			2,079.8			
G	31,601	82			2,087.0			
H	31,929	131			2,093.0			
I	32,097	190			2,097.1			
J	32,428	224			2,101.4			
K	32,766	302			2,106.2			
L	33,113	246			2,113.0			
M	33,463	365			2,120.0			
N	33,948	340			2,128.1			
O	34,261	343			2,135.2			
P	34,625	425			2,141.6			
Q	34,929	461			2,146.2			
R	35,239	527			2,151.8			
S	35,530	314			2,157.3			

[1] Feet above confluence with Yakima River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MANASTASH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Manastash Creek (Continued)								
T	35,908	564			2,164.5			
U	36,208	600			2,172.8			
V	36,506	595			2,177.6			
W	36,826	570			2,183.4			
X	37,266	495			2,192.8			
Y	37,662	583			2,198.6			
Z	38,096	707			2,206.7			
AA	38,490	441			2,215.5			
AB	38,922	405			2,224.7			
AC	39,178	512			2,226.7			
AD	39,567	421			2,235.7			
AE	39,976	636			2,243.5			
AF	40,441	652			2,251.6			
AG	40,888	427			2,261.7			
AH	41,253	228			2,266.6			
AI	41,461	258			2,271.7			
AJ	41,522	518			2,273.1			
AK	42,040	366			2,282.4			

[1] Feet above confluence with Yakima River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MANASTASH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Manastash Creek (Continued)								
AL	42,376	479			2,287.9			
AM	42,925	630			2,294.3			
AN	43,309	614			2,300.2			
AO	43,657	341			2,307.0			
AP	43,996	154			2,314.1			
AQ	44,599	397			2,326.6			
AR	44,976	299			2,333.5			
AS	45,284	256			2,339.5			
AT	45,585	197			2,343.9			
AU	45,914	469			2,350.9			
AV	46,331	439			2,358.9			
AW	46,678	320			2,366.7			
AX	46,969	243			2,372.3			
AY	47,247	261			2,379.8			
AZ	47,576	371			2,387.2			
BA	47,918	357			2,395.4			
BB	48,263	392			24,02.7			
BC	48,631	269			2,412.0			

[1] Feet above confluence with Yakima River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MANASTASH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Manastash Creek (Continued)								
BD	49,014	323			2,420.0			
BE	49,341	293			2,424.6			
BF	49,761	511			2,432.6			
BG	50,124	276			2,442.6			
BH	50,450	253			2,450.0			
BI	50,793	265			2,458.2			
BJ	51,226	175			2,466.3			
BK	51,525	172			2,473.3			
BL	51,854	144			2,479.9			
BM	52,190	309			2,486.4			
BN	52,510	316			2,495.7			
BO	52,803	150			2,501.8			
BP	53,152	85			2,506.3			
BQ	53,460	51			2,514.7			
BR	53,875	342			2,524.2			
BS	54,178	173			2,532.3			
BT	54,480	146			2,537.1			
BU	54,841	128			2,545.4			

[1] Feet above confluence with Yakima River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MANASTASH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Manastash Creek (Continued)								
BV	55,152	427			2,554.1			
BW	55,472	285			2,559.6			
BX	55,805	484			2,567.8			
BY	56,189	291			2,575.0			
BZ	56,319	398			2,578.8			
CA	56,437	439			2,582.4			
CB	56,746	431			2,587.9			
CC	57,040	288			2,594.0			
CD	57,370	127			2,603.1			
CE	57,723	303			2,613.1			
CF	58,051	210			2,621.9			
CG	58,322	189			2,628.3			
CH	58,778	272			2,635.0			
CI	59,121	347			2,646.2			
CJ	59,305	202			2,649.1			
CK	59,459	258			2,652.6			

[1] Feet above confluence with Yakima River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MANASTASH CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[3]	MEAN VELOCITY (FEET PER SECOND)[3]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[3]	WITH FLOODWAY (FEET NAVD88)[3]	INCREASE (FEET)[3]
Middle Fork Teanaway River								
A	149	305			2,252.0			
B	320	215			2,254.3			
C	575	357[2]			2,258.6			
D	731	274			2,260.9			
E	1,055	407			2,264.9			
F	1,360	412			2,269.5			
G	1,590	189			2,273.1			
H	2,220	362			2,281.6			
I	2,668	294			2,287.8			
J	3,200	535			2,295.5			
K	3,600	729			2,299.8			
L	3,956	230			2,305.6			
M	4,217	424			2,310.4			
N	4,617	501			2,314.2			
O	4,979	384			2,319.6			
P	5,247	347			2,323.9			
Q	5,585	400			2,327.3			

[1] Feet above confluence with Teanaway River and West Fork Teanaway River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

MIDDLE FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Middle Fork Teanaway River (Continued)								
R	6,040	357			2,333.2			
S	6,387	291			2,336.6			
T	6,800	133			2,342.1			
U	7,211	326			2,346.7			
V	7,580	106			2,351.9			
W	7,976	301			2,359.5			
X	8,310	274			2,364.5			
Y	8,655	614			2,370.7			
Z	8,998	294			2,375.7			
AA	9,350	331			2,382.3			
AB	9,763	267			2,389.3			
AC	10,100	244			2,394.3			
AD	10,380	332			2,399.0			
AE	10,746	438			2,403.8			
AF	11,140	113			2,408.2			
AG	11,380	168			2,411.5			
AH	11,742	185			2,415.9			
AI	12,114	179			2,422.1			

[1] Feet above confluence with Teanaway River and West Fork Teanaway River

[2] Data not available

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Middle Fork Teanaway River (Continued)								
AJ	12,611	477			2,429.5			
AK	13,010	479			2,435.3			
AL	13,373	591			2,442.1			
AM	13,731	334			2,448.5			
AN	14,080	393			2,452.4			
AO	14,400	196			2,457.3			
AP	14,820	327			2,463.8			
AQ	15,200	150			2,467.6			
AR	15,605	143			2,473.3			
AS	16,166	284			2,481.5			
AT	16,577	287			2,488.7			
AU	16,840	168			2,492.8			
AV	17,460	317			2,501.8			
AW	17,820	188			2,506.4			
AX	18,202	379			2,512.6			
AY	18,574	89			2,516.4			
AZ	18,974	159			2,524.0			
BA	19,320	181			2,529.8			

[1] Feet above confluence with Teanaway River and West Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MIDDLE FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Middle Fork Teanaway River (Continued)								
BB	19,620	103			2,533.7			
BC	19,920	175			2,538.7			
BD	20,353	441			2,546.1			
BE	20,648	216			2,549.9			
BF	21,040	149			2,555.3			
BG	21,461	177			2,561.0			
BH	21,820	120			2,565.8			
BI	22,216	408			2,569.9			
BJ	22,620	271			2,576.7			
BK	22,954	291			2,582.0			
BL	23,296	245			2,587.2			
BM	23,667	156			2,592.2			
BN	24,014	126			2,598.2			
BO	24,380	151			2,604.9			
BP	24,846	218			2,611.2			
BQ	25,186	166			2,618.8			

[1] Feet above confluence with Teanaway River and West Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MIDDLE FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Middle Fork Teanaway River (Continued)								
BR	25,531	230			2,623.8			
BS	25,930	287			2,630.6			
BT	26,292	174			2,636.7			
BU	26,440	179			2,639.7			

[1] Feet above confluence with Teanaway River and West Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

MIDDLE FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[3]	MEAN VELOCITY (FEET PER SECOND)[3]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[3]	WITH FLOODWAY (FEET NAVD88)[3]	INCREASE (FEET)[3]
North Fork Teanaway River								
A	200	594[2]			2,200.1			
B	722	290[2]			2,205.4			
C	1,064	110[2]			2,211.0			
D	1,298	349[2]			2,218.8			
E	1,649	400[2]			2,219.4			
F	2,016	283[2]			2,222.5			
G	2,434	335			2,227.1			
H	2,811	380			2,230.5			
I	3,140	440			2,233.6			
J	3,520	384			2,236.0			
K	3,952	526			2,238.5			
L	4,300	343			2,242.2			
M	4,693	260			2,249.7			
N	5,060	390			2,254.7			
O	5,419	259			2,258.4			
P	5,984	404			2,264.0			
Q	6,300	270			2,266.8			
R	6,749	584			2,270.8			

[1] Feet above confluence with Teanaway River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
North Fork Teanaway River (Continued)								
S	7,080	374			2,273.5			
T	7,460	477			2,276.5			
U	7,860	491			2,281.3			
V	8,255	393			2,285.0			
W	8,599	649			2,287.8			
X	8,980	724			2,291.8			
Y	9,293	376			2,296.1			
Z	9,727	437			2,300.3			
AA	10,114	393			2,304.1			
AB	10,464	342			2,310.0			
AC	10,823	468			2,316.7			
AD	11,257	332			2,321.8			
AE	11,587	582			2,326.5			
AF	11,967	397			2.332.7			
AG	12,289	562			2,336.5			
AH	12,688	401			2,338.8			
AI	13,040	337			2,346.2			
AJ	13,394	479			2,349.4			

[1] Feet above confluence with Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
North Fork Teanaway River (Continued)								
AK	13,814	704			2,351.8			
AL	14,260	692			2,354.7			
AM	14,647	608			2,357.6			
AN	14,984	553			2,360.3			
AO	15,374	385			2,363.9			
AP	15,720	829			2,368.4			
AQ	16,089	751			2,371.3			
AR	16,378	858			2,372.7			
AS	16,881	808			2,375.6			
AT	17,205	701			2,377.1			
AU	17,633	665			2,380.4			
AV	17,993	612			2,383.1			
AW	18,312	321			2,387.0			
AX	18,426	700			2,391.4			
AY	18,771	540			2,392.7			
AZ	19,131	695			2,397.0			
BA	19,450	626			2,399.9			
BB	19,771	711			2,404.2			

