



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Town of Ennis Madison County Montana	BRIDGE CULVERT	BASE MAP CHANGES FLOODWAY HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 300044		
IDENTIFIER	Madison County/Ennis Moores Creek Flood Mitigation-Revised	APPROXIMATE LATITUDE AND LONGITUDE: 45.344, -111.731 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 3000440001E DATE: June 16, 2011 TYPE: FIRM* NO.: 3000440003E DATE: June 16, 2011		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: June 16, 2011 PROFILES: 01P AND 02P SUMMARY OF DISCHARGE TABLE: 1 FLOODWAY DATA TABLE: 3	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REVISED REACH

Moores Creek - From approximately 1,000 feet downstream of 1st Street to approximately 1,140 feet upstream of Bauer Lane

SUMMARY OF REVISIONS				
Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Moores Creek	Zone AE	Zone AE	YES	YES
	Zone X (shaded)	Zone X (shaded)	YES	YES
	BFEs*	BFEs	YES	YES
	Floodway	Floodway	YES	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <https://www.fema.gov/national-flood-insurance-program>.

Patrick "Rick" F. Sacbabit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration



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LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance discharges computed in the submitted hydrologic model. Future development of projects upstream could cause increased discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on discharges and could, therefore, indicate that greater flood hazards exist in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on our website at <https://www.fema.gov/national-flood-insurance-program>.

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
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LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Jeanine D. Petterson
Director, Mitigation Division
Federal Emergency Management Agency, Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267
(303) 235-4830

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <https://www.fema.gov/national-flood-insurance-program>.

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LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below, and through FEMA's Flood Hazard Mapping website at https://www.floodmaps.fema.gov/fhm/bfe_status/bfe_main.asp

LOCAL NEWSPAPER

Name: *The Madisonian*

Dates: April 11, 2019 and April 18, 2019

Within 90 days of the second publication in the local newspaper, any interested party may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at <https://www.fema.gov/national-flood-insurance-program>.

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determine the flows. It was determined using topographical maps in AutoCAD that the drainage area for Moores Creek was 34.6 square miles and that 62.2 percent of that area was above 6000 feet (Reference 6). The other two methods, the Active Channel Width Method and the Bankfull-Width Method, use channel characteristics to determine the flows. A topographical survey from 2003 was used to determine the stream characteristics along Moores Creek (Reference 6). The active channel width was determined by surveying the width of the channel where short term geomorphic changes are located relative to normal flow through the channel (Reference 6). The bankfull width was measured from the top of the main channel banks with the actual bankfull locations with bankfull indicators. These indicators included changes in the banks such as the channel going from a vertical bank to a horizontal floodplain area, erosion along the banks and the vegetation limit along the channel (Reference 6). The average active channel width and bankfull widths were determined to be 12 feet and 17 feet respectively, from field surveys and topographic maps (Reference 6).

After the flows for each method were calculated a Weighted Average Method was used from the USGS Report to determine the final peak flows. Based on equations in the USGS Report, a weighting factor was calculated and applied to each flow in each method. These flows are then weighted inversely proportional to their error variance and then averaged. These weighted flows are listed in Table 1 below.

Table 1. Summary of Discharges

<u>Flooding Source and Location</u>	<u>Drainage Area (Square Miles)</u>	<u>Peak Discharges (Cubic Feet Per Second)</u>			
		<u>10- percent- annual chance event</u>	<u>2-percent- annual chance event</u>	<u>1-percent- annual chance event</u>	<u>0.2- percent- annual chance event</u>
Moores Creek					
Approximately 1,000 feet downstream of Main Street	34.6	245	452	559	826
Approximately 850 feet upstream of Bauer Lane	31.5	234	409	498	730

3.2 Hydraulic Analyses

REVISED DATA

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data Table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

There was not a previous FIS completed for the Town of Ennis. The hydraulics for this FIS for the Town of Ennis was taken from flood studies which GWE conducted to delineate a more current floodplain because of more development in the town (Reference 8). This study included only Moores Creek which runs through the town.

