

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 2



MATANUSKA-SUSITNA BOROUGH, ALASKA AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
HOUSTON, CITY OF	
MATANUSKA-SUSITNA, BOROUGH OF	020021
PALMER, CITY OF	
WASILLA, CITY OF	

PRELIMINARY
8/16/2016



FEMA

**REVISED:
TO BE DETERMINED**

FLOOD INSURANCE STUDY NUMBER
02170CV001B

Version Number 2.3.3.2

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Volume 2
Exhibits

Flood Profiles	<u>Panel</u>
Bodenburg Creek	01-05 P
Deception Creek	06-15 P
Deception Creek Tributary 1	16-19 P
Deception Creek Tributary 2	20-22 P
Deception Creek Tributary 3	23 P
Knik River	24-29 P
Little Susitna River	30-46 P
Matanuska River	47-58 P
Susitna River	59-61 P
Talkeetna River	62-65 P
Twister Creek	66-68 P
Wasilla Creek	69-74 P
Willow Creek	75-81 P
Willow Creek Tributary	82-84 P

Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT MATANUSKA-SUSITNA BOROUGH, ALASKA

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 60.3, *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 Matanuska-Susitna Borough, Alaska.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the 8-digit Hydrologic Unit Codes (HUC-8) sub-basins affecting each, are shown in Table 1. The Flood Insurance Rate Map (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
City of Houston	N/A	19020401, 19020505	7120F, 7138F, 7139F, 7140E*, 7143F, 7144F, 7145E*, 7163F, 8001F, 8002F, 8005E*, 8006F, 8007F, 8010F, 8020F, 8030E*, 8040F	
Borough of Matanuska-Susitna, Unincorporated Areas	020021	19020401, 19020402, 19020501, 19020502, 19020503, 19020504, 19020505, 19020601	400C, 0425C, 0825C, 0850C, 0875C*, 1325C, 1350C*, 1375C, 2725F, 2750F, 2755F, 2760F, 2765F, 2770F, 2780F, 2783E, 2784E, 2785E***, 2790F, 2792E, 2795F, 2801E, 2802E, 2803E, 2804E, 2806E, 2807E, 2808E, 2809E, 2811E, 2815F***, 2820E***, 3075C, 3100C*, 3425F, 3450F, 3475F, 3500F, 3505F, 3510F, 3515F***, 3520F, 3540F, 3550E*, 3750C*, 3775C*,	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Borough of Matanuska-Susitna, Unincorporated Areas	020021	19020401, 19020402, 19020501, 19020502, 19020503, 19020504, 19020505, 19020601	4125F, 4150F, 4175F, 4180E*, 4185E***, 4190E*, 4195E***, 4200C, 4205F***, 4210F, 4215F***, 4220F, 4225C, 4230F, 4235F, 4240F, 4245E*, 4250C, 4275C*, 4300C*, 4325C*, 4350C*, 4375C, 4400D*, 4425D*, 4450D*, 4875C, 4900C, 4925C, 4950F, 4950C, 4975C*, 4975F, 4980E*, 4985E***, 4990E*, 4995E***, 5000C*, 5005F, 5010F, 5015F, 5020F, 5025C*, 5050C, 5125D*, 5550C, 5575C, 5600C, 5625C, 5650C, 5675C*, 5700C*, 5725C, 5785D*, 5795D*, 6000F, 6025F, 6035F, 6042F, 6044F, 6045F***, 6050E***, 6055F, 6060F, 6061F, 6062F, 6063F, 6064F, 6068F, 6069F, 6070F, 6088F, 6089F, 6090E*, 6091E*, 6092F, 6093F, 6094F, 6100E*, 6111F, 6115E*, 6125E*, 6175C*, 6200C, 6225C, 6250C, 6275C, 6300C, 6325C, 6350C, 6410D*, 6420D*, 6850C, 6875C, 6900C, 6925C, 6950C, 6975C, 7000C*, 7025C*, 7050C*, 7050F, 7075D*, 7075F, 7080E*, 7085E*, 7090E*, 7095E*, 7102E, 7105E*, 7106E, 7107E, 7110E*, 7115F, 7120F, 7126E, 7128E, 7130E*, 7135E*, 7138F, 7140E*, 7143F, 7144F, 7145E*, 7150D*, 7155E*, 7160E*, 7163F, 7164F, 7165E*, 7168F, 7169F, 7170E*, 7175C*, 7188F, 7189F, 7190E*, 7193F, 7194F, 7195E*, 7200E*, 7200C*, 7211E*, 7212F, 7213F, 7214F, 7216F, 7217F, 7218F, 7219F, 7225E*, 7225C*, 7230E*, 7234F, 7235E*,	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Borough of Matanuska-Susitna, Unincorporated Areas	020021	19020401, 19020402, 19020501, 19020502, 19020503, 19020504, 19020505, 19020601	7236F, 7237F, 7238F, 7239E*, 7241F, 7242F, 7245E*, 7250C*, 7253F, 7255E*, 7260E*, 7261F, 7265F, 7270F, 7275C*, 7290F, 7300E*, 7675C*, 7700C*, 7725C*, 7750C, 7775C, 7800C*, 7825C*, 7850C*, 7875C*, 7900D*, 7975F, 7980F, 7985F, 7990E*, 7995E*, 8000D*, 8001F, 8002F, 8005E***, 8010F, 8015E*, 8020F, 8025C*, 8030E*, 8035E*, 8040F, 8045F, 8050C*, 8055F, 8060F, 8065F, 8070F, 8075C*, 8080F, 8085F, 8090F, 8095E*, 8100C*, 8105F, 8110F, 8115F, 8120F, 8130F, 8135E*, 8140F, 8145F, 8155F, 8160F, 8165F, 8170F, 8190F, 8200E*, 8550C*, 8575C*, 8600C*, 8625C*, 8650C*, 8663F, 8675C*, 8700C*, 8725C*, 8785F*, 8800E*, 8805F, 8810F, 8825E*, 8830F, 8835F, 8850E*, 8855E, 8860E, 8875E*, 8925D*, 9307F, 9326F, 9375C*, 9400C*, 9425C*, 9450C*, 9475C*, 9500C*, 9525C*, 9550C*, 9575C*, 9600D*, 9755C, 9760C, 9765C*, 9770C*, 9775C, 9780C*, 9785C*, 9790C*, 9795C, 9800C, 9815C**, 9820C, 9825C, 9830C, 9835C*, 9840C*, 9845C, 9850C**, 9855C,	
City of Palmer	N/A	19020402	7290F, 8135E*, 8155F	
City of Wasilla	N/A	19020401	8055F, 8060F, 8070F, 8080F, 8085F, 8090F, 8095E*, 8105F	

†See Index Maps for full panel number

* Panel Not Printed - No Special Flood Hazard Areas

**Panel Not Printed – These Areas Area Shown on Other Panels

***Panel Not Printed – Area in Zone D

1.4 Considerations for using this Flood Insurance Study Report

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

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

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

It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 31, “Map Repositories,” within this FIS Report.

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

The initial Countywide FIS Report for Matanuska-Susitna Borough became effective on March 17, 2011. Refer to Table 28 for information about subsequent revisions to the FIRMs.

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

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

- FEMA does not impose floodplain management requirements or special insurance ratings based on Limit of Moderate Wave Action (LiMWA) delineations at this time. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. If the LiMWA is

shown on the FIRM, it is being provided by FEMA as information only. For communities that do adopt Zone VE building standards in the area defined by the LiMWA, additional Community Rating System (CRS) credits are available. Refer to Section 2.5.4 for additional information about the LiMWA.

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.

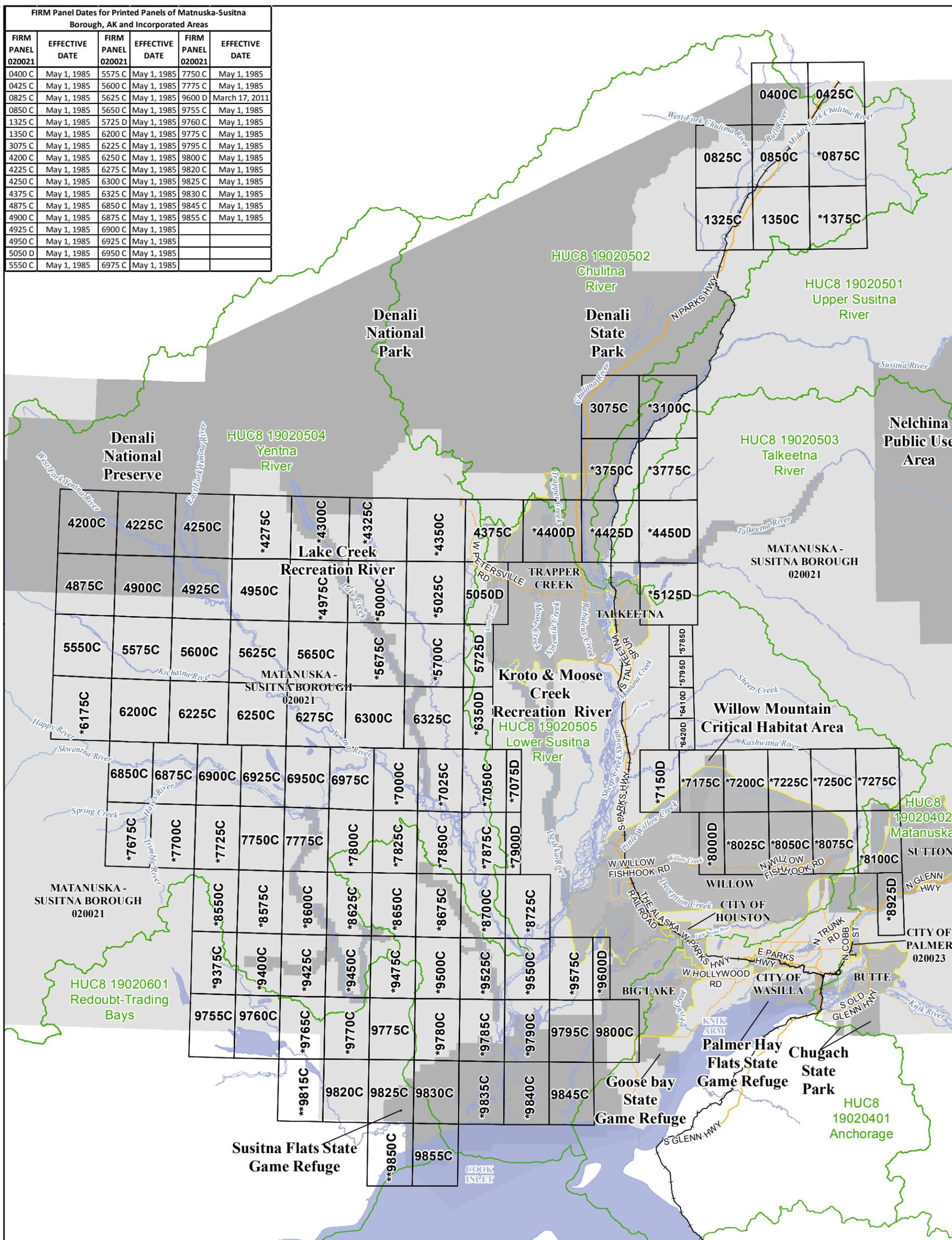
- Previous FIS Reports and FIRMs may have included levees that were accredited as reducing the risk associated with the 1% annual chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled “Mapping of Areas Protected by Levee Systems.”

Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 9 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE national levee database (nld.usace.army.mil). For all other levees, the user is encouraged to contact the appropriate local community.

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

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Matanuska-Susitna Borough, 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 United States Geological Survey (USGS) Hydrologic Unit Code – 8 (HUC-8) codes.

FIGURE 1: FIRM PANEL INDEX



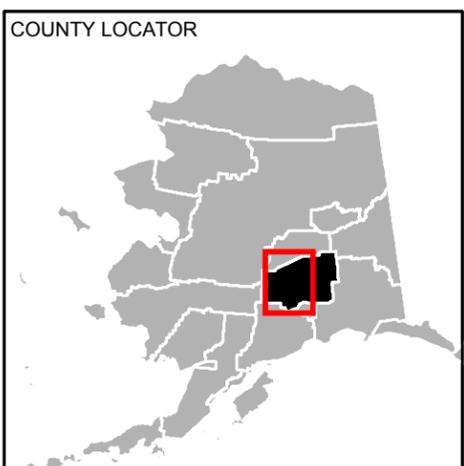
1 inch = 13 miles

Map Projection:
NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet
North American Datum of 1983

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

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SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 1 of 3)

MATANUSKA-SUSITNA BOROUGH, AK
And Incorporated Areas
PANELS PRINTED:

0400, 0425, 0825, 0850, 1325, 1350, 3075, 4200, 4225, 4250, 4375, 4875, 4900, 4925, 4950, 5050, 5550, 5575, 5600, 5625, 5650, 5725, 6200, 6225, 6250, 6275, 6300, 6325, 6850, 6875, 6900, 6925, 6950, 6975, 7750, 7775, 9600, 9755, 9760, 9775, 9795, 9800, 9820, 9825, 9830, 9845, 9855

FEMA

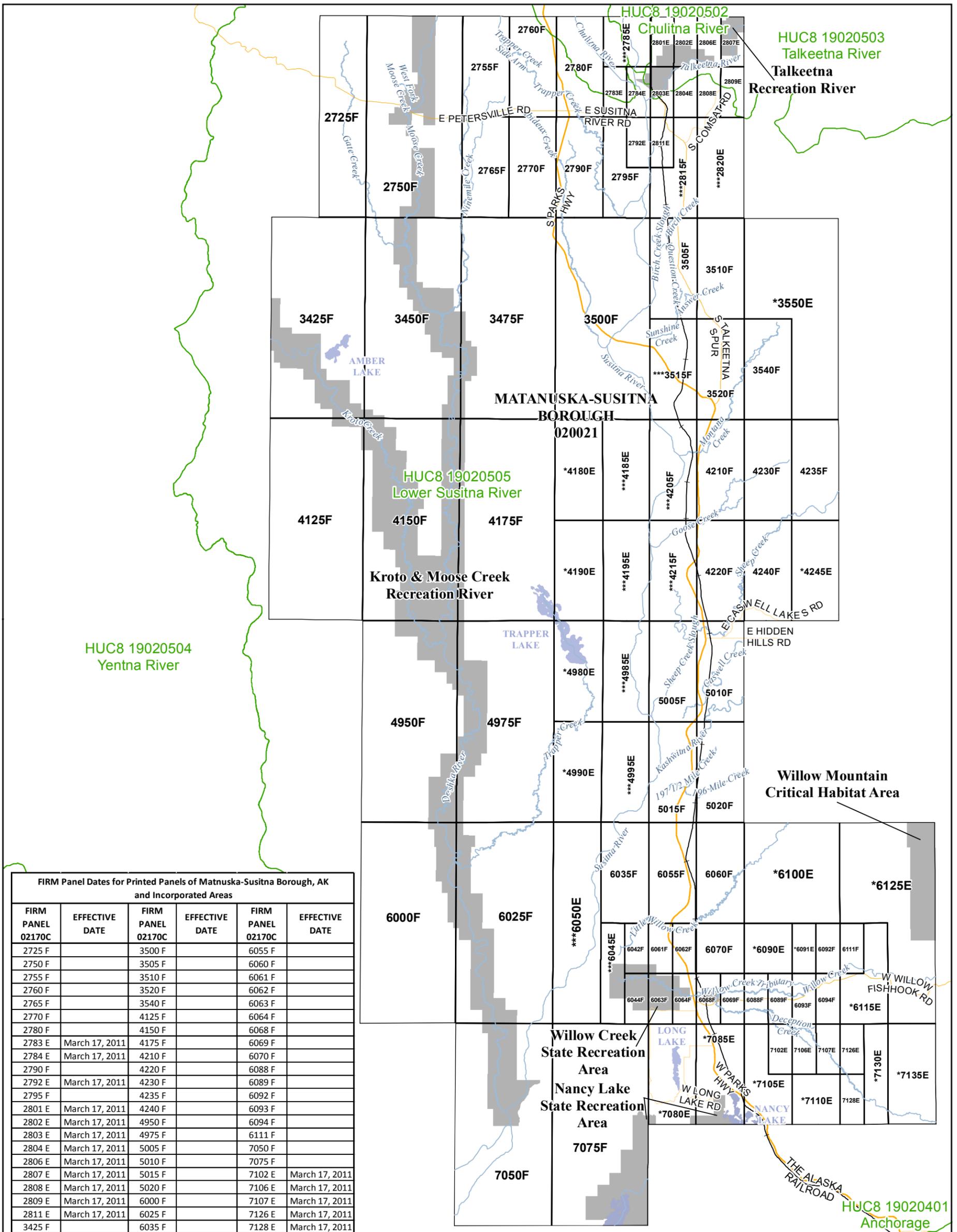
PRELIMINARY
8/19/2016

MAP NUMBER
02170CIND1B

MAP REVISED
TBD

* PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
** PANEL NOT PRINTED - THESE AREAS ARE SHOWN ON OTHER PANELS
*** PANEL NOT PRINTED - AREA IN ZONE D

