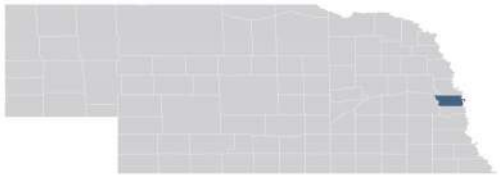
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 4



DOUGLAS COUNTY, NEBRASKA

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
BENNINGTON, CITY OF	310074
BOYS TOWN, VILLAGE OF	310353
DOUGLAS COUNTY, UNINCORPORATED AREAS	310073
OMAHA, CITY OF	315274
RALSTON, CITY OF	310077
VALLEY, CITY OF	310078
WATERLOO, VILLAGE OF	310079

REVISED:

FEMA

PRELIMINARY

2/17/2022

TO BE DETERMINED

FLOOD INSURANCE STUDY NUMBER
31055CV001E
Version Number 2.5.3.6

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Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT
DOUGLAS COUNTY, NEBRASKA

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were built

by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community’s regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Douglas County, Nebraska.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the United States Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC-8) sub-basins affecting each, are shown in Table 1. The FIRM panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Bennington, City of	310074	10230006	31055C0075J, 31055C0177K, 31055C0181J, 31055C0182J	
Boys Town, Village of	310353	10230006	31055C0194K, 31055C0213L, 31055C0307K, 31055C0326K	
Douglas County, Unincorporated Areas	310073	10200202, 10220003, 10230006	31055C0025H, 31055C0050J, 31055C0075J, 31055C0088J, 31055C0135H, 31055C0154J, 31055C0155J, 31055C0160J, 31055C0165H, 31055C0177K, 31055C0179K, 31055C0180J, 31055C0280H, 31055C0285J	
Omaha, City of	315274	10220003, 10230006	31055C0075J, 31055C0088J, 31055C0089J, 31055C0093J, 31055C0094J, 31055C0113H, 31055C0114J, 31055C0118J, 31055C0160J, 31055C0162J, 31055C0165H, 31055C0170L, 31055C0177K, 31055C0179K, 31055C0180J, 31055C0181J, 31055C0182J, 31055C0183K, 31055C0184J, 31055C0186K, 31055C0187K, 31055C0188K, 31055C0189K, 31055C0191K, 31055C0192J, 31055C0193K, 31055C0194K, 31055C0201J, 31055C0202J, 31055C0203J, 31055C0204J, 31055C0206J, 31055C0207J, 31055C0208J, 31055C0209J, 31055C0211J, 31055C0212J, 31055C0213L, 31055C0214J, 31055C0216J, 31055C0217J, 31055C0218J, 31055C0219J, 31055C0226H, 31055C0227J, 31055C0228H, 31055C0229J, 31055C0231J, 31055C0233J, 31055C0234J, 31055C0236H[1], 31055C0237J, 31055C0238J, 31055C0239H[1], 31055C0241J, 31055C0242J, 31055C0243J, 31055C0244J, 31055C0261J, 31055C0280H, 31055C0285J, 31055C0301J, 31055C0302K, 31055C0303J, 31055C0304J, 31055C0306K, 31055C0307K, 31055C0308K,	

[1] Panel Not Printed

Table 1: Listing of NFIP Jurisdictions (continued)

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Omaha, City of (continued)	315274	10220003, 10230006	31055C0327J, 31055C0328K, 31055C0329K, 31055C0331J, 31055C0332J, 31055C0333J, 31055C0334J, 31055C0351J, 31055C0352H1, 31055C0353J, 31055C0354H1, 31055C0360J	
Ralston, City of	310077	10230006	31055C0333J, 31055C0334J	
Valley, City of	310078	10200202, 10220003	31055C0135H, 31055C0145H, 31055C0153H, 31055C0154J, 31055C0155J, 31055C0160J, 31055C0161H, 31055C0162J, 31055C0165H, 31055C0170L	
Waterloo, Village of	310079	10220003	31055C0170L	

[1] Panel Not Printed

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1-percent-annual-chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

  It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 30, “Map Repositories,” within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

  The initial Countywide FIS Report for Douglas County became effective on December 2, 2005. Refer to Table 27 for information about subsequent revisions to the FIRMs.

  The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at www.fema.gov/national-flood-insurance-program-community-rating-system or contact your appropriate FEMA Regional Office for more information about this program.

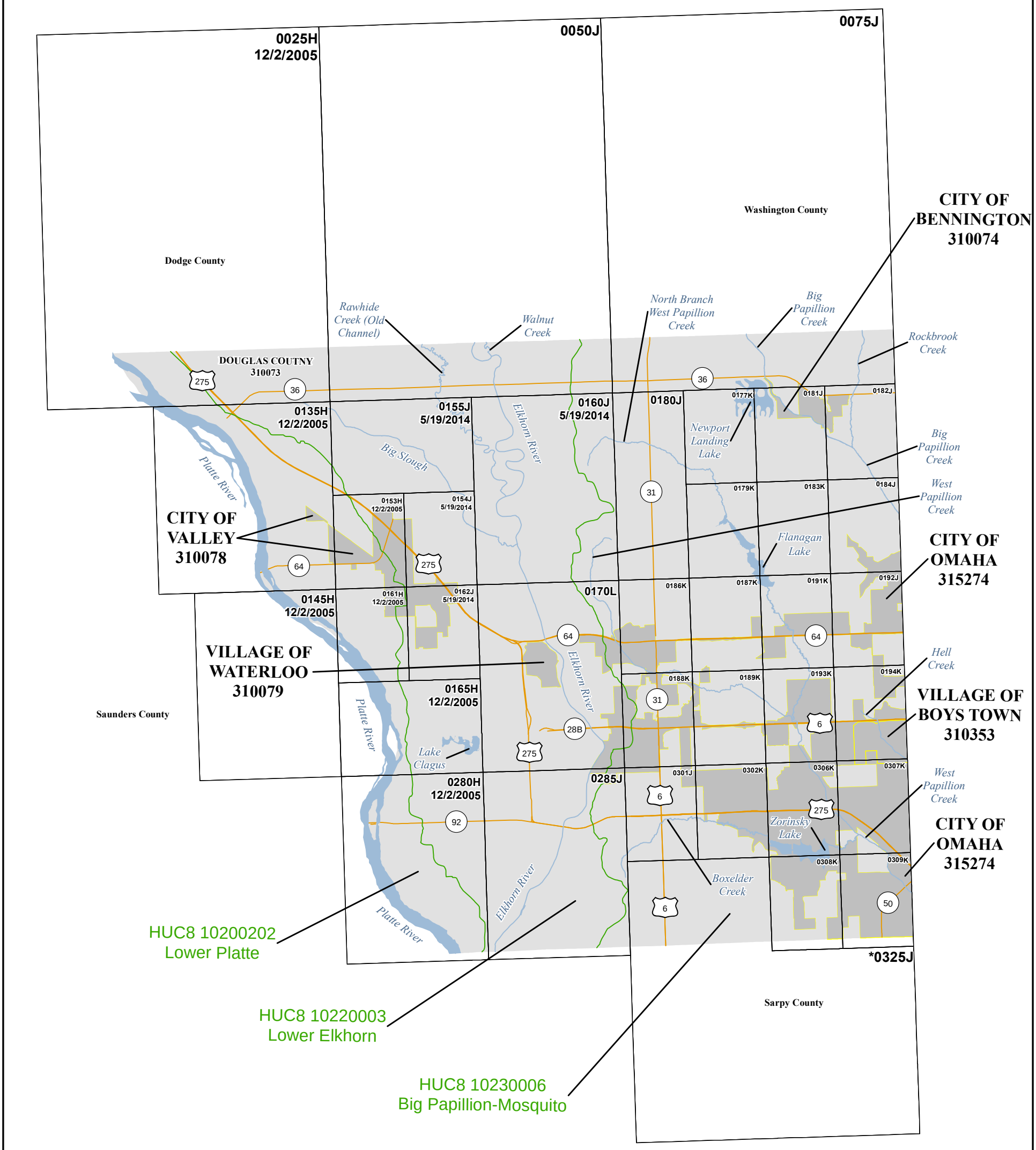
- FEMA does not design, build, inspect, operate, maintain, or certify levees. FEMA is responsible for accurately identifying flood hazards and communicating those hazards and risks to affected stakeholders. FEMA has identified one or more levee systems in this jurisdiction summarized in Table 8 of this FIS Report. For FEMA to continue to accredit the identified levees, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled "Mapping of Areas Protected by Levee Systems."

  Information on the levee systems in this jurisdiction can be obtained from the USACE National Levee Database (https://levees.sec.usace.army.mil/). For additional information, the user should contact the appropriate jurisdiction floodplain administrator and the levee owner or sponsor.

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

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

Figure 1: FIRM Index



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

N

1 inch = 12,500 feet 1:150,000

feet
0 6,250 12,500 25,000

Map Projection:
NAD 1983 UTM Zone 14N;
Western Hemisphere; Vertical Datum: NAD 88

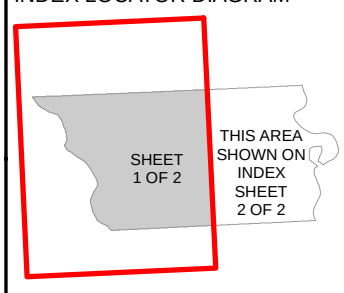
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

DOUGLAS COUNTY, NE
INDEX LOCATOR DIAGRAM



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 1 of 2)

DOUGLAS COUNTY, NEBRASKA, USA and Incorporated Areas

PANELS PRINTED:
0025, 0050, 0075, 0135, 0145, 0153, 0154, 0155, 0160, 0161, 0162, 0165, 0170, 0177, 0179, 0180, 0181, 0182, 0183, 0184, 0186, 0187, 0188, 0189, 0191, 0192, 0193, 0194, 0280, 0285, 0301, 0302, 0306, 0307, 0308, 0309

PRELIMINARY

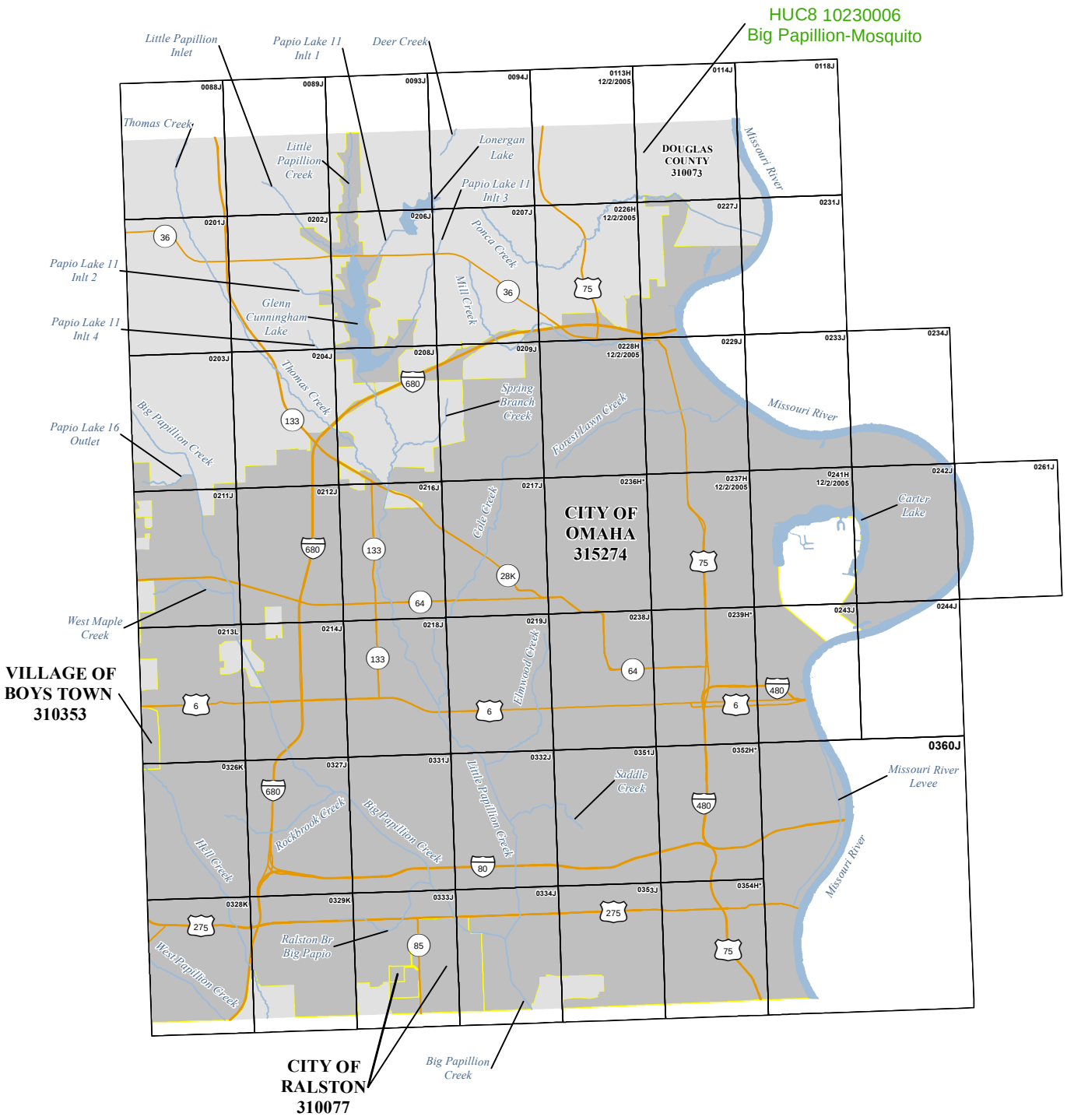
FEMA

MAP NUMBER
31055CIND1E

MAP REVISED

Figure 1: FIRM Index (continued)

Washington County



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

1 inch = 12,500 feet 1:150,000

0 6,250 12,500 25,000 feet

Map Projection:
NAD 1983 UTM Zone 14N;
Western Hemisphere; Vertical Datum: NAD 88

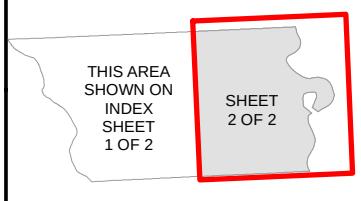
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

DOUGLAS COUNTY, NE
INDEX LOCATOR DIAGRAM



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 2 of 2)

DOUGLAS COUNTY, NEBRASKA, USA and Incorporated Areas

PANELS PRINTED:
0088, 0089, 0093, 0094, 0113, 0114, 0118, 0201, 0202, 0203, 0204, 0206, 0207, 0208, 0209, 0211, 0212, 0213, 0214, 0216, 0217, 0218, 0219, 0226, 0227, 0228, 0229, 0231, 0233, 0234, 0237, 0238, 0241, 0242, 0243, 0244, 0261, 0326, 0327, 0328, 0329, 0331, 0332, 0333, 0334, 0351, 0353, 0360

PRELIMINARY

FEMA

MAP NUMBER
31055CIND2E

MAP REVISED

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 27 in this FIS Report.

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

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

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

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

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

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

Figure 2: FIRM Notes to Users (continued)

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator (UTM) Zone 14**.** The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

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

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 30 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRMs dated 12/2/2005: aerial photography provided by the Omaha-Council Bluffs Metropolitan Area Planning Agency (MAPA) dated 2001, with a pixel resolution of either 0.25 or 0.5 meter.

Base map information shown on the FIRMs dated 5/19/2014: aerial photography provided by the Omaha-Council Bluffs MAPA dated 2001, with a pixel resolution of 1 meter.

Base map information shown on the FIRMs dated TBD was provided in digital format by the Nebraska Department of Natural Resources (NDNR). This information was derived from digital orthophotography at a 1-meter resolution from photography taken in 2014.

For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

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

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Douglas County, Nebraska, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 27 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

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

Figure 2: FIRM Notes to Users (continued)

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Douglas County, Nebraska, effective TBD.

ACCREDITED LEVEE: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit www.fema.gov/national-flood-insurance-program.

NON-ACCREDITED LEVEE SYSTEM: This panel contains a levee system that has not been accredited and is therefore not recognized as reducing the 1-percent-annual-chance flood hazard.

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

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

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

Figure 3: Map Legend for FIRM (continued)

OTHER AREAS OF FLOOD HAZARD

Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.

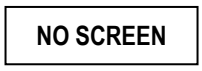
Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.

Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. See Notes to Users for important information.

Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than the 1% annual chance flood.