[1] Feet above confluence with Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
North Fork Teanaway River (Continued)								
BC	20,161	562			2,409.9			
BD	20,535	399			2,416.1			
BE	20,913	696			2,419.6			
BF	21,300	499			2,423.4			
BG	21,725	472			2,428.7			
BH	22,187	448			2,433.7			
BI	22,570	488			2,437.3			
BJ	22,948	519			2,442.1			
BK	23,266	605			2,446.0			
BL	23,680	596			2,450.6			
BM	24,056	661			2,453.3			
BN	24,455	724			2459.0			
BO	24,793	566			2,463.8			
BP	25,100	604			2,468.3			
BQ	25,508	846			2,471.9			
BR	25,843	718			2,474.3			
BS	26,176	629			2,478.5			
BT	26,500	680			2,482.8			

[1] Feet above confluence with Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
North Fork Teanaway River (Continued)								
BU	26,889	792			2,488.3			
BV	27,290	753			2,493.9			
BW	27,611	633			2,498.4			
BX	28,028	731			2,505.3			
BY	28,376	646			2,510.2			
BZ	28,731	832			2,515.0			
CA	29,080	764			2,519.7			
CB	29,580	801			2,526.8			
CC	29,760	745			2,528.9			
CD	30,244	547			2,535.0			
CE	30,573	404			2,538.8			
CF	30,940	493			2,543.4			
CG	31,288	441			2,549.0			
CH	31,713	460			2,554.3			
CI	32,184	549			2,561.5			
CJ	32,931	539			2,572.0			
CK	33,300	741			2,578.2			
CL	33,625	625			2,582.7			

[1] Feet above confluence with Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
North Fork Teanaway River (Continued)								
CM	34,000	553			2,588.3			
CN	34,353	402			2,593.5			
CO	34,711	408			2,598.1			
CP	35,052	291			2,603.1			
CQ	35,415	316			2,608.1			
CR	35,800	497			2,614.3			
CS	36,137	435			2,620.3			

[1] Feet above confluence with Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Reecer Creek								
A	67	354	2,355	0.8	1,540.7	1,540.7	1,541.7	1.0
B	2,159	344	284	1.2	1,542.5	1,542.5	1,542.9	0.4
C	2,805	177	173	1.8	1,547.1	1,547.1	1,547.2	0.1
D	3,828	168	516	1.7	1,555.5	1,555.5	1,555.6	0.1
E	5,820	229	432	2.0	1,565.4	1,565.4	1,565.9	0.5
F	7,241	151	319	2.5	1,575.6	1,575.6	1,575.8	0.2
G	8,140	452	398	2.0	1,582.5	1,582.5	1,582.5	0.0
H	9,469	150	242	3.3	1,594.5	1,594.5	1,594.6	0.1
I	10,774	220	304	2.7	1,604.4	1,604.4	1,604.6	0.2

[1] Feet above University Way

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

REECER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[3]	MEAN VELOCITY (FEET PER SECOND)[3]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[3]	WITH FLOODWAY (FEET NAVD88)[3]	INCREASE (FEET)[3]
Silver Creek								
A	25	38			2,148.1			
B	390	28			2,154.8			
C	740	43			2,160.0			
D	1,104	25[2]			2,165.1			
E	1,333	150			2,170.2			
F	1,447	50			2,177.0			
G	1,516	124			2,181.0			
H	1,801	30			2,182.6			
I	2,163	29			2,189.2			
J	2,532	94			2,193.2			
K	2,857	131			2,198.2			
L	3,303	92			2,204.4			
M	3,652	76			2,208.8			
N	4,341	78			2,217.8			
O	4,674	90			2,222.6			
P	5,099	115			2,230.4			
Q	5,181	107			2,236.2			
R	5,436	108			2,236.4			
S	5,879	92			2,240.6			

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

SILVER CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
Silver Creek (Continued)								
T	6,358	88			2,248.3			
U	6,646	99			2,254.1			
V	7,053	64			2,261.1			

[1] Feet above confluence with Yakima River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

SILVER 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River								
A	551	176[2]	4,246	1.73	1,826.3[3]	1,819.5[3]	1,820.3[3]	0.8
B	717	360	3,200	2.30	1,826.3[3]	1,823.1[3]	1,823.9[3]	0.8
C	1,149	320	2,200	3.34	1,826.3[3]	1,823.9[3]	1,824.7[3]	0.8
D	1,578	123[2]	1,240	5.93	1,826.3[3]	1,826.0[3]	1,826.8[3]	0.8
E	1,953	133	863	8.51	1,827.4	1,827.4	1,827.9	0.5
F	2,403	222[2]	1,084	6.78	1,831.5	1,831.5	1,832.0	0.5
G	2,952	160	1,141	6.44	1,833.1	1,833.1	1,833.3	0.2
H	3,032	198	1,114	6.60	1,833.7	1,833.7	1,833.9	0.2
I	3,375	233[2]	994	7.40	1,835.3	1,835.3	1,835.5	0.2
J	3,837	164	926	7.94	1,837.0	1,837.0	1,837.3	0.3
K	4,239	155	698	10.54	1,840.2	1,840.2	1,840.3	0.1
L	4,679	170	749	9.82	1,844.7	1,844.7	1,844.8	0.1
M	4,982	170	897	8.20	1,846.8	1,846.8	1,847.1	0.3
N	5,423	270	1,299	5.66	1,849.4	1,849.4	1,849.5	0.1
O	5,670	260	1,095	6.71	1,850.2	1,850.2	1,850.4	0.2
P	5,858	200	918	8.00	1,851.3	1,851.3	1,851.6	0.3
Q	6,277	220	1,148	6.40	1,853.2	1,853.2	1,854.2	1.0
R	6,627	318	981	7.49	1,856.0	1,856.0	1,856.1	0.1
S	7,001	430	1,697	4.33	1,857.8	1,857.8	1,858.7	0.9

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Elevation Computed Without Consideration of Backwater Effects From Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
T	7,270	275	1,075	6.83	1,858.8	1,858.8	1,859.7	0.9
U	7,706	230	911	8.07	1,861.9	1,861.9	1,862.1	0.2
V	8,088	240	1,040	7.07	1,864.5	1,864.5	1,864.6	0.1
W	8,624	400	1,844	3.99	1,866.3	1,866.3	1,866.7	0.4
X	9,161	450	1,248	5.89	1,868.5	1,868.5	1,868.9	0.4
Y	9,726	390	1,395	5.27	1,872.0	1,872.0	1,872.5	0.5
Z	10,104	136	746	9.85	1,873.7	1,873.7	1,874.2	0.5
AA	10,410	163	798	9.21	1,876.5	1,876.5	1,877.0	0.5
AB	10,780	194	1,166	6.31	1,879.2	1,879.2	1,879.8	0.6
AC	11,194	306	961	7.65	1,881.1	1,881.1	1,881.7	0.6
AD	11,569	219	974	7.55	1,883.8	1,883.8	1,884.5	0.7
AE	11,999	286	898	8.18	1,887.6	1,887.6	1,887.6	0.0
AF	12,379	303	1,097	6.70	1,890.8	1,890.8	1,891.4	0.6
AG	12,804	306	932	7.88	1,894.4	1,894.4	1,894.5	0.1
AH	13,154	340	1,317	5.58	1,896.7	1,896.7	1,897.4	0.7
AI	13,580	388	1,560	4.71	1,898.9	1,898.9	1,899.0	0.1
AJ	13,860	400	1,195	6.15	1,899.8	1,899.8	1,900.1	0.3
AK	14,101	392	1,051	6.99	1,901.6	1,901.6	1,901.9	0.3
AL	14,414	290	1,015	7.24	1,904.4	1,904.4	1,904.7	0.3

[1] Feet above confluence with Yakima River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
AM	14,721	172[2]	913	7.56	1,906.6	1,906.6	1,907.0	0.4
AN	15,030	150	812	8.49	1,909.2	1,909.2	1,909.3	0.1
AO	15,518	154	850	7.26	1,912.2	1,912.2	1,912.4	0.2
AP	15,948	155	828	8.34	1,914.4	1,914.4	1,914.6	0.2
AQ	16,336	348[2/3]	823	8.39	1,917.2	1,917.2	1,917.7	0.5
AR	16,757	209	870	7.93	1,920.7	1,920.7	1,921.1	0.4
AS	17,053	172	804	8.58	1,922.8	1,922.8	1,923.2	0.4
AT	17,566	213	882	7.83	1,926.9	1,926.9	1,927.2	0.3
AU	17,902	479	1,864	3.70	1,929.1	1,929.1	1,929.4	0.3
AV	18,694	312	877	7.86	1,933.0	1,933.0	1,933.5	0.5
AW	19,027	279	968	7.13	1,936.7	1,936.7	1,937.1	0.4
AX	19,304	261	1,125	6.13	1,938.7	1,938.7	1,938.8	0.1
AY	19,553	291	1,246	5.54	1,939.8	1,939.8	1,939.9	0.1
AZ	19,826	228	995	6.93	1,940.7	1,940.7	1,940.8	0.1
BA	20,108	256[2]	977	7.06	1,943.0	1,943.0	1,943.1	0.1
BB	20,438	161	969	7.12	1,945.5	1,945.5	1,946.3	0.8
BC	20,875	259	1,129	6.11	1,948.4	1,948.4	1,949.1	0.7
BD	21,256	267	856	8.06	1,950.8	1,950.8	1,951.4	0.6
BE	21,632	317[2]	1,560	4.42	1,953.8	1,953.8	1,954.5	0.7

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] This width excludes islands