FIGURE 1: FIRM PANEL INDEX



FIRM Panel Dates for Printed Panels of Matanuska-Susitna Borough, AK and Incorporated Areas					
FIRM PANEL	EFFECTIVE DATE	FIRM PANEL	EFFECTIVE DATE	FIRM PANEL	EFFECTIVE DATE
02170C		02170C		02170C	
2725 F		3500 F		6055 F	
2750 F		3505 F		6060 F	
2755 F		3510 F		6061 F	
2760 F		3520 F		6062 F	
2765 F		3540 F		6063 F	
2770 F		4125 F		6064 F	
2780 F		4150 F		6068 F	
2783 E	March 17, 2011	4175 F		6069 F	
2784 E	March 17, 2011	4210 F		6070 F	
2790 F		4220 F		6088 F	
2792 E	March 17, 2011	4230 F		6089 F	
2795 F		4235 F		6092 F	
2801 E	March 17, 2011	4240 F		6093 F	
2802 E	March 17, 2011	4950 F		6094 F	
2803 E	March 17, 2011	4975 F		6111 F	
2804 E	March 17, 2011	5005 F		7050 F	
2806 E	March 17, 2011	5010 F		7075 F	
2807 E	March 17, 2011	5015 F		7102 E	March 17, 2011
2808 E	March 17, 2011	5020 F		7106 E	March 17, 2011
2809 E	March 17, 2011	6000 F		7107 E	March 17, 2011
2811 E	March 17, 2011	6025 F		7126 E	March 17, 2011
3425 F		6035 F		7128 E	March 17, 2011

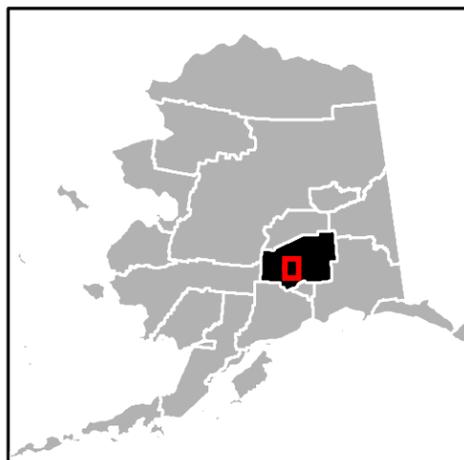
1 inch = 4 miles

Map Projection:
NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet
North American Datum of 1983

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SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 2 of 3)

MATANUSKA-SUSITNA BOROUGH, AK

And Incorporated Areas

PANELS PRINTED:

2725, 2750, 2755, 2760, 2765, 2770, 2780, 2783, 2784, 2790, 2792, 2795, 2801, 2802, 2803, 2804, 2806, 2807, 2808, 2809, 2811, 3425, 3450, 3475, 3500, 3505, 3510, 3520, 3540, 4125, 4150, 4175, 4210, 4220, 4230, 4235, 4240, 4950, 4975, 5005, 5010, 5015, 5020, 6035, 6042, 6044, 6055, 6060, 6061, 6062, 6063, 6064, 6068, 6069, 6070, 6088, 6089, 6092, 6093, 6094, 6111, 7102, 7106, 7107, 7126, 7128



FEMA

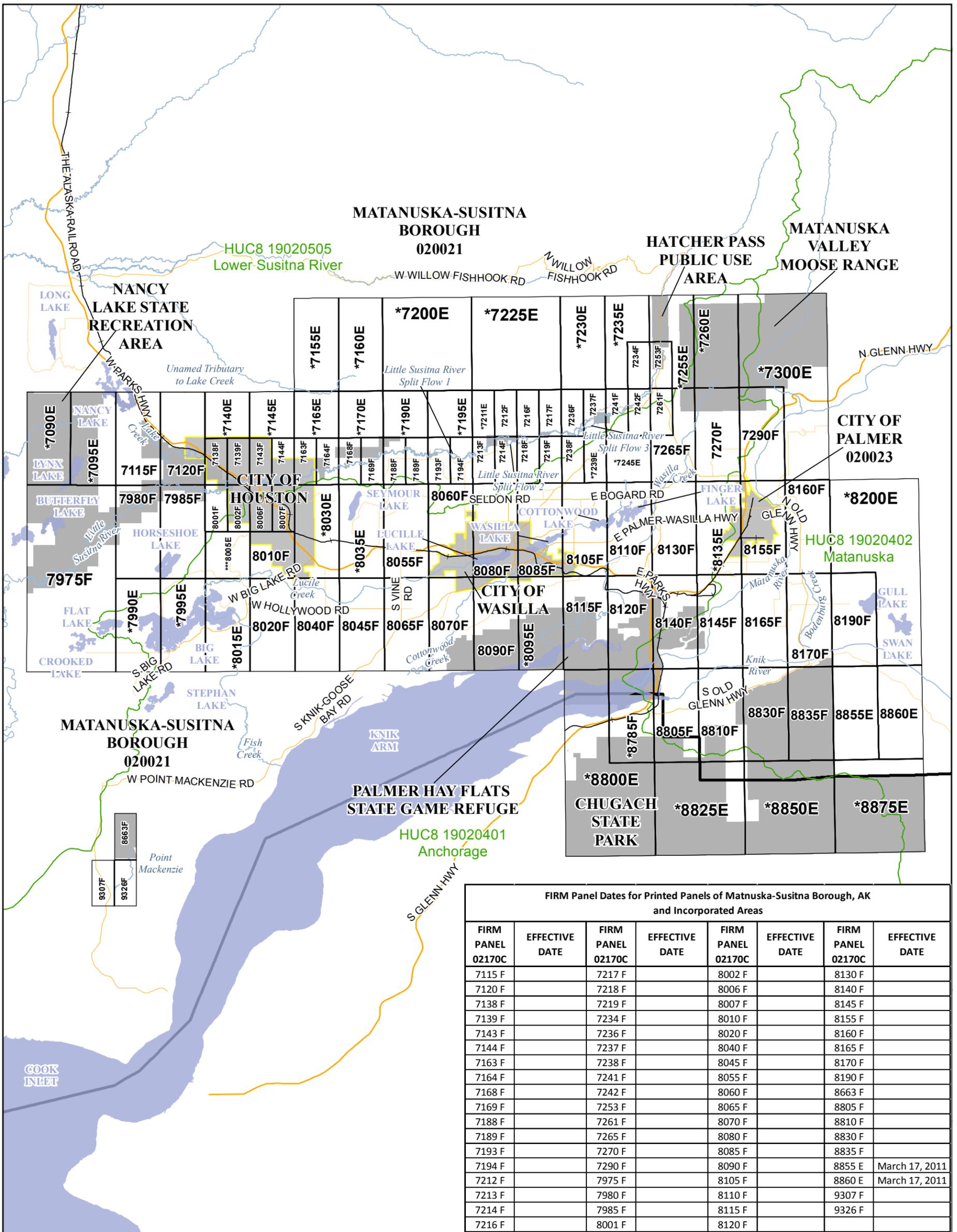
PRELIMINARY
8/19/2016

MAP NUMBER
02170CIND2B

MAP REVISED
TBD

* PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
** PANEL NOT PRINTED - THESE AREAS ARE SHOWN ON OTHER PANELS
*** PANEL NOT PRINTED - AREA IN ZONE D

FIGURE 1: FIRM PANEL INDEX



FIRM Panel Dates for Printed Panels of Matanuska-Susitna Borough, AK and Incorporated Areas

FIRM PANEL	EFFECTIVE DATE						
02170C		02170C		02170C		02170C	
7115 F		7217 F		8002 F		8130 F	
7120 F		7218 F		8006 F		8140 F	
7138 F		7219 F		8007 F		8145 F	
7139 F		7234 F		8010 F		8155 F	
7143 F		7236 F		8020 F		8160 F	
7144 F		7237 F		8040 F		8165 F	
7163 F		7238 F		8045 F		8170 F	
7164 F		7241 F		8055 F		8190 F	
7168 F		7242 F		8060 F		8663 F	
7169 F		7253 F		8065 F		8805 F	
7188 F		7261 F		8070 F		8810 F	
7189 F		7265 F		8080 F		8830 F	
7193 F		7270 F		8085 F		8835 F	
7194 F		7290 F		8090 F		8855 E	March 17, 2011
7212 F		7975 F		8105 F		8860 E	March 17, 2011
7213 F		7980 F		8110 F		9307 F	
7214 F		7985 F		8115 F		9326 F	
7216 F		8001 F		8120 F			

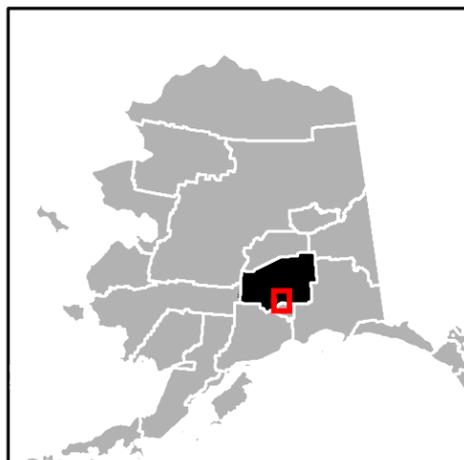
1 inch = 4 miles

Map Projection:
NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet
North American Datum of 1983

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[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX (Sheet 3 of 3)

MATANUSKA-SUSITNA BOROUGH, AK
And Incorporated Areas

PANELS PRINTED:

7115, 7120, 7138, 7139, 7143, 7144, 7163, 7164, 7168, 7169, 7188, 7189, 7193, 7194, 7212, 7213, 7214, 7216, 7217, 7218, 7219, 7234, 7236, 7237, 7238, 7241, 7242, 7253, 7261, 7265, 7270, 7290, 7975, 7980, 7985, 8001, 8002, 8006, 8007, 8010, 8020, 8040, 8045, 8055, 8060, 8065, 8070, 8080, 8085, 8090, 8105, 8110, 8115, 8120, 8130, 8140, 8145, 8155, 8160, 8165, 8170, 8190, 8663, 8805, 8810, 8830, 8835, 8855, 8860, 9307, 9326

FEMA

PRELIMINARY
8/19/2016

MAP NUMBER
02170CIND3B

MAP REVISED
TBD

* PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
** PANEL NOT PRINTED - THESE AREAS ARE SHOWN ON OTHER PANELS
*** PANEL NOT PRINTED - AREA IN ZONE D

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

Figure 2: FIRM Notes to Users

NOTES TO USERS

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

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

For community and countywide map dates, refer to Table 28 in this FIS Report.

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

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

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

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

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.

Figure 2. FIRM Notes to Users

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

PROJECTION INFORMATION: The projection used in the preparation of the map was State Plane Alaska Zone 4. The horizontal datum was 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/ or contact the National Geodetic Survey at the following address:

*NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242*

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

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by Matanuska-Susitna Borough GIS Department, Alaska State Geospatial Data Clearinghouse, USACE, and USGS. 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.

Figure 2. FIRM Notes to Users

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Matanuska-Susitna Borough, Alaska, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 28 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Matanuska-Susitna Borough, Alaska, effective "To Be Determined".

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 Matanuska-Susitna Borough, Alaska.

Figure 3: Map Legend for FIRM

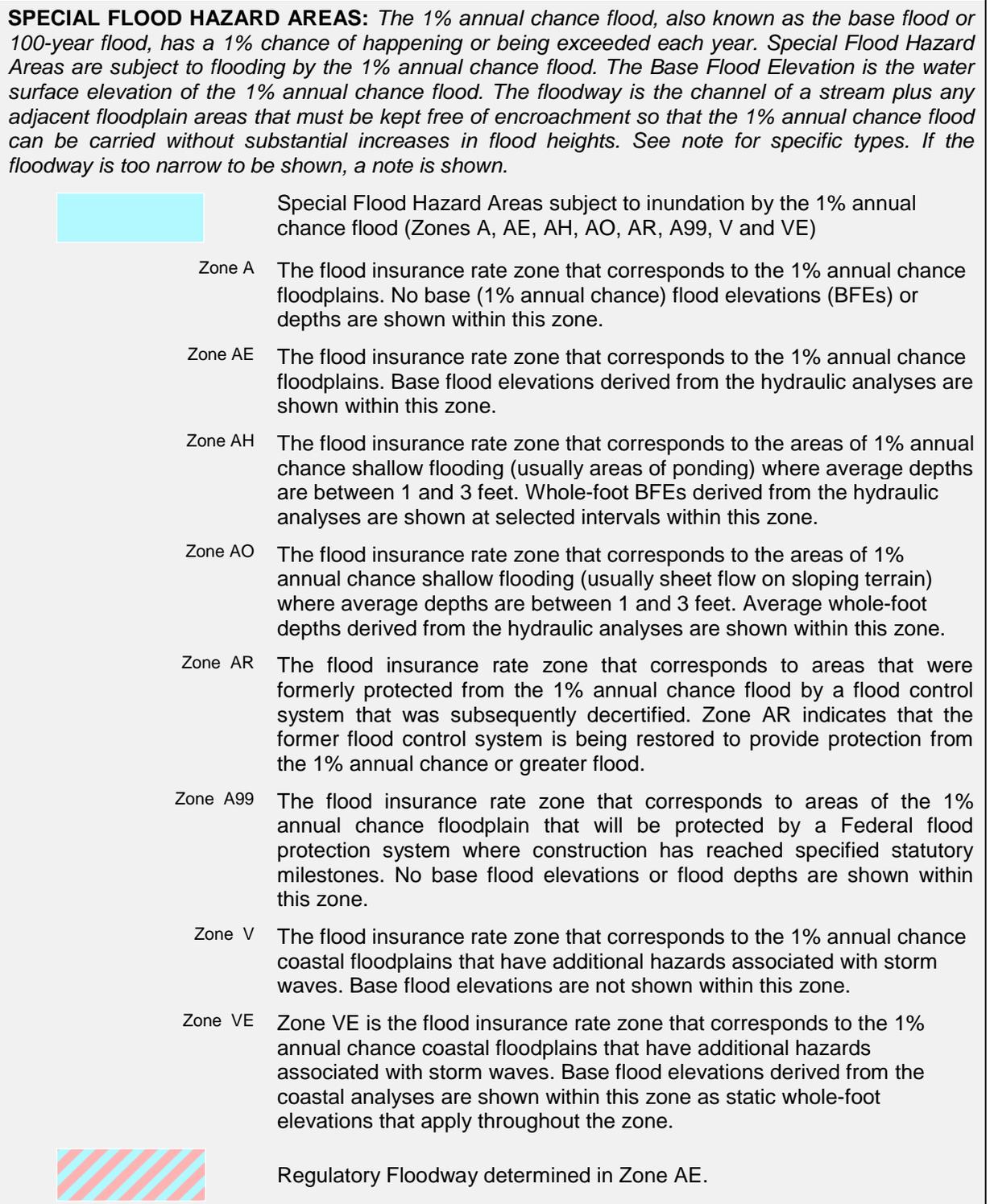


Figure 3: Map Legend for FIRM

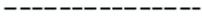
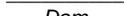
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate 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.
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)
<p>(ortho) (vector)</p>	
	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	
 <i>Aqueduct Channel Culvert Storm Sewer</i>	Channel, Culvert, Aqueduct, or Storm Sewer
 <i>Dam Jetty Weir</i>	Dam, Jetty, Weir
	Levee, Dike, or Floodwall
 <i>Bridge</i>	Bridge