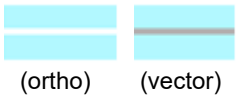
OTHER AREAS

Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.



Unshaded Zone X: Areas of minimal flood hazard.

FLOOD HAZARD AND OTHER BOUNDARY LINES



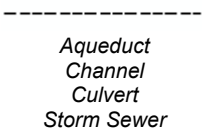
Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)

Limit of Study

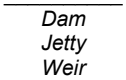
Jurisdiction Boundary

Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

GENERAL STRUCTURES



Channel, Culvert, Aqueduct, or Storm Sewer



Dam, Jetty, Weir

Levee, Dike, or Floodwall

Figure 3: Map Legend for FIRM (continued)

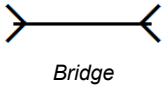
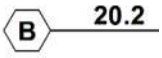
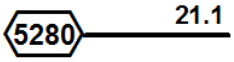
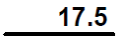
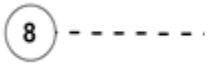
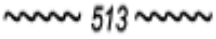
	Bridge
REFERENCE MARKERS	
	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
	Coastal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

Figure 3: Map Legend for FIRM (continued)

MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}E$	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16’ 52.5”	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

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

Depending on the accuracy of available topographic data (Table 22), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1-percent and 0.2-percent-annual-chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1-percent-annual-chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM. Figure 3, “Map Legend for FIRM”, describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area. Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Douglas County, respectively.

Table 2, “Flooding Sources Included in this FIS Report,” lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 12. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1-percent-annual-chance floodplain corresponds to the SFHAs. The 0.2-percent-annual-chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

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

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
90th Street Drain	Omaha, City of	Confluence with Little Papillion Creek	Approximately 1,360 feet upstream of North 90th Street	10230006	0.7		Y	AE	9/15/2018
90th Street Drain	Omaha, City of	Approximately 1,360 feet upstream of North 90th Street	Approximately 600 feet upstream of North 96th Street	10230006	0.4		N	A	March 1980
Beadle Creek	Omaha, City of	Confluence with South Papillion Creek	Approximately 1,173 upstream of S 189th Street	10230006	1.4		N	AE	9/15/2018
Bennington Creek	Bennington, City of	Confluence with Big Papillion Creek	Approximately 300 feet downstream of North 180th Street	10230006		0.4	N	AE	9/15/2018
Bennington Creek	Bennington, City of; Douglas County, Unincorporated Areas	Approximately 300 feet downstream of North 180th Street	Approximately 2,300 feet upstream of North 180th Street	10230006	0.5		N	AE	9/15/2018
Bennington Creek	Douglas County, Unincorporated Areas	Approximately 2,300 feet upstream of North 180th Street	Approximately 5,050 feet upstream of North 180th Street	10230006	0.5		Y	AE	9/15/2018
Big Papillion Creek	Bennington, City of; Douglas County, Unincorporated Areas; Omaha, City of; Ralston, City of	Sarpy/Douglas County boundary	Douglas/Washington County boundary	10230006	18.3		Y	AE	9/15/2018
Blood Creek	Omaha, City of	Confluence with Big Papillion Creek	At railroad	10230006	0.9		Y	AE	9/15/2018
Blood Creek	Omaha, City of	At railroad	Approximately 585 feet upstream of railroad	10230006		0.4	N	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Boettger Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 700 feet upstream of North 96th Street	10230006	0.3		N	AE	9/15/2018
Boettger Creek	Omaha, City of	Approximately 700 feet upstream of North 96th Street	Approximately 2,800 feet upstream of North 96th Street	10230006		0.07	N	AE	9/15/2018
Boettger Creek	Omaha, City of	Approximately 2,800 feet upstream of North 96th Street	Approximately 3,000 feet upstream of North 96th Street	10230006	0.03		N	AE	9/15/2018
Boettger Creek	Omaha, City of	Approximately 3,000 feet upstream of North 96th Street	Approximately 240 feet upstream of North 108th Street	10230006	0.9		Y	AE	9/15/2018
Boxelder Creek	Omaha, City of	Approximately 900 feet upstream of South 156th Street	Approximately 2,300 feet downstream of South 180th Street	10230006		0.4	N	AE	9/15/2018
Boxelder Creek	Omaha, City of	Approximately 2,300 feet downstream of South 180th Street	Approximately 600 feet downstream of South 180th Street	10230006	0.3		N	AE	9/15/2018
Boxelder Creek	Omaha, City of	Approximately 600 feet downstream of South 180th Street	Approximately 4,000 feet upstream of South 204th Street	10230006	3.8		Y	AE	9/15/2018
Butterflat Creek	Bennington, City of; Douglas County, Unincorporated Areas	Confluence with Big Papillion Creek	Approximately 185 feet downstream of Dutch Hall Road	10230006	0.8		Y	AE	9/15/2018
Cemetery Creek	Omaha, City of	Upstream face of Center Street Culvert	Approximately 2,800 feet upstream of Center Street Culvert	10230006	0.5		Y	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Champions Creek	Omaha, City of	Confluence with Eagle Run Creek	Approximately 590 feet upstream of Eagle Run Drive	10230006	0.2		Y	AE	9/15/2018
Cole Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 400 feet downstream of Sorensen Parkway	10230006	4.6		Y	AE	9/15/2018
Cole Creek	Omaha, City of	Approximately 100 feet southwest of the intersection of N 64th Plz and Sorsensen Pkwy	Approximately 50 feet northeast of the intersection of N 63rd St and Sorsensen Pkwy	10230006	0.2		N	A	March 1980
Eagle Run Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 2,360 feet upstream of North 132nd Street	10230006	1.9		Y	AE	9/15/2018
East Knight Creek	Omaha, City of	Confluence of Little Papillion Creek	Approximately 100 feet upstream of Rainwood Road	10230006	1.1		N	AE	9/15/2018
East Knight Creek	Omaha, City of	Approximately 100 feet upstream of Rainwood Road	Approximately 700 feet upstream of Rainwood Road	10230006	0.1		Y	AE	9/15/2018
Elkhorn River	Douglas County, Unincorporated Areas; Omaha, City of	Sarpy/Douglas County boundary	Approximately 700 feet downstream of West Dodge Road	10220003	6		Y	AE	June 1978
Elkhorn River	Omaha, City of; Waterloo, Village of	Approximately 700 feet downstream of West Dodge Road	Approximately 1,500 feet downstream from Pawnee Road	10220003	7		Y	AE	5/19/2014
Elkhorn River	Douglas County, Unincorporated Areas	Approximately 1,500 feet downstream from Pawnee Road	Douglas/Washington County boundary	10220003	4.4		Y	AE	June 1978

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Elmwood Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 1,720 feet upstream of Elmwood Park Road	10230006	0.4		Y	AE	9/15/2018
Elmwood Creek Overland	Omaha, City of	Confluence with Little Papillion Creek	Approximately 127 feet upstream of Elmwood Park Road	10230006	0.4		Y	AE	9/15/2018
F Street Drain	Omaha, City of	Confluence with Little Papillion Creek	Approximately 1,170 feet upstream of South 60th Street	10230006	0.7		Y	AE	9/15/2018
Frederic Street Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 2,370 feet upstream of Paddock Road	10230006	0.5		Y	AE	9/15/2018
Glenbrook Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 1,975 feet upstream of Sorensen Parkway	10230006	0.5		Y	AE	9/15/2018
Hanover Creek	Bennington, City of; Omaha, City of	Confluence with Big Papillion Creek	Approximately 2,360 feet upstream of Military Road	10230006	2		Y	AE	9/15/2018
Hell Creek	Boys Town, Village of; Omaha, City of	Sarpy/Douglas County boundary	Approximately 130 feet downstream of Doyle Drive	10230006	5.1		Y	AE	9/15/2018
Hell Creek	Boys Town, Village of	At Doyle Drive	At Overlook Road	10230006		0.04	N	AE	9/15/2018
Huntington Creek	Omaha, City of	Confluence with North Branch West Papillion	Approximately 75 feet downstream of North 156th Street	10230006	0.5		Y	AE	9/15/2018
Indian Creek	Omaha, City of	Confluence with West Papillion Creek	At Fort Street	10230006	2.4		Y	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Little Papillion Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 450 feet upstream of State Street	10230006	10.5		Y	AE	9/15/2018
Little Papillion Creek	Omaha, City of	Approximately 1,000 feet upstream of State Street	Approximately 900 feet downstream of Bennington Road	10230006		0.6	N	AE	9/15/2018
Little Papillion Creek	Omaha, City of	Approximately 900 feet downstream of Bennington Road	Douglas/Washington County boundary	10230006	2.3		N	AE	9/15/2018
Lockwood Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 540 feet downstream of Bennington Road	10230006	1.8		Y	AE	9/15/2018
Lonergan Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 170 feet upstream of Bennington Road	10230006	0.5		N	AE	9/15/2018
Lonergan Creek	Omaha, City of	Approximately 170 feet upstream of Bennington Road	Approximately 180 feet downstream of North 84th Street	10230006	0.4		Y	AE	9/15/2018
Lonergan Creek	Omaha, City of	Approximately 700 feet upstream of North 84th Street	Approximately 1,300 feet downstream of North 72nd Street	10230006		0.2	N	AE	9/15/2018
Maple Village Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 2,700 feet upstream of Maplewood Boulevard	10230006	1.3		Y	AE	9/15/2018
Meadow Lane Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 560 feet upstream of South 117th Street	10230006	0.8		Y	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Mill Creek	Omaha, City of	North 30th Street	Approximately 850 feet upstream of North 52nd Avenue	10230006	0.5		N	A	March 1980
Mission Creek	Omaha, City of	Sarpy/Douglas County boundary	Approximately 820 feet upstream of Monroe Street	10230006	0.4		Y	AE	9/15/2018
Mission Creek Overland	Omaha, City of	Sarpy/Douglas County boundary	At Monroe Street	10230006	0.3		N	AE	9/15/2018
Missouri River	Omaha, City of	Sarpy/Douglas County boundary	Douglas/Washington County boundary	10230006	19.8		Y	AE	November 2003
Mockingbird Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 170 feet upstream of Mockingbird Drive	10230006	1.4		Y	AE	9/15/2018
Morton Creek	Omaha, City of	Confluence with West Papillion Creek	Approximately 680 feet upstream of the confluence with West Papillion Creek	10230006	0.1		Y	AE	9/15/2018
North Boxelder Creek	Omaha, City of	Confluence with Boxelder Creek	Approximately 2,540 feet upstream of Marinda Street	10230006	1.5		Y	AE	9/15/2018
North Branch West Papillion	Omaha, City of	Confluence with West Papillion Creek	Approximately 800 feet upstream of Fort Street	10230006	4.4		Y	AE	9/15/2018
North Branch West Papillion	Omaha, City of	Approximately 800 feet upstream of Fort Street	Approximately 700 feet downstream of State Street	10230006		0.4	N	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
North Branch West Papillion	Omaha, City of	Approximately 700 feet downstream of State Street	At North 186th Street	10230006	1.4		N	AE	9/15/2018
North Branch West Papillion	Douglas County, Unincorporated Areas; Omaha, City of	At North 186th Street	Approximately 800 feet downstream of Rainwood Road	10230006	0.8		Y	AE	9/15/2018
North Standing Bear Creek	Omaha, City of	Confluence with Standing Bear Lake	At North 144th Street	10230006	0.2		N	AE	9/15/2018
North Standing Bear Creek	Omaha, City of	At North 144th Street	At Reservoir D-17	10230006	0.6		Y	AE	9/15/2018
North Standing Bear Creek	Omaha, City of	Approximately 400 feet upstream of Ida Street	Approximately 500 feet downstream of Sheffield Drive	10230006		0.08	N	AE	9/15/2018
North Washington Creek	Douglas County, Unincorporated Areas	Confluence with Washington Creek	At Dutch Hall Road	10230006	0.5		Y	AE	9/15/2018
Oak View Creek	Omaha, City of	Confluence with West Papillion Creek	Approximately 670 feet upstream of the railroad	10230006	0.5		Y	AE	9/15/2018
Old Bones Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 140 feet downstream of Dutch Hall Road	10230006	0.2		N	AE	9/15/2018
Old Bones Creek	Omaha, City of	Approximately 1,800 feet downstream of Dutch Hall Road	Approximately 140 feet downstream of Dutch Hall Road	10230006	0.3		Y	AE	9/15/2018
Old Lincoln Highway Creek	Omaha, City of	Confluence with West Papillion Creek	Approximately 1,410 feet upstream of Harney Street	10230006	1.6		Y	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Pacific Hollow Creek	Omaha, City of	Confluence with West Papillion Creek	Approximately 300 feet upstream of South 153rd Street	10230006	0.5		Y	AE	9/15/2018
Platte River	Douglas County, Unincorporated Areas; Valley, City of	Sarpy/Douglas County boundary	Douglas/Washington County boundary	10200202	18.3		Y	AE, AO	12/2/2005
Ponca Creek	Omaha, City of	At Pershing Drive	At Calhoun Road	10230006	2.3		Y	AE	January 1987
Ralston Creek	Omaha, City of; Ralston, City of	Confluence with Big Papillion Creek	Approximately 1,600 feet upstream of South 78th Street	10230006	1.4		Y	AE	9/15/2018
Ridgewood Creek	Bennington, City of; Douglas County, Unincorporated Areas	Confluence with Big Papillion Creek	Approximately 3,660 feet upstream of Pawnee Road	10230006	2.6		Y	AE	9/15/2018
Rockbrook Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 360 feet upstream of West Center Road	10230006	1.2		Y	AE	9/15/2018
Saddle Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 320 feet upstream of Charles Street	10230006	4		Y	AE	9/15/2018
South Standing Bear Creek	Omaha, City of	Approximately 3,000 feet downstream of North 144th Street	At North 144th Street	10230006	0.3		N	AE	9/15/2018
South Standing Bear Creek	Omaha, City of	At North 144th Street	Approximately 740 feet upstream of Fort Street	10230006	0.6		Y	AE	9/15/2018
South Standing Bear Creek	Omaha, City of	Approximately 740 feet upstream of Fort Street	Approximately 1,800 feet downstream of North 152nd Street	10230006		0.06	N	AE	9/15/2018

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
South Standing Bear Creek	Omaha, City of	Approximately 1,800 feet downstream of North 152nd Street	At North 152nd Street	10230006	0.3		N	AE	9/15/2018
South Standing Bear Creek	Omaha, City of	At North 152nd Street	Approximately 80 feet downstream North 155th Avenue	10230006	0.2		Y	AE	9/15/2018
South Washington Creek	Douglas County, Unincorporated Areas	Confluence with Washington Creek	Approximately 1,915 feet upstream of Pawnee Road	10230006	0.4		Y	AE	9/15/2018
Standing Bear Creek	Omaha, City of	Confluence with Big Papillion Creek	Approximately 150 feet upstream of North 132nd Street	10230006	0.8		Y	AE	9/15/2018
Standing Bear Creek	Omaha, City of	Approximately 600 feet upstream of North 132nd Street	Approximately 1,000 feet downstream of North 144th Street	10230006		0.2	N	AE	9/15/2018
Thomas Creek	Omaha, City of	Confluence with Little Papillion Creek	Approximately 460 feet downstream of Dutch Hall Road	10230006	7.2		Y	AE	9/15/2018
Tributary To Big Papillion Creek	Omaha, City of	At Charles Street	Approximately 170 feet downstream of Nicholas Street	10230006		0.07	N	AE	9/15/2018
Tributary to Cole Creek	Omaha, City of	Confluence with Cole Creek	North 60th Avenue	10230006	0.5		N	A	March 1980
Tributary To West Papillion Creek	Omaha, City of	Approximately 200 feet upstream of North 192nd Street	At West Dodge Road	10230006		0.1	N	AE	9/15/2018
Unnamed Tributary to Missouri River	Omaha, City of	North 36th Street	North 40th Street	10230006	0.3		N	A	March 1980

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

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Washington Creek	Bennington, City of; Douglas County, Unincorporated Areas	Confluence with Big Papillion Creek	Douglas/Washington County limits	10230006	0.3		Y	AE	9/15/2018
Washington Creek	Douglas County, Unincorporated Areas	Douglas/Washington County boundary	Approximately 450 feet upstream of North 216th Street	10230006	2.4		Y	AE	9/15/2018
West Papillion Creek	Omaha, City of	Sarpy/Douglas County boundary	Approximately 3,280 feet upstream of North 216th Street	10230006	13.7		Y	AE	9/15/2018
Whispering Ridge Creek	Omaha, City of	Confluence with West Papillion Creek	Approximately 640 feet downstream of Fort Street	10230006	2.8		Y	AE	9/15/2018
Whitehawk Creek	Omaha, City of	Confluence with Boxelder Creek	At Grover Street	10230006	0.6		Y	AE	9/15/2018
Whitehawk Creek	Omaha, City of	At Grover Street	At F Street	10230006		0.08	N	AE	9/15/2018
Whitehawk Creek	Omaha, City of	At F Street	Approximately 620 feet upstream of South 207th Street	10230006	2.5		Y	AE	9/15/2018