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
BF	22,061	221[2]	665	10.40	1,956.3	1,956.3	1,956.3	0.0
BG	22,270	423[2]	2,912	2.37	1,962.9	1,962.9	1,963.0	0.1
BH	22,604	312	1,816	3.80	1,963.0	1,963.0	1,963.1	0.1
BI	22,999	425[2/3]	1,581	4.36	1,963.3	1,963.3	1,963.8	0.5
BJ	23,397	363[3]	1,126	6.13	1,965.5	1,965.5	1,965.8	0.3
BK	23,760	408[3]	1,316	5.24	1,968.6	1,968.6	1,969.2	0.6
BL	24,143	390[3]	903	7.64	1,971.8	1,971.8	1,971.9	0.1
BM	24,541	300[3]	1,282	5.38	1,974.9	1,974.9	1,975.0	0.1
BN	24,913	330[3]	820	8.42	1,977.4	1,977.4	1,977.6	0.2
BO	25,290	490[3]	1,543	4.47	1,981.6	1,981.6	1,982.4	0.8
BP	25,706	640[3]	1,331	5.18	1,985.2	1,985.2	1,985.2	0.0
BQ	26,016	530[3]	1,367	5.05	1,987.5	1,987.5	1,987.6	0.1
BR	26,349	562	1,541	4.47	1,989.2	1,989.2	1,989.7	0.5
BS	26,808	320	983	7.02	1,992.7	1,992.7	1,993.0	0.3
BT	27,188	300	1,244	5.55	1,995.5	1,995.5	1,995.9	0.4
BU	27,591	277	918	7.52	1,997.9	1,997.9	1,998.3	0.4
BV	27,950	250	932	7.40	2,001.0	2,001.0	2,001.7	0.7
BW	28,376	285	1,205	5.72	2,004.0	2,004.0	2,004.9	0.9
BX	28,761	240	827	8.35	2,006.8	2,006.8	2,007.2	0.4

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] This width excludes islands

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
BY	29,185	245[2]	1,325	5.21	2,009.8	2,009.8	2,010.5	0.7
BZ	29,568	390	1,280	5.39	2,011.9	2,011.9	2,012.2	0.3
CA	29,921	340[2]	1,144	6.03	2,013.8	2,013.8	2,014.2	0.4
CB	30,302	363[2]	1,243	5.55	2,016.4	2,016.4	2,016.5	0.1
CC	30,664	442[2]	1,169	5.90	2,018.0	2,018.0	2,018.5	0.5
CD	31,065	310	1,043	6.61	2,020.3	2,020.3	2,021.1	0.8
CE	31,413	352	1,227	5.62	2,023.0	2,023.0	2,023.4	0.4
CF	31,777	400	1,109	6.22	2,025.2	2,025.2	2,025.7	0.5
CG	32,176	350	1,156	5.97	2,028.0	2,028.0	2,028.5	0.5
CH	32,491	410	946	7.29	2,030.7	2,030.7	2,031.1	0.4
CI	32,961	530	1,589	4.34	2,034.4	2,034.4	2,035.1	0.7
CJ	33,523	598	1,575	4.38	2,036.8	2,036.8	2,037.5	0.7
CK	33,929	533[2]	1,238	5.57	2,039.5	2,039.5	2,039.7	0.2
CL	34,327	216[2]	864	7.98	2,042.2	2,042.2	2,042.8	0.6
CM	34,708	425	1,565	4.41	2,044.6	2,044.6	2,045.6	1.0
CN	35,054	591	1,353	4.10	2,047.3	2,047.3	2,047.5	0.2
CO	35,461	673	1,723	4.01	2,049.8	2,049.8	2,050.5	0.7
CP	35,891	427	1,307	5.28	2,052.0	2,052.0	2,052.9	0.9
CQ	36,202	230	896	7.70	2,054.4	2,054.4	2,055.1	0.7

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
CR	36,578	313	1,081	6.38	2,058.4	2,058.4	2,058.8	0.4
CS	37,061	320	1,336	5.16	2,061.5	2,061.5	2,062.4	0.9
CT	37,439	273[2]	1,401	4.92	2,063.8	2,063.8	2,064.2	0.4
CU	37,881	141[2]	881	7.93	2,066.7	2,066.7	2,067.1	0.4
CV	38,236	310[2]	1,317	5.24	2,069.4	2,069.4	2,070.3	0.9
CW	38,604	292	1,107	6.23	2,072.3	2,072.3	2,072.5	0.2
CX	39,076	390	1,542	4.47	2,075.3	2,075.3	2,075.4	0.1
CY	39,465	295	1,032	6.69	2,077.4	2,077.4	2,077.5	0.1
CZ	39,831	360	1,162	5.94	2,080.5	2,080.5	2,080.8	0.3
DA	40,226	398	1,581	4.36	2,082.6	2,082.6	2,083.0	0.4
DB	40,582	306	1,102	6.26	2,084.3	2,084.3	2,084.6	0.3
DC	40,934	294	1,626	5.91	2,086.5	2,086.5	2,087.3	0.8
DD	41,312	144[2]	809	4.24	2,088.4	2,088.4	2,089.2	0.8
DE	41,704	294[2]	1,503	8.53	2,091.0	2,091.0	2,091.3	0.3
DF	42,094	432[2]	1,329	4.59	2,095.2	2,095.2	2,095.3	0.1
DG	42,432	417	1,090	5.19	2,096.3	2,096.3	2,096.5	0.2
DH	42,884	310	1,041	6.33	2,099.1	2,099.1	2,099.2	0.1
DI	43,175	355[2]	1,041	6.63	2,101.7	2,101.7	2101.8	0.1
DJ	43,561	225[2]	1,109	6.22	2,104.8	2,104.8	2105.1	0.3

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
DK	44,004	258[2]	1,175	5.87	2,107.8	2,107.8	2108.2	0.4
DL	44,464	320	1,167	5.91	2,111.2	2,111.2	2111.5	0.3
DM	44,804	226[2]	1,254	5.50	2,113.0	2,113.0	2,113.6	0.6
DN	45,173	294[2]	1,022	6.75	2,115.4	2,115.4	2,115.9	0.5
DO	45,483	385[2]	1,257	5.49	2,118.0	2,118.0	2,118.2	0.2
DP	45,876	443[2]	1,290	5.00	2,120.3	2,120.3	2,120.7	0.4
DQ	46,206	512	1,073	6.01	2,123.3	2,123.3	2,123.4	0.1
DR	46,613	473[2]	1,448	4.46	2,127.1	2,127.1	2,127.5	0.4
DS	47,030	550	1,375	4.69	2,130.2	2,130.2	2,130.8	0.6
DT	47,418	630	2,074	3.11	2,132.8	2,132.8	2,133.6	0.8
DU	47,824	580	1,626	3.97	2,134.8	2,134.8	2,135.6	0.8
DV	48,136	545[2]	1,425	4.52	2,137.0	2,137.0	2,137.8	0.8
DW	48,539	516[2]	1,593	4.05	2,140.3	2,140.3	2,141.0	0.7
DX	48,929	440	1,602	4.03	2,142.9	2,142.9	2,143.2	0.3
DY	49,180	459[2]	1,394	4.63	2,144.3	2,144.3	2,144.6	0.3
DZ	48,567	470[2]	1,267	5.09	2,147.1	2,147.1	2,147.4	0.3
EA	49,944	439[2]	1,162	5.55	2,150.5	2,150.5	2,150.9	0.4
EB	50,264	528	1,712	3.77	2,152.9	2,152.9	2,153.2	0.3
EC	50,683	363	1,182	5.46	2,155.6	2,155.6	2,156.2	0.6

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
ED	51,052	286[2]	1,361	4.74	2,158.5	2,158.5	2,159.4	0.9
EE	51,426	268	1,084	5.95	2,161.4	2,161.4	2,161.7	0.3
EF	51,791	312	1,554	4.15	2,163.6	2,163.6	2,163.7	0.1
EG	52,151	252[2]	1,156	5.58	2,164.8	2,164.8	2,164.9	0.1
EH	52,443	217	1,373	4.70	2,165.9	2,165.9	2,166.2	0.3
EI	52,876	505[2]	1,456	4.43	2,167.2	2,167.2	2,167.6	0.4
EJ	53,290	497[2]	985	6.55	2,169.8	2,169.8	2,170.3	0.5
EK	53,674	399[2]	1,492	4.32	2,173.5	2,173.5	2,174.2	0.7
EL	54,043	340	1,876	3.44	2,175.0	2,175.0	2,175.8	0.8
EM	54,392	318[2]	1,615	3.99	2,176.0	2,176.0	2,176.8	0.8
EN	54,706	284	840	7.68	2,179.1	2,179.1	2,179.5	0.4
EO	55,133	318[2]	1,530	4.22	2,183.4	2,183.4	2,184.1	0.7
EP	55,497	251	972	6.63	2,185.4	2,185.4	2,185.9	0.5
EQ	55,840	420	1,226	5.26	2,189.1	2,189.1	2,189.2	0.1
ER	56,276	467[2]	1,354	4.77	2,192.4	2,192.4	2,193.3	0.9
ES	56,564	519[2]	979	6.59	2,195.4	2,195.4	2,195.8	0.4
ET	56,940	710[2]	1,419	4.55	2,198.8	2,198.8	2,199.0	0.2
EU	57,241	399[2]	967	3.41	2,200.1	2,200.1	2,200.3	0.2
EV	57,595	376[2/3]	703	4.69	2,201.5	2,201.5	2,201.7	0.2

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] This width excludes islands

