CHAPTER 3
FLOOD RELATED STUDIES

Although the area has experienced regular flooding there have been few formal flood studies until more recently. There are a number of water quality studies in the basins.

UPPER YAKIMA RIVER COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN, 2007

The Upper Yakima River CFHMP was adopted by the County Commissioners in 1998. The plan's purpose was to gain an understanding of flood hazard characteristics and management alternatives in the more urbanized area along the Yakima River and Lower Naches between Union Gap and the northern County line located in Yakima Canyon in order to develop a flood hazard management program. Alternatives implemented after adoption of the 1998 CFHMP included changes to policies, programs and regulations through-out the county that will have a significant impact on flooding. Since the plan's adoption, zoning changes have been made to reduce development density in frequently flooded areas and a Floodplain Overlay District was added to the Yakima Urban Areas zoning code.

The Upper Yakima River CFHMP was updated in 2007 to incorporate infrastructure changes and new information available from a variety of studies. Since the land use recommendations were largely implemented within the cities and county, including ordinances in the interim, the updated plan focuses on reducing flood risks to - and caused by - the existing infrastructure: levees, bridges and highways.

The Upper Yakima River CFHMP 2007 Update includes some information about Spring (Chambers) Creek East.

CHANNEL MIGRATION ZONE

Yakima County Planning Division provided a Channel Migration Zone (CMZ) for Ahtanum Creek in 2005, which is one of the requirements for the Shoreline Master Program update. The County adopted the CMZ in April 2008. It is anticipated the City of Union Gap will also adopt this CMZ delineation.

In 2007 this CFHMP provided a review of stream channel characteristics to help determine the need for a more detailed CMZ study beyond the 2005 reconnaissance level. The review by Golder Associates, located in Appendix D, indicates that channel migration over-all is a minimal risk, so a more extensive study is not warranted.

FLOOD INSURANCE STUDIES

The National Flood Insurance Program (NFIP) is a federal program established in 1968 and administered by the Federal Emergency Management Agency (FEMA), which allows property owners to purchase flood insurance. Participating communities receive damage coverage in exchange for implementation of floodplain management measures to reduce flood risks. As part of NFIP, Flood Insurance Studies (FIS) develop Flood Insurance Rate Maps (FIRMs) mapping flood risk in a region that are used to establish flood insurance rates and to regulate development. An FIS typically provides descriptions of the topology, geography, and hydrology of a region, summarizes principle flood problems, flood hazard factors and flood protection measures, and determines flood insurance zones.

Existing Flood Insurance Rate Maps and Floodway Maps

The Federal Emergency Management Agency (FEMA) uses the results of the FIS to prepare Flood Insurance Rate Maps (FIRMs) identifying special flood hazard area (areas subject to inundation by the 100-year flood). FEMA has adopted the 100-year flood as the minimum base flood for floodplain management purposes and the 500-year flood as an additional area of lower flood risk.

Flood insurance studies for portions of Yakima County, the City of Yakima, and the City of Union Gap are based on information collected in the 1970s. The 1984 FIS study area includes Spring (Chambers) Creek East (labeled as Spring Creek 2 on FEMA flood maps), and Wide Hollow and Ahtanum Creek watersheds. A revision to the Yakima River maps was made in 1998 resulting from construction and certification of the levees along the Yakima River.

Most 1998 revisions for the FIS study area reflected changes to corporate limits; new hydrologic and hydraulic analysis of a portion of the Yakima River; and reanalysis of floodplains for Spring (Chambers) Creek East, needed due to the installation of a flood gate and permanent blockage of a flapper gate downstream.

Three FIS reports cover these waterways, namely the City of Yakima FIS, the City of Union Gap FIS, and the Yakima County FIS. Each FIS includes a portion of the Yakima River in its study region and therefore provides the same general flood history summary for this area. Spring (Chambers) Creek East is discussed in both the Union Gap FIS and County FIS because it currently flows from the Yakima River in Union Gap to Wide Hollow Creek just upstream of its confluence with Ahtanum Creek, which was in County jurisdiction.

Much of the Ahtanum and Wide Hollow watersheds area, such as the North Fork of the Ahtanum and Cottonwood Creek, have not gone through a detailed FIS study, and therefore have no mapped floodways. This will change in the FIRM restudy for Ahtanum and Wide Hollow Creeks underway now and scheduled for completion in 2011. Because of Spring (Chambers) Creek East's close connection with the Yakima River and its revision to Zone X due to the floodgate mentioned above, the current restudy will not review the mapping for this stream. Review of the floodplain for Spring (Chambers) Creek East will occur with the next restudy of this section of the Yakima River.

The following sections focus on some details of the FIS for each of these regions.

City of Yakima

The City joined the NFIP in the program on December 15, 1981. The Yakima area experiences frequent flooding. Certified levees and highways that function as levees along the Yakima River have decreased the city's risk from mainstem river flooding from a 100-year event. Various recurrence interval flood elevations at numerous cross sections on the Yakima River, and Wide Hollow, Spring Creek West (labeled Spring Creek 1 on FEMA maps) and Bachelor Creeks are available in the City of Yakima FIS.