For the hydraulics in this FIS, water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-RAS step-backwater computer program. Version 3.1.3 of the HEC-RAS program was used for developing the water surface profiles for steady, gradually varied

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EFFECTIVE: August 16, 2019

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						FEET	(NAVD)	
Moores Creek								
A	972	117	160	3.5	4,919.9	4,919.9	4,920.0	0.1
B	1,928	157	250	2.2	4,924.2	4,924.2	4,924.5	0.3
C	2,744	106	221	2.5	4,926.8	4,926.8	4,927.0	0.2
D	3,676	60	141	4.0	4,931.3	4,931.3	4,931.7	0.4
E	4,163	77	166	3.4	4,933.9	4,933.9	4,934.3	0.4
F	4,887	67	162	3.1	4,938.5	4,938.5	4,938.9	0.4
G	6,259	23	82	6.1	4,950.6	4,950.6	4,950.7	0.1
H	6,974	35	89	5.6	4,956.1	4,956.1	4,956.3	0.2
I	8,136	120	106	4.7	4,964.2	4,964.2	4,964.2	0.0
J	10,065	54	109	4.6	4,985.8	4,985.8	4,986.2	0.4
K	11,687	80	115	4.4	4,995.6	4,995.6	4,996.0	0.4
L	12,787	105	105	5.3	5,006.5	5,006.5	5,006.7	0.2
M	13,634	108	155	3.6	5,013.2	5,013.2	5,013.4	0.2
N	15,024	97	99	5.7	5,029.6	5,029.6	5,029.9	0.3

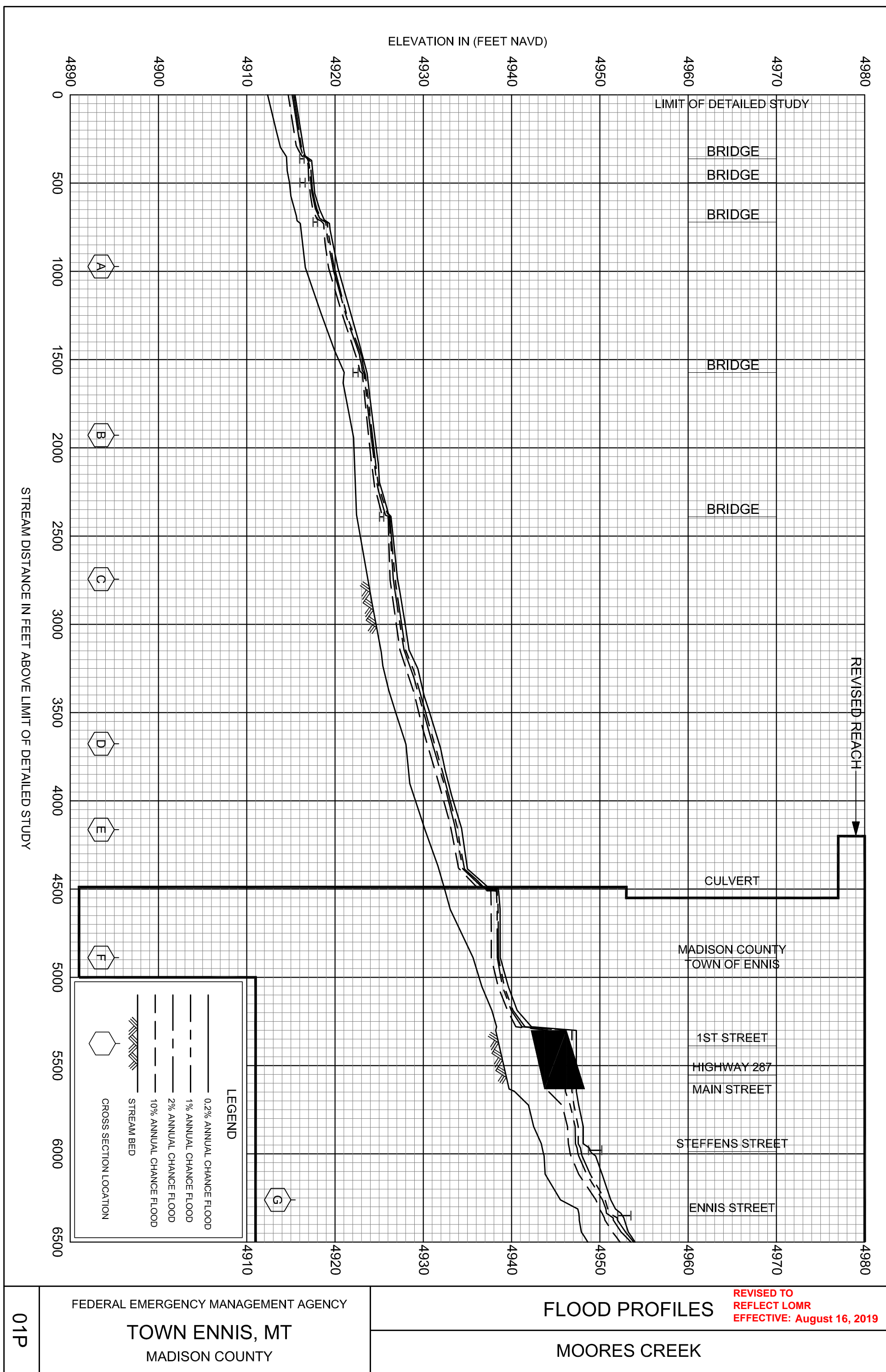
¹ Stream Distance in Feet above Limit of Detailed Study