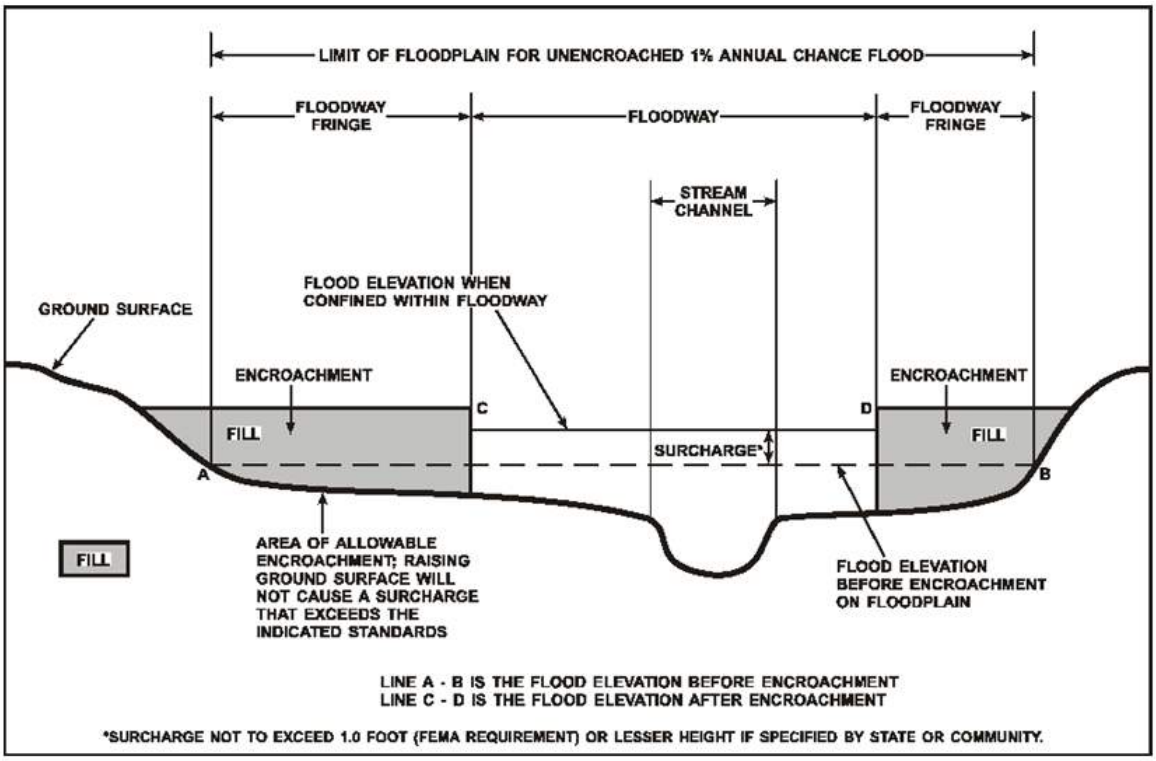
2.2 Floodways

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

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1-percent-annual-chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1-percent-annual-chance flood. The floodway fringe is the area between the floodway and the 1-percent-annual-chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. Regulations for Nebraska require communities in Douglas County to limit increases caused by encroachment to 1.0 foot. The floodway widths presented in this FIS Report and on the FIRM within the Big Papillion-Mosquito Watershed (10230006) were based on a computation method set forth by the Papio Missouri River Natural Resources District (PMRNRD) that considered future conditions hydrology, existing conditions hydrology, and a minimum setback from the river toe (USACE 2009). The setback was calculated by taking a 3:1 slope from the river toe until the location coincident with the natural ground surface and adding a 50-foot or 30-foot buffer as designated in the PMRNRD Master Plan to prevent construction in locations with low stability. The analysis consisted of a multiple equal-conveyance reductions based on (1) the 1-percent-annual-chance future conditions discharge, (2) the 1-percent-annual-chance existing conditions discharge, and (3) the 3:1 plus setback. The final floodway was determined at the widest encroachment location at each cross-section from all three scenarios. If the 3:1 plus setback encroachment was wider than the 1-percent-annual chance floodplain extent, the floodway was set to the 1-percent-annual-chance floodplain and ensuring an increase in surcharge no greater than 0.1 feet. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



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

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

2.3 Base Flood Elevations

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

BFEs are primarily intended for flood insurance rating purposes. Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. For example, the user may use the FIRM to determine the stream station of a location of interest and then use the profile to determine the 1-percent annual chance elevation at that location. Because only selected cross sections may be shown on the FIRM for riverine areas, the profile should be used to obtain the flood elevation between mapped cross sections. Additionally, for riverine areas, whole-foot elevations shown on the FIRM may not exactly reflect the elevations derived from the hydraulic analyses; therefore, elevations obtained from the profile may more accurately reflect the results of the hydraulic analysis.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Project.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Project.

2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this Flood Risk Project.

Figure 5: Wave Runup Transect Schematic

[Not applicable to this Flood Risk Project.]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this Flood Risk Project.

2.5.3 Coastal High Hazard Areas

This section is not applicable to this Flood Risk Project.

Figure 6: Coastal Transect Schematic

[Not applicable to this Flood Risk Project.]

2.5.4 Limit of Moderate Wave Action

This section is not applicable to this Flood Risk Project.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Figure 3, “Map Legend for FIRM.” Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Douglas County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Bennington, City of	AE, X
Boys Town, Village of	AE, X
Douglas County, Unincorporated Areas	AE, AO, X
Omaha, City of	A, AE, AO, X
Ralston, City of	AE, X
Valley, City of	AE, AO, X
Waterloo, Village of	AE, AO, X

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 4 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 4: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Big Papillion-Mosquito	10230006	Big Papillion Creek	Watershed encompasses approximately 2/3 of the area of Douglas County and is located in the central and eastern sections of the county.	1,114

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Lower Elkhorn	10220003	Elkhorn River	Watershed is located in the northwestern section of Douglas County and contains the second most area of the county.	2,204
Lower Platte	10200202	Platte River	Watershed located on the western side of Douglas County and contains the smallest area of the county.	527

4.2 Principal Flood Problems

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

Table 5: Principal Flood Problems

Flooding Source	Description of Flood Problems
Big Papillion Creek	Flood records extend back only to 1932. Prior to 1932, flooding occurred, but as the lands were mostly crops or pasture, damages were probably not sufficient to record the event. Flooding occurred in 1936, 1943, 1946, 1959, 1960, 1964, and 1965. The floods of 1964 and 1965 were the largest of record. These floods had discharges of 45,900 cfs and 31,200 cfs, respectively, downstream from the West Papillion Creek confluence and discharges of 15, 500 cfs and 16,500 cfs at 80th and F Streets (in Omaha) in 1964 and 1965, respectively (USACE 1967a and USACE 1967b). The following table lists discharges for past floods reported by the USACE. Peak Discharges on Big Papillion Creek at "F" Street August 2, 1956 — 10,900 June 20, 1960 — 9,500 May 26, 1964 — 9,500 June 16, 1964 — 15,500 September 7, 1965 — 16,500 Intermediate Regional — 23,500 Standard Project — 44,000

Table 5: Principal Flood Problems (continued)

Flooding Source	Description of Flood Problems
Elkhorn River	Floods on the Elkhorn River and its tributaries are most frequent during the period of normally heavy and sustained runoff from March until early summer, but can occur during other parts of the year. Generally, floods are caused by rapid melting of the accumulation of ice and snow, rain, or a combination of both. Floods of local extent, particularly on tributary streams, are the result of intense local storms. Early spring floods are caused or intensified by ice jams. Low ground between the Platte and Elkhorn Rivers slope generally from the Platte River downward to the Elkhorn. This causes shallow sheet flow with an average depth of 2 feet, as estimated by field inspection and high water marks. The flood of record occurred in June 1944, with a discharge of 100,000 cfs measured at the Village of Waterloo. The Elkhorn River remained within 1 foot of peak stage for 35 hours. Other extreme events recorded at the Village of Waterloo gage occurred on April 2, 1960, with 46,000 cfs, and March 29, 1962, with 50,200 cfs. Major flood events occurred in June 2010 due to heavy rainfall. In the vicinity of the Village of Waterloo, flows reached 40,000 cfs, where flows are normally 1,500 cfs (OMH 2010). The low-lying areas in the City of Valley and the unincorporated areas of Douglas County are subject to periodic flooding caused by the overflow of the Elkhorn River. The most severe flooding has occurred in the early spring as a result of snowmelt and heavy rains in conjunction with ice jams.
Hell Creek	There are very limited flood records for this stream. The flood of June 16-17, 1964, exceeded the 0.2-perent-annual-chance flood discharge. On September 7, 1965, the 1964 flood event was nearly equaled after some channel improvements (USACE 1969).
Little Papillion Creek	Flood records extend from 1932. Prior to urban development, flood damages were low, resulting in the non-documentation of floods. Flooding also occurred in 1943, 1944, 1946, 1947, 1950, 1951, 1957, 1958, 1959, 1960, 1964, and 1965. The 1960 flood appears to be the largest of record on Little Papillion Creek, having a discharge of 15,300 cfs and 10,000 cfs at Irvington and at Cass Street (in Omaha), respectively. Discharges of 8,500 cfs and 12,800 cfs occurred at the mouth of Little Papillion Creek in 1964 and 1965, respectively (USACE 1967a and USACE 1968).
Missouri River	Historically, the Missouri River was a major flood problem for the eastern edge of the City of Omaha. Due to the construction of six dams and reservoirs on the Missouri River in the states of North Dakota, South Dakota, and Montana; this is no longer the case. The completion of the Omaha levee and floodwall along the Missouri River protects the part of Omaha located between river miles 611.6 and 625.0 from flooding (USACE 1954). These flood control structures provide flood protection to portions of eastern Omaha in excess of the 0.2-percent-annual-chance flood landward of the levee and floodwall. Due mainly to tributary inflow downstream from the main stem dams and ice conditions, those areas of Omaha riverward of the levee and floodwall system are subject to flooding.

Table 5: Principal Flood Problems (continued)

Flooding Source	Description of Flood Problems
Platte River	The low-lying areas in the City of Valley and the unincorporated areas of Douglas County are subject to periodic flooding caused by the overflow of the Platte River. The most severe flooding has occurred in the early spring as a result of snowmelt and heavy rains in conjunction with ice jams. Most floods occur from April to June, usually as the result of rapid snowmelt and rainfall runoff. These floods are often aggravated by ice jams on the Platte River and its tributaries. The tributary floods are generally of short duration, since many of these streams have steep gradients, which cause rapid runoff. Conversely, the floods that occur along the Platte River are prolonged because of the wide, shallow valley slopes (USACE 1971a and MRBC 1975). The Platte River Valley is wide and flat, with considerable overbank storage available. This results in attenuation of overbank discharges as the flows move downstream. Floods in the Platte River basin occur primarily from runoff from the contributing drainage areas between the confluence of the North Platte River to the mouth of the Platte River. The flood of record on the Platte River occurred on March 30, 1960, when a discharge of 112,000 cfs was measured at the North Bend gage. The most damaging flood, however, occurred in March 1978, when high stages were produced by ice jams along the river (USGS). Flooding on the Platte River under open channel conditions would normally be of relatively long duration with ample warning prior to the peak. The majority of the floods on the Platte River have been the result of rapid snowmelt in conjunction with ice jams in the early spring. Several times since 1948, the Union Dike, a left-bank levee from Fremont to Valley, has been breached, most notably in the years 1960, 1962, and 1978. The USACE has determined that if the 1-percent-annual-chance flood occurs on the Platte River simultaneously with an ice-clogged channel, existing levees would be overtopped. However, the extent and nature of future flooding due to ice conditions is highly unpredictable. The flood threat under ice jam conditions is, therefore, very real, even though no overflow or breach of the diking system is expected under open channel conditions.
Ralston Creek	Flooding is simultaneous with Big Papillion Creek near the confluences of Ralston and Big Papillion Creek with Papillion Creek. There is no recorded history or gage data.
West Papillion Creek	There are very limited flood records for this stream. Floods occurred in 1948, 1950, 1959, 1964, 1965. The largest flood of record occurred in June 1964, having an approximate discharge of 40,800 cfs at the USACE gaging station, located approximately 7 miles upstream from the mouth at Giles Road, and 31,500 cfs at the mouth. The flood of September 7, 1965, had a discharge of 17,500 cfs at the mouth (USACE 1967b and USACE 1969).

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

Table 6: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Platte River	North Bend Gage	1272.8	1960	83	USGS
Platte River	North Bend Gage	1270.5	March 1962	4	USGS
Platte River	North Bend Gage	1272.2	June 1967	20	USGS
Platte River	North Bend Gage	1275.0	March 1971	2	USGS
Platte River	North Bend Gage	1278.1	March 1978	25	USGS
Platte River	North Bend Gage	1272.4	March 1993	50	USGS
Platte River	North Bend Gage	1272.9	March 1972	1	USGS

4.3 Non-Levee Flood Protection Measures

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

Table 7: Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Boxelder Creek	Dam Site 18	Dam	Zorinsky Lake	Dam was completed in 1984 and affects West Papillion Creek (USACE 1971d). Provides protection for the 1-percent-annual-chance flood event.
South Standing Bear Lake	Dam Site 16	Dam	Standing Bear Lake	Dam located near the upstream limits of the extraterritorial zoning limits for the City of Omaha (USACE 1971b). Provides protection for the 1-percent-annual-chance flood event.

4.4 Levees

For purposes of the NFIP, FEMA only recognizes levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with comprehensive floodplain management criteria. The Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) describes the information needed for FEMA to determine if a levee system reduces the flood hazard from the 1-percent-annual-chance flood. This information must be supplied to FEMA by the community or other party when a flood risk study or restudy is conducted, when FIRMs are revised, or upon FEMA request. FEMA reviews the information for the purpose of establishing the appropriate flood hazard zone.

Levee systems that are determined to reduce the hazard from the 1-percent-annual-chance flood are accredited by FEMA. FEMA can also grant provisional accreditation to a levee system that was previously accredited on an effective FIRM and for which FEMA is awaiting data and/or documentation to demonstrate compliance with 44 CFR 65.10. These levee systems are referred to as Provisionally Accredited Levees, or PALs. Provisional accreditation provides communities and levee owners with a specified timeframe to obtain the necessary data to confirm the levee system's accreditation status. Accredited levee systems and PALs are shown on the FIRM using the symbology shown in Figure 3. If the required information for a PAL is not submitted within the required timeframe, or if information indicates that a levee system no longer meets 44 CFR 65.10, FEMA will consider the levee system as non-accredited and issue an effective FIRM showing the levee-impacted area as a SFHA or Zone D.

FEMA coordinated with the USACE, the local communities, and other organizations to compile a list of levee systems that exist within Douglas County. Table 8, "Levee Systems," lists all accredited levee systems, PALs, and non-accredited levee systems shown on the FIRM for this FIS Report. Other categories of levees may also be included in the table. The Levee ID shown in this table may not match numbers based on other identification systems that were listed in previous FIS Reports. Levee systems identified in the table are displayed on the FIRM with notes to users to indicate their flood hazard mapping status.

Please note that the information presented in Table 8 is subject to change at any time. For that reason, the latest information regarding the levee systems presented in the table may be obtained by accessing the National Levee Database. For additional information, contact the levee owner/sponsor or the local community shown in Table 30.