Figure 3: Map Legend for FIRM

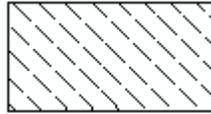
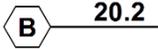
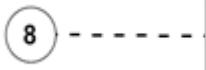
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): <i>CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.</i>	
 CBRS AREA 09/30/2009	Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.
 OTHERWISE PROTECTED AREA 09/30/2009	Otherwise Protected Area
REFERENCE MARKERS	
 22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
 17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
 8	Coastal Transect
 	<p>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.</p> <p>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.</p>
 513	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

Figure 3: Map Legend for FIRM

BASE MAP FEATURES	
 <i>Missouri Creek</i>	River, Stream or Other Hydrographic Feature
	Interstate Highway
	U.S. Highway
	State Highway
	County Highway
 MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
 RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
⁴² 76 ^{000m} E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1% annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2% 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 Matanuska-Susitna Borough 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% 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 23), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1% and 0.2% 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% annual chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% 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 Matanuska-Susitna Borough, Alaska, 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 13. 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% annual chance floodplain corresponds to the SFHAs. The 0.2% 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
196 Mile Creek	Matanuska-Susitna Borough	Confluence with 197 1/2 Mile Creek	3.4 miles upstream of Alaska Railroad	19020505	4.2		N	A	2015
197 1/2 Mile Creek	Matanuska-Susitna Borough	Confluence with Susitna River	1.4 miles upstream of Alaska Railroad	19020505	4.6		N	A	2015
Answer Creek	Matanuska-Susitna Borough	Confluence with Sunshine Creek	0.7 mile upstream of S. Talkeetna Spur	19020505	2.6		N	A	2015
Bodenburg Creek	Matanuska-Susitna Borough	Confluence with Knik River	Matanuska River	19020402	5		N	AE	2015
Caswell Creek	Matanuska-Susitna Borough	Confluence with Susitna River	4.3 miles upstream of Alaska Railroad	19020505	7.4		N	A	2015
Cottonwood Creek	Matanuska-Susitna Borough	0.3 miles upstream of W. Demaree Circle	Wasilla Lake	19020401	8.7		N	A	2015
Deception Creek	Matanuska-Susitna Borough	Confluence with Willow Creek	Approx. 10.3 miles upstream of confluence	19020505	10.3		Y	AE	1982
Deception Creek Tributary 1	Matanuska-Susitna Borough	Confluence with Deception Creek	Approx. 1.6 miles upstream of confluence	19020505	1.6		Y	AE	1982
Deception Creek Tributary 2	Matanuska-Susitna Borough	Confluence with Deception Creek	Approx. 1.3 miles upstream of confluence	19020505	1.3		Y	AE	1982
Deception Creek Tributary 3	Matanuska-Susitna Borough	Confluence with Deception Creek	Approx. 0.5 miles upstream of confluence	19020505	0.5		Y	AE	1982
Gate Creek	Matanuska-Susitna Borough	Confluence with Moose Creek	3.8 mile upstream of E. Petersville Road	19020505	14.4		N	A	2015
Goose Creek	Matanuska-Susitna Borough	Confluence with Susitna River	3.5 miles upstream of Alaska Railroad	19020505	5.1		N	A	2015
Kashwitna River	Matanuska-Susitna Borough	Confluence with Susitna River	4.5 miles upstream of Alaska Railroad	19020505	7.3		N	A	2015

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
Knik River	Matanuska-Susitna Borough	3.0 miles upstream of Alaska Railroad	2.0 miles upstream of S. Old Glenn Highway	19020402	6.3		N	AE	2015
Knik River western	Matanuska-Susitna Borough	Alaska Railroad	3.0 miles upstream of Alaska Railroad	19020402	3.3		N	A	2015
Kroto Creek	Matanuska-Susitna Borough	16.2 miles upstream of confluence with Susitna River	5.3 miles upstream of S. Oilwell Road	19020505	40.7		N	A	2015
Lake Creek	Matanuska-Susitna Borough	Confluence with Little Susitna River	1.2 miles downstream of N. Lynx Lake Road	19020505	5.8		N	A	2015
Little Susitna River	Matanuska-Susitna Borough	26.5 miles upstream of confluence with Cook Inlet	1.0 miles downstream of Alaska Railroad	19020505	21.7		N	A	2015
Little Susitna River	Matanuska-Susitna Borough	1.0 miles downstream of Alaska Railroad	150 feet upstream of E. Edgerton Road	19020505	36.9		Y	AE	2015
Little Willow Creek	Matanuska-Susitna Borough	Confluence with Susitna River	6.6 miles upstream of Alaska Railroad	19020505	14.5		N	A	2015
Lucile Creek	Matanuska-Susitna Borough	0.6 miles downstream of W. Big Lake Road	Lucile Lake	19020401	13.3		N	A	2015
Matanuska River	Matanuska-Susitna Borough	0.3 miles upstream of N. Old Glenn Highway	3.9 miles upstream of N. Old Glenn Highway	19020402	2.6		N	A	2015
Matanuska River	Matanuska-Susitna Borough	3.2 miles upstream of confluence with Knik River	0.3 miles upstream of N. Old Glenn Highway	19020402	7.3		N	AE	2015
Montana Creek	Matanuska-Susitna Borough	Confluence with Susitna River	0.6 mile upstream of E. Yoder Road	19020505	9.3		N	A	2015
Moose Creek	Matanuska-Susitna Borough	Confluence with Kroto Creek	3.1 miles upstream of E. Petersville Road	19020505	45.2		N	A	2015

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
Ninemile Creek	Matanuska-Susitna Borough	Confluence with Moose Creek	2.5 miles upstream of E. Petersville Road	19020505	16.5		N	A	2015
Question Creek	Matanuska-Susitna Borough	Confluence with Sunshine Creek	0.3 mile downstream of S. Talkeetna Spur	19020505	2.9		N	A	2015
Rabideux Creek	Matanuska-Susitna Borough	Confluence with Susitna River	0.2 mile downstream of E. Petersville Road	19020505	14.7		N	A	2015
Sheep Creek	Matanuska-Susitna Borough	Confluence with Susitna River	12.0 miles upstream of Alaska Railroad	19020505	15.6		N	A	2015
Sheep Creek Slough	Matanuska-Susitna Borough	Mouth	2.1 Miles upstream of the mouth	19020505	2.1		N	A	2015
Sunshine Creek	Matanuska-Susitna Borough	Confluence with Susitna River	Confluence with Answer Creek	19020505	1.9		N	A	2015
Susitna River	Matanuska-Susitna Borough	Limit of Detailed Study (Approx. 1.1 miles downstream of Talkeetna River)	Confluence with Talkeetna River	19020505	1.1		Y	AE	1982
Susitna River	Matanuska-Susitna Borough	Approx. 31 miles upstream of confluence	Approx. 40 miles upstream of confluence	19020505	9.8		N	A	1982
Susitna River	Matanuska-Susitna Borough	Confluence with Talkeetna River	Approx. 16,850 Ft. from confluence with Talkeetna River	19020505	2.0		Y	AE	2009
Talkeetna River	Matanuska-Susitna Borough	Confluence with Susitna River	Approx. 27,000 Ft. from confluence with Susitna River	19020503	5.1		Y	AE	2009
Trapper Creek	Matanuska-Susitna Borough	Confluence with Susitna River	0.4 mile upstream of S. Hugo Loop	19020505	16.8		N	A	2015
Trapper Creek Side Arm	Matanuska-Susitna Borough	Confluence with Trapper Creek	0.3 mile upstream of confluence with Trapper Creek	19020505	0.3		N	A	2015

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
Twister Creek	Matanuska-Susitna Borough	14,500 Ft. above South Talkeetna Spur Road Crossing	Approx. 17,100 Ft. above South Talkeetna Spur Road Crossing	19020503, 19020505	3.4		N	AE	2009
Unnamed Point Mackenzie	Matanuska-Susitna Borough	1.6 miles downstream of W. Alsop Road	0.7 miles upstream of W. Alsop Road	19020401	2.3		N	A	2015
Unamed Tributary to Lake Creek	Matanuska-Susitna Borough	Confluence with Lake Creek	Alaska Railroad	19020505	3.9		N	A	2015
Upper Matanuska River	Matanuska-Susitna Borough	0.4 miles upstream of N. Old Glenn Highway	3.9 miles upstream of N. Old Glenn Highway	19020402	3.5		N	A	2015
Wasilla Creek	Matanuska-Susitna Borough	0.3 upstream of N. Palmer-Fishhook Road	2.9 Miles Upstream of Crab Cir.	19020401	2.9		N	A	2016
Wasilla Creek	Matanuska-Susitna Borough	E. Nelson Road	0.3 upstream of N. Palmer-Fishhook Road	19020401	12.9		N	AE	2015
West Fork Moose Creek	Matanuska-Susitna Borough	Confluence with Moose Creek	2.1 miles upstream of confluence with Moose Creek	19020505	2		N	A	2015
Willow Creek	Matanuska-Susitna Borough	Confluence with Susitna River	1.9 miles upstream of N. Shirley Towne Dr.	19020505	13.9		Y	AE	2015
Willow Creek Tributary	Matanuska-Susitna Borough	Confluence with Willow Creek	Approx. 7.4 miles upstream (confluence with Willow Creek)	19020505	7.1		Y	AE	2015

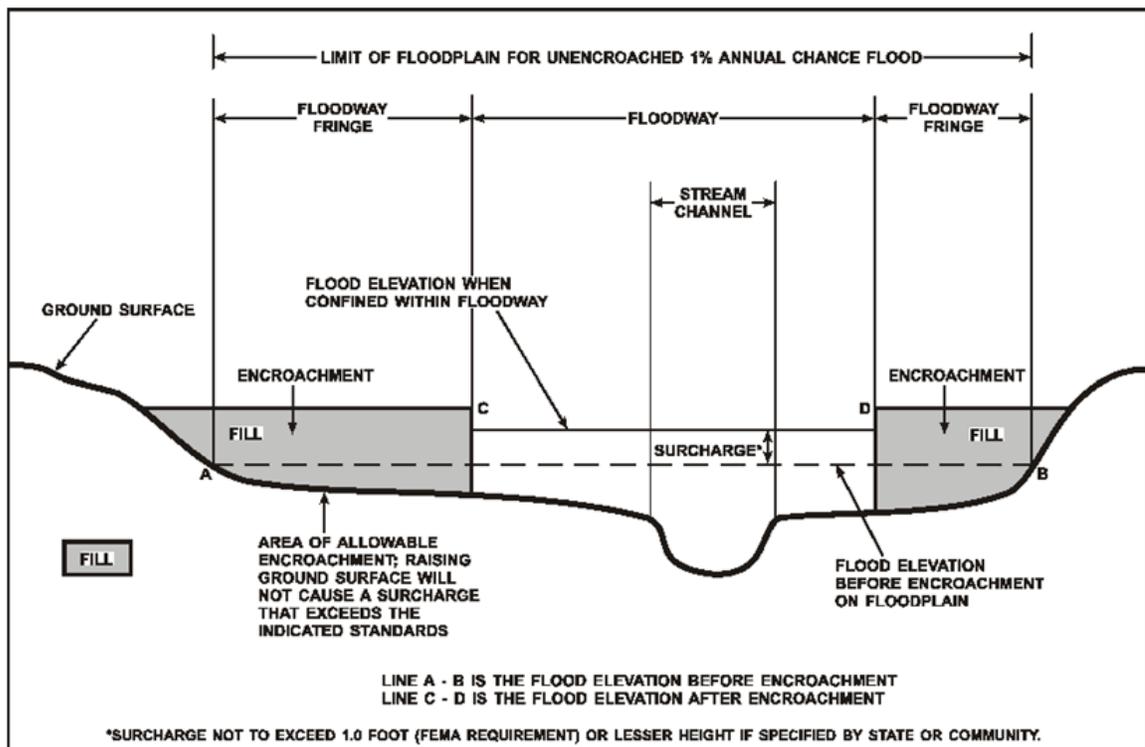
2.2 Floodways

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

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

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

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 24, “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% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

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

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

2.4 Non-Encroachment Zones

This section is not applicable to this Flood Risk Project.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Project.

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

Table 3 lists the flood insurance zones in Matanuska-Susitna Borough.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
Houston, City of	A, AE, X
Matanuska-Susitna Borough, Unincorporated Areas	A, AE, D, X
Palmer, City of	A, AE, X
Wasilla, City of	A, X

3.2 Coastal Barrier Resources System

This section is not applicable to this Flood Risk Project.

Table 4: Coastal Barrier Resources System Information

[Not Applicable to this Flood Risk Project]

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 5 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 5: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Anchorage	19020401	Whitewater River	Knik Arm; which includes Wasilla Creek, Lucile Creek and Cottonwood Creek. City of Wasilla	1517
Chulitna River	19020502	Chulitna River	North Central portion of the Borough	2591
Lower Susitna River	19020505	Lower Susitna River	Central Portion of the Borough including; City of Houston, Susitna River & Little Susitna River and tributaries	3531
Matanuska	19020402	Matanuska River	City of Palmer; Matanuska River and Knik River	3357
Redoubt-Trading Bays	19020601	N/A	Southwestern edge of the Borough including Theodore River and Coal Creek Draining directly into the Knik Arm	4439
Talkeetna River	19020503	Talkeetna River	Talkeetna Area along with the Talkeetna River	2034
Yenta River	19020504	Yenta River	Largest Watershed toward the Western Half of the Borough	6137

4.2 Principal Flood Problems

Table 6 contains a description of the principal flood problems that have been noted for Matanuska-Susitna Borough by flooding source.