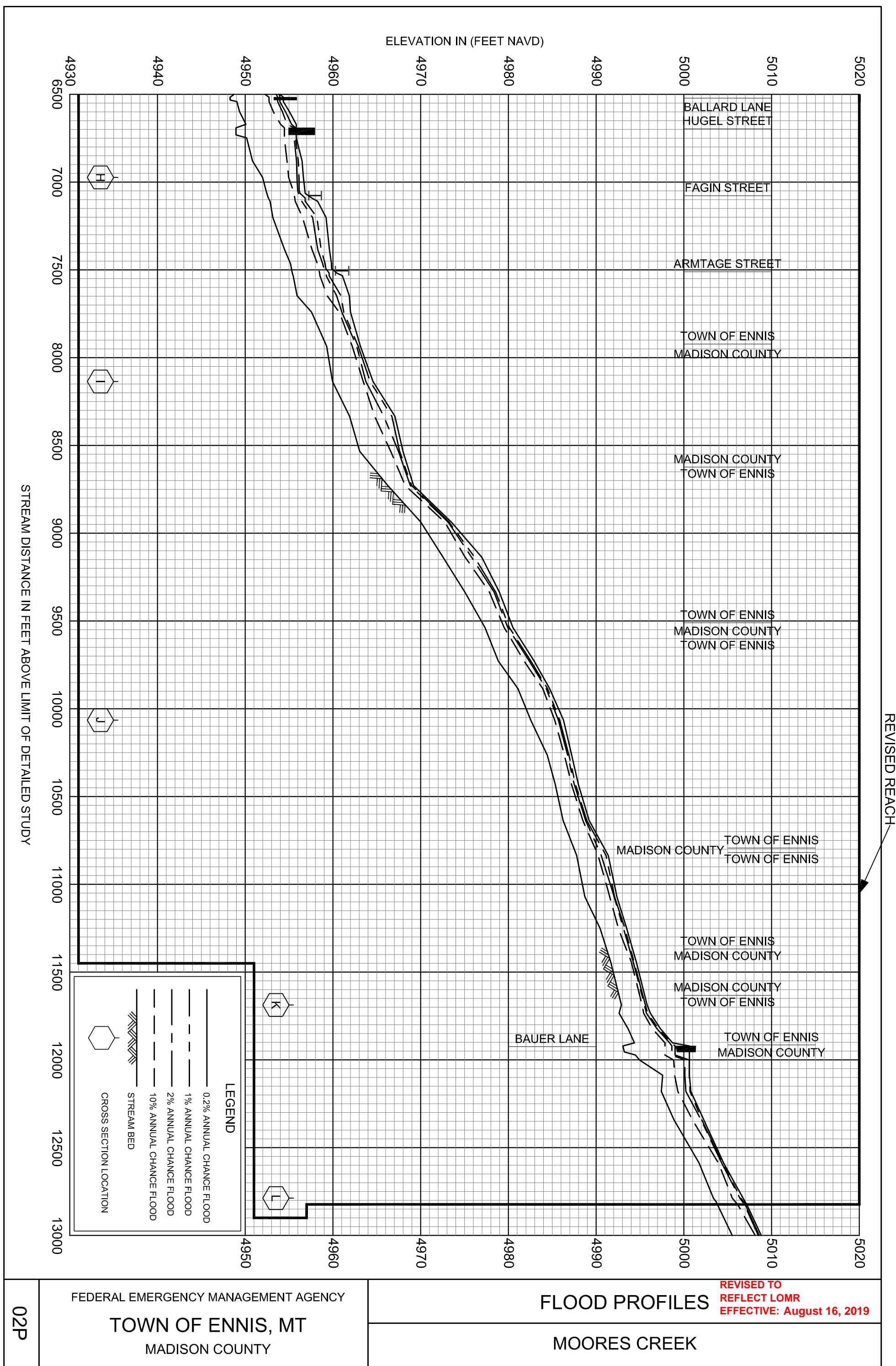
TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
TOWN OF ENNIS, MT
MADISON COUNTY