Table 8: Levees

Community	Flooding Source	NLD Levee System ID	NLD Levee System Name	Levee System Status on Effective FIRM	FIRM Panel(s)	Levee Owner(s)/Sponsor(s)
Omaha, City of	Missouri River	4705000082	Omaha – Missouri River RB	Accredited	31055C0243J, 31055C0360J, 31055C0229J, 31055C0233J, 31055C0234J, 31055C0242J, 31055C0244J	Cities of Omaha and Carter Lake
Waterloo, Village of	Elkhorn River	4705000091	Waterloo – Elkhorn River RB	Accredited	31055C0170L	City of Waterloo
Omaha, City of; Ralston, City of	Big Papillion River	4705000122	Little Papio RB & Big Papio LB	Non-Accredited	31055C0334J	Papio-Missouri River NRD
Omaha, City of; Ralston, City of	Big Papillion River	4705000123	NEDOUG16 – Big Papio RB – L St to Thompson Cr	Non-Accredited	31055C0333J, 31055C0334J	Papio-Missouri River NRD
Omaha, City of	Little Papillion Creek, Big Papillion River	4705000128	NEDOUG16 LB & Little Papio LB – L St to Copper Cr	Non-Accredited	31055C0334J	Papio-Missouri River NRD
Omaha, City of	Big Papillion Creek	4705000140	Big Papio RB – West Center to L St	Non-Accredited	31055C0333J, 31055C0331J	Papio-Missouri River NRD
Omaha, City of	Big Papillion Creek	4705000155	Big Papio LB – West Center to L St	Non-Accredited	31055C0331J	Papio-Missouri River NRD
Douglas, County of	Platte River	1705000597	No-Name Dike	Non-Accredited	31055C0161H, 31055C0165H, 31055C0280H	Unknown

Table 8: Levee Systems (continued)

Community	Flooding Source	NLD Levee System ID	NLD Levee System Name	Levee System Status on Effective FIRM	FIRM Panel(s)	Levee Owner(s)/Sponsor(s)
Douglas, County of	Platte River	4705000164	Valley-Union and No Name Dikes System	Non-Accredited	31055C0025H, 31055C0135H, 31055C0145H, 31055C0161H	Papio-Missouri River NRD and Burlington Northern Santa Fe Railroad

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance, respectively, of being equaled or exceeded during any year.

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

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

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

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 12. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 9. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 10. Stream gage information is provided in Table 11.

Table 9: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
90th St Drain	At the confluence with Little Papillion Creek	1.3	10	669	845	1,029	1,063	1,523
Bennington Creek	At the confluence with Big Papillion Creek	4.6	30	60	110	200	260	470
Big Papillion	At Railroad	219	14,200	19,590	25,700	31,960	35,210	49,860
Big Papillion	Q St	217	14,430	20,110	25,870	32,060	35,330	49,990
Big Papillion	At the confluence of Little Papillion Creek	157	11,430	15,110	18,040	21,610	23,340	33,930
Big Papillion	Confluence of Mockingbird Creek	155	11,550	14,990	17,930	21,760	23,540	34,130
Big Papillion	At Interstate 80	152	11,550	14,990	17,930	21,760	23,540	34,130
Big Papillion	At West Center Road	149	11,060	14,450	17,410	21,630	23,360	33,880
Big Papillion	Confluence of Rockbrook Creek	147	10,970	14,350	17,320	21,620	23,340	33,850
Big Papillion	Approximately 2,200 feet downstream of S 105th Street	145	11,280	14,780	18,270	22,940	24,630	35,840
Big Papillion	At Interstate 680	144	11,180	14,670	18,280	22,960	24,650	35,880
Big Papillion	At West Dodge Expressway	141	11,020	14,460	18,210	22,860	24,550	35,800
Big Papillion	Approximately 2,700 feet downstream of Blondo Street	140	10,930	14,330	18,160	22,790	24,460	35,720
Big Papillion	Blondo St	139	10,840	14,240	18,150	22,790	24,440	35,770
Big Papillion	Approximately 1,200 feet upstream of Blondo Street	136	10,680	14,040	17,960	22,590	24,240	35,500
Big Papillion	At N 120th Street	132	10,640	14,930	19,160	23,960	25,500	37,620
Big Papillion	At Fort Street	129	10,550	14,880	19,080	23,840	25,450	37,460
Big Papillion	Confluence of Standing Bear Creek	127	10,560	14,890	19,100	23,860	25,560	37,610
Big Papillion	Approximately 550 feet downstream of Military Road	121	10,510	14,860	19,060	23,820	25,510	37,450

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Big Papillion	Approximately 2,400 feet downstream of State Street	119	10,550	15,130	19,360	24,110	25,720	37,690
Big Papillion	Approximately 2,300 feet upstream of State Street	117	10,570	15,420	19,540	24,260	25,860	37,810
Big Papillion	3100 ft upstream of State St	116	10,590	15,430	19,550	24,280	25,870	37,820
Big Papillion	Approximately 400 feet downstream of the confluence of Lockwood Creek	115	10,620	15,430	19,530	24,230	25,790	37,740
Big Papillion	Confluence of Lockwood Creek	113	11,190	16,210	20,500	25,390	26,950	39,500
Big Papillion	Confluence of Ridgewood Creek	111	11,230	16,140	20,400	25,230	26,740	39,230
Big Papillion	Approximately 2,000 feet downstream of N 156th Street	108	11,270	16,090	20,310	25,080	26,550	38,990
Big Papillion	Confluence of Hanover Creek	106	11,660	16,240	20,400	25,160	26,630	39,090
Big Papillion	Approximately 3,000 feet downstream of N 168th Street	104	11,550	16,000	20,130	24,810	26,210	38,520
Big Papillion	Confluence of Bennington Creek	102	11,720	15,970	20,030	24,660	26,010	38,250
Big Papillion	Approximately 1,100 feet upstream of Pawnee Road	97.5	11,940	16,220	20,090	24,780	26,130	38,310
Big Papillion	Confluence with Butterflat Creek	96.1	11,370	15,990	20,060	24,730	26,060	38,200
Big Papillion	Confluence with Washington Creek	85.7	11,200	15,580	19,480	23,960	25,230	36,900
Big Papillion	At Dutch Hall Road	75.7	11,020	15,240	18,980	23,210	24,270	35,350
Blood Creek	At the confluence with Big Papillion Creek	2.1	390	520	640	760	790	1,100
Boettger Creek	At Glenn Cunningham Lake	2.9	920	1,880	2,760	3,520	3,820	5,260
Boettger Creek	Glenn Cunningham Lake Park	2.8	1,770	2,450	3,030	3,660	3,890	5,330
Boettger Creek	Approximately 600 feet upstream of Pawnee Road	1.7	1,140	1,550	1,900	2,280	2,420	3,280

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Boxelder Creek	At S 180th Street	11.6	3,240	4,640	5,820	7,100	7,690	10,820
Boxelder Creek	Approximately 600 feet downstream of S 192nd Street	9.5	2,870	4,120	5,210	6,380	6,880	9,940
Boxelder Creek	Confluence with North Boxelder Creek	4.2	1,670	2,320	2,880	3,480	3,700	5,070
Boxelder Creek	Approximately 800 feet upstream of the confluence with North Boxelder Creek	1.6	560	790	990	1,200	1,340	1,790
Butterflat Creek	At the confluence with Big Papillion Creek	11.3	5,879	7,901	9,183	10,726	10,861	15,239
Cemetery Creek	At the confluence with Saddle Creek	0.6	961	1,307	1,602	1,921	1,921	2,759
Champions Creek	Approximately 200 feet upstream of Eagle Run Drive	1.1	150	210	260	320	320	470
Cole Creek	At the confluence with Little Papillion Creek	6.7	1,770	2,520	3,180	3,920	4,010	5,960
Cole Creek	At Blondo Street	6.1	1,740	2,470	3,130	3,840	3,930	5,790
Cole Creek	At Maple Street	5.2	1,420	2,020	2,560	3,140	3,240	4,740
Cole Creek	At Military Avenue	4.1	1,120	1,600	2,020	2,480	2,580	3,760
Cole Creek	300 feet downstream of Ames Ave	3.2	930	1,310	1,650	2,020	2,060	3,040
Cole Creek	Approximately 1,400 feet downstream of Parkview Lane	2.1	640	910	1,150	1,400	1,440	2,110
Eagle Run Creek	At the confluence with Big Papillion Creek	3.3	860	1,200	1,490	1,810	1,830	2,680
Eagle Run Creek	Confluence of Champions Creek	2.5	610	840	1,050	1,270	1,290	1,880
Eagle Run Creek	Approximately 800 feet upstream of the confluence with Champions Creek	1.4	470	650	810	980	990	1,440

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
East Knight Creek	At Glenn Cunningham Reservoir	1.9	1,091	1,466	1,806	2,157	2,339	3,103
East Knight Creek	At Rainwood Road	1.3	900	1,210	1,490	1,780	1,930	2,560
Elkhorn Creek	Approximately 5,827 feet upstream of State Highway 64/West Maple Road	6,900	34,860	*	59,040	71,010	*	103,100
Elmwood Creek	At Pacific Street	1.9	930	1,310	1,650	2,010	2,030	2,980
Elmwood Creek	At the confluence with Little Papillion Creek	1.9	940	1,324	1,667	2,031	2,051	3,012
Elmwood Creek	Approximately 700 feet downstream of Dodge Street	1.3	650	910	1,140	1,390	1,400	2,050
F St Drain	At the confluence with Little Papillion Creek	1.3	1,020	1,330	1,610	1,900	1,900	2,680
Frederic St Drain	Approximately 600 feet upstream of Paddock Road	1.3	550	740	910	1,090	1,090	1,570
Giles Creek	At the confluence with Big Papillion Creek	1.5	310	410	510	610	620	880
Glenbrook Creek	At the confluence with Little Papillion Creek	1.3	867	1,164	1,428	1,700	1,766	2,443
Hanover Creek	At the confluence with Big Papillion Creek	2.7	314	456	567	709	800	1,064
Hanover Creek	Approximately 1,400 feet upstream of Bennington Road	2.6	310	450	560	700	790	1,050
Hanover Creek	Approximately 800 feet downstream of N 168th Street	1.2	130	180	230	280	310	420
Hell Creek	At the confluence with West Papillion Creek	5.7	2,170	2,900	3,550	4,240	4,350	6,130
Hell Creek	Approximately 800 feet downstream of I Street	3.3	840	1,130	1,390	1,680	1,750	2,540

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Hell Creek	At Shirley Street	1.5	290	420	560	710	750	1,110
Huntington Creek	At the confluence with North Branch West Papillion	1.1	850	1,110	1,340	1,590	1,590	2,250
Indian Creek	At the confluence with West Papillion Creek	2.3	1,050	1,450	1,785	2,121	2,207	3,095
Indian Creek	Approximately 1,100 feet downstream of West Maple Road	2.0	970	1,340	1,650	1,960	2,040	2,860
Indian Creek	Approximately 2,700 feet downstream of Fort Street	1.0	510	710	870	1,050	1,110	1,520
Little Papillion Creek	At the confluence with Big Papillion Creek	59.9	10,190	15,050	19,920	22,460	22,980	30,520
Little Papillion Creek	2,600 feet upstream of L St	57.6	10,090	15,010	19,410	24,240	25,840	35,590
Little Papillion Creek	2,600 feet upstream of Grover St	51.3	9,040	13,030	16,470	20,280	21,740	30,060
Little Papillion Creek	Confluence of Elmwood Creek	48.4	8,720	12,440	15,580	19,170	20,740	28,890
Little Papillion Creek	2000 ft upstream of S 72nd St	46.5	8,610	12,140	15,130	18,630	20,200	27,650
Little Papillion Creek	550 ft upstream of Dodge St	38.5	6,770	9,380	11,710	14,360	15,840	21,010
Little Papillion Creek	At the confluence of 90th Street Drain	37.6	6,540	9,020	11,260	13,810	15,280	20,340
Little Papillion Creek	At the confluence of Maple Village Creek	33.8	5,400	7,480	9,380	11,500	12,910	17,210
Little Papillion Creek	At the confluence of Thomas Creek	21.0	1,570	2,170	2,680	3,240	3,470	4,770
Little Papillion Creek	At Read Street	19.1	680	940	1,170	1,430	1,590	2,140
Little Papillion Creek	Confluence of Boettger Creek	11.5	4,330	6,800	8,860	11,120	11,750	17,180
Little Papillion Creek	Approximately 1,700 feet upstream of Pawnee Road	7.5	4,090	5,780	7,250	8,850	9,120	13,130
Little Papillion Creek	Confluence of Old Bones Creek	6.5	3,760	5,220	6,530	7,930	8,130	11,640

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Little Papillion Creek	Approximately 500 feet downstream of Dutch Hall Road	4.9	2,870	3,990	5,010	6,090	6,240	8,950
Lockwood Creek	At the confluence with Big Papillion Creek	2.8	187	281	351	433	504	667
Lockwood Creek	Approximately 1,500 feet upstream of N 138th Street	2.0	160	240	300	370	430	570
Lonergan Creek	Downstream of Lonergan Lake	0.9	50	80	110	130	150	290
Lonergan Creek	At Glenn Cunningham Reservoir	0.9	777	1,033	1,248	1,483	1,514	2,107
Lonergan Creek	At Bennington Road	0.5	593	788	952	1,132	1,155	1,608
Maple Village Creek	At the confluence with Little Papillion Creek	1.8	580	800	1,010	1,230	1,270	1,820
Meadow Lane Creek	At the confluence with Big Papillion Creek	1.6	234	325	407	498	498	742
Meadow Lane Creek	Approximately 450 feet downstream of N 114th Street	1.5	230	320	400	490	490	730
Mission Creek	At the confluence with South Papillion Creek	1.3	947	1,216	1,450	1,707	1,707	2,374
Mission Creek Overland	At the confluence with Mission Creek, just downstream of Harrison Street.	N/A	121	195	283	398	398	836
Missouri River	At confluence with Boyer River	322,536	122,100	131,400	146,800	173,400	*	245,900
Missouri River	At confluence with Pigeon Creek	322,769	123,400	132,500	147,800	174,600	*	247,700
Missouri River	At USGS Gage 066110000	322,800	123,600	132,700	147,900	174,700	*	247,900
Missouri River	At the confluence of Mosquito Creek	323,038	123,600	132,700	147,900	174,700	*	247,900
Mockingbird Creek	At the confluence with Big Papillion Creek	2.4	930	1,240	1,510	1,810	1,810	2,620

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Mockingbird Creek	At L Street	2.0	693	925	1,121	1,341	1,341	1,930
Mockingbird Creek	S 90th St	1.5	600	800	970	1,160	1,160	1,670
Mockingbird Creek	Approximately 200 feet upstream of Mockingbird Drive	0.8	350	450	550	650	650	930
Morton Creek	At the confluence with West Papillion Creek	0.5	382	513	622	742	753	1,069
North Boxelder Creek	At the confluence with Boxelder Creek	2.7	1,152	1,580	1,947	2,344	2,436	3,404
North Boxelder Creek	At the Highway 275 Ramp	2.6	1,130	1,550	1,910	2,300	2,390	3,340
North Boxelder Creek	Approximately 400 feet upstream of S 208th Street	1.4	590	800	980	1,180	1,220	1,710
North Branch West Papillion	At the confluence with West Papillion	15.5	2,470	3,360	4,120	4,920	5,040	6,970
North Branch West Papillion	Confluence of Huntington Creek	13.4	1,400	1,900	2,330	2,800	2,880	4,060
North Branch West Papillion	Approximately 400 feet downstream of N 168th Street	12.3	770	1,040	1,270	1,530	1,640	2,260
North Branch West Papillion	At Ida Street	10.0	3,660	5,300	6,570	7,930	8,680	11,720
North Branch West Papillion	1800 ft downstream of State St	8.7	3,490	4,900	5,970	7,140	7,790	10,540
North Branch West Papillion	Approximately 700 feet downstream of State Street	4.8	1,940	2,720	3,310	4,000	4,360	5,810
North Branch West Papillion	Approximately 1,800 feet downstream of Rainwood Road	3.7	1,610	2,290	2,870	3,480	3,740	4,830
North Standing Bear Creek	At the confluence with Standing Bear Reservoir	2.7	590	750	890	1,070	1,120	2,790
Oak View Creek	At the confluence with West Papillion Creek	1.1	659	872	1,055	1,248	1,268	1,765