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Teanaway River (Continued)								
EW	58,295	355[3]	1,248	2.64	2,205.4	2,205.4	2,205.6	0.2
EX	58,650	259[3]	709	4.66	2,207.0	2,207.0	2,207.3	0.3
EY	59,022	300[3]	684	4.83	2,210.0	2,210.0	2,210.3	0.3
EZ	59,405	179[3]	853	3.87	2,213.0	2,213.0	2,213.2	0.2
FA	59,836	149[3]	485	6.81	2,218.5	2,218.5	2,218.7	0.2
FB	60,208	280	1,233	2.68	2,222.0	2,222.0	2,222.6	0.6
FC	60,648	203[2]	603	5.47	2,224.5	2,224.5	2,224.8	0.3
FD	60,986	194[2]	669	4.93	2,227.5	2,227.5	2,227.9	0.4
FE	61,407	140[2/3]	655	5.04	2,231.1	2,231.1	2,231.2	0.1
FF	61,851	208	803	4.11	2,235.3	2,235.3	2,235.3	0.0
FG	62,327	183	*	*	2,239.5	*	*	*
FH	62,780	299	*	*	2,243.0	*	*	*
FI	63,067	433	*	*	2,246.1	*	*	*

[1] Feet above confluence with Yakima River

[2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] This width excludes islands

* Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
West Fork Teanaway River								
A	160	179			2,252.1			
B	492	193			2,252.6			
C	829	248			2,254.7			
D	1,251	149			2,259.2			
E	1,657	127			2,261.4			
F	2,020	317			2,266.0			
G	2,293	136			2,267.7			
H	2,391	406			2,271.7			
I	2,768	113			2,272.3			
J	3,128	85			2,275.9			
K	3,528	135			2,279.4			
L	3,826	150			2,280.6			
M	4,203	138			2,283.5			
N	4,569	119			2,287.8			
O	4,920	102			2,291.0			
P	5,272	122			2,294.1			
Q	5,560	80			2,296.1			
R	5,933	353			2,301.7			
S	6,432	133			2,308.7			
T	6,940	133			2,314.2			

[1] Feet from confluence with Teanaway River and Middle Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
West Fork Teanaway River (Continued)								
U	7,625	243			2,319.3			
V	8,262	516			2,324.7			
W	8,511	191			2,327.8			
X	8,925	321			2,332.8			
Y	9,140	91			2,336.3			
Z	9,640	222			2,341.4			
AA	9,876	261			2,343.0			
AB	10,371	199			2,348.0			
AC	10,734	156			2,351.0			
AD	11,081	214			2,355.8			
AE	11,450	297			2,359.7			
AF	11,780	166			2,362.9			
AG	12,131	109			2,367.8			
AH	12,507	287			2,372.7			
AI	13,130	264			2,379.6			
AJ	13,432	202			2,382.6			
AK	14,267	275			2,389.9			
AL	14,835	222			2,395.8			
AM	15,175	254			2,400.7			
AN	15,556	365			2,405.5			

[1] Feet from confluence with Teanaway River and Middle Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
West Fork Teanaway River (Continued)								
AO	15,906	277			2,409.7			
AP	16,292	122			2,413.8			
AQ	16,608	141			2,410.3			
AR	16,980	235			2,414.8			
AS	17,368	326			2,419.7			
AT	17,707	285			2,425.0			
AU	18,060	287			2,430.9			
AV	18,409	235			2,437.5			
AW	18,791	252			2,446.9			
AX	19,116	381			2,450.4			
AY	19,478	587			2,455.7			
AZ	19,847	276			2,459.9			
BA	20,175	397			2,464.2			
BB	20,465	517			2,468.7			
BC	20,825	144			2,472.7			
BD	21,161	140			2,476.1			
BE	21,534	373			2,480.0			
BF	22,142	178			2,484.6			
BG	22,725	341			2,491.4			
BH	23,055	327			2,496.1			

[1] Feet from confluence with Teanaway River and Middle Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[2]	MEAN VELOCITY (FEET PER SECOND)[2]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[2]	WITH FLOODWAY (FEET NAVD88)[2]	INCREASE (FEET)[2]
West Fork Teanaway River (Continued)								
BI	23,428	189			2,501.8			
BJ	23,768	187			2,504.8			
BK	23,845	235			2,506.0			
BL	24,165	187			2,509.5			
BM	24,550	270			2,513.7			
BN	25,002	374			2,518.8			
BO	25,457	216			2,523.3			
BP	25,800	297			2,527.5			
BQ	26,196	359			2,534.3			
BR	26,550	458			2,540.0			
BS	26,969	455			2,545.2			
BT	27,469	208			2,552.1			
BU	27,866	308			2,556.3			
BV	28,172	461			2,561.4			
BW	28,500	292			2,565.1			
BX	28,910	331			2,571.1			
BY	29,209	256			2,576.5			
BZ	29,532	325			2,580.3			
CA	29,845	292			2,585.1			
CB	30,168	322			2,590.9			

[1] Feet from confluence with Teanaway River and Middle Fork Teanaway River

[2] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK TEANAWAY RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)[3]	MEAN VELOCITY (FEET PER SECOND)[3]	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)[3]	WITH FLOODWAY (FEET NAVD88)[3]	INCREASE (FEET)[3]
West Fork Teanaway River (Continued)								
CC	30,520	257			2,594.7			
CD	30,869	111			2,600.9			
CE	31,140	158			2,604.9			
CF	31,660	113			2,610.4			
CG	31,940	94			2,614.2			
CH	32,024	83[2]			2,614.7			
CI	32,489	259[2]			2,620.5			
CJ	32,849	154			2,624.5			
CK	33,207	154[2]			2,628.8			
CL	33,603	196[2]			2,633.1			
CM	33,920	151[2]			2,638.0			
CN	34,332	297[2]			2,643.8			
CO	34,645	210			2,648.1			
CP	34,970	210[2]			2,654.2			
CQ	35,387	179[2]			2,659.9			
CR	35,785	150[2]			2,667.2			
CS	36,131	227[2]			2,674.3			
CT	36,464	152[2]			2,680.3			
CU	36,935	663			2,687.8			

[1] Feet from confluence with Teanaway River and Middle Fork Teanaway River [2] Mapped floodway width does not match model. Figure depicts the mapped floodway width.

[3] Data not available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

WEST FORK TEANAWAY 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River								
A	-1,278	570	5,635	6.02	1,423.4	1,423.4	1,424.3	0.9
B	-683	560	5,261	6.44	1,424.2	1,424.2	1,425.0	0.8
C	-178	610	5,853	5.79	1,425.3	1,425.3	1,425.8	0.5
D	511	400	3,618	8.93	1,426.4	1,426.4	1,426.8	0.4
E	681	400	3,452	9.36	1,426.8	1,426.8	1,427.4	0.6
F	1,153	360	3,664	8.82	1,428.2	1,428.2	1,428.8	0.6
G	1,602	370	3,724	8.67	1,429.4	1,429.4	1,429.8	0.4
H	2,069	435	4,789	6.74	1,430.7	1,430.7	1,431.3	0.6
I	2,547	480	4,749	6.80	1,431.4	1,431.4	1,432.0	0.6
J	3,083	580	5,973	5.41	1,432.4	1,432.4	1,433.1	0.7
K	3,612	820	6,488	4.98	1,433.0	1,433.0	1,433.7	0.7
L	4,099	1,140	7,949	4.06	1,434.1	1,434.1	1,434.5	0.4
M	4,672	1,200	9,112	3.54	1,434.7	1,434.7	1,435.2	0.5
N	5,272	1,580	9,381	3.44	1,435.2	1,435.2	1,435.8	0.6
O	5,692	1,780	9,291	3.48	1,435.6	1,435.6	1,436.3	0.7
P	6,082	1,760	8,784	3.68	1,436.1	1,436.1	1,436.9	0.8
Q	6,526	1,740	7,948	4.06	1,436.8	1,436.8	1,437.6	0.8
R	6,950	1,740	8,057	4.01	1,437.6	1,437.6	1,438.4	0.8
S	7,550	1,930	12,168	2.65	1,438.4	1,438.4	1,439.4	1.0
T	8,065	1,800	9,591	3.37	1,438.8	1,438.8	1,439.8	1.0

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
U	8,625	1,640	6,933	4.66	1,439.4	1,439.4	1,440.4	1.0
V	8,980	1,740	8,714	3.71	1,440.2	1,440.2	1,441.1	0.9
W	9,559	2,030	9,473	3.41	1,441.6	1,441.6	1,441.9	0.3
X	10,119	2,020	8,989	3.58	1,442.2	1,442.2	1,442.6	0.4
Y	10,582	1,700	7,403	4.34	1,442.9	1,442.9	1,443.3	0.4
Z	11,102	1,720	6,471	4.97	1,444.1	1,444.1	1,444.7	0.6
AA	11,666	1,780	6,307	5.10	1,445.7	1,445.7	1,446.5	0.8
AB	12,168	2,060	8,129	3.96	1,447.3	1,447.3	1,448.3	1.0
AC	12,691	2,340	9,416	3.41	1,448.8	1,448.8	1,449.4	0.6
AD	13,217	2,280	6,689	4.81	1,450.1	1,450.1	1,450.5	0.4
AE	13,595	2,550[2]	7,586	4.24	1,451.3	1,451.3	1,451.8	0.5
AF	14,378	2,600[2]	6,666	4.82	1,454.1	1,454.1	1,454.2	0.1
AG	14,696	2,920[2]	8,492	3.79	1,455.0	1,455.0	1,455.7	0.7
AH	15,116	2,600[2]	7,742	4.15	1,456.2	1,456.2	1,457.2	1.0
AI	15,516	2,460[2]	8,058	3.99	1,457.8	1,457.8	1,458.7	0.9
AJ	15,737	2,210[2]	6,763	4.75	1,458.9	1,458.9	1,459.6	0.7
AK	16,137	2,300	6,048	5.32	1,461.2	1,461.2	1,461.8	0.6
AL	16,537	2,200	6,984	4.60	1,463.3	1,463.3	1,464.0	0.7
AM	16,817	2,100	7,805	4.12	1,464.2	1,464.2	1,465.2	1.0
AN	17,308	1,900	7,551	4.26	1,465.6	1,465.6	1,466.5	0.9