Table 6: Principal Flood Problems

Flooding Source	Description of Flood Problems
All sources	Floods in Matanuska-Susitna Borough can occur as a result of a combination of factors, including heavy snow pack, temperature, sunshine, and precipitation. The sequence of events affects the flooding potential. Spring floods on streams may occur as a result of an above-normal snowfall during the winter followed by an unusually cold spring and a rapid snowmelt. Summer and fall floods usually result from intense precipitation. In addition, an ice jam could occur during the winter or during spring breakup causing overbank flooding. Ice jams have caused the highest flooding on these streams, but no frequency has been applied to this type of flood. Typical of most of Alaska, there is little information available concerning historical floods in Matanuska-Susitna Borough. Public agencies and longtime residents, however, substantiate that floods have occurred. Information of historical floods was obtained primarily from interviews with residents in the area.
Deception Creek	Deception Creek also originates in the Talkeetna Mountains and generally flows north and west for approximately 20 miles to join Willow Creek just upstream of the Parks Highway. At the present time, the entire length of Deception Creek is sparsely developed with very few crossings. The Little Susitna River drains the southern slopes of the Talkeetna Mountains and has its headwaters in the mountains. The land form is such that the river intercepts numerous minor tributaries directly from the mountain slopes to the north. It is an extreme meandering stream and has a total length of approximately 75 miles.
Willow Creek	Willow Creek crosses the Parks Highway at mile 72. It originates in the Talkeetna Mountains and generally flows west to join the Susitna River. It has a total length of approximately 35 miles of which only the lower 18 is developable. The two major tributaries to this stream are Peters Creek and Deception Creek. The lower reaches of the stream, especially above the Parks Highway, are under intense pressure for subdivision and development in spite of the fact that there are obvious flood hazards within the area.

Table 7 contains information about historic flood elevations in the communities within Matanuska-Susitna Borough.

Table 7: Historic Flooding Elevations

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Willow Creek	Water overtopped the railroad, caused by ice jam.	*	1938	*	FIS 2011
Little Susitna River	Pier in railroad bridge washed out.	*	1943	*	FIS 2011
Little Susitna River	Rain on rapid snowmelt caused roads to wash out, damaged culvert.	*	1949	*	FIS 2011

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
Willow Creek	Heavy rainfall damaged railroad.	*	1955	*	FIS 2011
Little Susitna River	Massive road washouts at Houston and Little Susitna Inn, track and culverts washed out.	*	1959	*	FIS 2011
Little Susitna River	Roads washed out, damaged culverts.	*	1963	*	FIS 2011
Little Susitna River	Ice jam flooding.	*	1964	*	FIS 2011
Willow Creek	Ice jam flooding.	*	1964	*	FIS 2011
Willow Creek	Log jam caused flooding near Willow, damage to highways and residences.	*	1971	*	FIS 2011
Little Susitna River	Railroad undermined at Houston caused derailment of 13 cars. Man-made dam broke during rainfall. Lower Hatcher Pass Road bridge over the Little Susitna River washed out.	*	1971	*	FIS 2011
Matanuska River	Flooding resulted when a landslide-formed dam on Granite Creek (a tributary to the Matanuska River) broke during a period of rainfall and snowmelt. Water overtopped Old Palmer Highway in the Bodenbug Butte area, and residential and commercial buildings were flooded. Discharge was estimated at 80,000 cubic feet per second (cfs). Estimated 1%-annual-chance discharge for the Matanuska River at Palmer is 40,000 cfs.	*	1971	Greater than 100 year	FIS 2011
Willow Creek	Ice and log jams caused flooding. Approximately five homes were flooded off Hatcher Pass Road, 2 to 5 miles east of the Parks Highway.	*	1975	*	FIS 2011
All Sources	Borough-wide; Heavy precipitation associated with a large storm system resulted in major flooding in several areas of south-central Alaska.	*	October 1986	*	FIS 2011

Flooding Source	Location	Historic Peak (Feet NAVD88)	Event Date	Approximate Recurrence Interval (years)	Source of Data
All Sources	Borough-wide; Major flooding occurred in the Matanuska-Susitna Borough from intense rainfall delivered by a storm that tracked in a southeast direction from Nome toward Cordova.	*	August 2006	*	FIS 2011

* No Information Available

4.3 Non-Levee Flood Protection Measures

Table 8 contains information about non-levee flood protection measures within Matanuska-Susitna Borough such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

Table 8: Non-Levee Flood Protection Measures

Flooding Source	Structure Name	Type of Measure	Location	Description of Measure
Matanuska River	Old Glenn Highway	Dike	Highway side near river.	Protect the Highway from overtopping Spring Runoff – does not protect against the 1-percent-annual-chance-flood
All Sources	N/A	Zoning Ordinances	Areas noted for Flood Hazard	Restrict development determined by previous U.S. Army Corps of Engineers or U.S. Geological Survey studies.

4.4 Levees

This section is not applicable to this Flood Risk Project.

Table 9: Levees

[Not Applicable to this Flood Risk Project]

SECTION 5.0 – ENGINEERING METHODS

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

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

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

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 27, “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 13. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

A summary of the discharges is provided in Table 10. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected flooding sources. A summary of stillwater elevations developed for non-coastal flooding sources is provided in Table 11. (Coastal stillwater elevations are discussed in Section 5.3 and shown in Table 17.) Stream gage information is provided in Table 12.

Peak discharges for selected recurrence intervals on Deception Creek; Deception Creek Tributaries 1, 2, and 3; Willow Creek; and Willow Creek Tributary were determined utilizing Clarks time-area unit hydrograph analysis sub-routine in the computer program HEC-1 developed by the U.S. Army Corps of Engineers (Reference 3). Precipitation was determined from the U.S. Weather Bureau Technical Paper No. 53 (Reference 4) and used in the HEC-1 program. These frequencies were confirmed through a regional-frequency analysis developed for other gaged basins in the same geographic area.

Peak discharges for selected recurrence intervals on the Little Susitna River were determined utilizing a regional analysis of drainage area-peak discharge relationships for other stream-gaging stations within the geographic area of the Little Susitna River.

Table 10: 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
196 Mile Creek	Mouth	19.3	477.2	622.7	738.6	858.1	1,235.7	1,167.7
197 1/2 Mile Creek	Upstream of confluence With 196 Mile Creek	12.3	290.3	381.0	453.6	528.6	761.2	723.8
197 1/2 Mile Creek	Below confluence With 196 Mile Creek	31.6	6,708.1	8,221.8	9,384.9	10,546.3	15,186.7	13,460.8
197 1/2 Mile Creek	Mouth	32.8	734.2	946.6	1,114.7	1,287.1	1,853.4	1,730.6
Answer Creek	Upstream of confluence With Question Creek	24.1	452.9	583.8	687.4	793.7	1,142.9	1,067.1
Birch Creek	Mouth	30.1	526.8	675.0	792.1	911.8	1,313.0	1,218.9
Birch Creek	313 Feet Upstream Of S Talkeetna Spur	26.2	455.3	584.6	686.8	791.5	1,139.8	1,060.3
Birch Creek Slough	Upstream of confluence With Birch Creek	0.8	17.6	24.1	29.4	35.1	50.5	50.1
Birch Creek Slough	Mouth	31.3	543.2	695.4	815.5	938.2	1,351.0	1,252.9
Birch Creek Slough	Below Confluence With Birch Creek	30.2	457.9	584.0	683.5	785.0	1,130.4	1,044.8
Bodenburg Creek	Mouth	5.0	130.0	170.0	210.0	250.0	*	340.0
Caswell Creek	4.4 Miles Upstream Of Alaska Railroad	18.6	362.5	469.7	555.0	642.7	925.4	868.9
Caswell Creek	Mouth	24.2	475.5	613.7	723.3	835.7	1,203.4	1,125.2
Cottonwood Creek	1130 Feet Upstream Of N Seward Meridian Parkway	21.1	206.6	267.0	315.2	364.9	525.5	493.2
Cottonwood Creek	At The Intersection Of E Parks Highway And Cottonwood Creek	27.8	265.3	341.1	401.3	463.3	667.1	622.7
Cottonwood Creek	0.3 Miles Downstream Of West Demaree Circle	34.3	331.3	424.6	498.6	574.7	827.6	770.2

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
Deception Creek	Mouth (At Willow Creek)	58	3,650	*	5,400	6,300	*	9,000
Deception Creek Tributary 1	Mouth (At Deception Creek)	*	1,110	*	1,620	1,840	*	2,450
Deception Creek Tributary 2	Mouth (At Deception Creek)	*	1,050	*	1,550	1,840	*	2,580
Deception Creek Tributary 3	Mouth (At Deception Creek)	*	690	*	1,030	1,200	*	1,720
Deshka River	Mouth (At Sustina River)	643.7	9,533.5	11,548.6	13,091.1	14,626.9	21,062.7	18,463.2
Deshka River	5.4 Miles Upstream Of Confluence With Little Sustina River	627.0	9,281.2	11,247.7	12,753.4	14,252.8	20,524.0	17,998.9
Deshka River	6.3 Miles Upstream Of Confluence With Little Sustina River	599.3	8,901.0	10,796.1	12,247.7	13,693.8	19,719.1	17,308.0
Deshka River	Upstream of confluence With Trapper Creek	457.6	7,291.8	8,903.6	10,141.8	11,378.8	16,385.4	14,478.8
Gate Creek	Upstream of confluence With Moose Creek	19.8	504.9	659.1	782.1	908.8	1,308.7	1,237.4
Gate Creek	115 Feet Upstream Of W Petersville Road	10.7	353.7	466.5	557.0	650.5	936.7	894.4
Goose Creek	Mouth	36.7	876.4	1,130.2	1,331.0	1,536.8	2,213.0	2,066.5
Kashwitna River	Mouth	354.7	11,239.8	13,713.9	15,603.0	17,474.8	25,163.7	22,161.6
Knik River	1060 Feet Upstream Of Alaska Railroad	1,180.0	61,200.0	80,100.0	97,400.0	117,800.0	*	180,900.0
Kroto Creek	Upstream of confluence With Moose Creek	364.0	3,487.8	4,356.0	5,029.5	5,707.8	8,219.3	7,424.8
Kroto Creek	25.3 Miles Upstream Of The Mouth	115.0	2,587.1	3,241.4	3,750.0	4,263.1	6,138.9	5,564.0
Kroto Creek	Upstream Limit Of Study - 5.2 Miles Upstream Of South Oilwell Road	149.3	1,864.1	2,354.3	2,737.1	3,124.7	4,499.6	4,111.4

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
Kroto Creek	3.4 Miles Upstream Of The Confluence With Deshka Creek	78.5	7,081.4	8,664.5	9,880.0	11,092.7	15,973.5	14,133.9
Kroto Creek	4.7 Miles Upstream Of The Mouth Of Kroto Creek	339.0	714.3	921.9	1,086.2	1,254.7	1,806.8	1,688.7
Kroto Creek	Below Confluence With Moose Creek	328.1	2,587.8	3,243.8	3,754.6	4,271.0	6,150.3	5,580.8
Lake Creek	Upstream of confluence With Unnamed Tributary To Lake Creek	25.6	263.2	339.6	400.5	463.2	667.0	624.9
Lake Creek	Upstream of confluence With Little Susitna River	32.8	339.6	436.5	513.5	592.7	853.5	796.4
Little Susitna River	At Schrock Road	118.4	7,400.0	9,050.0	11,400.0	13,500.0	*	19,000.0
Little Susitna River	Alaska Railroad	171.0	8,300.0	10,100.0	12,900.0	15,200.0	*	21,600.0
Little Susitna River	3500 Feet Downstream Of Welch Road	76.3	3,243.0	4,360.0	5,341.0	6,459.0	7,397.0	9,752.0
Little Susitna River	3500 Feet Upstream Of Welch Road	76.6	5,800.0	7,600.0	8,900.0	10,500.0	*	14,900.0
Little Willow Creek	Mouth	164.2	3,644.2	4,536.9	5,228.3	5,923.8	8,530.2	7,681.3
Little Willow Creek	1.5 Miles Downstream Of The Alaska Railroad	134.5	6,494.2	7,964.2	9,094.1	10,222.5	14,720.4	13,054.9
Little Willow Creek	5 Miles Upstream Of The Alaska Railroad	105.9	2,190.5	2,763.0	3,210.1	3,663.4	5,275.4	4,816.9
Lucile Creek	Mouth	17.7	201.9	262.9	311.8	362.4	521.8	493.5
Lucile Creek	At The Intersection Of S Johnson Road And Lucile Creek	16.2	182.9	238.5	283.0	329.2	474.1	448.9

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
Lucile Creek	At The Intersection Of S Vine Road And Lucile Creek	11.2	125.9	165.1	196.7	229.5	330.5	314.9
Lucile Creek	0.3 Miles Upstream Of S Foothills Boulevard	9.1	105.7	139.3	166.4	194.6	280.2	268.2
Lucile Creek	1775 Feet Upstream Of S Mack Drive	7.6	84.7	111.8	133.7	156.5	225.4	216.1
Matanuska River	1.4 Miles Upstream Of The Alaska Railroad	2,070.0	36,900.0	44,300.0	49,700.0	55,100.0	*	68,700.0
Montana Creek	Mouth	150.9	6,754.0	9,507.0	11,948.0	14,767.0	17,288.0	23,013.0
Montana Creek	Usgs Gage Number 15292800 Montana Creek Near Montana, Ak	150.8	6,755.0	9,508.0	11,950.0	14,770.0	17,290.0	23,020.0
Montana Creek	7.2 Miles Upstream Of S Parks Highway	128.2	4,797.0	6,635.0	8,243.0	10,079.0	12,145.0	15,388.0
Moose Creek	Upstream of confluence With Kroto Creek	178.8	3,720.8	4,616.3	5,309.0	6,004.6	8,646.6	7,759.7
Moose Creek	Upstream of confluence With Ninemile Creek	121.0	2,719.9	3,404.8	3,936.9	4,473.6	6,441.9	5,833.3
Moose Creek	3.8 Miles Upstream Of Ninemile Creek (Below Confluence With Unnamed Tributary)	117.0	2,597.5	3,252.1	3,760.9	4,274.0	6,154.6	5,574.3
Moose Creek	Upstream of confluence With Gate Creek	70.6	1,384.2	1,754.8	2,045.3	2,340.7	3,370.6	3,094.1
Moose Creek	Upstream of confluence With Westfork Moose Creek At West Petersville Road	33.8	686.6	882.2	1,036.7	1,194.8	1,720.5	1,601.1

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
Moose Creek	3.8 Miles Upstream Of Ninemile Creek (Above Confluence With Unnamed Tributary)	92.3	2,104.0	2,646.8	3,069.8	3,497.4	5,036.2	4,583.5
Moose Creek	3.0 Miles Upstream Of The Confluence With Gate Creek	61.1	1,208.8	1,536.6	1,793.9	2,055.9	2,960.5	2,725.1
Moose Creek	Below Confluence With Westfork Moose Creek	51.1	1,031.3	1,315.7	1,539.4	1,767.5	2,545.2	2,351.4
Ninemile Creek	Upstream of confluence With Moose Creek	22.9	467.0	604.0	712.7	824.3	1,186.9	1,112.0
Ninemile Creek	1 Mile Upstream Of Moose Creek (Below Confluence With Unnamed Tributary)	22.8	464.6	601.0	709.2	820.3	1,181.2	1,106.8
Ninemile Creek	1 Mile Upstream Of Moose Creek (Above Confluence With Unnamed Tributary)	14.7	294.3	383.1	454.0	527.0	758.9	715.9
Ninemile Creek	9.6 Miles Upstream Of The Confluence With Moose Creek	10.2	206.2	270.2	321.5	374.5	539.2	512.1
Ninemile Creek	9.6 Miles Upstream Of The Confluence With Moose Creek	5.8	168.7	225.7	271.9	320.1	460.9	446.8
Ninemile Creek	13.8 Miles Upstream Of The Confluence With Moose Creek	4.7	139.9	188.0	227.1	267.9	385.8	375.6
Ninemile Creek	720 Feet Downstream Of E Petersville Road	3.7	111.2	150.0	181.6	214.8	309.3	302.4
Question Creek	1.7 Miles Upstream Of The Confluence With Answer Creek	1.3	132.8	132.8	92.2	77.1	45.5	62.8