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Oak View Creek	At Industrial Road	1.0	650	860	1,040	1,230	1,250	1,740
Old Bones Creek	At the confluence with Little Papillion Creek	2.0	1,069	1,478	1,819	2,183	2,239	3,172
Old Lincoln Highway Creek	At the confluence with West Papillion Creek	1.9	1,096	1,458	1,790	2,131	2,182	3,026
Old Lincoln Highway Creek	Approximately 200 feet downstream of Old Lincoln Highway	1.8	1,090	1,450	1,780	2,120	2,170	3,010
Old Lincoln Highway Creek	At N 180th Street	1.1	600	800	980	1,170	1,190	1,690
Pacific Hollow Creek	At the confluence with West Papillion Creek	1.1	605	822	1,008	1,210	1,241	1,753
Platte River	At North Bend Gage	82,900	62,000	*	106,000	132,000	*	220,000
Ponca Creek	At John J. Pershing Drive	6.1	3,800	*	6,200	7,100	*	9,700
Ponca Creek	Approximately 1,550 feet upstream of John J. Pershing Drive	5.3	3,300	*	5,200	5,900	*	8,000
Ponca Creek	Approximately 900 feet downstream of North 36th Street	5.1	3,200	*	5,000	5,700	*	7,700
Ponca Creek	Approximately 550 feet upstream of North 36th Street	4.4	3,000	*	4,600	5,200	*	6,800
Ponca Creek	Approximately 1,200 feet upstream of North 36th Street	3.3	2,400	*	3,100	3,400	*	4,000
Ponca Creek	At Calhoun Road	2.6	2,300	*	2,900	3,200	*	3,700
Ralston Creek	At the confluence with Big Papillion Creek	1.7	330	440	530	620	630	890
Ridgewood Creek	At the confluence with Big Papillion Creek	3.2	998	1,354	1,680	2,016	2,127	2,921

*Not calculated for this Flood Risk Project

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Ridgewood Creek	Approximately 1,500 feet downstream of Bennington Road	3.0	980	1,330	1,650	1,980	2,090	2,870
Ridgewood Creek	Approximately 2,200 feet upstream of Pawnee Road	1.2	870	1,180	1,440	1,730	1,790	2,490
Rockbrook Creek	Approximately 1,000 feet upstream of the confluence with Big Papillion Creek	2.2	860	1,170	1,450	1,740	1,760	2,550
Rockbrook Creek	At the confluence with Big Papillion Creek	2.2	864	1,175	1,457	1,748	1,768	2,562
Rockbrook Creek	At West Center Road	1.7	670	900	1,110	1,330	1,350	1,940
Saddle Creek	40 ft upstream of S 64th Ave	5.2	5	10	81	1,160	1,160	3,973
Saddle Creek	150 ft upstream of S 60th St	5.1	447	1,585	2,560	3,628	3,628	6,414
Saddle Creek	Approximately 50 ft downstream of Westbrook Ave	4.8	635	1,742	2,689	3,728	3,728	6,436
Saddle Creek	783 ft upstream of West Lawn Cemetery Rd	3.9	522	1,512	2,360	3,289	3,289	5,713
Saddle Creek	370ft downstream of Pine St	3.7	455	1,265	1,972	2,725	2,725	4,714
Saddle Creek	Approximately 250 ft upstream of Poppleton Ave	2.8	5	355	831	1,335	1,338	2,680
Saddle Creek	Approximately 110 ft upstream of Leavenworth St	2.6	5	280	738	1,223	1,223	2,519
Saddle Creek	Approximately 300 ft upstream of Jones St	2.3	5	161	593	1,049	1,049	2,268
Saddle Creek	Approximately 50 ft downstream of Douglas St	1.7	5	10	150	470	470	1,330
Saddle Creek	Approximately 120 ft downstream of Cuming St	1.2	5	10	125	394	394	1,116
Saddle Creek	Approximately 325 ft upstream of Charles St	0.8	5	10	22	242	242	832

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
South Papillion Creek	At Interstate 80	32.8	9,080	11,890	14,530	17,330	18,050	25,090
South Papillion Creek	At S 144th Street	30.5	8,620	11,360	13,800	16,480	17,100	23,740
South Papillion Creek	At S 156th Street	15.4	7,790	10,290	12,520	14,950	15,520	21,540
South Papillion Creek	At S 168th Street	12.8	6,770	9,030	10,960	13,050	13,590	18,650
South Papillion Creek	Approximately 2,500 feet downstream of the confluence of Beadle Creek	10.2	5,590	7,450	9,040	10,740	11,180	15,310
South Papillion Creek	Approximately 200 feet upstream of S 204th Street	2.7	1,470	1,960	2,380	2,840	2,990	4,050
South Standing Bear Creek	At the confluence with Standing Bear Reservoir	2.1	660	800	930	1,050	1,060	2,080
South Standing Bear Creek	Approximately 600 feet upstream of Fort Street	1.7	260	280	320	650	680	1,880
South Washington Creek	Approximately 1,000 feet upstream of Pawnee Road	1.1	330	440	540	650	700	940
South Washington Creek	At the confluence with Washington Creek	1.1	331	442	542	653	703	944
Standing Bear Creek	At the confluence with Big Papillion Creek	0.3	629	831	1,006	1,199	1,220	1,700
Thomas Creek	At the confluence with Little Papillion Creek	10.8	3,800	5,420	6,780	8,260	9,420	12,330
Thomas Creek	At Interstate 680	9.5	3,730	5,310	6,620	8,070	9,090	11,970
Thomas Creek	At State Street	8.3	4,050	5,700	7,130	8,580	9,450	12,600
Thomas Creek	At Rainwood Road	6.6	3,290	4,630	5,770	7,020	7,590	10,350
Thomas Creek	Approximately 600 feet upstream of Bennington Road	4.9	2,540	3,570	4,430	5,380	5,650	7,920
Thomas Creek	Approximately 400 feet upstream of Pawnee Road	4.1	2,210	3,080	3,820	4,620	4,810	6,730

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Thompson Creek	At the confluence with Big Papillion Creek	1.8	300	400	490	580	580	840
Washington Creek	At Dutch Hall Road	10.0	3,190	4,390	5,420	6,550	6,850	9,020
Washington Creek	Approximately 500 feet upstream of County Road 25	8.4	2,650	3,610	4,430	5,270	5,490	7,480
Washington Creek	Approximately 1,000 feet downstream of Dutch Hall Road	6.6	2,030	2,770	3,410	4,060	4,240	5,710
Washington Creek	Confluence of North Washington Creek	5.5	1,610	2,190	2,640	3,180	3,380	4,610
Washington Creek	At N 204th Street	4.0	1,160	1,570	1,890	2,270	2,450	3,290
Washington Creek	Confluence of South Washington Creek	2.7	780	1,060	1,300	1,560	1,670	2,250
Washington Creek	Approximately 800 feet upstream of the confluence of South Washington Creek	1.6	450	620	750	910	970	1,310
West Papillion Creek	Approximately 500 feet upstream of the confluence with South Papillion Creek	63.1	7,980	10,610	11,680	13,920	15,380	22,670
West Papillion Creek	Approximately 2,900 feet upstream of Interstate 80	61.4	7,980	10,540	12,080	14,920	16,200	23,580
West Papillion Creek	Approximately 500 feet upstream of Q Street	59.3	8,310	10,570	12,980	16,370	17,490	25,160
West Papillion Creek	2000 ft downstream of S 132nd St	59.3	8,160	10,450	12,400	15,650	16,780	24,270
West Papillion Creek	Approximately 1,200 feet upstream of L Street	57.8	8,450	11,010	13,760	17,110	18,230	26,030
West Papillion Creek	Confluence of Oak View Creek	55.6	8,590	11,760	14,550	17,880	18,980	26,860
West Papillion Creek	Confluence of Boxelder Creek	54.5	8,480	11,900	14,560	17,790	18,850	26,490
West Papillion Creek	Approximately 3,000 feet downstream of S 156th Street	38.2	8,950	12,530	15,580	18,810	19,840	27,690

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
West Papillion Creek	At the confluence of Morton Creek	36.6	8,700	12,130	15,020	18,110	19,120	26,550
West Papillion Creek	600 feet downstream of confluence of Morton Creek	36.5	8,710	12,150	15,030	18,120	19,130	26,560
West Papillion Creek	Approximately 1,300 feet upstream of Pacific Street	34.8	8,400	11,620	14,310	17,230	18,200	25,190
West Papillion Creek	At the confluence of North Branch West Papillion	33.1	8,180	11,260	13,820	16,620	17,610	24,280
West Papillion Creek	2300 ft upstream of Pacific St	33.1	8,070	11,150	13,710	16,490	17,460	24,120
West Papillion Creek	600 ft downstream of N 168th St	17.6	6,660	9,010	11,120	13,290	14,130	19,190
West Papillion Creek	Confluence of Old Lincoln Highway Creek	15.8	5,910	8,000	9,860	11,770	12,510	17,060
West Papillion Creek	Confluence of Whispering Ridge Creek	13.9	5,190	7,030	8,680	10,360	11,020	15,030
West Papillion Creek	Approximately 1,600 feet downstream of Old Lincoln Highway	11.9	4,270	5,760	7,100	8,450	8,930	12,250
West Papillion Creek	750 ft downstream of N 192nd St	10.3	3,950	5,410	6,630	7,890	8,290	11,310
West Papillion Creek	Approximately 500 feet downstream of N 192nd Street	8.3	3,790	5,180	6,400	7,650	8,050	11,060
West Papillion Creek	Confluence of Indian Creek	7.1	3,290	4,520	5,600	6,710	7,060	9,660
West Papillion Creek	Approximately 1,000 feet downstream of N 204th Street	5.2	2,350	3,220	4,010	4,860	5,130	6,960
West Papillion Creek	At West Maple Road	3.4	1,500	2,070	2,580	3,100	3,350	4,580
West Papillion Creek	Approximately 800 feet upstream of N 216th Street	2.6	1,080	1,520	1,880	2,280	2,480	3,360
West Papillion Creek	2000 ft upstream of N 216th St	1.1	380	540	670	820	900	1,210
Whispering Ridge Creek	At the confluence with West Papillion Creek	2.8	1,170	1,615	2,013	2,446	2,656	3,593

Table 9: Summary of Discharges (continued)

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Whispering Ridge Creek	Approximately 700 feet downstream of West Maple Road	2.0	1,000	1,380	1,720	2,090	2,270	3,070
Whitehawk Creek	At the confluence with Boxelder Creek	4.2	975	1,426	1,796	2,227	2,535	4,023
Whitehawk Creek	Approximately 400 feet downstream of Grover Street	4.0	950	1,390	1,750	2,170	2,470	3,920
Whitehawk Creek	At Q Street	1.8	790	1,100	1,370	1,660	1,810	2,440
Whitehawk Creek	At S 204th Street	1.2	590	820	1,010	1,220	1,310	1,790

*Not calculated for this Flood Risk Project

Figure 7: Frequency Discharge-Drainage Area Curves

[Not applicable to this Flood Risk Project.]

Table 10: Summary of Non-Coastal Stillwater Elevations

Flooding Source	Location	Elevations (feet NAVD88)					
		10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Bennington Creek	Newport Landing Lake	1,140.3	1,141.0	1,141.4	1,141.9	1,142.2	1,143.1
Blood Creek	Upstream of Railroad	1,026.2	1,028.7	1,030.5	1,032.0	1,032.3	1,035.0
Boettger Creek	Dam Site 4	1,144.4	1,145.0	1,145.2	1,145.4	1,145.5	1,145.8
Boxelder Creek	Zorinsky Lake	1,115.7	1,117.5	1,118.8	1,120.2	1,120.9	1,123.7
Hell Creek	Boys Town Reservoir No. 1	1,192.6	1,193.0	1,193.2	1,193.4	1,193.5	1,194.1
Little Papillion Creek	Glenn Cunningham Reservoir	1,124.8	1,126.2	1,127.4	1,128.6	1,129.3	1,131.6
Lonergan Creek	Lonergan Reservoir	1,207.3	1,207.6	1,207.8	1,208.1	1,208.2	1,208.8
North Branch West Papillion	Dam Site 15A	1,169.9	1,171.6	1,173.0	1,174.4	1,175.7	1,177.9
North Standing Bear Creek	Dam Site 17	1,129.7	1,133.0	1,134.1	1,135.0	1,135.1	1,136.9
South Standing Bear Creek	Dam Site 18	1,136.5	1,138.7	1,140.3	1,141.4	1,141.5	1,143.8
Standing Bear Creek	Standing Bear Lake	1,109.3	1,110.1	1,110.9	1,111.8	1,111.9	1,114.9
Tributary to West Papillion Creek	Dam Site 13	1,168.1	1,169.1	1,170.1	1,171.1	1,171.5	1,173.6
Tributary to Big Papillion Creek	Candlewood Reservoir	1,090.6	1,092.3	1,093.8	1,094.7	1,094.7	1,095.5
Whitehawk Creek	Zorinsky Basin No. 3	1,155.5	1,157.0	1,158.2	1,159.4	1,159.8	1,161.4

Table 11: Stream Gage Information used to Determine Discharges

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Elkhorn River	06800500	USGS	Elkhorn River at Waterloo, NE	6,900	1929	1975
Elkhorn River	06799000	USGS	Elkhorn River near Norfolk, NE	2,790	1946	1975
Elkhorn River	06798500	USGS	Elkhorn River near Neligh, NE	2,200	1932	1975
Elkhorn River	06797500	USGS	Elkhorn River near Ewing, NE	1,400	1947	1975
Logan Creek	06799500	USGS	Logan Creek near Uehling, NE	1,015	1941	1975
Maple Creek	06800000	USGS	Maple Creek near Nickerson, NE	368	1952	1975
Missouri River	*	*	*	*	*	*
Platte River	06805500	USGS	Platte River at Louisville, NE	85,370	1954	1994
Platte River	06801000	USGS	Platte River near Ashland, NE	83,600	1929	1960
Platte River	06796000	USGS	Platte River at North Bend, NE	70,400	1950	1994
Platte River	06774000	USGS	Platte River near Duncan, NE	59,300	1942	1994
Platte River	06770500	USGS	Platte River near Grand Island, NE	57,650	1942	1994

* Multiple gages used in the hydrologic analysis of the Missouri River. Please refer to the UMRSFFS report (USACE 2004) for a full description of the gages and methodology used to calculate peak discharges.

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments

for which a floodway was computed (Section 6.3), selected cross sections are also listed in Table 23, “Floodway Data.”

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

Table 12: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
90th Street Drain	Confluence with Little Papillion Creek	Approximately 1,360 feet upstream of North 90th Street	HEC-HMS (USACE ND2)	HEC-RAS 4.1.0 (USACE 2010)	9/15/2018	AE w/ Floodway	Hydraulic model represents overland flow above an existing storm drain. A nominal 10 cfs flow was used in the hydraulic model for the 10-percent-annual-chance event based on the assumption that the 10-percent-annual chance discharge could be carried through the storm drain and the remaining flow contributed to the overland flow.
90th Street Drain	Approximately 1,360 feet upstream of North 90th Street	Approximately 600 feet upstream of North 96th Street	Unknown	Unknown	March 1980	A	Studied by approximate methods (FEMA 1982).
Beadle Creek	Confluence with South Papillion Creek	Approximately 1,173 upstream of S 189th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Beadle Creek is located along the border of Sarpy and Douglas Counties. Special flood hazards from Beadle Creek mapped in Douglas County are due to backwater extending upstream of Polk Street.
Bennington Creek	Confluence with Big Papillion Creek	Approximately 300 feet downstream of North 180th Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Newport Landing Lake.
Bennington Creek	Approximately 300 feet downstream of North 180th Street	Approximately 2,300 feet upstream of North 180th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Newport Landing Lake.
Bennington Creek	Approximately 2,300 feet upstream of North 180th Street	Approximately 5,050 feet upstream of North 180th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Big Papillion Creek	Sarpy/Douglas County boundary	Douglas/Washington County boundary	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	Regulatory elevations on riverside of levees and regulatory profile consider presence of levees. Floodway analysis does not consider presence of levees.
Blood Creek	Confluence with Big Papillion Creek	At railroad	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	Flows are based on hydraulic restriction at culvert under railroad.
Blood Creek	At railroad	Approximately 585 feet upstream of railroad	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Special Flood Hazard Areas are caused by a restriction in culvert underneath railroad at upstream end of Blood Creek. Area was modeled separately to determine elevation upstream of railroad culvert and downstream flows.
Boettger Creek	Confluence with Little Papillion Creek	Approximately 700 feet upstream of North 96th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	
Boettger Creek	Approximately 700 feet upstream of North 96th Street	Approximately 2,800 feet upstream of North 96th Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Dam Site 4.
Boettger Creek	Approximately 2,800 feet upstream of North 96th Street	Approximately 3,000 feet upstream of North 96th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Dam Site 4.
Boettger Creek	Approximately 3,000 feet upstream of North 96th Street	Approximately 240 feet upstream of North 108th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Boxelder Creek	Approximately 900 feet upstream of South 156th Street	Approximately 2,300 feet downstream of South 180th Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Zorinsky Lake.
Boxelder Creek	Approximately 2,300 feet downstream of South 180th Street	Approximately 600 feet downstream of South 180th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on normal depth.
Boxelder Creek	Approximately 600 feet downstream of South 180th Street	Approximately 4,000 feet upstream of South 204th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Butterflat Creek	Confluence with Big Papillion Creek	Approximately 185 feet downstream of Dutch Hall Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Cemetery Creek	Upstream face of Center Street Culvert	Approximately 2,800 feet upstream of Center Street Culvert	HEC-HMS (USACE ND2)	HEC-RAS 4.1.0 (USACE 2010)	9/15/2018	AE w/ Floodway	Hydraulic model contains culvert to approximate downstream boundary condition.
Champions Creek	Confluence with Eagle Run Creek	Approximately 590 feet upstream of Eagle Run Drive	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Cole Creek	Confluence with Little Papillion Creek	Approximately 400 feet downstream of Sorensen Parkway	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Cole Creek	Approximately 100 feet southwest of the intersection of N 64th Plz and Sorsensen Pkwy	Approximately 50 feet northeast of the intersection of N 63rd St and Sorsensen Pkwy	Unknown	Unknown	March 1980	A	Studied by approximate methods (FEMA 1982)