[1] Feet above confluence with Wilson Creek

[2] This width excludes islands

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
AO	17,731	1,850	6,582	4.88	1,466.9	1,466.9	1,467.7	0.8
AP	18,290	1,950	6,468	4.97	1,468.6	1,468.6	1,469.5	0.9
AQ	18,834	2,000	8,177	3.93	1,470.4	1,470.4	1,471.3	0.9
AR	19,092	2,270	6,710	3.69	1,470.7	1,470.7	1,471.7	1.0
AS	19,603	2,380	10,013	3.21	1,471.7	1,471.7	1,472.7	1.0
AT	20,061	2,290	8,158	3.94	1,472.7	1,472.7	1,473.6	0.9
AU	20,461	2,240	7,294	4.41	1,473.9	1,473.9	1,474.7	0.8
AV	20,941	2,600	8,399	3.83	1,475.6	1,475.6	1,476.3	0.7
AW	21,407	2,870	8,744	3.68	1,476.9	1,476.9	1,477.5	0.6
AX	22,053	3,110	9,252	3.47	1,478.8	1,478.8	1,479.6	0.8
AY	22,621	3,230	9,985	3.22	1,480.1	1,480.1	1,481.1	1.0
AZ	23,167	2,930	7,937	4.05	1,481.6	1,481.6	1,482.5	0.9
BA	23,810	2,300	7,906	4.07	1,483.8	1,483.8	1,484.8	1.0
BB	24,230	1,940	7,120	4.52	1,485.3	1,485.3	1,486.2	0.9
BC	25,195	1,780	7,439	4.32	1,488.7	1,488.7	1,489.1	0.4
BD	25,744	1,600	7,186	4.47	1,489.8	1,489.8	1,490.6	0.8
BE	26,267	1,400	5,582	5.76	1,491.4	1,491.4	1,492.3	0.9
BF	26,706	1,430	5,626	5.71	1,494.0	1,494.0	1,494.5	0.5
BG	27,409	1,770	6,911	4.65	1,496.6	1,496.6	1,497.4	0.8

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
BH	27,884	1,890	7,468	4.31	1,497.8	1,497.8	1,498.8	1.0
BI	28,536	1,960	6,476	7.96	1,499.9	1,499.9	1,500.8	0.9
BJ	29,264	1,520	5,008	6.42	1,503.5	1,503.5	1,503.8	0.3
BK	29,848	1,130	7,940	4.05	1,506.1	1,506.1	1,506.4	0.3
BL	30,279	1,230	9,018	3.55	1,506.4	1,506.4	1,506.9	0.5
BM	30,670	1,370	6,876	4.65	1,506.8	1,506.8	1,507.4	0.6
BN	31,035	1,420	11,282	2.94	1,508.5	1,508.5	1,509.4	0.9
BO	31,587	1,460	9,354	3.42	1,508.8	1,508.8	1,509.8	1.0
BP	31,995	1,380	7,438	4.30	1,509.2	1,509.2	1,510.1	0.9
BQ	32,557	1,200	5,829	5.49	1,510.5	1,510.5	1,511.2	0.7
BR	33,156	1,020	6,018	5.32	1,512.4	1,512.4	1,513.2	0.8
BS	33,699	800	4,145	7.72	1,514.2	1,514.2	1,514.9	0.7
BT	34,313	949	6,272	5.10	1,516.9	1,516.9	1,517.7	0.8
BU	34,573	1,120	7,205	4.44	1,517.5	1,517.5	1,518.3	0.8
BV	35,033	1,400	7,272	4.40	1,518.4	1,518.4	1,519.0	0.6
BW	35,719	1,440	8,948	3.58	1,519.8	1,519.8	1,520.1	0.3
BX	36,319	1,470	8,773	3.65	1,520.7	1,520.7	1,520.9	0.2
BY	36,859	1,440	7,764	4.12	1,521.5	1,521.5	1,521.6	0.1
BZ	37,415	1,060	6,249	5.12	1,522.6	1,522.6	1,523.6	1.0

[1] Feet above confluence with Wilson 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
CA	38,090	912	3,488	9.17	1,526.5	1,526.5	1,526.5	0.0
CB	38,856	789	6,541	4.89	1,530.0	1,530.0	1,530.0	0.0
CC	39,549	584	5,607	5.60	1,530.5	1,530.5	1,530.7	0.2
CD	40,187	530	4,372	7.18	1,531.3	1,531.3	1,531.4	0.1
CE	40,736	460	3,798	8.27	1,532.4	1,532.4	1,532.7	0.3
CF	41,252	364	3,262	9.63	1,533.6	1,533.6	1,534.0	0.4
CG	41,823	490	4,402	7.13	1,535.6	1,535.6	1,536.1	0.5
CH	42,446	730	6,026	5.21	1,537.0	1,537.0	1,537.5	0.5
CI	42,911	710	3,813	8.23	1,537.5	1,537.5	1,538.0	0.5
CJ	43,369	710	5,027	6.25	1,539.2	1,539.2	1,540.1	0.9
CK	43,732	540	3,820	8.22	1,539.9	1,539.9	1,540.7	0.8
CL	44,150	390	4,142	7.58	1,541.4	1,541.4	1,542.4	1.0
CM	44,347	363	3,352	9.37	1,542.8	1,542.8	1,543.2	0.4
CN	44,953	670	6,886	4.56	1,544.7	1,544.7	1,545.1	0.4
CO	45,437	620[2]	5,594	5.61	1,545.1	1,545.1	1,545.5	0.4
CP	45,899	500[2]	3,438	9.13	1,545.8	1,545.8	1,546.1	0.3
CQ	46,329	880	7,484	4.20	1,547.3	1,547.3	1,548.2	0.9
CR	46,815	970	7,807	4.02	1,547.8	1,547.8	1,548.7	0.9
CS	47,304	1,060	7,375	3.99	1,548.3	1,548.3	1,549.3	1.0

[1] Feet above confluence with Wilson Creek

[2] This width excludes islands

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
CT	47,834	970	7,217	4.35	1,548.9	1,548.9	1,549.8	0.9
CU	48,332	740	4,990	6.29	1,549.8	1,549.8	1,550.6	0.8
CV	48,851	540	3,884	8.08	1,551.5	1,551.5	1,552.2	0.7
CW	49,881	400	3,154	9.96	1,553.5	1,553.5	1,554.2	0.7
CX	49,952	470	3,589	8.75	1,556.7	1,556.7	1,557.5	0.8
CY	50,413	600	3,780	8.31	1,558.2	1,558.2	1,559.1	0.9
CZ	50,946	661	3,601	8.25	1,561.0	1,561.0	1,561.4	0.4
DA	51,587	775	4,159	7.14	1,563.4	1,563.4	1,563.8	0.4
DB	52,012	921	4,802	6.18	1,565.2	1,565.2	1,565.3	0.1
DC	52,475	1,120	4,174	7.12	1,566.5	1,566.5	1,566.6	0.1
DD	52,875	1,200	5,569	5.55	1,568.0	1,568.0	1,568.5	0.5
DE	53,412	1,320	6,419	4.81	1,569.3	1,569.3	1,570.0	0.7
DF	53,762	1,430	6,993	4.42	1,570.0	1,570.0	1,570.8	0.8
DG	54,302	1,350	7,806	3.96	1,571.0	1,571.0	1,571.8	0.8
DH	54,878	1,280	9,004	3.43	1,571.9	1,571.9	1,572.7	0.8
DI	55,368	1,130	6,691	4.62	1,572.6	1,572.6	1,573.3	0.7
DJ	55,664	1,000	4,408	7.01	1,573.2	1,573.2	1,573.9	0.7
DK	56,174	1,010	5,211	5.93	1,575.7	1,575.7	1,576.5	0.8
DL	56,682	660	4,118	7.50	1,577.5	1,577.5	1,578.3	0.8

[1] Feet above confluence with Wilson 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
DM	57,350	680	4,714	6.55	1,580.1	1,580.1	1,580.8	0.7
DN	57,955	620	3,981	7.76	1,581.8	1,581.8	1,582.5	0.7
DO	58,519	850	5,184	5.96	1,583.8	1,583.8	1,584.6	0.8
DP	59,010	1,080	5,730	5.39	1,585.0	1,855.0	1,855.8	0.8
DQ	59,423	1,320	6,606	4.68	1,586.5	1,586.5	1,587.0	0.5
DR	59,874	1,420	6,873	4.50	1,587.4	1,587.4	1,588.1	0.7
DS	60,324	1,460	6,162	5.01	1,588.3	1,588.3	1,589.1	0.8
DT	60,852	1,600	6,878	4.49	1,589.5	1,589.5	1,590.5	1.0
DU	61,413	1,270	5,127	6.03	1,591.3	1,591.3	1,592.0	0.7
DV	61,918	1,020	5,084	6.08	1,593.2	1,593.2	1,593.5	0.3
DW	62,393	790	4,347	7.11	1,594.5	1,594.5	1,594.9	0.4
DX	62,918	780	3,756	8.23	1,596.1	1,596.1	1,596.6	0.5
DY	63,223	860	3,979	7.76	1,597.6	1,597.6	1,598.2	0.6
DZ	63,343	420	3,530	8.75	1,598.9	1,598.9	1,599.3	0.4
EA	63,787	600	7,125	4.34	1,602.6	1,602.6	1,602.7	0.1
EB	64,166	400	4,224	7.32	1,602.6	1,602.6	1,602.8	0.2
EC	64,468	1,670	17,631	1.75	1,605.1	1,605.1	1,605.2	0.1
ED	65,166	2,010	14,158	2.18	1,605.2	1,605.2	1,605.4	0.2
EE	65,569	1,920	9,977	3.10	1,605.3	1,605.3	1,605.5	0.2