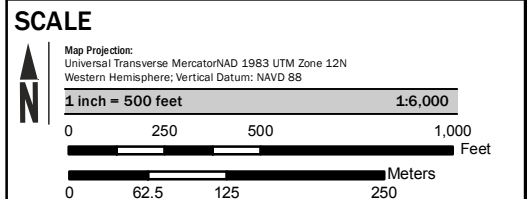
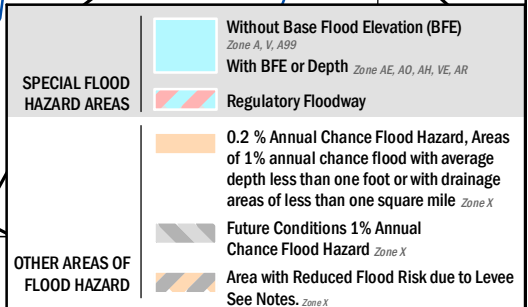
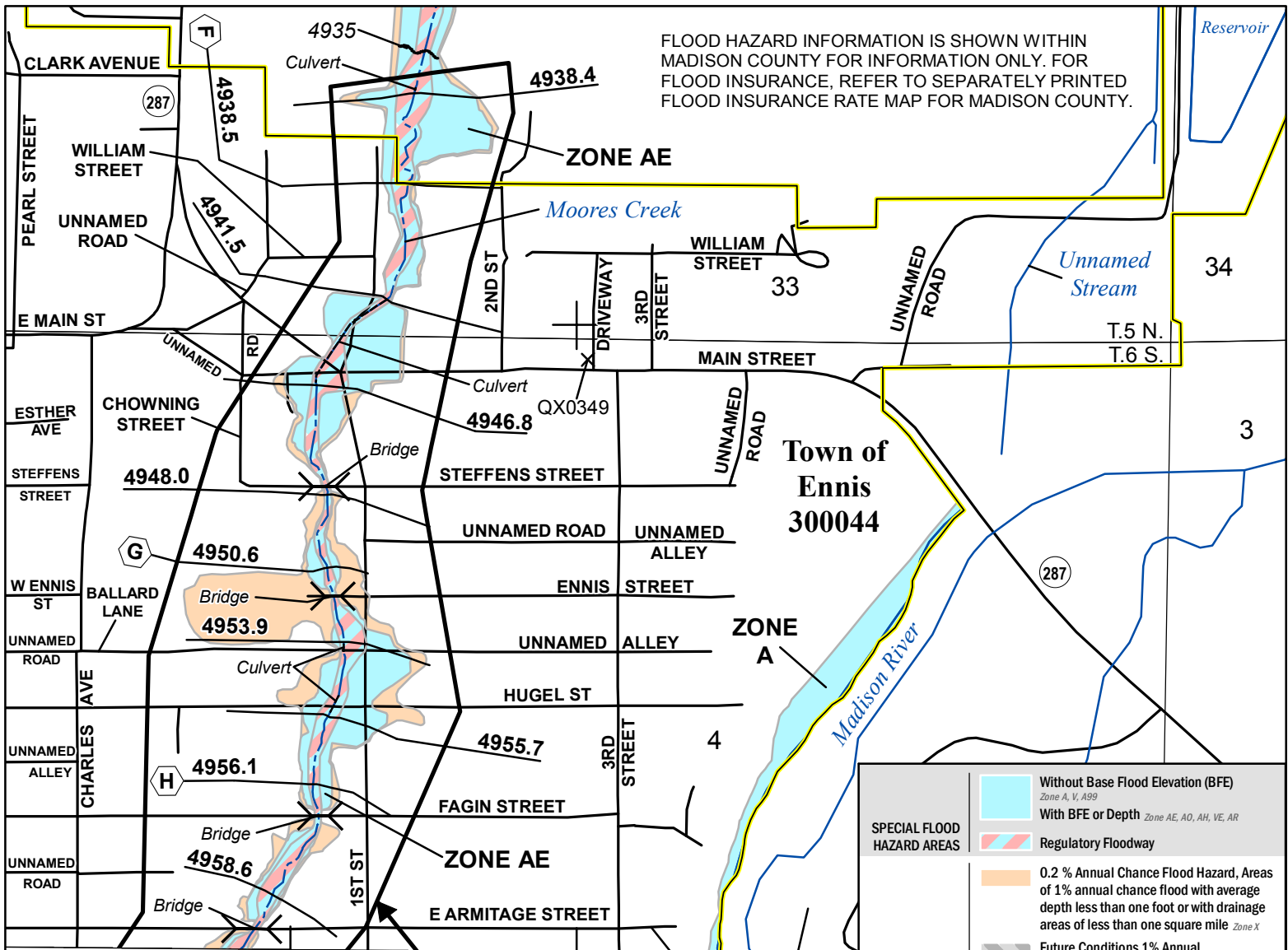
FLOODWAY DATA **REVISED TO**
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MOORES CREEK