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Eagle Run Creek	Confluence with Big Papillion Creek	Approximately 2,360 feet upstream of North 132nd Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
East Knight Creek	Confluence of Little Papillion Creek	Approximately 100 feet upstream of Rainwood Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Glenn Cunningham Reservoir.
East Knight Creek	Approximately 100 feet upstream of Rainwood Road	Approximately 700 feet upstream of Rainwood Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Elkhorn River	Sarpy/Douglas County boundary	Approximately 700 feet downstream of West Dodge Road	OTHER	HEC-2 4.6.2 (May 1991)	June 1978	AE w/ Floodway	Flows were based on records for the USGS gage at Waterloo for 1929 through 1975 except for two years without data (USGS ND). The 10-, 2-, and 1- percent-annual-chance floods were adjusted for regional effects. The 0.2-percent-annual-chance flood had a skew of 0.276 due to the similar results from the Platte River Level B Study (MRBC 1975). Floodplain mapping based on topographic maps at 1:24,000 scale and 10-ft contour interval (USGS 1975). Flood hazards along this portion of Elkhorn River were revised under LOMR 07-07-0850P. See Table 26 for more information.
Elkhorn River	Approximately 700 feet downstream of West Dodge Road	Approximately 1,500 feet downstream from Pawnee Road	OTHER	HEC-RAS 4.0 (USACE 2008)	5/19/2014	AE w/ Floodway	Conducted as a PMR accrediting the Waterloo Levee.

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Elkhorn River	Approximately 1,500 feet downstream from Pawnee Road	Douglas/Washington County boundary	OTHER	HEC-2 4.6.2 (May 1991)	June 1978	AE w/ Floodway	Flows were based on records for the USGS gage at Waterloo for 1929 through 1975 except for two years without data (USGS ND). The 10-, 2-, and 1- percent-annual-chance floods were adjusted for regional effects. The 0.2-percent-annual-chance flood had a skew of 0.276 due to the similar results from the Platte River Level B Study (MRBC 1975). Floodplain mapping based on topographic maps at 1:24,000 scale and 10-ft contour interval (USGS 1975).
Elmwood Creek	Confluence with Little Papillion Creek	Approximately 1,720 feet upstream of Elmwood Park Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Elmwood Creek Overland	Confluence with Little Papillion Creek	Approximately 127 feet upstream of Elmwood Park Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
F Street Drain	Confluence with Little Papillion Creek	Approximately 1,170 feet upstream of South 60th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Frederic Street Creek	Confluence with Big Papillion Creek	Approximately 2,370 feet upstream of Paddock Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Glenbrook Creek	Confluence with Little Papillion Creek	Approximately 1,975 feet upstream of Sorensen Parkway	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Hanover Creek	Confluence with Big Papillion Creek	Approximately 2,360 feet upstream of Military Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Hell Creek	Sarpy/Douglas County boundary	Approximately 130 feet downstream of Doyle Drive	HEC-HMS (USACE ND2)	HEC-RAS 4.1.0 (USACE 2010)	9/15/2018	AE w/ Floodway	
Hell Creek	At Doyle Drive	At Overlook Road	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Boys Town Reservoir No. 1
Huntington Creek	Confluence with North Branch West Papillion	Approximately 75 feet downstream of North 156th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Indian Creek	Confluence with West Papillion Creek	At Fort Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Little Papillion Creek	Confluence with Big Papillion Creek	Approximately 450 feet upstream of State Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Little Papillion Creek	Approximately 1,000 feet upstream of State Street	Approximately 900 feet downstream of Bennington Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Also known as Glenn Cunningham Reservoir
Little Papillion Creek	Approximately 900 feet downstream of Bennington Road	Douglas/Washington County boundary	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Glenn Cunningham Reservoir.
Lockwood Creek	Confluence with Big Papillion Creek	Approximately 540 feet downstream of Bennington Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Lonergan Creek	Confluence with Little Papillion Creek	Approximately 170 feet upstream of Bennington Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Glenn Cunningham Reservoir.

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Lonergan Creek	Approximately 170 feet upstream of Bennington Road	Approximately 180 feet downstream of North 84th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Lonergan Creek	Approximately 700 feet upstream of North 84th Street	Approximately 1,300 feet downstream of North 72nd Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Lonergan Reservoir
Maple Village Creek	Confluence with Little Papillion Creek	Approximately 2,700 feet upstream of Maplewood Boulevard	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Meadow Lane Creek	Confluence with Big Papillion Creek	Approximately 560 feet upstream of South 117th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Mill Creek	North 30th Street	Approximately 850 feet upstream of North 52nd Avenue	Unknown	Unknown	March 1980	A	Studied by approximate methods (FIS 1982)
Mission Creek	Sarpy/Douglas County boundary	Approximately 820 feet upstream of Monroe Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Mission Creek Overland	Sarpy/Douglas County boundary	At Monroe Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	The flow input for overland flow model is assumed to be equal to the weir flow component at the Monroe Street culvert as estimated by the Mission Creek main model.
Missouri River	Sarpy/Douglas County boundary	Douglas/Washington County boundary	OTHER	OTHER	November 2003	AE w/ Floodway	A summary of the hydrologic and hydraulic methodology used for the Missouri River is provided in the narrative below.

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Mockingbird Creek	Confluence with Big Papillion Creek	Approximately 170 feet upstream of Mockingbird Drive	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Morton Creek	Confluence with West Papillion Creek	Approximately 680 feet upstream of the confluence with West Papillion Creek	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
North Boxelder Creek	Confluence with Boxelder Creek	Approximately 2,540 feet upstream of Marinda Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	Construction of Zorinsky Water Quality Basin No. 1 was completed after project terrain data was collected (Merrick 2011). For this reason, hydraulic cross sections through the basin are based on design plans (Olsonn 2013) and the Special Flood Hazard Areas surrounding the basin were delineated based on aerial imagery (NDNR 2014).
North Branch West Papillion	Confluence with West Papillion Creek	Approximately 800 feet upstream of Fort Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
North Branch West Papillion	Approximately 800 feet upstream of Fort Street	Approximately 700 feet downstream of State Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Dam Site 15A. Construction of this reservoir was completed after project terrain data was collected (Merrick 2011). For this reason, the Special Flood Hazard Areas surrounding dam and spillway were delineated based on as-built grading provided by the Papio-Missouri River NRD (PMRNRD 2018).
North Branch West Papillion	Approximately 700 feet downstream of State Street	At North 186th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Dam Site 15A.

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
North Branch West Papillion	At North 186th Street	Approximately 800 feet downstream of Rainwood Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
North Standing Bear Creek	Confluence with Standing Bear Lake	At North 144th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Standing Bear Lake.
North Standing Bear Creek	At North 144th Street	At Reservoir D-17	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
North Standing Bear Creek	Approximately 400 feet upstream of Ida Street	Approximately 500 feet downstream of Sheffield Drive	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Dam Site 17
North Washington Creek	Confluence with Washington Creek	At Dutch Hall Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Oak View Creek	Confluence with West Papillion Creek	Approximately 670 feet upstream of the railroad	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Old Bones Creek	Confluence with Little Papillion Creek	Approximately 140 feet downstream of Dutch Hall Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	
Old Bones Creek	Approximately 1,800 feet downstream of Dutch Hall Road	Approximately 140 feet downstream of Dutch Hall Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Old Lincoln Highway Creek	Confluence with West Papillion Creek	Approximately 1,410 feet upstream of Harney Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Pacific Hollow Creek	Confluence with West Papillion Creek	Approximately 300 feet upstream of South 153rd Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Platte River	Sarpy/Douglas County boundary	Douglas/Washington County boundary	HEC-FFA 3.0 (USACE 1992 FFA)	HEC-2 (USACE 1990 HEC2)	12/2/2005	AO, AE w/ Floodway	Used records from the USGS gage station at North Bend, Nebraska in the HEC-FFA software. Peak flows developed for the North Bend Gage were used from the Elkhorn River through North Bend. Data from the stations on the Platte River at Duncan, Grand Island, Ashland, and Louisville, Nebraska were used to develop regional skews. Station skews were developed for both the snowmelt season (December through March) and rainfall season (April through December). For the flood profiles in cases where the 2- and 1-percent-annual-chance flood elevations are close together, only the 1-percent-annual-chance profile was drawn. Starting water surface elevations at the downstream limit were established using the computed elevations at cross section 198700 from the previous Lower Platte River FIS report (USACE 1994 and USACE 1996).
Ponca Creek	At Pershing Drive	At Calhoun Road	EPA SWMM (USEPA 1971)	HEC-2 (USACE 1976)	January 1987	AE w/ Floodway	Rainfall depth-duration-frequency data for the computation of floods on Ponca Creek are from the National Oceanic and Atmospheric Administration's (NOAA's) Technical Memorandum NWS HYDRO-35 (USDC 1977). A soil infiltration rate of 0.30 inch per hour was used in each basin.

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Ralston Creek	Confluence with Big Papillion Creek	Approximately 1,600 feet upstream of South 78th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Ridgewood Creek	Confluence with Big Papillion Creek	Approximately 3,660 feet upstream of Pawnee Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Rockbrook Creek	Confluence with Big Papillion Creek	Approximately 360 feet upstream of West Center Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Saddle Creek	Confluence with Little Papillion Creek	Approximately 320 feet upstream of Charles Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	Flows derived from previous USACE estimates of underground sewer capacities. These capacities were subtracted from Papillion Watershed HEC-HMS model and interpolated for each cross section in the hydraulic model. See Supplemental Information in Hydraulic Data Capture for additional information.
South Standing Bear Creek	Approximately 3,000 feet downstream of North 144th Street	At North 144th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in Standing Bear Lake.
South Standing Bear Creek	At North 144th Street	Approximately 740 feet upstream of Fort Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
South Standing Bear Creek	Approximately 740 feet upstream of Fort Street	Approximately 1,800 feet downstream of North 152nd Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as South Standing Bear Lake

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
South Standing Bear Creek	Approximately 1,800 feet downstream of North 152nd Street	At North 152nd Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Hydraulic model downstream boundary condition based on known water surface elevation in South Standing Bear Lake.
South Standing Bear Creek	At North 152nd Street	Approximately 80 feet downstream North 155th Avenue	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
South Washington Creek	Confluence with Washington Creek	Approximately 1,915 feet upstream of Pawnee Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Standing Bear Creek	Confluence with Big Papillion Creek	Approximately 150 feet upstream of North 132nd Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Standing Bear Creek	Approximately 600 feet upstream of North 132nd Street	Approximately 1,000 feet downstream of North 144th Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Standing Bear Lake
Thomas Creek	Confluence with Little Papillion Creek	Approximately 460 feet downstream of Dutch Hall Road	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Tributary To Big Papillion Creek	At Charles Street	Approximately 170 feet downstream of Nicholas Street	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Candlewood Reservoir
Tributary to Cole Creek	Confluence with Cole Creek	North 60th Avenue	Unknown	Unknown	March 1980	A	Zone A flood hazards from approximately N 64th Street to the confluence of Cole Creek were modified to tie into the updated Zone AE Cole Creek study.

Table 12: Summary of Hydrologic and Hydraulic Analyses (continued)

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Tributary To West Papillion Creek	Approximately 200 feet upstream of North 192nd Street	At West Dodge Road	HEC-HMS (USACE ND2)	N/A	9/15/2018	AE	Also known as Dam Site 13
Unnamed Tributary to Missouri River	North 36th Street	North 40th Street	Unknown	Unknown	March 1980	A	Studied by approximate methods (FIS 1982)
Washington Creek	Confluence with Big Papillion Creek	Douglas/Washington County limits	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Washington Creek	Douglas/Washington County boundary	Approximately 450 feet upstream of North 216th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
West Papillion Creek	Sarpy/Douglas County boundary	Approximately 3,280 feet upstream of North 216th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	Regulatory elevations on riverside of levees and regulatory profile consider presence of levees. Floodway analysis does not consider presence of levees.
Whispering Ridge Creek	Confluence with West Papillion Creek	Approximately 640 feet downstream of Fort Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Whitehawk Creek	Confluence with Boxelder Creek	At Grover Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	
Whitehawk Creek	At Grover Street	At F Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE	Also known as Zorinsky Basin No. 3
Whitehawk Creek	At F Street	Approximately 620 feet upstream of South 207th Street	HEC-HMS (USACE ND2)	HEC-RAS 5.0.3 (USACE 2016)	9/15/2018	AE w/ Floodway	

Special Considerations for the Missouri River

The hydrologic and hydraulic analyses for the Missouri River were performed by the US Army Corps of Engineers as part of the Upper Mississippi River System Flow Frequency Study (UMRSFFS) (USACE 2004). This study was a collaboration of effort between the Rock Island, St. Louis, Kansas City, Omaha, and St. Paul districts and was completed in 2003. The 1-percent-annual-chance flood water surface profile and floodway computations on the Missouri River were performed within the USACE's Hydrologic Engineering Centers River Analysis System (HEC-RAS) for the Federal Emergency Management Agency (FEMA) under Interagency Agreement No. HSFE07-06-X-0012 by the Kansas City and Omaha districts and were completed in 2007.

The hydrologic analysis for the UMRSFFS utilized a combination of the following methods and approaches to determine discharge-frequency relationships: 100 years of record from 1898 to 1998; the log-Pearson Type III distribution for unregulated flows at gages; main stem flows between gages determined by interpolation of the mean and standard deviation for the annual flow distribution based on drainage area in conjunction with a regional skew; flood control reservoir impacts defined by regulated versus non-regulated relationships for discharges; extreme events determined by factoring up major historic events; HEC-HMS and/or HEC-1 models for the main tributaries; and the UNET unsteady flow program (USACE 1997) to address hydraulic impacts.

In situations where historic records were not adequate or appropriate to develop discharge-frequency relationships or to verify the results, hydrologic modeling was used to create synthetic flows based on rainfall.

The computation of unregulated flow frequency relationships on the Missouri River upstream of the Kansas River required special consideration due to the combination of the two historic peak flow periods consisting of the plains snowmelt of the early spring and the mountain snowmelt and plains rainfall of the late spring/early summer. An additional concern related to the Missouri River was flow depletion due to irrigation and reservoir evaporation. Historic depletions were added to the observed flow record to help obtain unregulated flows, while historic depletions were adjusted to present level depletions for computation of the regulated flow record. The result of the hydrologic aspects of the study was a discharge and related frequency of occurrence for stations or given cross section located along each of the principle main stem rivers. The main hydraulic tool used to determine flood elevations along the Missouri River was the UNET unsteady flow computer modeling program (USACE 1997). Included in the UNET model were the main stem of the Mississippi River, several of its main tributaries, navigation dams, and the levees and levee systems. Hydrographic surveys were assembled from navigation channel maintenance surveys, dam periodic inspection surveys, and environment management project surveys.

These surveys date from 1997 or later. For areas where no digital hydrographic surveys were available, such as in some side channels and chutes, depths were estimated from the most current printed surveys available. Bluff-to-bluff digital terrain data collected in 1995 and 1998 were used to supplement the channel survey data (Earthdata 1998).

Model development consisted of constructing HEC-RAS models from the original cross-sections, adding in ineffective flow areas or obstructions as necessary, and then converting the models to UNET. The UNET model was calibrated to reproduce recorded flood hydrographs for a selected period of record. The UNET model was calibrated to both stage and discharge at gaging locations primarily by adjusting roughness coefficients and estimated lateral inflows. Annual peak flows

and peak stages from the period of record run of the calibrated UNET model were used to develop rating curves for each cross section location. Using these station rating curves and the station frequency flows developed during the hydrology phase, frequency elevation points were obtained for each cross section location. Connecting the corresponding points resulted in flood frequency profiles. These profiles were coordinated among the computational teams and appropriate adjustments were made to assure consistency.