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
EF	66,260	1,830	7,130	4.3	1,606.0	1,606.0	1,606.5	0.5
EG	66,679	1,730	7,948	3.9	1,606.7	1,606.7	1,607.4	0.7
EH	67,384	351	2,270	11.8	1,608.6	1,608.6	1,609.2	0.6
EI	68,004	475	4,351	6.2	1,612.9	1,612.9	1,612.9	0.0
EJ	68,867	339	3,182	8.4	1,613.6	1,613.6	1,614.1	0.5
EK	70,918	700	5,883	4.6	1,620.1	1,620.1	1,620.6	0.5
EL	73,010	572	5,990	4.5	1,631.0	1,631.0	1,631.2	0.2
EM	74,338	442	3,427	7.8	1,632.0	1,632.0	1,632.4	0.4
EN	76,592	232	3,327	8.1	1,638.8	1,638.8	1,639.0	0.2
EO	78,671	502	7,637	3.5	1,641.0	1,641.0	1,641.9	0.9
EP	80,191	190	2,564	10.5	1,648.7	1,648.7	1,648.8	0.1
EQ	81,108	360	3,405	7.9	1,651.4	1,651.4	1,651.4	0.0
ER	82,784	850	5,731	4.7	1,654.6	1,654.6	1,654.9	0.3
ES	84,289	382	6,294	4.3	1,656.0	1,656.0	1,656.7	0.7
ET	85,663	468	2,305	11.6	1,659.4	1,659.4	1,659.4	0.0
EU	87,120	382	3,350	8.0	1,665.2	1,665.2	1,665.7	0.5
EV	88,506	355	3,002	8.9	1,668.6	1,668.6	1,669.1	0.5
EW	90,059	252	2,884	9.3	1,672.8	1,672.8	1,673.5	0.7
EX	91,394	245	2,058	13.0	1,676.7	1,676.7	1,677.0	0.3

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
EY	93,691	364	3,174	8.5	1,681.7	1,681.7	1,682.0	0.3
EZ	95,385	635	4,442	6.0	1,687.1	1,687.1	1,687.2	0.1
FA	96,944	437	3,741	7.2	1,691.0	1,691.0	1,691.4	0.4
FB	98,544	488	3,034	8.8	1,694.1	1,694.1	1,695.1	1.0
FC	148,015	188	2,244	12.97	1,810.7	1,810.7	1,811.6	0.9
FD	148,506	210	2,792	10.42	1,813.9	1,813.9	1,814.8	0.9
FE	148,895	230	3,235	9.0	1,815.4	1,815.4	1,816.4	1.0
FF	149,261	230	3,309	8.8	1,816.3	1,816.3	1,817.3	1.0
FG	149,712	215	3,210	9.06	1,817.3	1,817.3	1,818.3	1.0
FH	150,069	215	3,315	8.78	1,818.2	1,818.2	1,819.2	1.0
FI	150,496	168	2,709	8.9	1,818.3	1,818.3	1,818.7	0.4
FJ	152,230	334	3,842	6.3	1,822.6	1,822.6	1,822.8	0.2
FK	153,139	405	4,348	4.6	1,824.1	1,824.1	1,824.5	0.4
FL	154,327	340	3,342	5.9	1,824.9	1,824.9	1,825.5	0.6
FM	156,333	753	5,437	3.6	1,829.0	1,829.0	1,829.5	0.5
FN	157,271	759	4,357	4.6	1,830.2	1,830.2	1,830.9	0.7
FO	158,397	1,040	5,887	3.4	1,832.9	1,832.9	1,833.6	0.7
FP	160,080	1,656	7,115	2.8	1,835.1	1,835.1	1,835.7	0.6
FQ	163,153	1,528	8,393	2.4	1,842.1	1,842.1	1,842.3	0.2

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
FR	164,901	1,520	6,195	3.2	1,844.5	1,844.5	1,845.1	0.6
FS	166,400	940	4,691	4.2	1,848.0	1,848.0	1,849.0	1.0
FT	168,123	1,285	6,301	3.1	1,852.0	1,852.0	1,852.8	0.8
FU	170,044	569	3,559	5.6	1,857.1	1,857.1	1,857.6	0.5
FV	171,758	435	2,891	6.9	1,860.7	1,860.7	1,861.3	0.6
FW	172,747	520	3,603	5.5	1,863.4	1,863.4	1,864.1	0.7
FX	174,349	600	4,580	4.3	1,867.1	1,867.1	1,867.7	0.6
FY	175,740	400	3,174	6.2	1,869.3	1,869.3	1,870.3	1.0
FZ	177,080	405	3,742	5.3	1,874.4	1,874.4	1,874.6	0.2
GA	178,600	955	4,483	4.4	1,877.9	1,877.9	1,878.2	0.3
GB	181,165	1,081	5,054	3.9	1,883.8	1,883.8	1,884.0	0.2
GC	182,345	998	4,782	4.1	1,886.9	1,886.9	1,886.9	0.1
GD	183,029	877	5,009	4.0	1,887.9	1,887.9	1,887.9	0.0
GE	184,530	562	3,423	5.8	1,895.2	1,895.2	1,895.5	0.3
GF	186,225	350	2,663	7.4	1,899.8	1,899.8	1,900.3	0.5
GG	189,131	706	4,069	4.9	1,908.5	1,908.5	1,909.1	0.6
GH	190,421	273	2,554	7.8	1,910.7	1,910.7	1,911.7	1.0
GI	191,271	288	2,902	6.8	1,913.5	1,913.5	1,913.9	0.4
GJ	192,382	280	2,510	7.6	1,916.5	1,916.5	1,916.5	0.0

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
GK	192,913	281	2,432	7.9	1,917.4	1,917.4	1,917.7	0.3
GL	193,605	293	3,100	6.2	1,919.6	1,919.6	1,920.4	0.9
GM	194,291	274	2,078	9.2	1,920.5	1,920.5	1,921.0	0.5
GN	196,006	225	1,656	11.6	1,925.9	1,925.9	1,926.2	0.3
GO	197,251	260	2,667	7.2	1,931.3	1,931.3	1,932.0	0.7
GP	198,436	283	2,644	7.3	1,933.4	1,933.4	1,934.1	0.8
GQ	199,974	252	2,099	9.1	1,937.6	1,937.6	1,937.6	0.0
GR	200,819	282	2,598	7.4	1,940.2	1,940.2	1,940.5	0.3
GS	201,660	156	1,578	12.2	1,941.8	1,941.8	1,942.2	0.4
GT	202,900	300	3,004	6.4	1,946.9	1,946.9	1,947.6	0.7
GU	204,276	320	2,202	8.7	1,949.7	1,949.7	1,950.3	0.6
GV	204,876	349	2,387	8.0	1,953.0	1,953.0	1,953.0	0.0
GW	206,098	309	2,828	6.8	1,956.6	1,956.6	1,956.8	0.2
GX	206,961	518	4,435	4.3	1,958.9	1,958.9	1,959.3	0.4
GY	208,019	633	3,815	5.0	1,960.2	1,960.2	1,960.6	0.4
GZ	208,760	311	3,294	4.1	1,961.8	1,961.8	1,962.5	0.7
HA	209,038	307	2,264	6.0	1,962.0	1,962.0	1,962.6	0.6
HB	210,828	930	3,639	3.7	1,966.5	1,966.5	1,966.9	0.4
HC	212,402	999	4,680	2.9	1,969.5	1,969.5	1,970.2	0.7

[1] Feet above confluence with Wilson 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
HD	214,734	1,019	3,828	3.5	1,974.0	1,974.0	1,974.4	0.5
HE	215,458	1,123	3,868	3.5	1,976.1	1,976.1	1,976.4	0.4
HF	216,819	1,047	4,440	3.0	1,979.3	1,979.3	1,980.3	1.0
HG	217,270	816	3,567	3.8	1,981.0	1,981.0	1,981.2	0.2
HH	218,915	435	1,978	6.8	1,985.3	1,985.3	1,986.1	0.8
HI	221,069	569	3,395	4.0	1,992.4	1,992.4	1,993.1	0.7
HJ	223,605	368	2,239	6.0	1,996.7	1,996.7	1,997.1	0.4
HK	224,969	244	2,518	5.4	2,000.4	2,000.4	2,000.8	0.5
HL	226,511	130	1,352	10.0	2,002.8	2,002.8	2,002.9	0.1
HM	229,109	154	1,366	9.9	2,009.3	2,009.3	2,009.9	0.6
HN	230,582	180	1,670	8.1	2,012.7	2,012.7	2,013.6	0.9
HO	231,034	200	1,716	7.9	2,014.7	2,014.7	2,015.2	0.5
HP	233,584	145	1,326	10.2	2,020.2	2,020.2	2,020.5	0.3
HQ	234,102	222	1,672	8.1	2,022.5	2,022.5	2,022.5	0.0
HR	235,820	315	2,361	5.7	2,025.3	2,025.3	2,026.1	0.8
HS	236,706	207	1,179	11.4	2,026.0	2,026.0	2,026.2	0.2
HT	238,196	383	2,212	6.1	2,031.7	2,031.7	2,031.9	0.2
HU	239,500	324	2,487	5.4	2,034.7	2,034.7	2,034.6	-0.1
HV	240,751	138	1,269	10.6	2,036.0	2,036.0	2,036.4	0.4