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
Question Creek	1.8 Miles Upstream Of The Confluence With Answer Creek	1.0	36.1	50.0	61.6	73.9	106.4	106.9
Question Creek	2.1 Miles Upstream Of The Confluence With Answer Creek	0.9	32.8	45.6	56.3	67.6	97.3	98.0
Question Creek	2.2 Miles Upstream Of The Confluence With Answer Creek	0.6	21.6	30.4	37.7	45.6	65.6	66.8
Question Creek	1660 Feet Downstream Of S Talkeetna Road	0.5	19.9	28.0	34.8	42.0	60.5	61.8
Question Creek	Upstream of confluence With Answer Creek	1.6	55.5	76.3	93.4	111.5	160.5	159.8
Rabideux Creek	At East Rabideux Access	47.9	817.1	1,038.0	1,211.7	1,388.4	1,999.3	1,839.8
Rabideux Creek	1.4 Miles Upstream Of The Mouth	31.1	643.3	828.2	974.5	1,124.3	1,619.0	1,509.7
Sheep Creek	12.2 Miles Upstream Of The Alaska Railroad	124.5	2,252.3	2,821.5	3,264.7	3,712.7	5,346.4	4,848.8
Sheep Creek	Mouth	135.2	3,397.8	4,231.0	4,875.9	5,523.5	7,953.8	7,159.8
Sheep Creek Slough	Mouth	139.7	3,491.9	4,345.0	5,005.1	5,667.7	8,161.5	7,341.4
Sunshine Creek	Mouth	61.3	1,041.6	1,317.7	1,534.1	1,753.9	2,525.7	2,314.1
Susitna River	Upstream Of The Talkeetna River Confluence	*	*	*	*	185,000.0	*	*
Susitna River	Downstream Of The Talkeetna River Confluence	*	*	*	*	216,000.0	*	*
Talkeetna River	Mouth	*	*	*	*	80,900.0	*	*
Trapper Creek	Mouth	27.1	516.5	664.8	782.1	902.4	1,299.4	1,211.5
Trapper Creek Side Arm	Upstream of confluence With Trapper Creek	3.5	113.5	153.5	186.2	220.5	317.5	311.2

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
Unnamed Point Mackenzie	2 Miles Downstream Of Walsop Road	1.0	18.1	25.1	31.0	37.3	53.7	54.2
Unnamed Tributary To Lake Creek	Mouth	5.8	87.2	116.8	140.7	165.9	238.9	232.2
Unnamed Tributary To Lake Creek	Alaska Railroad	2.8	40.3	54.6	66.2	78.5	113.1	111.1
Wasilla Creek	Mouth	41.4	570.4	736.9	869.3	1,005.7	1,448.3	1,357.6
Wasilla Creek	At Usgs Gage Number 15285000 Wasilla Creek Near Palmer, Ak	18.3	238.1	325.1	402.2	490.9	539.4	751.8
Wasilla Creek	Upstream Of Crabb Cir	14.9	0.0	25.0	244.1	327.6	694.6	599.7
Wasilla Creek	2.9 Miles Upstream Of Crabb Cir	13.5	0.0	25.0	241.8	323.1	667.3	609.7
West Fork Moose Creek	Upstream of confluence With Moose Creek At West Petersville Road	17.3	419.1	547.4	649.9	755.5	1,087.9	1,029.4
Willow Creek	Usgs Gage Number 15294005 - Willow Creek Near Willow, Ak	166.9	6,211.0	8,966.0	11,610.0	14,880.0	16,760.0	25,650.0
Willow Creek	Downstream Of Parks Highway	255.0	9,800.0	11,800.0	14,600.0	16,900.0	*	24,200.0
Willow Creek Tributary**	Upstream – Sta 37,302 Ft	*	22.7	110.8	320.1	566.9	823.0	1,558.3
Willow Creek Tributary**	Middle – Sta 26,188 Ft	*	23.2	117.1	370.7	723.8	1,192.6	2,595.0
Willow Creek Tributary**	Downstream – Sta 13,042 Ft	*	83.5	217.1	547.8	976.8	1,523.9	3,149.5

* Not calculated for this Flood Risk Project

** Split Flow Analysis with Willow Creek, drainage area calculated with Willow Creek.

Figure 7: Frequency Discharge-Drainage Area Curves

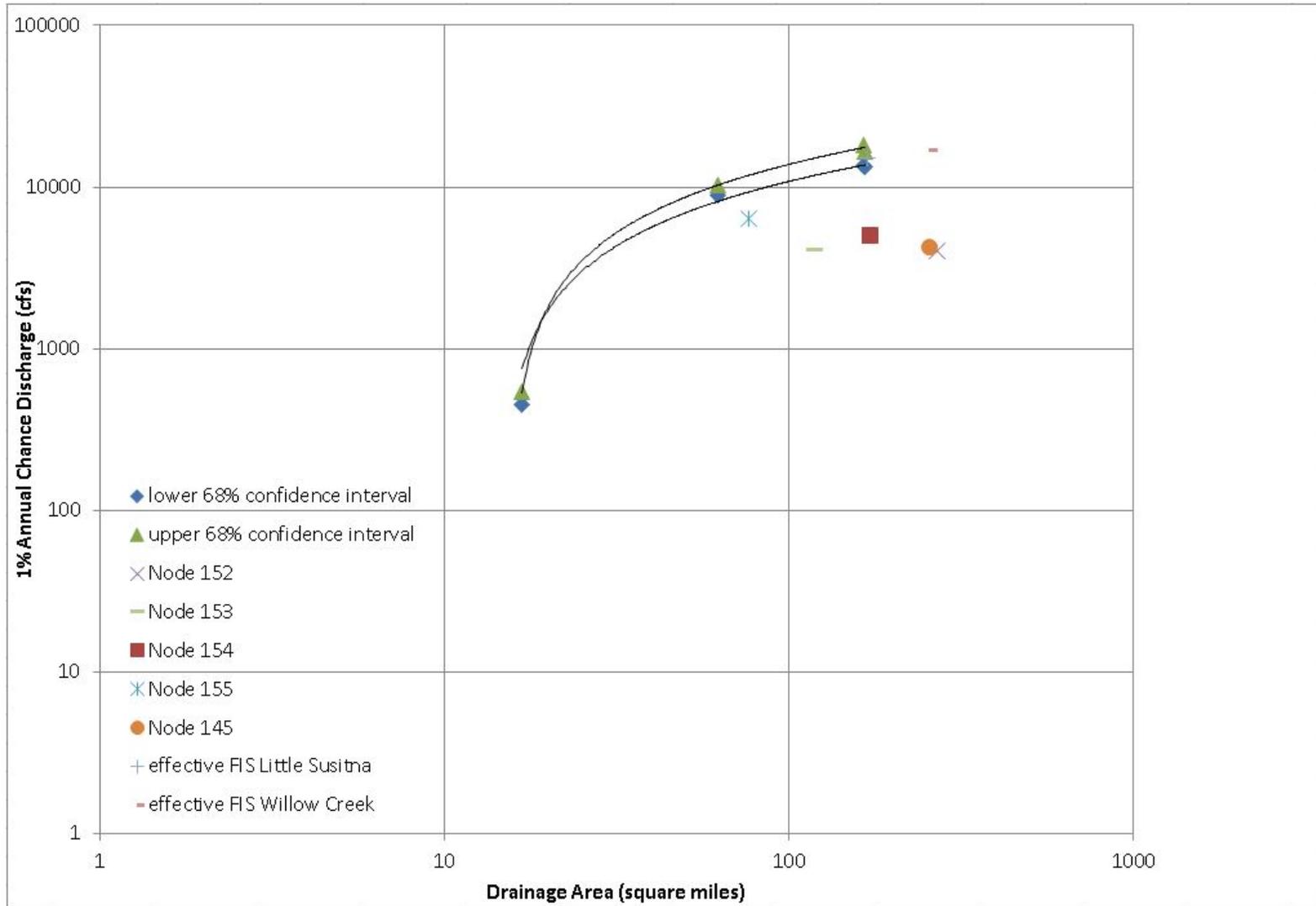


Table 11: Summary of Non-Coastal Stillwater Elevations

Flooding Source	Location	Elevations (feet NAVD88)				
		10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Lucile Lake	Lucile Creek Cross Section 70553.76	*	*	*	320.5	*
Wasilla Lake	E Palmer – Wasilla Hwy Culvert	*	*	*	331.8	*

*Not calculated for this Flood Risk Project

Table 12: 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
Knik River	Gage No. 15281000	USGS	Knik River near Palmer AK	1180	8/5/1948	9/23/2012
Little Susitna River	Gage No. 15290000	USGS	Little Susitna River near Palmer AK	62.6	6/21/1949	6/17/2013
Matanuska River	Gage No. 15284000	USGS	Matanuska River at Palmer AK	2070	7/11/1949	9/21/2012
Montana Creek	Gage No. 1529800	USGS	Montana Creek Near Montana AK	164.1	6/1/1963	5/31/2013
Wasilla Creek	Gage No. 15285000	USGS	Wasilla Creek near Palmer AK		8/10/1971	9/21/2012
Willow Creek	Gage No. 15294005	USGS	Willow Creek Near Willow AK	166	5/28/1979	9/11/2013

5.2 Hydraulic Analyses

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

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 24, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 13. Roughness coefficients are provided in Table 14. 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 13: 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
196 Mile Creek	Confluence with 197 1/2 Mile Creek	3.4 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
197 1/2 Mile Creek	Confluence with Susitna River	1.4 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Answer Creek	Confluence with Sunshine Creek	0.7 mile upstream of S. Talkeetna Spur	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Birch Creek	Confluence with Birch Creek Slough	S. Talkeetna Spur	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	D	Complete effects of hydraulic structures were not considered in the model. Approximate Floodplain not published due to unknown study on Susitna River Zone D.
Birch Creek Slough	Confluence with Susitna River	1.8 miles upstream of confluence with Birch Creek	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	D	Complete effects of hydraulic structures were not considered in the model. Approximate Floodplain not published due to unknown study on Susitna River Zone D.
Bodenburg Creek	Confluence with Knik River	Matanuska River	2003 Regression USGS Region 4 & High Water Marks	HEC-RAS 4.1	09/01/2014	AE	USACE Study - Floodway analysis could not be conducted.
Caswell Creek	Confluence with Susitna River	4.3 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Cottonwood Creek	0.3 miles upstream of W. Demaree Circle	Wasilla Lake	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Deception Creek	Confluence with Willow Creek	Approx. 10.3 miles upstream of confluence	Regression USGS Region 4	HEC-2	April 1982	AE	
Deception Creek Tributary 1	Confluence with Deception Creek	Approx. 1.6 miles upstream of confluence	Regression USGS Region 4	HEC-2	April 1982	AE	

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
Deception Creek Tributary 2	Confluence with Deception Creek	Approx. 1.3 miles upstream of confluence	Regression USGS Region 4	HEC-2	April 1982	AE	
Deception Creek Tributary 3	Confluence with Deception Creek	Approx. 0.5 miles upstream of confluence	Regression USGS Region 4	HEC-2	April 1982	AE	
Gate Creek	Confluence with Moose Creek	3.8 mile upstream of E. Petersville Road	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Goose Creek	Confluence with Susitna River	3.5 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Kashwitna River	Confluence with Susitna River	4.5 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Knik River	3.0 miles upstream of Alaska Railroad	2.0 miles upstream of S. Old Glenn Highway	2003 Regression USGS Region 4 & High Water Marks	HEC-RAS 4.1	09/01/2014	AE w/ Floodway	USACE Study Leveraged model was revised to address floodway surcharge limit
Knik River Western	Alaska Railroad	3.0 miles upstream of Alaska Railroad	2003 Regression USGS Region 4 & High Water Marks	HEC-RAS 4.1	05/27/2015	A	USACE Study - Complete effects of hydraulic structures were not considered in the model.
Kroto Creek	16.2 miles upstream of confluence with Susitna River	5.3 miles upstream of S. Oilwell Road	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Lake Creek	Confluence with Little Susitna River	1.2 miles downstream of N. Lynx Lake Road	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Little Susitna River	1.0 miles downstream of Alaska Railroad	150 feet upstream of E. Edgerton Road	2003 Regression USGS Region 4 & Gage Analysis	HEC-RAS 4.1	7/23/2015	AE w/ Floodway	Previous consideration of three split flows were combined into a single channel analysis

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Little Susitna River	26.5 miles upstream of confluence with Cook Inlet	1.0 miles downstream of Alaska Railroad	2003 Regression USGS Region 4 & Gage Analysis	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Little Willow Creek	Confluence with Susitna River	6.6 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Lucile Creek	0.6 miles downstream of W. Big Lake Road	Lucile Lake	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Matanuska River	0.3 miles upstream of N. Old Glenn Highway	3.9 miles upstream of N. Old Glenn Highway	2003 Regression USGS Region 4 & High Water Marks	HEC-RAS 4.1	05/27/2015	A	USACE Study -Complete effects of hydraulic structures were not considered in the model.
Matanuska River	3.2 miles upstream of confluence with Knik River	0.3 miles upstream of N. Old Glenn Highway	2003 Regression USGS Region 4 & High Water Marks	HEC-RAS 4.1	09/01/2014	AE	USACE Study - Floodway analysis could not be conducted
Montana Creek	Confluence with Susitna River	0.6 mile upstream of E. Yoder Road	Weighted Regression & Gage Analysis	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Moose Creek	Confluence with Kroto Creek	3.1 miles upstream of E. Petersville Road	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Ninemile Creek	Confluence with Moose Creek	2.5 miles upstream of E. Petersville Road	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Question Creek	Confluence with Sunshine Creek	0.3 mile downstream of S. Talkeetna Spur	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Rabideux Creek	Confluence with Susitna River	0.2 mile downstream of E. Petersville Road	1994 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.

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
Sheep Creek	Confluence with Susitna River	12.0 miles upstream of Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Sheep Creek Slough	Mouth	2.1 Miles upstream of the mouth	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Sunshine Creek	Confluence with Susitna River	Confluence with Answer Creek	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Susitna River	Confluence with Talkeetna River	Approx. 16,850 Ft. from confluence with Talkeetna River	High Water Marks - USACE	FESWMS & HEC-RAS	07/01/2009	AE w/ Floodway	Tied in with Approximate Study done on the Downstream portion of the Susistna River.
Talkeetna River	Confluence with Susitna River	Approx. 27,000 Ft. from confluence with Susistna River	High Water Marks - USACE	FESWMS & HEC-RAS	07/01/2009	AE w/ Floodway	Tied in with Approximate Study done on the Downstream portion of the Susistna River.
Trapper Creek	Confluence with Susitna River	0.4 mile upstream of S. Hugo Loop	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Trapper Creek Side Arm	Confluence with Trapper Creek	0.3 mile upstream of confluence with Trapper Creek	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Twister Creek	14,500 Ft. above South Talkeetna Spur Road Crossing	Approx. 17,100 Ft. above South Talkeetna Spur Road Crossing	High Water Marks - USACE	FESWMS & HEC-RAS	07/01/2009	AE	Tied in with Approximate Study done on the Downstream portion of the Susistna River.
Unnamed Point Mackenzie	1.6 miles downstream of W. Alsop Road	0.7 miles upstream of W. Alsop Road	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Unnamed Tributary to Lake Creek	Confluence with Lake Creek	Alaska Railroad	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Upper Matanuska River	0.4 miles upstream of N. Old Glenn Highway	3.9 miles upstream of N. Old Glenn Highway	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.