Some special considerations and techniques were required to address especially complex flow reaches. The confluences of the Missouri and Illinois Rivers with the Mississippi relied primarily on development of graphical stage-probability relationships for backwater-impacted cross sections. These were created using a graphical Weibull approach. The graphical period-of-record stage-probability curves were combined to blend a consistent and reasonable profile for each probability flood. Confluences of many other smaller streams with the main stem also exhibited backwater effects resulting in discontinuities in the profiles. A computer routine was developed to smooth the profile in these reaches so as to form a consistent, reasonable transition through the zone of backwater.

The 1-percent-annual-chance water surface elevation profile was calculated using the HEC-RAS 3.1.3 computer program (USACE 2005). Upon completion of the Upper Mississippi River System Flow Frequency Study (UMRSFFS) (USACE 2004), FEMA funded the Corps of Engineers to compute a floodway for the studied reach of the Missouri River. This floodway determination consisted of converting the hydraulic data from UNET to HEC-RAS, calibrating the HEC-RAS steady-state models to the UMRSFFS results for the 1-percent-annual-chance profile, and performing the floodway computations.

The 1-percent-annual-chance elevations from this calibrated HEC-RAS model were used as the basis to delineate the associated 1-percent-annual-chance floodplain and correspond to the base flood elevation shown on the maps. The 10-, 2-, and 0.2-percent-annual-chance elevations shown on the flood profiles were plotted using the original UNET elevation.

Table 13: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
90th Street Drain	0.030 - 0.039	0.030 - 0.100
Bennington Creek	0.032 - 0.035	0.035 - 0.080
Big Papillion Creek	0.030	0.030 - 0.090
Blood Creek	0.035	0.015 - 0.060
Boettger Creek	0.032 - 0.040	0.035 - 0.060
Boxelder Creek	0.045	0.035 - 0.070
Butterflat Creek	0.045	0.035 - 0.090
Cemetery Creek	0.035 - 0.045	0.045 - 0.070
Champions Creek	0.030	0.025 - 0.060
Cole Creek	0.030 - 0.045	0.015 - 0.060
Eagle Run Creek	0.045 - 0.055	0.035 - 0.090
East Knight Creek	0.030 - 0.050	0.040 - 0.100
Elkhorn River	0.032	0.065
Elmwood Creek	0.045	0.029 - 0.060
Elmwood Creek Overland	0.015	0.015 - 0.045
F Street Drain	0.037 - 0.060	0.025 - 0.070
Frederic Street Creek	0.045	0.060
Glenbrook Creek	0.040 - 0.045	0.015 - 0.070
Hanover Creek	0.045	0.030 - 0.085
Hell Creek	0.035 - 0.050	0.030 - 0.500
Huntington Creek	0.048 - 0.050	0.040 - 0.055
Indian Creek	0.040 - 0.050	0.040 - 0.500
Little Papillion Creek	0.025 - 0.055	0.015 - 0.450
Lockwood Creek	0.035	0.040 - 0.090
Lonergan Creek	0.040 - 0.045	0.045 - 0.070
Maple Village Creek	0.044 - 0.045	0.020 - 0.060
Meadow Lane Creek	0.035	0.017 - 0.050
Mission Creek	0.040 - 0.045	0.040 - 0.045
Mission Creek Overland	0.055	0.055
Missouri River	0.023 - 0.024	0.024 - 0.990
Mockingbird Creek	0.035	0.015 - 0.050
Morton Creek	0.035 - 0.040	0.030 - 0.070
North Boxelder Creek	0.040 - 0.045	0.030 - 0.070
North Branch West Papillion	0.035 - 0.065	0.035 - 0.070
North Standing Bear Creek	0.010 - 0.040	0.025 - 0.080
North Washington Creek	0.045 - 0.090	0.035 - 0.115
Oak View Creek	0.033 - 0.050	0.023 - 0.060
Old Bones Creek	0.030 - 0.040	0.040 - 0.070
Old Lincoln Highway Creek	0.025 - 0.070	0.025 - 0.080
Pacific Hollow Creek	0.025 - 0.050	0.025 - 0.043
Platte River	0.025 - 0.030	0.050 - 0.095
Ponca Creek	0.045 - 0.065	0.080

Table 13: Roughness Coefficients (continued)

Flooding Source	Channel “n”	Overbank “n”
Ralston Creek	0.035 - 0.040	0.015 - 0.050
Ridgewood Creek	0.035	0.025 - 0.060
Rockbrook Creek	0.045 - 0.450	0.040 - 0.080
Saddle Creek	0.015 - 0.033	0.015 - 0.450
South Standing Bear Creek	0.045 - 0.050	0.045 - 0.070
South Washington Creek	0.045	0.035 - 0.070
Standing Bear Creek	0.045	0.045 - 0.090
Thomas Creek	0.030 - 0.045	0.035 - 0.500
Washington Creek	0.045	0.030 - 0.070
West Papillion Creek	0.035 - 0.060	0.025 - 0.800
Whispering Ridge Creek	0.035 - 0.050	0.040 - 0.065
Whitehawk Creek	0.030 - 0.050	0.030 - 0.070

5.3 Coastal Analyses

This section is not applicable to this Flood Risk Project.

Table 14: Summary of Coastal Analyses
[Not applicable to this Flood Risk Project.]

5.3.1 Total Stillwater Elevations

This section is not applicable to this Flood Risk Project.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas
[Not applicable to this Flood Risk Project.]

Table 15: Tide Gage Analysis Specifics
[Not applicable to this Flood Risk Project.]

5.3.2 Waves

This section is not applicable to this Flood Risk Project.

5.3.3 Coastal Erosion

This section is not applicable to this Flood Risk Project.

5.3.4 Wave Hazard Analyses

This section is not applicable to this Flood Risk Project.

Table 16: Coastal Transect Parameters

[Not applicable to this Flood Risk Project.]

Figure 9: Transect Location Map

[Not applicable to this Flood Risk Project]

5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Project.

Table 17: Summary of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

Table 18: Results of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov.

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

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

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

Table 19: Countywide Vertical Datum Conversion

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Arlington	SW	41.37	-96.24	+0.476
Elkhorn	SW	41.24	-96.12	+0.384
Fremont East	SW	41.37	-96.37	+0.470
Kennard	SW	41.37	-96.12	+0.436
Leshara	SW	41.24	-96.37	+0.433
Valley	SW	41.24	-96.24	+0.404
Average Conversion from NGVD29 to NAVD88 = +0.434 feet				

The studied reach of Missouri River spans multiple counties in multiple states and the river forms the actual border between adjacent counties. The Upper Mississippi River System Flow Frequency Study (UMRSFFS) (USACE 2004) was originally performed using the NGVD29 vertical datum. Applying an average countywide datum shift to convert to

NAVD88 would have resulted in a mismatch of elevations between counties. Therefore, in order to perform the most accurate vertical datum conversion possible, and to maintain consistency in approach across county lines, the datum conversion for the Missouri River was performed on a cross-section by cross-section basis, rather than by applying an average county-wide or stream-wide value.

Table 20: Stream-Based Vertical Datum Conversion

[Not applicable to this Flood Risk Project.]

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM Database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/media-library/resources-documents/collections/361.

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

Table 21: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Aerial Photo Index	Metropolitan Area Planning Agency (MAPA)	2001	1 meter	Spatial and attribute information for base index for FIRMs dated 5/19/2014 (MAPA 2001).
Aerial Photo Index	Metropolitan Area Planning Agency (MAPA)	2001	0.25 & 0.5 meter	Spatial and attribute information for base index for FIRMs dated 12/2/2005 (MAPA 2001).
Aerial Photography	Hardin Company	Not Provided	1:7,920	Submittal information for Aerial Photographs Platte River, Scale 1:7,920: Valley, Nebraska (Hardin ND).
Aerial Photography	USACE	Multiple	Various	Submittal information for Aerial Photography Published November 1977; March 1978; April 1979 (USACE Multiple).

Table 21: Base Map Sources (continued)

Data Type	Data Provider	Data Date	Data Scale	Data Description
Imagery	Nebraska DNR	2014	Not Provided	Spatial and attribute information for base index and submittal information for FIRMs dated TBD (NDNR 2014).
National Levee Dataset - Levee Centerlines	United States Army Corps of Engineers (USACE)	TBD	Not Provided	Spatial and attribute information for levees from National Levee Database for FIRMs dated TBD (USACE ND1).
NGS Benchmarks	National Geodetic Survey	1985	Not Provided	Spatial and attribute information for NGS benchmark locations for FIRMs dated 12/2/2005 and 5/19/2014 (NGS 1985).
Political Boundaries	DC (Douglas County) GIS	2017	Not Provided	Spatial and attribute information for political area boundaries for FIRMs dated TBD (DCGIS 2017a).
Political Boundaries	Nebraska Department of Natural Resources	2002	Not Provided	Spatial and attribute information for political areas for FIRMs dated 12/2/2005 and 5/19/2014 (NDNR 2002).
Public Land Survey System Polygons, FIRM Panel Index based on USGS Quads	United States Geological Survey	2001	Not Provided	Spatial and attribute information for the public land survey system, FIRM panel layout and the quad index for FIRMs dated TBD (USGS 2001).
Railroads	DC (Douglas County) GIS	2017	Not Provided	Spatial and attribute information for transportation features for FIRMs dated TBD (DCGIS 2017b).
River Marks	United States Army Corp of Engineers (USACE)	2003	Not Provided	Spatial and attribute information for river marks for FIRMs dated 12/2/2005 and 5/19/2014 (USACE 2003.)
Street Centerlines	DC (Douglas County) GIS	2018	Not Provided	Spatial and attribute information for roads centerlines for FIRMs dated TBD.
Submittal Layout	Stantec Consulting Inc	2018	Not Provided	Spatial and attribute information for subbasins for FIRMs dated TBD (Stantec 2018a).
Townships	Nebraska DNR	1995	Not Provided	Spatial and attribute information for Public Land Survey System areas within Douglas County for firms dated TBD (NDNR 1995).
Water Bodies	DC (Douglas County) GIS	2017	Not Provided	Spatial and attribute information for surface water features for FIRMs dated TBD (DCGIS 2017c).

Table 21: Base Map Sources (continued)

Data Type	Data Provider	Data Date	Data Scale	Data Description
Waterlines	DC (Douglas County) GIS	2016	Not Provided	Spatial and attribute information for water lines for FIRMs dated TBD (DCGIS 2016.
Watershed Boundary Dataset	United States Geological Survey	2019	Not Provided	Spatial and attribute information for subbasins for FIRMs dated TBD (USGS 2019).

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 22.

In cases where the 1-percent and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

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

Table 22: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data			
		Description	Vertical Accuracy	Horizontal Accuracy	Citation
Douglas County, Unincorporated Areas; Omaha, City of	Elkhorn River	Topographic Maps at a scale of 1:24,000 with a contour interval of 10 feet	Not Provided	Not Provided	USGS 1968
Douglas County, Unincorporated Areas; Omaha, City of; Waterloo, Village of	Elkhorn River	Douglas County LiDAR	Not Provided	Not Provided	Horizon 2005
Douglas, County of; Valley, City of	Platte River	Aerial Photography	Not Provided	Not Provided	Hardin ND
Omaha, City of	Ponca Creek	7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 feet: Gretna, Nebraska, 1956, photorevised 1969 and 1975; Elkhorn, Nebraska, 1968, photorevised 1975	Not Provided	Not Provided	USGS 1975
Douglas, County of; Omaha, City of	Missouri River	Iowa Department of Natural Resources	1m RMSE	Not Provided	IDNR 2010
Omaha, City of	Zone A's	7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 10 feet: Gretna, Nebraska, 1956, photorevised 1969 and 1975; Elkhorn, Nebraska, 1968, photorevised 1975	Not Provided	Not Provided	USGS 1975
Bennington, City of; Boys Town, Village of; Douglas County, Unincorporated Areas; Omaha, City of; Ralston, City of	All Other Flooding Sources not previously listed	Merrick and Company	0.36m at the 95% confidence level	1.04m at the 95% confidence level	Merrick 2011

BFEs shown at cross sections on the FIRM represent the 1-percent-annual-chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report.

Table 23: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,024	61	98	5.6	1,055.3	1,055.3	1,055.7	0.4
B	1,219	113	228	2.4	1,056.9	1,056.9	1,057.8	0.9
C	1,496	50	131	4.2	1,059.0	1,059.0	1,059.2	0.2
D	1,818	54	86	6.4	1,062.8	1,062.8	1,062.9	0.1
E	1,987	61	91	6.0	1,064.1	1,064.1	1,064.3	0.2
F	2,268	55	81	6.7	1,067.9	1,067.9	1,068.0	0.1
G	2,500	97	671	0.8	1,074.3	1,074.3	1,074.7	0.4
H	3,001	64	214	2.5	1,074.4	1,074.4	1,074.7	0.3
I	3,489	46	85	6.4	1,076.0	1,076.0	1,076.1	0.1
J	3,747	44	83	6.5	1,078.9	1,078.9	1,078.9	0.0

[1] Feet above confluence with Little Papillion Creek

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, NE

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: 90TH STREET DRAIN

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	7,800	42	38	6.0	1,142.7	1,142.7	1,142.7	0.0
B	8,492	47	90	2.5	1,144.5	1,144.5	1,144.5	0.0
C	8,995	17	36	6.8	1,145.3	1,145.3	1,145.3	0.0
D	9,501	16	37	6.1	1,148.5	1,148.5	1,148.5	0.0
E	10,000	17	29	7.2	1,153.3	1,153.3	1,153.3	0.0
F	10,505	21	34	6.8	1,159.4	1,159.4	1,159.4	0.0

[1]FEET ABOVE CONFLUENCE WITH BIG PAPILLION CREEK

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, NE

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BENNINGTON CREEK

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	65,856	340	4,738	5.7	1003.4	1003.4	1003.9	0.5
B	68,653	302	3,433	9.3	1004.5	1004.5	1004.8	0.3
C	68,754	341	5,064	6.9	1008.4	1008.4	1008.9	0.5
D	70,997	315	4,536	7.1	1009.5	1009.5	1009.9	0.4
E	71,656	395	4,466	7.3	1010.0	1010.0	1010.3	0.3
F	73,724	231	3,296	6.6	1011.3	1011.3	1011.5	0.2
G	74,240	217	3,293	6.7	1011.7	1011.7	1012.0	0.3
H	76,593	284	3,888	5.6	1013.6	1013.6	1013.6	0.0
I	76,745	281	3,452	6.3	1013.6	1013.6	1013.7	0.1
J	79,861	252	3,402	6.4	1016.3	1016.3	1016.3	0.0
K	80,416	333	4,009	5.8	1017.1	1017.1	1017.1	0.0
L	80,816	288	3,323	6.9	1020.5	1020.5	1020.6	0.1
M	81,721	362	4,374	5.0	1022.0	1022.0	1022.0	0.0
N	83,018	293	3,858	5.6	1022.4	1022.4	1022.5	0.1
O	84,376	515	4,771	4.6	1023.6	1023.6	1023.6	0.0
P	87,251	268	3,190	6.8	1024.7	1024.7	1024.8	0.1
Q	87,429	339	5,360	4.0	1026.0	1026.0	1026.0	0.0
R	88,810	955	5,923	4.0	1026.1	1026.1	1026.2	0.1
S	89,637	718	4,193	5.3	1026.6	1026.6	1026.7	0.1
T	93,672	416	4,503	5.1	1029.6	1029.6	1029.7	0.1
U	95,020	270	2,911	7.9	1030.0	1030.0	1030.1	0.1
V	95,460	148	2004	11.5	1032.1	1032.1	1032.1	0.0