[1] Feet above confluence with Wilson Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
HW	241,069[1]	127	1,366	9.9	2,037.5	2,037.5	2,037.5	0.0
HX	243,619[1]	348	1,626	8.3	2,043.8	2,043.8	2,043.8	0.0
HY	246,530[1]	947	6,425	2.1	2,048.3	2,048.3	2,049.2	0.9
HZ	247,858[1]	825	6,124	2.2	2,051.8	2,051.8	2,052.3	0.5
IA	249,035[1]	337	1,986	6.8	2,052.6	2,052.6	2,052.8	0.2
IB	250,264[1]	213	1,743	7.7	2,054.2	2,054.2	2,055.3	1.1
IC	252,569[1]	300	2,387	5.6	2,060.1	2,060.1	2,060.6	0.5
ID	255,467[1]	327	2,278	5.9	2,066.5	2,066.5	2,067.1	0.6
IE	257,147[1]	604	3,686	3.7	2,069.1	2,069.1	2,069.6	0.5
IF	259,376[1]	908	3,621	3.7	2,072.3	2,072.3	2,073.0	0.7
IG	259,690[1]	936	3,564	3.8	2,072.5	2,072.5	2,073.4	0.9
IH	98,358[2]	780	3,742	3.26	2,074.1	2,074.1	2,075.1	1.0
II	98,714[2]	720	3,851	3.17	2,074.7	2,074.7	2,075.6	0.9
IJ	99,187[2]	590	3,663	3.33	2,075.3	2,075.3	2,076.1	0.8
IK	99,584[2]	575	2,472	4.94	2,075.7	2,075.7	2,076.5	0.8
IL	99,795[2]	575	2,999	4.07	2,076.5	2,076.5	2,077.2	0.7
IM	100,126[2]	595	3,912	3.12	2,077.1	2,077.1	2,077.9	0.8
IN	100,319[2]	685	3,998	3.05	2,077.2	2,077.2	2,078.0	0.8
IO	100,677[2]	845	5,620	2.17	2,077.7	2,077.7	2,078.4	0.7

[1] Feet above confluence with Wilson Creek

[2] Feet above confluence with Teanaway River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
IP	101,056	1,000	4,916	2.48	2,077.9	2,077.9	2,078.6	0.7
IQ	101,306	1,080[2]	4,048	3.01	2,078.2	2,078.2	2,078.8	0.6
IR	102,786	1,000[2]	3,045	4.01	2,083.1	2,083.1	2,083.7	0.6
IS	103,238	1,620	5,014	2.43	2,084.6	2,084.6	2,085.4	0.8
IT	103,554	1,320[2]	2,825	4.32	2,085.4	2,085.4	2,085.9	0.5
IU	103,874	1,390[2]	5,258	2.32	2,086.6	2,086.6	2,087.2	0.6
IV	104,290	1,320[2]	4,161	2.93	2,087.2	2,087.2	2,088.1	0.9
IW	104,653	1,130[2]	3,556	3.43	2,088.1	2,088.1	2,089.1	1.0
IX	104,963	930[2]	2,751	4.44	2,089.4	2,089.4	2,090.1	0.7
IY	105,280	1,470[2]	5,234	2.33	2,091.1	2,091.1	2,092.0	0.9
IZ	105,726	1,320[2]	3,401	3.59	2,092.5	2,092.5	2,093.1	0.6
JA	105,905	1,220[2]	3,742	3.26	2,093.1	2,093.1	2,093.9	0.8
JB	106,188	910[2]	3,387	3.6	2,094.1	2,094.1	2,094.9	0.8
JC	106,619	1,160	4,852	2.51	2,095.2	2,095.2	2,096.1	0.9
JD	107,037	626	2,625	4.65	2,095.9	2,095.9	2,096.8	0.9
JE	107,465	665	3,054	4.0	2,098.2	2,098.2	2,098.4	0.2
JF	107,866	664	3,495	3.49	2,098.8	2,098.8	2,099.4	0.6
JG	108,361	940	4,244	2.87	2,099.6	2,099.6	2,100.2	0.6
JH	110,501	1,460	3,556	3.43	2,104.9	2,104.9	2,105.8	0.9

[1] Feet above confluence with Teanaway River
[2] This width excludes islands

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
JI	110,991	1,350	4,440	2.75	2,107.1	2,107.1	2,107.9	0.8
JJ	111,833	1,080	4,064	3.0	2,109.1	2,109.1	2,110.0	0.9
JK	112,199	1,120	4,049	3.01	2,110.0	2,110.0	2,110.9	0.9
JL	112,611	1,160	3,937	2.97	2,111.2	2,111.2	2,111.9	0.7
JM	112,863	1,160	4,298	2.72	2,112.0	2,112.0	2,112.6	0.6
JN	113,134	1,310	3,851	3.04	2,112.5	2,112.5	2,113.0	0.5
JO	113,816	1,120	3,916	2.99	2,113.8	2,113.8	2,114.7	0.9
JP	114,177	1,080	2,519	4.64	2,115.2	2,115.2	2,115.9	0.7
JQ	114,388	1,080	3,641	3.21	2,116.9	2,116.9	2,117.4	0.5
JR	114,676	1,280	3,907	2.99	2,117.5	2,117.5	2,118.2	0.7
JS	114,908	1,040[2]	3,011	3.89	2,118.1	2,118.1	2,118.8	0.7
JT	115,421	1,570[2]	3,394	3.45	2,121.0	2,121.0	2,121.0	0.0
JU	115,781	1,190[2]	3,188	3.67	2,122.3	2,122.3	2,122.8	0.5
JV	116,117	1,180[2]	4,106	2.85	2,123.1	2,123.1	2,124.0	0.9
JW	116,697	1,180	2,874	4.07	2,125.0	2,125.0	2,125.5	0.5
JX	116,797	1,180	2,684	4.36	2,125.4	2,125.4	2,125.8	0.4
JY	117,093	1,030	2,706	4.32	2,126.4	2,126.4	2,127.1	0.7
JZ	117,430	960	4,146	2.82	2,128.0	2,128.0	2,128.2	0.2
KA	117,960	777	2,281	5.13	2,129.0	2,129.0	2,129.2	0.2

[1] Feet above confluence with Teanaway River
[2] This width excludes islands

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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
KB	118,280	726	2,751	4.25	2,130.0	2,130.0	2,130.3	0.3
KC	118,500	840	2,489	4.5	2,130.7	2,130.7	2,131.2	0.5
KD	118,907	900	3,998	2.8	2,132.1	2,132.1	2,132.8	0.7
KE	119,501	720	4,003	2.8	2,133.0	2,133.0	2,133.6	0.6
KF	119,897	280	4,447	2.52	2,133.5	2,133.5	2,134.2	0.7
KG	120,040	250	4,468	2.51	2,133.6	2,133.6	2,134.3	0.7
KH	120,420	340	5,349	2.09	2,133.9	2,133.9	2,134.5	0.6
KI	120,732	360	1,739	6.44	2,134.0	2,134.0	2,134.6	0.6
KJ	121,234	465	1,657	6.76	2,136.3	2,136.3	2,136.4	0.1
KK	121,520	530	1,970	5.68	2,137.6	2,137.6	2,138.1	0.5
KL	121,888	330	1,485	7.54	2,139.2	2,139.2	2,139.4	0.2
KM	122,298	176	1,074	10.43	2,141.5	2,141.5	2,142.0	0.5
KN	122,737	157	1,391	8.05	2,144.1	2,144.1	2,145.0	0.9
KO	123,158	160	1,415	7.92	2,145.7	2,145.7	2,146.3	0.6
KP	123,491	215	1,629	6.88	2,147.1	2,147.1	2,147.7	0.6
KQ	123,777	177	1,959	5.72	2,148.0	2,148.0	2,148.8	0.8
KR	124,129	194	1,509	7.42	2,148.4	2,148.4	2,149.1	0.7
KS	124,480	183	1,564	7.16	2,149.5	2,149.5	2,150.2	0.7
KT	124,840	150	1,485	7.54	2,150.7	2,150.7	2,151.0	0.3

[1] Feet above confluence with Teanaway 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
KU	125,230	115	1,257	8.91	2151.3	2151.3	2151.8	0.5
KV	125,600	183	*	*	2184.2	*	*	*
KW	132,600	114	*	*	2184.2	*	*	*
KX	133,039	418	*	*	2184.7	*	*	*
KY	133,410	294	*	*	2185.1	*	*	*
KZ	133,750	299	*	*	2185.2	*	*	*
LA	134,177	234	*	*	2185.7	*	*	*
LB	134,584	307	*	*	2186.6	*	*	*
LC	134,951	277	*	*	2187.4	*	*	*
LD	135,365	214	*	*	2188.3	*	*	*
LE	135,715	172	*	*	2189.4	*	*	*
LF	135,999	177	*	*	2190.7	*	*	*
LG	136,430	158	*	*	2192.7	*	*	*
LH	136,780	225	*	*	2194.0	*	*	*
LI	137,030	192	*	*	2194.1	*	*	*
LJ	137,224	165	*	*	2195.2	*	*	*
LK	137,776	183	*	*	2197.7	*	*	*
LL	138,158	181	*	*	2198.9	*	*	*
LM	138,883	152	*	*	2201.2	*	*	*

[1] Feet above confluence with Teanaway River

* Data Not Available

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
LN	139,405	194	1,756	3.59	2,203.0	2,203.0	2,203.9	0.9
LO	139,641	172	1,505	4.19	2,203.2	2,203.2	2,204.0	0.8
LP	140,384	1,050	5,631	1.12	2,203.8	2,203.8	2,204.6	0.8
LQ	141,864	800	1,837	3.43	2,205.4	2,205.4	2,205.8	0.4
LR	142,281	670	1,448	4.35	2,207.6	2,207.6	2,208.3	0.7
LS	142,431	510	1,757	3.59	2,208.2	2,208.2	2,209.1	0.9
LT	142,619	525	3,014	2.09	2,212.4	2,212.4	2,212.5	0.1
LU	142,981	350	1,947	3.13	2,212.5	2,212.5	2,212.7	0.2
LV	143,363	440	1,418	4.3	2,212.8	2,212.8	2,213.2	0.4
LW	143,638	610	3,484	1.75	2,213.3	2,213.3	2,214.2	0.9
LX	143,991	725	2,245	2.72	2,213.5	2,213.5	2,214.3	0.8
LY	144,433	690	1,817	3.36	2,214.7	2,214.7	2,215.7	1.0
LZ	144,649	645	2,044	2.98	2,216.0	2,216.0	2,216.6	0.6
MA	145,066	670	1,368	4.46	2,217.8	2,217.8	2,218.4	0.6
MB	145,852	820	1,960	3.11	2,222.1	2,222.1	2,223.0	0.9
MC	146,573	153	634	9.62	2,226.6	2,226.6	2,226.9	0.3
MD	147,187	159	1,913	3.19	2,229.0	2,229.0	2,229.5	0.5
ME	147,831	166	583	10.46	2,230.7	2,230.7	2230.7	0.0
MF	148,563	150	1,088	5.61	2,235.9	2,235.9	2238.5	0.6