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
Wasilla Creek	E. Nelson Road	0.3 upstream of N. Palmer-Fishhook Road	2003 Regression USGS Region 4 & Gage Analysis	HEC-RAS 4.1	07/06/2015	AE	Data for hydraulic structures was provided by the Borough.
Wasilla Creek	0.3 upstream of N. Palmer-Fishhook Road	2.9 miles Upstream of Crabb Cir	2003 Regression USGS Region 4 & Gage Analysis	HEC-RAS 4.1	04/01/2016	A	
West Fork Moose Creek	Confluence with Moose Creek	2.1 miles upstream of confluence with Moose Creek	2003 Regression USGS Region 4	HEC-RAS 4.1	05/27/2015	A	Complete effects of hydraulic structures were not considered in the model.
Willow Creek	Confluence with Susitna River	1.9 miles upstream of N. Shirley Towne Dr.	2003 Regression USGS Region 4 & Gage Analysis	HEC-RAS 4.1	06/03/2015	AE w/ Floodway	
Willow Creek Tributary	Confluence with Willow Creek	Approx. 7.4 miles upstream (confluence with Willow Creek)	Split Flow Analysis	HEC-RAS 4.1	06/03/2015	AE w/ Floodway	

Table 14: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
196 Mile Creek	0.035	0.080-0.120
197 1/2 Mile Creek	0.035	0.080-0.150
Answer Creek	0.035	0.100-0.150
Birch Creek	0.035	0.120-0.140
Birch Creek Slough	0.035	0.120-0.150
Bodenburg Creek	0.049	0.090
Caswell Creek	0.035	0.080-0.150
Cottonwood Creek	0.035	0.080-0.150
Deception Creek	*	*
Deception Creek Tributary 1	*	*
Deception Creek Tributary 2	*	*
Deception Creek Tributary 3	*	*
Gate Creek	0.035	0.080-0.150
Goose Creek	0.035	0.080-0.150
Kashwitna River	0.035	0.080-0.150
Knik River (Approximate)	0.027	0.100-0.150
Knik River (Detailed)	0.027	0.027-0.150
Kroto Creek	0.035	0.065-0.120
Lake Creek	0.035	0.080-0.150
Little Susitna River	0.035	0.100-0.150
Little Willow Creek	0.035	0.080-0.150
Lucile Creek	0.035	0.065-0.150
Matanuska River (Approximate)	0.030	0.090-0.100
Matanuska River (Detailed)	0.027	0.090-0.150
Montana Creek	0.035	0.090-0.150
Moose Creek	0.035	0.065-0.150
Ninemile Creek	0.035	0.065-0.150
Question Creek	0.035	0.090-0.150
Rabideux Creek	0.035	0.080-0.150
Sheep Creek	0.035	0.100-0.150
Sunshine Creek	0.035	0.140-0.150
Susitna River	*	*
Talkeetna River	*	*

Flooding Source	Channel “n”	Overbank “n”
Trapper Creek	0.035	0.080-0.150
Trapper Creek Side Arm	0.035	0.100-0.140
Twister Creek	*	*
Unnamed Tributary to Lake Creek	0.035	0.065-0.080
Unnamed Point Mackenzie	0.035	0.065-0.150
Upper Matanuska River	0.030	0.090-0.100
Wasilla Creek	0.040-0.045	0.020-0.135
West Fork Moose Creek	0.035	0.080-0.120
Willow Creek	0.040	0.048-0.100
Willow Creek Tributary	0.048	0.048-0.100

*Not calculated for this Flood Risk Project

5.3 Coastal Analyses

This section is not applicable to this Flood Risk Project.

Table 15: 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 16: 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 17: 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 18: Summary of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

Table 19: 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, or contact the National Geodetic Survey (NGS) at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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 contact information services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Matanuska-Susitna Borough are provided in Table 20.

Table 20: Countywide Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

A countywide conversion factor could not be generated for Matanuska-Susitna Borough because the maximum variance from average exceeds 0.25 feet. Calculations for the vertical offsets on a stream by stream basis are depicted in Table 21.

Table 21: Stream-Based Vertical Datum Conversion

Flooding Source	Average Vertical Datum Conversion Factor (feet)
Deception Creek, Deception Creek Tributaries, Susitna River, Talkeetna River, Twister Creek	+6.1
Little Susitna and Little Susitna Split Flows	+6.2
Lucille Lake, Wasilla Lake	+6.1

6.2 Base Map

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

Base map information shown on the FIRM was derived from the sources described in Table 22.

Table 22: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophoto & LiDAR	Matanuska-Susitna Borough	2011	1 foot GSD	Color orthoimagery and LiDAR provided to Borough, developed by AERO-METRIC, Inc.
Political Boundaries, Transportation, and Streams	Matanuska-Susitna Borough GIS	2014	N/A	Municipal and Borough boundaries, Roads and railroads, Streams, rivers, and lakes
State Park Units, Water Areas, and Public Land Survey Systems (PLSS)	Alaska State Geo-Spatial Data Clearinghouse	2014	1:24,000	PLSS Data & NHD gathered from USGS

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 23.

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

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. Table 2 indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 24, “Floodway Data.”

Certain flooding sources may have been studied that do not have published BFEs on the FIRMs, or for which there is a need to report the 1% annual chance flood elevations at selected cross sections because a published Flood Profile does not exist in this FIS Report. These streams may have also been studied using methods to determine non-encroachment zones rather than floodways. For these flooding sources, the 1% annual chance floodplain boundaries 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 23. All topographic data used for modeling or mapping has been converted as necessary to NAVD88. The 1% annual chance elevations for selected cross sections along these flooding sources, along with their non-encroachment widths, if calculated, are shown in Table 25, “Flood Hazard and Non-Encroachment Data for Selected Streams.”

Table 23: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data					
		Description	Scale	Contour Interval	RMSE _z	Accuracy _z	Citation
Matanuska-Susitna Borough	Multiple	LiDAR	N/A	2 ft			MAT-SU 2011

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations.

Table 24: 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	117	*	*	*	51.0	*	*	*
B	3,395	*	*	*	58.8	*	*	*
C	5,583	*	*	*	64.4	*	*	*
D	7,355	*	*	*	68.7	*	*	*
E	8,025	*	*	*	70.6	*	*	*
F	8,900	*	*	*	74.3	*	*	*
G	9,437	*	*	*	75.1	*	*	*
H	9,538	*	*	*	75.3	*	*	*
I	11,858	*	*	*	82.2	*	*	*
J	13,945	*	*	*	89.0	*	*	*
K	15,892	*	*	*	97.0	*	*	*
L	15,946	*	*	*	97.3	*	*	*
M	17,572	*	*	*	101.2	*	*	*
N	18,636	*	*	*	102.8	*	*	*
O	20,094	*	*	*	109.4	*	*	*
P	21,303	*	*	*	116.2	*	*	*
Q	22,127	*	*	*	117.4	*	*	*
R	22,721	*	*	*	118.0	*	*	*
S	22,929	*	*	*	118.5	*	*	*
T	23,118	*	*	*	119.2	*	*	*
U	23,168	*	*	*	119.4	*	*	*
V	23,524	*	*	*	120.4	*	*	*

¹Feet above Confluence with Knik River

* Data not available – No floodway analysis

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: BODENBURG CREEK

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	24,132	*	*	*	121.5	*	*	*
X	24,782	*	*	*	122.3	*	*	*
Y	25,098	*	*	*	122.6	*	*	*
Z	25,428	*	*	*	123.4	*	*	*
AA	25,727	*	*	*	127.9	*	*	*
AB	26,125	*	*	*	131.3	*	*	*
AC	26,379	*	*	*	132.0	*	*	*

¹ Feet above Confluence with Knik River

* Data not available – No floodway analysis

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: BODENBURG CREEK

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	600	500	1,706	3.6	180.8	180.8	181.8	1.0
B	750	500	1,903	3.2	182.3	182.3	182.3	0.0
C	880	500	2,153	2.8	182.5	182.5	182.6	0.1
D	2,140	350	1,249	4.9	184.3	184.3	184.9	0.6
E	3,420	290	864	7.1	189.9	189.9	190.0	0.1
F	4,540	350	1,410	4.3	194.4	194.4	194.5	0.1
G	6,360	243	850	7.1	200.2	200.2	200.3	0.1
H	7,680	210	970	6.2	205.0	205.0	205.6	0.6
I	8,655	300	1,231	4.9	208.0	208.0	208.8	0.8
J	10,415	450	1,161	5.2	213.9	213.9	214.8	0.9
K	11,635	450	1,558	3.9	218.0	218.0	219.0	1.0
L	13,735	450	1,253	4.8	224.3	224.3	224.8	0.5
M	14,505	632	1,269	4.8	228.1	228.1	228.7	0.6
N	15,305	550	1,252	4.8	233.4	233.4	233.5	0.1
O	17,255	650	1,823	3.3	238.5	238.5	239.0	0.5
P	18,330	800	1,483	4.0	242.2	242.2	242.5	0.3
Q	18,620	800	1,580	2.6	243.7	243.7	244.1	0.4
R	19,705	400	686	4.3	247.0	247.0	247.0	0.0
S	20,985	400	1,557	3.2	250.2	250.2	250.5	0.3
T	22,285	500	1,085	3.7	252.7	252.7	253.0	0.3
U	23,400	285	666	5.3	257.3	257.3	257.3	0.0
V	24,765	250	1,018	2.7	259.2	259.2	259.9	0.7
W	26,130	52	155	8.8	264.0	264.0	264.3	0.3
X	27,180	439	721	3.9	269.4	269.4	269.8	0.4
Y	28,230	132	343	9.6	275.3	275.3	275.3	0.0
Z	29,730	500	1,019	4.7	282.8	282.8	283.4	0.6

¹Feet above confluence with Willow Creek

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: DECEPTION CREEK

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
AA	31,230	920	1,296	3.0	288.6	288.6	288.9	0.3
AB	32,950	379	726	4.8	294.4	294.4	294.7	0.3
AC	33,400	162	303	7.4	295.2	295.2	295.6	0.4
AD	34,930	544	772	2.9	302.5	302.5	302.5	0.0
AE	36,460	503	633	3.5	308.0	308.0	308.1	0.1
AF	37,185	579	1,272	3.2	312.1	312.1	312.9	0.8
AG	37,705	300	664	5.6	316.4	316.4	316.4	0.0
AH	38,340	500	1,271	2.9	318.4	318.4	318.7	0.3
AI	41,350	295	596	5.0	336.8	336.8	337.0	0.2
AJ	43,160	331	574	5.2	352.2	352.2	352.2	0.0
AK	44,255	450	677	6.8	363.5	363.5	363.5	0.0
AL	45,235	324	658	6.4	376.0	376.0	376.5	0.5
AM	46,190	98	402	10.5	384.1	384.1	384.3	0.2
AN	47,400	400	753	5.6	397.4	397.4	397.9	0.5
AO	48,525	184	473	9.0	412.9	412.9	412.9	0.0
AP	49,700	154	468	9.1	424.1	424.1	424.8	0.7
AQ	50,750	144	414	10.3	437.3	437.3	437.3	0.0
AR	51,705	90	365	11.6	450.2	450.2	450.2	0.0
AS	52,470	259	656	6.5	458.3	458.3	458.4	0.1
AT	53,020	188	523	7.7	465.2	465.2	465.2	0.0
AU	53,410	188	521	7.7	470.6	470.6	470.6	0.0
AV	53,800	300	652	6.1	477.2	477.2	477.3	0.1
AW	54,620	300	660	6.1	485.7	485.7	486.0	0.3

¹ Feet above confluence with Willow Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DECEPTION CREEK

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
AX	55,530	300	680	5.8	491.8	491.8	491.8	0.0
AY	55,700	134	434	9.2	492.9	492.9	493.0	0.1
AZ	56,675	490	864	4.6	508.0	508.0	508.7	0.7
BA	58,120	536	815	4.9	524.1	524.1	525.1	1.0
BB	59,410	142	445	8.9	540.0	540.0	540.0	0.0
BC	59,650	152	419	8.8	542.4	542.4	542.4	0.0
BD	59,920	97	350	10.5	545.7	545.7	545.8	0.1
BE	60,610	175	475	7.7	556.6	556.6	556.6	0.0
BF	61,385	267	623	5.9	562.8	562.8	563.2	0.4
BG	61,785	136	410	9.2	567.4	567.4	567.4	0.0
BH	62,410	135	405	8.7	573.8	573.8	573.8	0.0

¹ Feet above confluence with Willow Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
**MATANUSKA-SUSITNA BOROUGH,
ALASKA**
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DECEPTION CREEK

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	3802	400	945	1.9	243.7	243.7	244.1	0.4
B	1,030	400	878	3.4	246.5	246.5	246.6	0.1
C	1,710	400	396	2.5	251.6	251.6	251.6	0.0
D	2,240	400	859	1.8	253.3	253.3	253.9	0.6
E	2,710	400	641	3.3	257.0	257.0	257.1	0.1
F	3,120	500	1,392	2.0	258.5	258.5	259.0	0.5
G	4,370	600	1,191	3.5	264.2	264.2	264.4	0.2
H	5,170	600	1,140	2.3	268.1	268.1	268.3	0.2
I	6,520	330	604	3.6	275.0	275.0	275.5	0.5
J	7,660	300	196	2.7	282.9	282.9	283.4	0.5
K	8,560	500	586	2.4	288.9	288.9	289.2	0.3

¹ Feet above confluence with Deception Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
**MATANUSKA-SUSITNA BOROUGH,
ALASKA**
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DECEPTION CREEK TRIBUTARY 1

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	360	185	469	3.8	294.4	294.4	294.8	0.4
B	680	165	569	5.3	295.7	295.7	296.6	0.9
C	1,780	400	1,014	3.0	302.0	302.0	302.8	0.8
D	2,580	253	594	5.1	308.7	308.7	309.5	0.8
E	3,000	500	558	2.2	312.6	312.6	313.2	0.6
F	3,650	193	289	3.8	316.4	316.4	317.4	1.0
G	3,920	490	488	2.3	319.9	319.9	319.9	0.0
H	4,620	645	1,145	3.4	323.8	323.8	324.1	0.3
I	5,790	500	557	2.9	336.3	336.3	336.9	0.6
J	7,140	300	470	3.5	352.3	352.3	352.4	0.1

¹ Feet above confluence with Deception Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
**MATANUSKA-SUSITNA BOROUGH,
ALASKA**
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DECEPTION CREEK TRIBUTARY 2

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	610	150	231	5.2	315.9	315.9	316.5	0.6
B	1,010	183	314	3.8	318.6	318.6	319.4	0.8
C	1,770	200	444	2.7	321.5	321.5	322.0	0.5
D	2,400	200	305	3.9	324.9	324.9	324.9	0.0

¹ Feet above confluence with Deception Creek

TABLE 24

FEDERAL EMERGENCY MANAGEMENT AGENCY
**MATANUSKA-SUSITNA BOROUGH,
ALASKA**
AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: DECEPTION CREEK TRIBUTARY 3