[1]FEET ABOVE CONFLUENCE WITH MISSOURI RIVER

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
W	96,202	240	3,447	6.7	1,035.1	1,035.1	1,035.1	0.0
X	96,335	229	3,692	6.2	1,035.8	1,035.8	1,035.8	0.0
Y	97,489	390	3,691	6.2	1,036.3	1,036.3	1,036.3	0.0
Z	97,846	420	5,061	4.5	1,037.5	1,037.5	1,037.5	0.0
AA	101,446	308	3,816	6.0	1,039.6	1,039.6	1,039.6	0.0
AB	101,607	252	3,659	6.3	1,040.0	1,040.0	1,040.1	0.1
AC	102,155	400	3,749	6.4	1,040.5	1,040.5	1,040.5	0.0
AD	102,448	290	3,637	6.3	1,041.2	1,041.2	1,041.3	0.1
AE	105,840	650	3,763	6.1	1,044.0	1,044.0	1,044.1	0.1
AF	107,742	293	3,424	6.8	1,045.6	1,045.6	1,045.7	0.1
AG	108,344	700	6,013	3.8	1,048.7	1,048.7	1,048.7	0.0
AH	110,108	725	5,983	3.8	1,049.8	1,049.8	1,049.8	0.0
AI	112,776	289	3,421	6.6	1,051.6	1,051.6	1,051.6	0.0
AJ	113,155	332	4,017	5.6	1,052.2	1,052.2	1,052.2	0.0
AK	113,518	527	5,836	3.9	1,055.1	1,055.1	1,055.1	0.0
AL	114,262	1268	9,501	2.4	1,055.6	1,055.6	1,055.6	0.0
AM	116,713	1470	7,747	3.1	1,056.1	1,056.1	1,056.1	0.0
AN	119,199	425	4,955	4.8	1,059.5	1,059.5	1,059.5	0.0
AO	123,333	2000	7,994	3.0	1,063.2	1,063.2	1,063.2	0.0
AP	124,492	1767	6,222	3.8	1,065.2	1,065.2	1,065.2	0.0
AQ	124886	1870	10805	2.2	1067.5	1067.5	1067.5	0
AR	128,414	1,670	8,483	2.8	1,069.6	1,069.6	1,069.6	0.0

[1]FEET ABOVE CONFLUENCE WITH MISSOURI RIVER

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AS	132,080	1,040	3,545	6.8	1,071.4	1,071.4	1,071.4	0.0
AT	132,797	1,895	9,789	2.5	1,074.0	1,074.0	1,074.0	0.0
AU	136,543	1,296	3,398	7.1	1,076.6	1,076.6	1,076.7	0.1
AV	136,606	1,325	5,145	4.7	1,078.0	1,078.0	1,078.0	0.0
AW	139,565	1,330	2,954	8.6	1,080.2	1,080.2	1,080.2	0.0
AX	141,747	920	3,942	6.4	1,083.8	1,083.8	1,083.8	0.0
AY	144,294	1,015	5,880	4.3	1,088.7	1,088.7	1,088.7	0.0
AZ	145,940	1,182	3,637	6.9	1,089.2	1,089.2	1,089.3	0.1
BA	146,495	1,120	5,269	5.2	1,091.0	1,091.0	1,091.0	0.0
BB	147,436	1,038	3,692	7.0	1,092.8	1,092.8	1,092.8	0.0
BC	149,735	985	5,086	4.9	1,094.7	1,094.7	1,094.7	0.0
BD	152,710	780	5,490	4.5	1,098.3	1,098.3	1,098.3	0.0
BE	152,865	330	4,448	5.5	1,099.7	1,099.7	1,099.9	0.2
BF	153,431	251	3,587	6.9	1,100.0	1,100.0	1,100.1	0.1
BG	154,802	234	3,714	6.6	1,101.3	1,101.3	1,101.4	0.1
BH	155,892	251	2,768	9.4	1,101.7	1,101.7	1,101.8	0.1
BI	156,433	650	3,979	6.2	1,103.4	1,103.4	1,103.4	0.0
BJ	158,805	1,390	4,232	5.8	1,105.3	1,105.3	1,105.3	0.0
BK	159,656	1,320	7,171	3.5	1,107.5	1,107.5	1,107.5	0.0
BL	161,878	670	3,329	8.5	1,108.4	1,108.4	1,108.4	0.0

[1]FEET ABOVE CONFLUENCE WITH MISSOURI RIVER

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	2,816	26	94	8.1	1004.5	1004.5	1004.5	0.0
B	3,072	39	160	4.8	1006.0	1006.0	1006.0	0.0
C	3,930	27	78	9.8	1008.3	1008.3	1008.4	0.1
D	4,248	35	160	4.8	1010.8	1010.8	1010.8	0.0
E	4,697	33	84	9.1	1011.6	1011.6	1011.6	0.0
F	4,800	94	327	2.7	1013.4	1013.4	1013.4	0.0

[1]FEET ABOVE CONFLUENCE WITH BIG PAPILLION CREEK

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	4,471	120	478	8.2	1,145.9	1,145.9	1,146.1	0.2
B	4,806	136	558	7.1	1,147.7	1,147.7	1,147.8	0.1
C	5,715	99	545	6.7	1,150.7	1,150.7	1,150.7	0.0
D	6,904	59	435	8.4	1,154.2	1,154.2	1,154.3	0.1
E	7,227	124	870	4.3	1,157.4	1,157.4	1,157.4	0.0
F	7,724	55	395	9.3	1,157.5	1,157.5	1,157.5	0.0
G	8,773	63	360	6.3	1,163.9	1,163.9	1,163.9	0.0
H	9,121	58	278	8.2	1,166.5	1,166.5	1,166.5	0.0

[1]FEET ABOVE CONFLUENCE WITH LITTLE PAPILLION CREEK

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, NE

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BOETTGER CREEK

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,705	468	1,971	3.6	1,120.2	1,120.2	1,120.8	0.6
B	2,237	192	1,086	6.5	1,121.5	1,121.5	1,122.1	0.6
C	2,442	280	2,497	2.8	1,124.2	1,124.2	1,124.8	0.6
D	3,592	285	2,066	3.8	1,125.0	1,125.0	1,125.8	0.8
E	4,272	288	1,642	4.3	1,126.0	1,126.0	1,126.7	0.7
F	5,084	378	2,810	3.3	1,128.0	1,128.0	1,128.6	0.6
G	6,314	407	2,784	2.6	1,130.3	1,130.3	1,131.0	0.7
H	6,809	293	1,627	4.8	1,130.6	1,130.6	1,131.2	0.6
I	7,225	357	1,290	5.5	1,130.8	1,130.8	1,131.7	0.9
J	8,019	418	1,949	3.6	1,134.1	1,134.1	1,134.1	0.0
K	8,718	333	1,194	6.5	1,134.5	1,134.5	1,135.0	0.5
L	8,771	348	1,504	6.1	1,135.3	1,135.3	1,135.8	0.5
M	9,071	175	881	8.1	1,136.1	1,136.1	1,136.4	0.3
N	9,311	342	1,519	4.7	1,137.9	1,137.9	1,138.0	0.1
O	9,366	300	1,527	4.7	1,138.3	1,138.3	1,138.5	0.2
P	9,933	182	1,053	6.2	1,139.9	1,139.9	1,139.9	0.0
Q	10,113	181	1,819	3.7	1,140.7	1,140.7	1,140.7	0.0
R	10,260	210	2,141	3.2	1,140.9	1,140.9	1,140.9	0.0
S	10,860	334	1,217	5.2	1,141.5	1,141.5	1,141.5	0.0
T	11,316	366	1,314	4.9	1,142.1	1,142.1	1,142.7	0.6
U	12,022	196	884	7.2	1,143.1	1,143.1	1,143.8	0.7

[1]FEET ABOVE UPPER LIMIT OF ZORINSKY LAKE

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	12,690	288	1,197	5.7	1,146.7	1,146.7	1,146.8	0.1
W	13,146	174	749	8.5	1,147.3	1,147.3	1,147.4	0.1
X	13,765	239	1,422	4.5	1,150.7	1,150.7	1,151.4	0.7
Y	14,285	260	1,616	4.0	1,151.7	1,151.7	1,152.6	0.9
Z	14,903	187	1,139	5.6	1,152.4	1,152.4	1,153.3	0.9
AA	15,294	258	1,309	4.9	1,153.4	1,153.4	1,154.2	0.8
AB	15,786	184	1,019	6.3	1,154.3	1,154.3	1,154.9	0.6
AC	16,222	201	1,208	5.3	1,155.8	1,155.8	1,156.2	0.4
AD	16,693	162	929	6.9	1,156.6	1,156.6	1,157.2	0.6
AE	17,208	148	955	3.6	1,159.0	1,159.0	1,159.3	0.3
AF	17,591	144	932	3.7	1,159.4	1,159.4	1,159.7	0.3
AG	17,972	240	922	3.8	1,161.8	1,161.8	1,161.8	0.0
AH	18,285	187	601	5.8	1,162.3	1,162.3	1,162.3	0.0
AI	18,785	95	249	4.8	1,163.5	1,163.5	1,163.7	0.2
AJ	19,286	49	276	4.3	1,164.8	1,164.8	1,164.9	0.1
AK	19,702	56	295	4.1	1,165.8	1,165.8	1,165.8	0.0
AL	20,162	39	239	5.0	1,166.5	1,166.5	1,166.6	0.1
AM	20,363	336	1,030	1.5	1,177.3	1,177.3	1,177.4	0.1
AN	21,037	96	160	8.5	1,177.6	1,177.6	1,177.6	0.0
AO	21,309	65	245	4.9	1,180.4	1,180.4	1,180.4	0.0
AP	21,615	47	162	7.4	1,181.5	1,181.5	1,181.5	0.0

[1]FEET ABOVE UPPER LIMIT OF ZORINSKY LAKE

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,614	92	1,126	9.5	1105.3	1105.3	1105.3	0.0
B	2,000	97	1,202	8.9	1107.2	1107.2	1107.2	0.0
C	3,118	127	1,328	8.1	1110.8	1110.8	1110.8	0.0
D	3,332	410	1,835	5.9	1113.2	1113.2	1113.3	0.1
E	4,218	590	2,275	4.7	1115.6	1115.6	1115.6	0.0

[1]FEET ABOVE CONFLUENCE WITH BIG PAPILLION CREEK

TABLE 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, NE

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BUTTERFLAT CREEK

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	24	80	567	3.8	1,050.3	1,050.3	1,051.3	1.0
B	353	72	532	3.6	1,051.6	1,051.6	1,052.2	0.6
C	464	72	360	5.3	1,054.0	1,054.0	1,054.4	0.4
D	1,228	69	332	5.8	1,058.1	1,058.1	1,058.1	0.0
E	2,381	48	254	7.6	1,064.5	1,064.5	1,064.5	0.0
F	2,778	93	258	7.4	1,080.7	1,080.7	1,080.8	0.1

[1]FEET ABOVE CULVERT AT CENTER STREET

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE [1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	93	64	77	4.1	1,087.9	1,087.3[2]	1,087.3	0.0
B	239	40	108	3.0	1,087.9	1,087.9[2]	1,087.9	0.0
C	348	29	47	6.8	1,088.2	1,088.2	1,088.2	0.0
D	765	44	115	2.8	1,090.5	1,090.5	1,090.5	0.0
E	877	32	60	5.3	1,090.5	1,090.5	1,090.5	0.0
F	1,104	25	45	7.1	1,091.4	1,091.4	1,091.4	0.0
G	1,261	32	72	4.4	1,092.6	1,092.6	1,092.6	0.0

[1] Feet above confluence with Eagle Run Creek
[2] Elevation computed without considering the backwater effects from Eagle Run Creek

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,547	83	593	9.2	1,043.4	1039.5[2]	1,039.5	0.0
B	1,717	61	312	12.6	1,043.4	1039.5[2]	1,039.5	0.0
C	2,017	116	571	6.9	1,043.4	1042.6[2]	1,042.6	0.0
D	2,369	82	692	5.7	1,043.7	1,043.7	1,043.7	0.0
E	2,501	55	596	6.8	1,043.7	1,043.7	1,043.7	0.0
F	2,633	51	496	7.9	1,043.7	1,043.7	1,043.7	0.0
G	2,720	52	481	8.2	1,044.6	1,044.6	1,044.6	0.0
H	3,177	69	383	10.2	1,046.1	1,046.1	1,046.1	0.0
I	3,849	67	438	9.0	1,048.7	1,048.7	1,048.7	0.0
J	4,190	130	630	6.4	1,052.0	1,052.0	1,052.1	0.1
K	4,999	62	624	6.4	1,053.4	1,053.4	1,053.5	0.1
L	5,489	88	747	6.2	1,056.9	1,056.9	1,056.9	0.0
M	6,000	45	647	7.5	1,057.4	1,057.4	1,057.4	0.0
N	6,382	141	781	5.0	1,066.8	1,066.8	1,066.8	0.0
O	6,704	156	925	4.3	1,067.2	1,067.2	1,067.2	0.0
P	6,911	76	762	5.0	1,067.3	1,067.3	1,067.3	0.0
Q	7,211	125	707	5.4	1,067.8	1,067.8	1,067.8	0.0
R	7,764	174	634	6.1	1,068.4	1,068.4	1,068.4	0.0
S	8,239	174	785	4.9	1,069.1	1,069.1	1,069.1	0.0
T	9,174	96	660	5.8	1,069.8	1,069.8	1,069.9	0.1
U	9,835	56	440	8.7	1,070.7	1,070.7	1,070.7	0.0

[1]FEET ABOVE CONFLUENCE WITH LITTLE PAPILLION CREEK

[2]COMPUTED WITHOUT CONSIDERATION OF BACKWATER EFFECTS FROM LITTLE PAPILLION CREEK

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	10,763	166	1,289	2.4	1,080.5	1,080.5	1,080.5	0.0
W	11,563	143	1,034	5.7	1,080.5	1,080.5	1,080.5	0.0
X	12,043	74	320	9.8	1,080.5	1,080.5	1,080.6	0.1
Y	12,431	72	388	8.1	1,083.8	1,083.8	1,084.0	0.2
Z	12,772	108	649	5.2	1,086.4	1,086.4	1,086.5	0.1
AA	13,525	107	484	6.5	1,087.7	1,087.7	1,087.8	0.1
AB	13,894	228	836	3.8	1,088.9	1,088.9	1,089.2	0.3
AC	14,304	180	686	5.9	1,090.8	1,090.8	1,091.0	0.2
AD	14,696	81	379	8.3	1,091.2	1,091.2	1,091.4	0.2
AE	15,392	66	503	4.9	1,094.0	1,094.0	1,094.1	0.1
AF	15,902	68	661	3.8	1,101.3	1,101.3	1,101.4	0.1
AG	16,200	59	538	4.6	1,101.4	1,101.4	1,101.4	0.0
AH	16,500	67	502	4.9	1,101.6	1,101.6	1,101.6	0.0
AI	17,502	294	1,380	1.5	1,106.2	1,106.2	1,106.3	0.1
AJ	17,726	331	1,227	1.7	1,106.2	1,106.2	1,106.4	0.2
AK	18,060	188	522	3.9	1,106.2	1,106.2	1,106.4	0.2
AL	18,635	331	757	2.7	1,107.6	1,107.6	1,108.3	0.7
AM	18,836	349	768	2.8	1,108.1	1,108.1	1,108.4	0.3
AN	19,497	129	338	6.0	1,109.5	1,109.5	1,109.5	0.0
AO	19,685	104	296	6.8	1,110.8	1,110.8	1,110.9	0.1
AP	20,000	86	305	4.6	1,112.7	1,112.7	1,112.7	0.0

[1]FEET ABOVE CONFLUENCE WITH LITTLE PAPILLION CREEK

Table 23: Floodway Data (continued)

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AQ	20,159	97	317	4.9	1,113.1	1,113.1	1,113.1	0.0
AR	20,340	47	207	6.8	1,113.6	1,113.6	1,113.6	0.0
AS	20,620	86	182	7.7	1,115.0	1,115.0	1,115.0	0.0
AT	20,752	77	203	6.9	1,116.6	1,116.6	1,116.6	0.0
AU	21,017	81	182	7.7	1,117.8	1,117.8	1,117.8	0.0
AV	21,324	40	201	7.3	1,119.5	1,119.5	1,119.5	0.0
AW	21,605	115	359	3.9	1,123.1	1,123.1	1,123.1	0.0
AX	22,056	54	245	5.7	1,125.2	1,125.2	1,125.2	0.0
AY	22,201	47	228	6.1	1,125.7	1,125.7	1,125.7	0.0
AZ	22,543	149	491	3.5	1,127.4	1,127.4	1,127.4	0.0
BA	22,747	62	292	4.8	1,128.6	1,128.6	1,128.7	0.1
BB	23,515	48	142	9.9	1,130.8	1,130.8	1,130.8	0.0
BC	24,533	117	432	3.2	1,139.1	1,139.1	1,139.1	0.0

[1]FEET ABOVE CONFLUENCE WITH LITTLE PAPILLION CREEK