[1] Feet above confluence with Teanaway River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA 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 NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
Yakima River (Continued)								
MG	149,238	179	926	6.39	2,237.7	2,237.7	2,238.5	0.8
MH	150,012	510	2,021	3.02	2,240.5	2,240.5	2,240.9	0.4
MI	150,791	460	1,250	4.67	2,242.3	2,242.3	2,242.9	0.6
MJ	151,403	570	1,243	4.7	2,245.6	2,245.6	2,246.2	0.6
MK	152,132	360	1,032	5.66	2,249.1	2,249.1	2,249.9	0.8
ML	153,847	940	1,113	5.24	2,258.9	2,258.9	2,259.8	0.9
MM	154,357	690	1,474	3.96	2,261.9	2,261.9	2,262.7	0.8
MN	155,171	653	1,285	4.54	2,266.9	2,266.9	2,267.0	0.1

[1] Feet above confluence with Teanaway River

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA

AND INCORPORATED AREAS

FLOODWAY DATA

YAKIMA RIVER

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 (1-percent-annual-chance) 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-annual-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 AR

Zone AR is the flood insurance risk zone that corresponds to an area of special flood hazard formerly protected from the 1-percent-annual-chance flood event by a flood-control system that was subsequently decertified. Zone AR indicates that the former flood-control system is being restored to provide protection from the 1-percent-annual-chance or greater flood event.

Zone A99

Zone A99 is the flood insurance risk zone that corresponds to areas of the 1-percent-annual-chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No BFEs or depths are shown within this zone.

Zone V

Zone V is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no BFEs are shown within this zone.

Zone VE

Zone VE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals 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.

Zone X (Future Base Flood)

Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.

Zone D

Zone D is the flood insurance risk zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

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 countywide FIRM presents flooding information for the geographic area of Kittitas County. Previously, FIRMs were prepared for each incorporated community of the County identified as flood-prone. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 6, “Community Map History”.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Cle Elum, City of	June 28, 1974	August 20, 1976	May 5, 1981	None
Ellensburg, City of	December 17, 1973	April 16, 1976 March 13, 1979	May 5, 1981	None
Kittitas, City of	June 14, 1974	April 16, 1976	April 15, 1982	None
Kittitas County, Unincorporated Areas	November 8, 1977	None	May 5, 1981	December 6, 1999
Roslyn, City of	October 22, 1976	None	June 5, 1985	None
South Cle Elum, Town of	July 11, 1975	None	May 5, 1981	None

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

KITTITAS COUNTY, WA
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

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

Countywide FIS reports for the adjacent Washington County of Pierce is effective as of March 7, 2017.

Countywide FIS reports for the adjacent Washington Counties of Chelan (2004), Grant (2009), King (2005), and Yakima (2009) have already gone effective (References 31, 32, 33, and 34).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Federal Regional Center, 130 228th Street, SW, Bothell, Washington 98021-9796.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Study, City of Cle Elum, City of South Cle Elum, City of Ellensburg, Town of Kittitas, Kittitas County and Unincorporated Areas, Kittitas County, Washington, Washington, D.C., October 15, 1981.

2. U.S. Census Bureau, 2010 Census: Kittitas County, Washington. Retrieved July 28, 2016 from http://www.factfinder.census.gov.

3. The Weather Channel, Monthly Averages for Kittitas County, Washington. Retrieved October 22, 2010 from http://www.weather.com.

4. JARA Division of Sasaki, Walker, Roberts Associates, Environmental Assessment of Ellensburg Valley in the Wilson Creek Watershed, Washington, Sausalito, California, 1975.

5. U.S. Department of the Interior, Geological Survey, Water-Supply Papers, Surface Water-Supply of the United States, Part 12, Pacific Slope Basins in Washington and upper Columbia River Basin, Prior to 1971.

6. U.S. Department of the Interior, Geological Survey, Water Resources Data for Washington, Part 1, Surface-Water Records, Tacoma, Washington, 1971-1974.

7. U.S. Department of the Interior, Geological Survey, Reports WA75-1, WA76-1, WA77-1, Water Resources Data for Washington, Tacoma, Washington, 1975-1977.

8. Kittitas County, Washington, Flood History, https://www.co.kittitas.wa.us/public-works/flood/history.aspx

9. Pacific Northwest River Basin Commission, Comprehensive Framework Study of Water and Related Lands, Appendix VII, Flood Control, 1971.

10. U.S. Army Corps of Engineers, National Levee Database, http://nld.usace.army.mil/

11. WATERSHED Science & Engineering, Draft Technical Memorandum: Flood and Erosion Assessment – Yakima River Hansen Pits to Yakima Canyon, Kittitas County, Washington, June 18, 2014.

12. U.S. Water Resources Council, "Guidelines for Determining Flood Flow Frequency," Bulletin 17, Hydrology Committee, March 1976.

13. U.S. Department of the Interior, Geological Survey, Water-Supply Paper 1687, Magnitude and Frequency of Floods in the United States, Part 12, Pacific Slope Basins in Washington and Upper Columbia River Basin, G.L. Bodhaine and D.M. Thomas, 1964.

14. U.S. Department of the Interior, Geological Survey, Open-File Report 74-336, Magnitude and Frequency of Floods in Washington, J.E. Cummans, M.R. Collings, and E.G. Nassar, 1975.

15. U.S. Department of the Interior, Geological Survey, Computer Program PeakFQ, Annual Flood-Frequency Analysis Using Bulletin 17B Guidelines. Version 5.2.0, 2007.

16. Interagency Advisory Committee on Water Data, 1982, Guidelines for Determining Flood Flow Frequency – Bulletin 17B of the Hydrology Subcommittee, Office of Water-Data Coordination, U.S. Geological Survey, Reston, VA.

17. U.S. Army Corps of Engineers Hydrologic Engineering Center, Computer Program HEC-Statistical Software Package (HEC-SSP). Version 2.0, October 2010.

18. Sumioka, S.S., Kresch, D.L., and Kasnick, K.D., 1998, Magnitude and Frequency of Floods in Washington: U.S. Geological Survey Water-Resources Investigations Report 97-4277, 91 p.

19. Knowles, S.M. and Sumioka, S.S., 2001, The National Flood-Frequency Program—Methods for Estimating Flood Magnitude and Frequency in Washington, 2001: U.S. Geological Survey Fact Sheet FS-016-01, 4 p.

20. U.S. Department of the Interior, Geological Survey, Water Resources Division, Open-File Report 76-499, Computer Applications for Step-Backwater and Floodway Analyses, User's Manual, 1976.

21. U.S. Department of the Interior, Geological Survey, Water Resources Division, Measurement of Peak Discharges at Culverts by Indirect Methods, Techniques of Water-Resources Investigations of the United States Geological Survey, Book 3, Chapter A3, 1968.

22. U.S. Department of the Interior, Geological Survey, Water Resources Division, Measurement of Peak Discharges at Dams by Indirect Methods, Techniques of Water-Resources Investigations of the United States Geological Survey, Book 3, Chapter A5, 1967.

23. Walker and Associates, Aerial Photographs, Kittitas County, Washington, Scale 1:9,600, Flown March through May 1976.

24. U.S. Department of Housing and urban Development, Federal Insurance Administration, Alluvial Fan Special Flood Hazard Zone Mapping, July 19, 1979.

25. U.S. Army Corps of Engineers, Computer Program HEC-RAS River Analysis System Version 4.1.0, January 2010.

26. U.S. Army Corps of Engineers, *CORPSCON*, Version 6.0.1, conversion software http://www.agc.army.mil/corpscon/index.html

27. U.S. Department of the Interior, Geological Survey, 15-Minute Series Topographic Maps, Scale 1:62,500; Contour Interval 80 feet: Cle Elum, Washington (1958); Easton, Washington (1961); Thorp, Washington (1958); Ellensburg, Washington (1958).

28. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000; Contour Interval 20 feet: Vantage, Washington (1965); Kittitas, Washington (1953); East Kittitas, Washington (1953); Ellensburg North, Washington (1958); Colockum Pass SW, Washington (1966); Ellensburg South, Washington (1958).

29. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, 1:24,000, Contour Interval 40 feet: Thorp, Washington (1958); Colockum Pass SE, Washington (1966).

30. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Kittitas County, Washington, Scale 1:24,000, November 1977.

31. Federal Emergency Management Agency, Flood Insurance Study, Chelan County and Incorporated Areas, Chelan County, Washington, Washington, D.C., September 30, 2004.

32. Federal Emergency Management Agency, Flood Insurance Study, Grant County and Incorporated Areas, Grant County, Washington, Washington, D.C., February 18, 2009.

33. Federal Emergency Management Agency, Flood Insurance Study, King County and Incorporated Areas, King County, Washington, Washington, D.C., August 19, 2020.

34. Federal Emergency Management Agency, Flood Insurance Study, Yakima County and Incorporated Areas, Yakima County, Washington, Washington, D.C., November 18, 2009.