FLOOD HAZARD INFORMATION IS SHOWN WITHIN
MADISON COUNTY FOR INFORMATION ONLY. FOR
FLOOD INSURANCE, REFER TO SEPARATELY PRINTED
FLOOD INSURANCE RATE MAP FOR MADISON COUNTY.



FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

TOWN OF
ENNIS,
MONTANA
MADISON COUNTY

PANEL 1 of 5

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
ENNIS, TOWN OF	300044	0001	E

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VERSION NUMBER
1.1.1.0
MAP NUMBER
3000440001E
MAP REVISED
JUNE 16, 2011

NOTE: MAP AREA SHOWN ON THIS PANEL
IS LOCATED WITHIN TOWNSHIP 5S,
RANGE 1W AND TOWNSHIP 6S, RANGE 1W.

FLOOD HAZARD INFORMATION IS SHOWN WITHIN
MADISON COUNTY FOR INFORMATION ONLY. FOR
FLOOD INSURANCE, REFER TO SEPARATELY PRINTED
FLOOD INSURANCE RATE MAP FOR MADISON COUNTY.

NOTE: MAP AREA SHOWN ON THIS
PANEL IS LOCATED WITHIN TOWNSHIP 6S,
RANGE 1W.

FLOOD HAZARD INFORMATION IS SHOWN WITHIN MADISON COUNTY
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PRINTED FLOOD INSURANCE RATE MAP FOR MADISON COUNTY.

JOINS PANEL 0001

42°00'00"E

Town of
Ennis
300044

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FLOOD INSURANCE, REFER TO
SEPARATELY PRINTED FLOOD
INSURANCE RATE MAP FOR
MADISON COUNTY.

5

BEAVERHEAD
STREET

DRIVEWAY

ZONE
AE

1%-ANNUAL-CHANCE
FLOOD DISCHARGE
CONTAINED IN CULVERT

REVISED
AREA

5000.6

5006.5

5012 5010

5013

8

34

HARDY LANE

9

COMLEY
ROAD

UNNAMED ALLEY

GRIZZLY ST

Madison
County

COMLEY WAY

4976.1

MOORES
CREEK
COURT

ZONE
AE

4969.0

4980.1

4985.8

4988.9

4995.6
K

4993.3

JEFFERSON
STREET

Madison
River

4964.2

4961.2

Moore's
Creek

443°00'00"E

ZONE
A

UNNAMED
ROAD

GRIZZLY STREET

Madison
County

1ST ST

RODEO
ROAD

2ND ST

SPECIAL FLOOD
HAZARD AREAS

Without Base Flood Elevation (BFE)
Zone A, V, A99
With BFE or Depth Zone AE, AO, AH, VE, AR
Regulatory Floodway

OTHER AREAS OF
FLOOD HAZARD

0.2 % Annual Chance Flood Hazard, Areas
of 1% annual chance flood with average
depth less than one foot or with drainage
areas of less than one square mile Zone X
Future Conditions 1% Annual
Chance Flood Hazard Zone X
Area with Reduced Flood Risk due to Levee
See Notes- Zone X

SCALE

Map Projection:
Universal Transverse MercatorNAD 1983 UTM Zone 12N
Western Hemisphere; Vertical Datum: NAVD 88
1 inch = 500 feet 1:6,000
0 250 500 1,000 Feet
0 62.5 125 250 Meters

FEMA



National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

TOWN OF
ENNIS,
MONTANA
MADISON COUNTY



FEMA

PANEL 3 of 5

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
ENNIS, TOWN OF	300044	0003	E

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VERSION NUMBER
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