City of Union Gap

The City of Union Gap joined the NFIP program on May 2, 1983. Union Gap is approximately 5 miles south of the City of Yakima and is the location of the original Yakima town site. "The site of Yakima City was too swampy and too constrained by the nearby ridges for easy development. Thus, over the protests of the Yakima City residents, the Northern Pacific established its station several miles north where there was more developable land." Flooding caused by the Yakima River, Ahtanum Creek, Wide Hollow Creek, and Spring (Chambers) Creek East are included in the FIS (labeled Spring Creek 2 in the County FIS).

Yakima River floodwaters directly affect a portion of the City of Union Gap: floodwater backwaters through the Wide Hollow Creek culvert under I-82. The current maps account for this backwater, but show all other portions of I-82 as having sufficient freeboard to contain the 100 year flood on the Yakima. The 1996 flood, which was just over a 100 year flood as defined in the FIS, overtopped I-82 just south of the City of Union Gap, in the project area of this CFHMP. The Upper Yakima CFHMP recommends remapping of the floodplain in this area to account for changes in the channel that have occurred since the original mapping in 1974.

Yakima County

The Yakima County FIS includes the unincorporated areas of Yakima County. The Yakama Nation, which occupies almost half of the land in the county, is excluded from this FIS, except the Yakima River and Ahtanum Creek floodplains that lie within the Yakama Nation reservation boundary. Some outlying areas were not studied due to lack of development or development potential in the near future. Yakima County entered the program of the NFIP on June 5, 1985.

The FIRMs show different types of flood hazard areas, or zones, based on the location of the 100-year floodplain and the type of analysis used to predict water surface elevations. Flood hazard zones are used to determine insurance rates.

The FIRM shows the floodway, as determined by FEMA. The floodway usually includes the main channel of the stream and the land along its sides that must be reserved in an unobstructed condition in order to convey the 100-year flood without increasing flood levels

by more than 1 foot (or less if specified in local ordinances). FEMA requires communities to designate the floodway to avoid significantly increasing upstream flood elevations.

To maintain insurance coverage, communities must prohibit development within the designated floodway that would cause any increase in the 100-year flood elevation. The state has additional restrictions beyond FEMA's in floodways (RCW 86.16.041) for residential development.

2009 Map Modernization and Digital Flood Insurance Rate Maps

As part of the Federal Map Modernization program all Yakima County FIRMs were updated in 2009 to digital versions, known as DFIRMs using updated and higher resolution ground data, where it exists, including the Ahtanum and Wide Hollow basins.

2011 DFIRM Restudy

Map restudies for the Ahtanum Creek and Wide Hollow Creek watersheds were started in 2005 as part of FEMA's Map Modernization program using updated hydrology, higher resolution 2 foot contour LiDAR ground data and detailed surveys at bridges. This new data, along with historic flood path and elevation data from the 1996 flood (approximately an 80-year event) was incorporated in modern hydraulic models to increase floodplain and floodway resolution as the basis for the new preliminary FIRMs to be released in 2011.

YAKIMA COUNTY HAZARD MITIGATION GRANT PROGRAM APPLICATIONS

In September 1997, Yakima County Public Works submitted two applications to the Washington State Military Department, Emergency Management Division, Hazard Mitigation Grant Program. Both applications requested funding to alleviate flood risk in the Ahtanum valley on Rutherford Road (affected by Hatton Creek) and near the intersection of S 42nd Ave and Emma Lane (affected by Ahtanum and Bachelor Creeks). Yakima County was not awarded funding for either project proposed in 1997.

The 1997 Rutherford Road application proposed building overtopping structures at the beginning of Rutherford Road to stop flood waters from gaining uncontrolled access to the roadside ditches. It also proposed that additional control structures be placed along roadside ditches to control water velocity. The second 1997 application proposed development of a second channel on Ahtanum Creek west of S 42nd Ave near Emma Lane that is in closer alignment with what is believed to be the natural channel of creek. This second application was successfully resubmitted in 2007 and will lead to structural measures to minimize flood damage. A third HMGP application was made in 2007 for Shaw Creek overflows (documented in 2001 and identified in this CFHMP). This application was unsuccessful and was resubmitted in 2010 as a Pre Disaster Mitigation grant.

The most recent HMGP application FEMA identified repetitive loss properties - to purchase or elevate the buildings in 2009 has successfully made it through the state review process and has been awarded by FEMA in 2010.