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	0	7,650	30,520	3.9	37.6	37.6	38.2	0.6
B	1,790	5,643	35,347	3.3	38.1	38.1	38.8	0.7
C	3,754	4,992	23,568	5.0	38.6	38.6	39.4	0.8
D	5,719	5,479	24,188	4.9	41.0	41.0	41.6	0.6
E	7,950	5,560	25,857	4.6	43.0	43.0	43.5	0.5
F	12,976	4,306	25,718	4.6	44.8	44.8	45.4	0.6
G	15,301	3,813	27,039	4.4	45.8	45.8	46.5	0.7
H	17,021	3,682	24,253	4.9	46.6	46.6	47.4	0.8
I	18,300	4,225	26,822	4.4	47.4	47.4	48.3	0.9
J	19,303	4,100	24,141	4.9	48.0	48.0	48.9	0.9
K	20,315	3,492	23,010	5.1	48.6	48.6	49.5	0.9
L	21,364	2,900	20,226	5.8	49.2	49.2	50.1	0.9
M	22,518	2,780	25,918	4.5	50.0	50.0	50.9	0.9
N	23,670	1,737	18,587	6.3	50.2	50.2	51.2	1.0
O	24,389	1,450	16,569	7.1	50.5	50.5	51.5	1.0
P	24,952	426	9,111	12.9	51.4	51.4	51.6	0.2
Q	25,126	938	14,331	8.2	53.3	53.3	53.8	0.5
R	26,917	1,279	15,268	7.7	54.9	54.9	55.4	0.5
S	28,923	1,980	23,267	5.1	55.9	55.9	56.9	1.0
T	30,869	1,638	21,904	5.4	56.5	56.5	57.4	0.9
U	33,164	2,116	21,397	5.5	57.2	57.2	58.1	0.9
V	35,678	1,910	29,524	4.0	58.7	58.7	59.7	1.0

¹Feet beginning 240 Feet downstream of the Alaska Railroad

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: KNIK RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	63	1,420	7,155	4.3	236.4	236.4	237.3	0.9
B	7,232	1,870	6,946	6.1	240.7	240.7	241.3	0.6
C	11,487	1,800	4,096	8.9	243.2	243.2	243.6	0.4
D	15,101	350	1,757	11.8	246.9	246.9	247.9	1.0
E	17,916	1,163	7,681	4.7	253.6	253.6	253.7	0.1
F	23,326	230	2,519	6.6	255.4	255.4	255.8	0.4
G	28,781	1,150	6,043	5.5	258.3	258.3	258.6	0.2
H	35,286	1,200	5,781	6.3	263.0	263.0	263.5	0.5
I	43,502	920	5,155	6.3	268.5	268.5	269.2	0.7
J	54,038	1,745	6,243	6.9	275.7	275.7	276.6	0.9
K	61,305	1,400	5,662	6.8	282.8	282.8	283.2	0.4
L	66,338	1,535	5,011	7.5	287.3	287.3	288.0	0.6
M	72,371	1,700	5,202	7.9	294.6	294.6	295.4	0.8
N	78,587	1,595	7,231	5.8	303.2	303.2	303.8	0.6
O	83,776	977	4,206	8.0	310.7	310.7	311.3	0.6
P	88,994	1,203	6,487	5.4	318.1	318.1	318.8	0.7
Q	94,288	1,153	4,540	7.4	327.4	327.4	327.9	0.5
R	101,354	1,650	5,679	7.3	335.3	335.3	335.9	0.6
S	107,381	1,646	5,636	6.4	343.9	343.9	344.5	0.6
T	113,795	1,258	4,785	8.3	358.1	358.1	358.6	0.6
U	117,081	1,830	4,376	8.6	366.6	366.6	367.6	1.0
V	118,662	1,115	3,011	10.2	372.2	372.2	372.7	0.5
W	123,234	1,658	4,471	7.7	384.6	384.6	385.2	0.6
X	127,785	1,099	4,971	5.9	395.4	395.4	396.4	1.0
Y	129,849	649	3,142	9.2	400.8	400.8	401.8	1.0
Z	132,799	885	3,840	8.1	407.7	407.7	408.5	0.8

¹Stream distance in feet beginning approximately 15,000 Feet downstream of Alaska Railroad Bridge

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: LITTLE SUSITNA RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
AA	134,720	1,452	3,688	9.5	413.9	413.9	414.2	0.3
AB	136,886	986	4,369	6.1	425.2	425.2	425.2	0.0
AC	138,660	1,759	3,884	9.4	429.3	429.3	429.3	0.1
AD	141,480	1,360	3,847	10.0	439.9	439.9	440.9	1.0
AE	144,028	2,124	6,325	6.3	450.4	450.4	450.3	0.0
AF	146,134	1,794	4,043	9.9	455.8	455.8	455.8	0.0
AG	148,183	1,480	4,465	6.8	460.8	460.8	460.9	0.2
AH	149,573	1,274	3,618	9.4	466.4	466.4	467.0	0.6
AI	151,205	805	3,328	9.1	474.2	474.2	474.9	0.8
AJ	153,151	992	2,791	11.8	481.6	481.6	482.2	0.6
AK	155,265	1,106	2,842	10.3	491.8	491.8	492.7	0.9
AL	156,847	912	3,177	9.5	502.1	502.1	502.3	0.2
AM	158,647	380	1,737	13.2	509.5	509.5	510.3	0.8
AN	161,487	650	3,102	8.9	522.7	522.7	523.7	0.9
AO	163,429	1,514	3,993	7.3	531.5	531.5	532.1	0.6
AP	164,616	1,768	3,281	9.5	537.5	537.5	537.9	0.3
AQ	167,077	1,760	3,056	9.5	549.0	549.0	549.1	0.1
AR	170,509	2,019	4,383	5.6	566.4	566.4	566.4	0.0
AS	173,657	858	2,287	11.1	587.2	587.2	587.5	0.3
AT	176,052	996	2,152	11.9	603.1	603.1	603.1	0.1
AU	178,955	600	2,290	8.2	623.5	623.5	623.6	0.1
AV	182,875	415	1,177	9.6	644.9	644.9	644.8	0.0
AW	186,950	970	1,369	10.7	673.3	673.3	673.5	0.1
AX	190,069	828	1,603	11.6	708.2	708.2	708.4	0.3
AY	193,688	263	915	14.9	755.2	755.2	755.2	0.0
AZ	194,712	304	1,566	7.9	772.0	772.0	772.0	0.0

¹Stream distance in feet beginning approximately 15,000 Feet downstream of Alaska Railroad Bridge

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: LITTLE SUSITNA RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	16,670	*	*	*	73.9	*	*	*
B	21,244	*	*	*	83.7	*	*	*
C	24,101	*	*	*	88.5	*	*	*
D	29,162	*	*	*	97.1	*	*	*
E	32,669	*	*	*	102.4	*	*	*
F	36,686	*	*	*	108.8	*	*	*
G	39,896	*	*	*	115.3	*	*	*
H	43,666	*	*	*	121.5	*	*	*
I	46,063	*	*	*	127.7	*	*	*
J	47,220	*	*	*	129.6	*	*	*
K	48,804	*	*	*	131.3	*	*	*
L	49,810	*	*	*	132.3	*	*	*
M	54,692	*	*	*	139.7	*	*	*
N	60,132	*	*	*	149.3	*	*	*
O	64,977	*	*	*	157.3	*	*	*
P	68,983	*	*	*	163.4	*	*	*
Q	72,257	*	*	*	169.8	*	*	*
R	78,120	*	*	*	179.0	*	*	*
S	82,120	*	*	*	187.4	*	*	*
T	88,047	*	*	*	195.7	*	*	*
U	89,018	*	*	*	196.6	*	*	*
V	89,280	*	*	*	199.7	*	*	*
W	90,114	*	*	*	201.5	*	*	*
X	92,715	*	*	*	206.7	*	*	*
Y	93,995	*	*	*	207.5	*	*	*

¹ Feet beginning approximately 13.7 Miles downstream of N Old Glenn Hwy

* Data not available – No floodway analysis

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: MATANUSKA RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	6,935	44,922	4.8	335.8	335.8	336.0	0.2
B	2,460	5,729	35,411	6.1	337.3	337.3	337.4	0.1
C	4,649	4,952	30,859	7.0	339.7	339.7	339.9	0.2
D	6,964	5,330	39,878	5.4	342.2	342.2	342.6	0.4
E	8,830	5,012	34,873	6.2	343.8	343.8	344.1	0.3
F	12,271	59,532	36,486	5.1	346.7	346.7	346.9	0.2
G	14,242	34,802	22,669	8.2	349.9	349.9	350.1	0.2
H	15,585	36,932	25,432	7.3	351.7	351.7	352.2	0.5
I	16,836	3,983	27,828	6.1	355.2	355.2	355.9	0.7

¹ Feet upstream from Limit of Detailed Study

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: SUSITNA RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	3,487	²	11,333	7.1	347.7	347.7	348.5	0.8
B	4,422	²	8,507	9.5	353.4	353.4	353.4	0.0
C	4,954	²	15,909	5.1	354.9	354.9	355.2	0.3
D	6,941	²	29,086	2.8	356.0	356.0	356.2	0.2
E	9,155	4,742	29,109	2.8	357.7	357.7	357.9	0.2
F	10,463	3,182	16,090	5.0	360.0	360.0	360.4	0.4
G	11,220	3,840	22,035	3.7	362.0	362.0	362.5	0.5
H	12,066	4,134	22,926	3.5	364.7	364.7	365.4	0.7
I	13,272	5,166	21,983	3.7	366.2	366.2	367.0	0.8
J	13,743	5,827	26,248	3.1	367.7	367.7	368.4	0.7
K	15,346	4,966	21,243	3.8	370.8	370.8	371.4	0.6
L	16,198	4,564	17,531	4.6	373.1	373.1	373.7	0.6
M	17,411	3,585	14,055	5.8	375	375	375.7	0.7
N	17,857	3,137	14,371	5.6	376.2	376.2	376.9	0.7
O	18,474	2,855	16,003	5.1	378.3	378.3	379.0	0.7
P	19,415	2,757	14,915	5.4	379.8	379.8	380.7	0.9
Q	19,898	2,812	17,214	4.7	381.0	381	381.9	0.9
R	20,370	2,803	15,930	5.1	381.3	381.3	382.2	0.9
S	21,255	3,012	20,160	4.0	384.8	384.8	385.6	0.8
T	21,928	2,672	19,123	4.2	386.2	386.2	386.8	0.6
U	24,392	1,745	11,125	7.3	389.0	389.0	389.6	0.6
V	25,439	1,658	10,770	7.5	391.0	391.0	391.6	0.6
W	25,952	1,281	5,831	13.9	391.2	391.2	391.8	0.6
X	26,674	1,388	9,252	8.7	393.5	393.5	394.0	0.5
Y	27,099	1,330	7,800	10.4	393.6	393.6	394.4	0.8

¹ Feet upstream from confluence with Susitna River

² Floodway not computed/shown for this cross section

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: TALKEETNA RIVER

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,553	*	*	*	351.7	*	*	*
B	3,141	*	*	*	352.3	*	*	*
C	3,906	*	*	*	353.7	*	*	*
D	4,424	*	*	*	355.3	*	*	*
E	5,177	*	*	*	356.0	*	*	*
F	7,340	*	*	*	360.9	*	*	*
G	8,911	*	*	*	363.3	*	*	*
H	9,490	*	*	*	365.0	*	*	*
I	11,754	*	*	*	369.1	*	*	*
J	12,717	*	*	*	370.2	*	*	*
K	13,452	*	*	*	372.1	*	*	*
L	15,360	*	*	*	375.2	*	*	*
M	15,615	*	*	*	376.3	*	*	*
N	15,889	*	*	*	379.2	*	*	*
O	16,660	*	*	*	380.5	*	*	*
P	17,089	*	*	*	380.8	*	*	*

¹Feet above South Talkeetna Spur Road Crossing

* Data not available – No floodway analysis

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: TWISTER CREEK

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	84	*	*	*	34.2	*	*	*
B	1,364	*	*	*	37.9	*	*	*
C	3,349	*	*	*	59.3	*	*	*
D	4,876	*	*	*	78.4	*	*	*
E	7,343	*	*	*	99.5	*	*	*
F	10,685	*	*	*	129.5	*	*	*
G	11,702	*	*	*	138.3	*	*	*
H	12,842	*	*	*	143.3	*	*	*
I	14,977	*	*	*	157.6	*	*	*
J	17,311	*	*	*	177.6	*	*	*
K	19,209	*	*	*	191.2	*	*	*
L	22,629	*	*	*	211.3	*	*	*
M	23,883	*	*	*	218.7	*	*	*
N	25,867	*	*	*	231.3	*	*	*
O	27,852	*	*	*	241.6	*	*	*
P	29,192	*	*	*	250.7	*	*	*
Q	31,267	*	*	*	263.3	*	*	*
R	32,415	*	*	*	270.5	*	*	*
S	33,339	*	*	*	275.8	*	*	*
T	34,617	*	*	*	282.9	*	*	*
U	35,400	*	*	*	288.1	*	*	*
V	36,266	*	*	*	293.5	*	*	*
W	37,382	*	*	*	299.7	*	*	*

¹Feet beginning 136 feet downstream of E Nelson Road

* Data not available – No floodway analysis

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WASILLA CREEK

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
X	38,025	*	*	*	303.5	*	*	*
Y	38,828	*	*	*	307.9	*	*	*
Z	40,360	*	*	*	318.2	*	*	*
AA	42,663	*	*	*	331.2	*	*	*
AB	44,317	*	*	*	341.0	*	*	*
AC	45,635	*	*	*	350.1	*	*	*
AD	46,047	*	*	*	355.6	*	*	*
AE	47,476	*	*	*	362.1	*	*	*
AF	49,607	*	*	*	378.1	*	*	*
AG	50,629	*	*	*	386.6	*	*	*
AH	51,868	*	*	*	395.7	*	*	*
AI	53,898	*	*	*	411.4	*	*	*
AJ	55,451	*	*	*	425.9	*	*	*
AK	57,054	*	*	*	438.9	*	*	*
AL	58,189	*	*	*	444.9	*	*	*
AM	59,601	*	*	*	451.3	*	*	*
AN	61,279	*	*	*	456.8	*	*	*
AO	62,174	*	*	*	463.4	*	*	*
AP	65,068	*	*	*	480.2	*	*	*
AQ	65,949	*	*	*	485.6	*	*	*
AR	66,672	*	*	*	491.5	*	*	*
AS	68,266	*	*	*	502.1	*	*	*

¹Feet beginning 136 feet downstream of E Nelson Road

* Data not available – No floodway analysis

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WASILLA CREEK

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	1,636	1636	1,890	6,474	108.1	108.1	109.1	1.0
B	4,199	4199	1,615	5,042	112.1	112.1	113.1	1.0
C	6,732	6732	1,540	6,238	116.6	116.6	117.3	0.7
D	10,228	10228	870	3,368	123.0	123	123.6	0.6
E	12,261	12261	1,390	5,195	126.7	126.7	127.6	0.9
F	14,468	14468	1,450	4,639	132.7	132.7	132.9	0.2
G	16,587	16586	1,825	6,707	136.0	136	136.4	0.4
H	20,251	20251	2,040	6,525	141.4	141.4	142.3	0.9
I	23,750	23750	1,760	5,633	150.0	150	150.5	0.5
J	27,180	27180	1,549	13,460	162.4	162.4	163.1	0.7
K	28,475	28475	2,022	8,102	162.9	162.9	163.6	0.7
L	32,368	32368	1,830	19,446	172.5	172.5	173.3	0.8
M	34,470	34470	1,097	5,003	177.2	177.2	177.7	0.5
N	37,587	37586	717	3,447	189.4	189.4	190.4	1.0
O	39,635	39635	1,080	4,378	196.8	196.8	197.8	1.0
P	41,534	41534	800	2,623	206.2	206.2	206.3	0.1
Q	43,888	43888	557	2,500	214.7	214.7	215.5	0.8
R	46,510	46510	620	3,021	226.4	226.4	226.9	0.5
S	48,764	48764	610	2,126	234.5	234.5	234.9	0.4
T	51,666	51666	550	2,837	247.8	247.8	248.5	0.7
U	53,882	53882	462	3,085	260.2	260.2	261.1	0.9
V	55,576	55576	790	2,662	265.8	265.8	266.5	0.7
W	58,530	58530	235	1,226	283.8	283.8	284	0.2
X	60,415	60415	380	1,705	302.6	302.6	302.9	0.3
Y	62,252	62252	424	1,669	315.1	315.1	315.1	0.0
Z	63,780	63780	507	1,798	332.1	332.1	332.1	0.0