Yakima County Flood Control Assistance Account Program Grant Applications

As described in Chapter 1 the Flood Control Assistance Account Program (FCAAP) provided grant support to produce this CFHMP. FCAAP also provides grant assistance for flood mitigation projects. Yakima County applied for several mitigation grants pertaining to this area beginning in 2003. Unsuccessful applications included proposals for a Flood Response Plan and Emma Lane area mitigation. Successful applications include: Wide Hollow Creek and North and South Fork Ahtanum Creek map restudies; and a grant for repetitive loss property buy-outs. The map FIS restudy will be finalized in 2011 and one house on Wide Hollow Creek has been purchased. This house had several flood insurance claims and is a FEMA identified repetitive loss property.

AHTANUM WATERSHED ASSESSMENT & PROGRAMMATIC EIS

The "Ahtanum Creek Watershed Assessment" was released by Ecology in February 2004. The assessment included analysis of additional water storage in a new Pine Hollow Reservoir and associated water rights modifications between Ahtanum Irrigation District (AID) and Wapato Irrigation District (WIP), habitat rehabilitation opportunities, and flood hazard reduction opportunities in the basin, including the limited role of the proposed reservoir in management of flood flows. The assessment included major stakeholders concerned with irrigation and water use in the Ahtanum watershed including: Department of Ecology, Department of Fish and Wildlife, AID, WIP, Yakama Nation and Yakima County.

Flooding issues were considered in the analysis and recommendations of the assessment. As currently proposed, the off-channel storage possibility will not provide a decrease in flood flows due to the design and cost increase that would be required for the project.

The "Draft Programmatic Environmental Impact Statement for the Ahtanum Creek Watershed Restoration Program" (EIS) was released in February 2005. Implementation of the major component of the EIS, the proposed Pine Hollow Reservoir, will require development of agreements between the Yakama Nation, other (both on- and off-Reservation) water rights holders, and the Washington State Department of Ecology. Negotiation and development of these agreements has not occurred since the EIS was finalized. The ongoing Storage Study for the Yakima Basin EIS by the Bureau of Reclamation, Ecology, the Yakama Nation and the County will include reference to Pine Hollow as a storage alternative; this basin-wide process may result in some movement forward on the Pine Hollow Reservoir.

NATIONAL WATER QUALITY ASSESSMENT

The National Water-Quality Assessment (NAWQA) Program is a study undertaken by the USGS to describe the status and trends in the quality of the nation's groundwater and surface-water resources and to provide a sound understanding of the natural and human factors that affect the quality of these resources. Agricultural lands are one focus of these studies.

At the end of the first of two planned stages, which included sampling in the Yakima basin in 1987, the Yakima basin was selected as one of several nationwide watershed pilot studies for intensive data collection and analysis of water, sediment and aquatic biota, in order to direct and complete parameters gathered across the nation in the second phase. The USGS conducted additional Yakima basin sampling between 1999 and 2000 to assess trends in water quality. The assessment focused exclusively on agricultural impacts to surface water quality. The follow-up study identified fecal coliform, arsenic, sediment, phosphorus and insecticides above water quality standards, although at lower levels than previously found due to improved sediment control in agricultural return drains.

The studies are contained in the following USGS publications: Circular 1237, Water Quality in the Yakima River Basin, Washington, 1999-2000, Water Resources Investigations Report 02-4054, Fecal-Indicator Bacteria in the Yakima River Basin, Washington – An Examination of 1999 and 2000 Synoptic Sampling Data and their Relation to Historical Data, and Water Resources Investigations Report 02-4177, Occurrence and Distribution of Dissolved Trace Elements in the Surface Waters of the Yakima River Basin, Washington.

A stream condition index, consisting of four water quality measures and four habitat measures, showed "good" overall stream condition at two of three sample locations on Ahtanum Creek, the remaining location was ranked "intermediate" condition. Fecal coliform bacteria remained elevated at 3 of 4 sample locations on Ahtanum and Wide Hollow Creeks.

TOTAL MAXIMUM DAILY LOAD

Section 303(d) of the Federal Clean Water Act requires states and the EPA to biannually list all surface waters for which beneficial uses – such as drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. Waters placed on the 303(d) list require the preparation of Total Maximum Daily Loads (TMDLs) to identify the maximum amount of a pollutant to be discharged into a waterbody so as not to impair uses of the water, and allocate that amount among various sources. Once listed, Ecology prioritizes 303(d) water bodies for TMDLs.

Wide Hollow Creek is on the current 303(d) list for fecal coliform and temperature. The proposed 303(d) list, pending acceptance from EPA, has Wide Hollow Creek impaired by dissolved oxygen; pH; endosulfan; dieldrin; DDT; 4,4'-DDE and 4,4'-DDT. Wide Hollow Creek has been included with an existing TMDL for toxics in the Lower Yakima watershed

to address the listed pesticides. In addition, Wide Hollow Creek has been combined with Moxee Drain and Cowiche Creek in an "Urban Creeks" TMDL for temperature and fecal coliform based on data in 2001.

There are Drainage Improvement District (DID) pipes and City storm sewers that carry urban runoff and drain to Wide Hollow. Additional information about DIDs is located in Chapter 4.

Ahtanum Creek is proposed for the 303(d) listing for temperature and fecal coliform.

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