¹ Feet beginning 4.5 miles downstream of W Parks Highway

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WILLOW CREEK

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
AA	64,797	262	2,125	8.0	344.3	344.3	344.3	0.0
AB	65,963	399	1,800	9.4	354.2	354.2	354.6	0.4
AC	67,297	188	1,305	13.0	369.1	369.1	369.4	0.3
AD	68,581	168	1,190	14.2	382.7	382.7	383.2	0.5
AE	69,667	134	1,260	13.4	395.1	395.1	395.9	0.8
AF	70,866	246	1,484	11.4	408.7	408.7	408.7	0.0
AG	72,460	751	2,373	7.1	426.3	426.3	426.4	0.1
AH	75,018	163	1,247	13.6	457.1	457.1	457.1	0.0

¹ Feet beginning 4.5 miles downstream of W Parks Highway

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WILLOW CREEK

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	1,594	87	341	2.9	172.5 ²	165.3	165.3	0.0
B	3,145	142	337	2.9	172.7 ²	169.5	170	0.5
C	4,923	272	571	1.7	173.9	173.9	174	0.1
D	5,930	95	210	4.7	176.1	176.1	176.4	0.3
E	7,524	130	244	4	180.2	180.2	180.7	0.5
F	8,654	173	423	2.3	183.6	183.6	184.2	0.6
G	10,465	81	225	4.3	188.4	188.4	188.5	0.1
H	11,826	81	133	7.3	192.3	192.3	192.3	0.0
I	12,613	140	409	2.4	198.3	198.3	199.2	0.9
J	14,579	240	435	1.7	204.5	204.5	204.9	0.4
K	15,702	191	206	3.5	206.9	206.9	206.9	0.0
L	17,714	85	264	2.7	214.6	214.6	215.6	1.0
M	18,559	70	304	2.4	218.1	218.1	218.9	0.8
N	19,734	70	259	2.8	221.6	221.6	222.1	0.5
O	20,996	85	199	3.6	225.7	225.7	226.4	0.7
P	22,797	72	216	3.3	231.8	231.8	232.1	0.3
Q	23,807	95	277	2.6	235.7	235.7	236.1	0.4
R	25,847	51	132	5.5	244.9	244.9	245	0.1
S	26,678	60	129	4.4	249.1	249.1	249.2	0.1
T	27,794	80	232	2.4	252	252	252.4	0.4
U	28,830	70	192	3.0	258.5	258.5	258.6	0.1
V	29,984	85	226	2.5	264.4	264.4	264.4	0.0
W	31,092	60	141	4.0	273.1	273.1	273.5	0.4
X	32,220	70	216	2.6	280.3	280.3	281.1	0.8
Y	33,963	57	199	2.8	294.2	294.2	295.2	1.0
Z	35,171	26	64	8.8	300.6	300.6	301.2	0.6

¹ Feet above confluence with Willow Creek

² Flooding controlled by Willow Creek

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WILLOW CREEK TRIBUTARY

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
AA	36,036	45	111	5.1	308.7	308.7	308.8	0.1
AB	36,602	48	153	3.7	315.4	315.4	315.8	0.4
AC	37,302	60	92	6.2	325.8	325.8	326.5	0.7

¹ Feet above confluence with Willow Creek

TABLE 24

**FEDERAL EMERGENCY MANAGEMENT AGENCY
MATANUSKA-SUSITNA BOROUGH,
ALASKA
AND INCORPORATED AREAS**

FLOODWAY DATA

FLOODING SOURCE: WILLOW CREEK TRIBUTARY

Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable to this Flood Risk Project.

Table 26: Summary of Coastal Transect Mapping Considerations

[Not applicable to this Flood Risk Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 31, “Map Repositories”).

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA.

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill”. Visit the “Flood Map-Related Fees” section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loba for the “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill” or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the “Flood Map-Related Fees” section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/mt-2-application-forms-and-instructions and download the form “MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision”. Visit the “Flood Map-Related Fees” section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Matanuska-Susitna Borough FIRM are listed in Table 27. Please note that this table only includes LOMCs that have been issued on the FIRM panels updated by this map revision. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.

Table 27: Incorporated Letters of Map Change

[Not applicable to this Flood Risk Project]

6.5.4 Physical Map Revisions

Physical Map Revisions (PMRs) are an official republication of a community’s NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community’s chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the “Flood Map Revision Processes” section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Matanuska-Susitna Borough. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBM) and/or Flood Boundary and Floodway Maps (FBFM) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 28, “Community Map History.” A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.
- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or “pending” (for Preliminary FIS Reports) is shown. If the community is listed in Table 28 but not identified on the map, the community is treated as if it were unmapped.
- *Initial FHBM Effective Date* is the effective date of the first Flood Hazard Boundary Map (FHBM). This date may be the same date as the Initial NFIP Map Date.
- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.
- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community.
- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as Physical Map Revisions (PMR) of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Matanuska-Susitna Borough FIRMs in countywide format was 03/17/2011.

Table 28: Community Map History

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Matanuska-Susitna Borough (and Incorporated Areas)	02/28/1978	02/28/1978	12/4/1979	05/1/1985	06/03/1986 03/17/2011

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 29 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 29: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Deception Creek and Tributaries 1-3; Little Susitna River and Split Flows; Willow Creek and Tributary; All significant approximate flooding sources	5/01/1985	U.S Army Corps of Engineers	IAA-H-1878 & EMW-E-1153	April 1982	Matanuska-Susitna Borough & Communities
Talkeetna River (Including Overflows to Twister Creek and Billion Slough) and Susitna River; Multiple Approximate Flooding Sources Digitized	3/17/2011	Northwest Hydraulic Consultants (NHC)	EMS-2001-CO-0067	July 2009	Matanuska-Susitna Borough & Communities
Bodenburg Creek, Knik River, Little Susitna River, Matanuska River, Wasilla Creek, Willow Creek and Tributary; Multiple Approximate Flooding Sources	TBD	Strategic Alliance for Risk Reduction (STARR)	HSFE10-13-J-0073	March 2016	Matanuska-Susitna Borough & Communities

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 30. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 30: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Matanuska-Susitna Borough & Communities (including Houston, Palmer, & Wasilla)	TBD	4/23-25/2013	Discovery	FEMA, STARR, Matnuska-Susitna Borough, City of Wasilla, City of Talkeetna, City of Houston, Citizens
		1/20/2016	Flood Risk Review	FEMA, STARR, Matnuska-Susitna Borough, Alaska DNR
		2016	Resilience	FEMA,
		2017	CCO Open House	FEMA,
Matanuska-Susitna Borough & Communities (including Houston, Palmer, & Wasilla)	3/17/2011	2/11/2010	Final CCO	FEMA, Matanuska-Susitna Borough, numerous local surveying companies, Alaska Department of Natural Resources (DNR)
Matanuska-Susitna Borough & Communities (including Houston, Palmer, & Wasilla)	5/01/1985	7/20/1977	Initial CCO	FEMA, USACE, Matanuska-Susitna Borough
		9/29/1983 – 3 meetings	Final CCO	FEMA, USACE, Matanuska-Susitna Borough

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

The U.S. Soil Conservation Service has prepared three Flood Hazard Studies, two Flood Plain Management Studies and a Flood Plain Inventory Report for various streams in Matanuska-Susitna Borough (References USDA). These reports were the sources of some of the approximate flood boundaries presented in this study.

In addition, USACE prepared a Tsunami Prediction Study for Matanuska-Susitna Borough in 1967 in response to the destruction caused by the March 1964 tsunami (USACE 1964).

Table 31 is a list of the locations where FIRMs for Matanuska-Susitna Borough can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 31: Map Repositories

Community	Address	City	State	Zip Code
Matanuska-Susitna Borough and Incorporated Areas	Planning Department 350 East Dahlia Avenue	Palmer	AK	99645

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 32.

Table 32 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of State and local GIS data in their state.

Table 32: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/engineering-library
NFIP website	www.fema.gov/national-flood-insurance-program
NFHL Dataset	msc.fema.gov
FEMA Region X	Federal Regional Center, 130 228th Street SW, Bothell, WA 98021-9796 (425) 487-4657
Other Federal Agencies	
USGS website	www.usgs.gov
Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Sally Russell Cox Alaska Dept. Community & Econ. Dev. 550 West 7th Avenue, Suite 1770 Anchorage, AK 99501-3510 Phone: (907) 269-4588 sally.cox@alaska.gov
State GIS Coordinator	Richard McMahon Chief, Land Records Information System State of Alaska, Department of Natural Resources 550 West 7th Avenue, Suite 706 Anchorage, AK 99501 Phone: (907) 269-8836 richard_mcmahon@dnr.state.ak.us
Statewide Hazard Mitigation Lead Facilitator	Ann Gravier Alaska Division of Homeland Security and Emergency Management P.O. Box 5750 Ft. Richardson, AK 99505-5750 Phone: (907) 428-7000 / (Toll Free) (800) 478-2337 mark.roberts@alaska.gov

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 33 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 33: Bibliography and References

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
CENSUS 1980	U.S. Department of Commerce	1980 Census of Population	Bureau of the Census		November 1981	
CENSUS 2000	U.S. Department of Commerce	Alaska: 2000 Summary Population and Housing Unit Counts, PHC-3-3	U.S. Census Bureau		July 2003	
USACE HEC-1	U.S. Department of the Army	Hydrologic Engineering Center, HEC-1 Flood Hydrograph Package	Corps of Engineers, Davis	California	1973	
RPT 53	U.S. Department of Commerce	"Technical Paper No. 53"	Weather Bureau		1973	
FEMA 1986	Federal Emergency Management Agency	Flood Insurance Study, Matanuska-Susistna Borough		Alaska	June 3, 1986	FEMA Map Service Center http://msc.fema.gov
Bulletin 17	U.S. Water Resources Council	"A Uniform Method for Determining Flood Flow Frequency", Bulletin 17			March 1976	
USGS 1979	U.S. Department of the Interior	"Flood Characteristics of Alaska Streams"	Geological Survey		1979	
USGS 1969	U.S. Department of the Interior	"The Breakout of Alaska's Lake George"	Geological Survey		1969	
USACE HEC-2	U.S. Department of the Army	Hydrologic Engineering Center, Computer Program HEC-2 Water-Surface Profiles	Corps of Engineers, Davis	California	1976	
NPAS 1977	North Pacific Aerial Surveys, Inc.	Topographic Maps, Willow and Deception Creeks, Scale 1:4,800, Contour Interval 5 feet			1977	http://topomaps.usgs.gov

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
NPAS 1978	North Pacific Aerial Surveys, Inc.	Topographic Maps, Little Susitna River, Scale 1:4,800, Contour Interval 5 feet			1978	http://topomaps.usgs.gov
USACE 1984	U.S. Department of the Army	Anchorage Alaska District, Flood Insurance Study, Matanuska River Cross Section	Corps of Engineers	Matanuska-Susitna Borough, Alaska	June 1984	http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/
NPAS 1980	North Pacific Aerial Surveys, Inc.	Topographic Maps, Bodenbug Butte Area - Palmer, Scale 1:2,400, Contour Interval 2 feet			1980	http://topomaps.usgs.gov
FHBM MATSU	U.S. Department of Housing and Urban Development	Flood Hazard Boundary Map, Matanuska-Susitna Borough, Scale 1:24000	Federal Insurance Administration	Alaska	1979	FEMA Map Service Center http://msc.fema.gov
FHBM PALMER	U.S. Department of Housing and Urban Development	Flood Hazard Boundary Map, City of Palmer, Scale 1:6000	Federal Insurance Administration	Alaska	1979	FEMA Map Service Center http://msc.fema.gov
USDA APRIL 1981	U.S. Department of Agriculture	Flood Hazard Study, 196 Mile, Caswell, Sheep, Goose, Montana, Answer, and Birch Creeks and Tributaries, Scale 1:25,944	Soil Conservation Service	Matanuska-Susitna Borough, Alaska	April 1981	
USDA SEPT 1981	U.S. Department of Agriculture	Flood Hazard Study, Troublesome, Byers, and Honolulu Creeks, Scale 1:25,263	Soil Conservation Service	Matanuska-Susitna Borough, Alaska	September 1981	

Citation in this FIS	Publisher/ Issuer	Publication Title, "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USDA JAN 1982	U.S. Department of Agriculture	Flood Hazard Study, Kroto, Rabideux, Trapper, East and Middle Forks of Chulitna River, and Peters Creeks, Scale 1:25,263	Soil Conservation Service	Matanuska-Susitna Borough, Alaska	January 1982	
USDA 1980	U.S. Department of Agriculture	Flood Plain Inventory Report, Lower Little Susitna River and Little Willow Creek, Scale 1:63,360	Soil Conservation Service	Matanuska-Susitna Borough, Alaska	February 1980	
USDA MAY 1982	U.S. Department of Agriculture	Flood Plain Management Study, Kashwitna River, Wasilla, Cottonwood, and Lucille Creeks, Scales 1:6,000 and 1:25	Soil Conservation Service	Matanuska-Susitna Borough, Alaska	May 1982	
USDA SEP 1982	U.S. Department of Agriculture	Flood Plain Management Study, Beluga Subbasin Streams, Scale 1:63,600	Soil Conservation Service	Matanuska-Susitna and Kenai Peninsula Boroughs	September 1982	
USACE 1980	U.S. Department of the Army	Expanded Flood Plain Information Study for Willow, Alaska	Corps of Engineers		June 1980	http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/
FIS 1979	U.S. Department of Housing and Urban Development	Flood Insurance Study, Municipality of Anchorage, Alaska	Federal Insurance Administration		March 1979	FEMA Map Service Center http://msc.fema.gov
USDA 2004	United States Department of Agriculture Farm Services Agency	2004 Aerial Photography.				

Citation in this FIS	Publisher/ Issuer	<i>Publication Title</i> , "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
NHC 2008	Northwest Hydraulic Consultants	QA/QC Floodplain Mapping Submittal for Talkeetna and Susitna Rivers Memorandum, To Debra Heiden	Map Modernization Team Region X, from Chris Frei and Bob Elliot		6/18/2008	
PAPER 47	U.S. Department of Commerce	"Technical Paper No. 47"	Weather Bureau			
USACE 1972	U.S. Department of the Army	SSARR (Stream Flow Synthesis and Reservoir Regulation)	Corps of Engineers, North Pacific Division	Portland, Oregon	September 1972	http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/
USACE 1977	U.S. Department of the Army	Water Resources Development by the U.S. Army Corps of Engineers in Alaska	Corps of Engineers		1977	http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/
RPT H743	Waterways Experiment Station	Technical Report H743		Vicksburg, Mississippi	May 1974	http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/