

PROJECT KICKOFF MEETING
Phillips County Floodplain Mapping Project
November 6, 2019

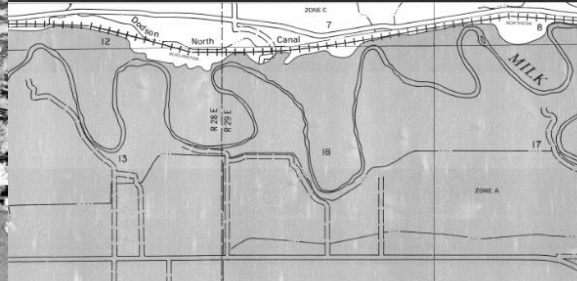
Purpose:

- Project Overview
- Review Project Team, Scope & Schedule
- Levee certification/accreditation
- Questions & Discussion

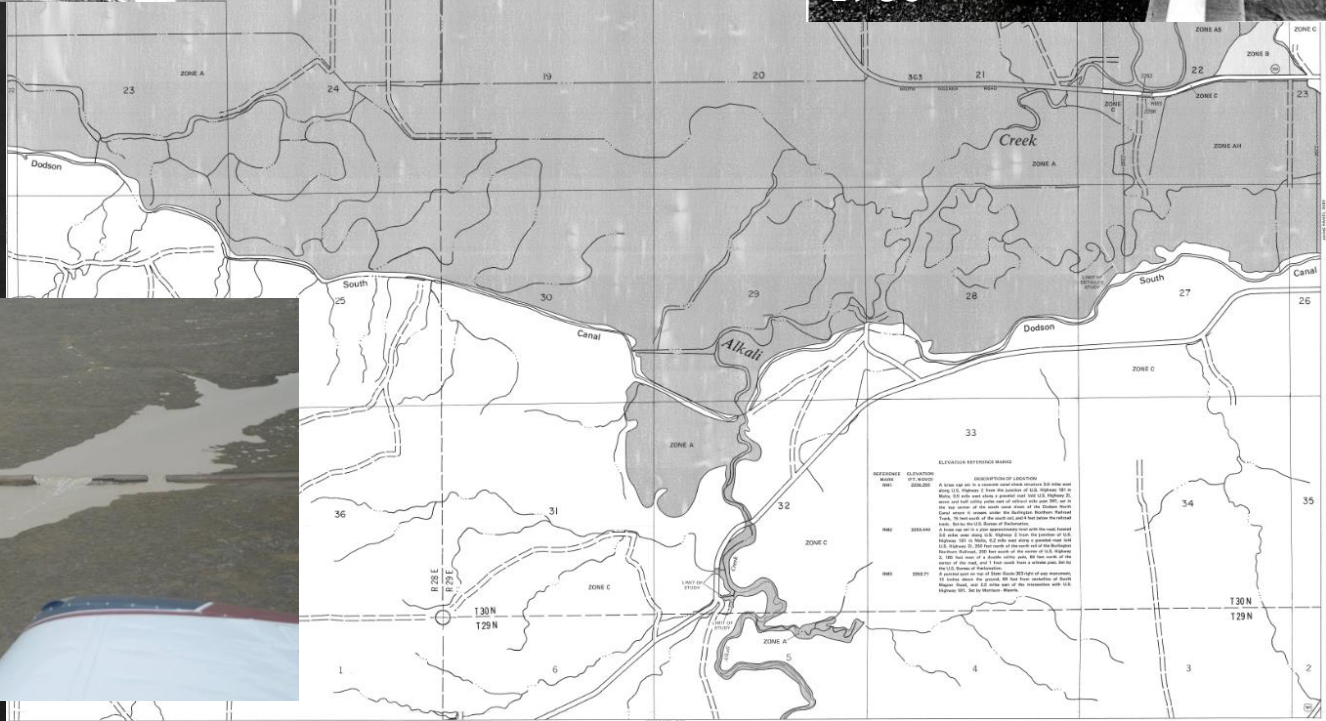
Identifying risk through mapping



1986



1986

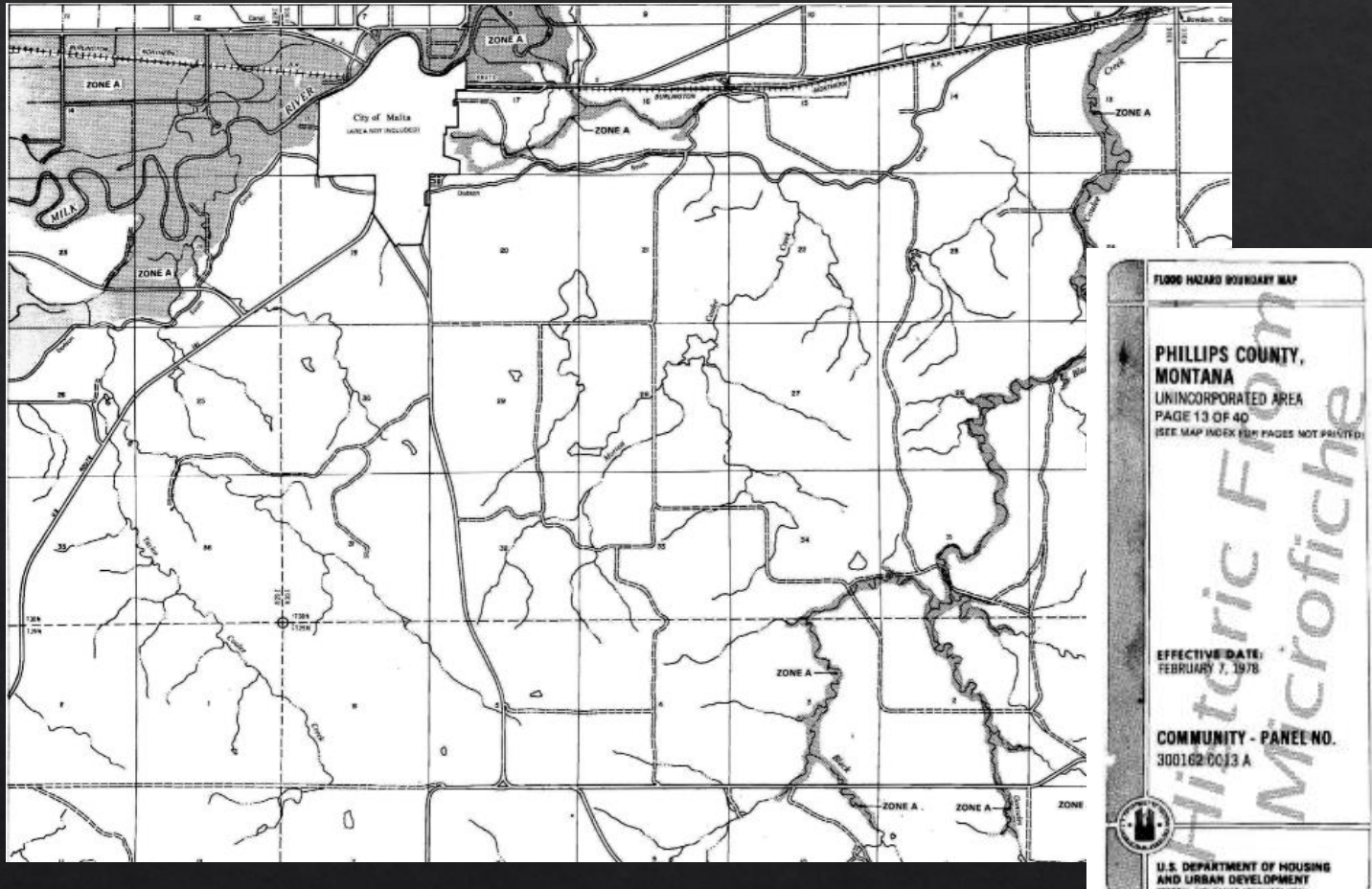


2016



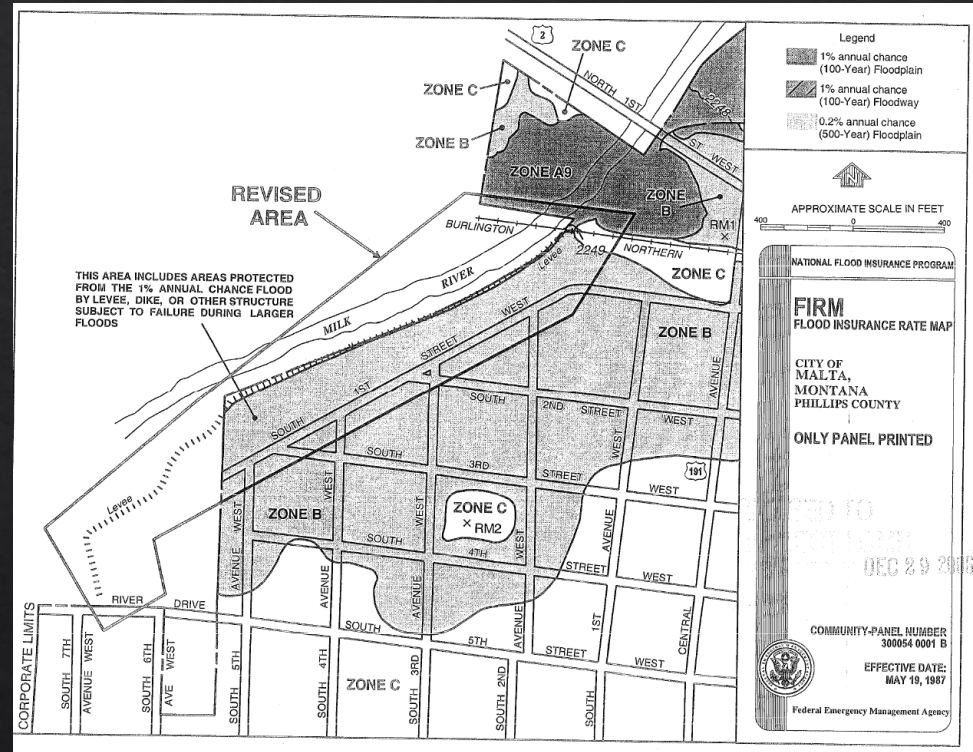
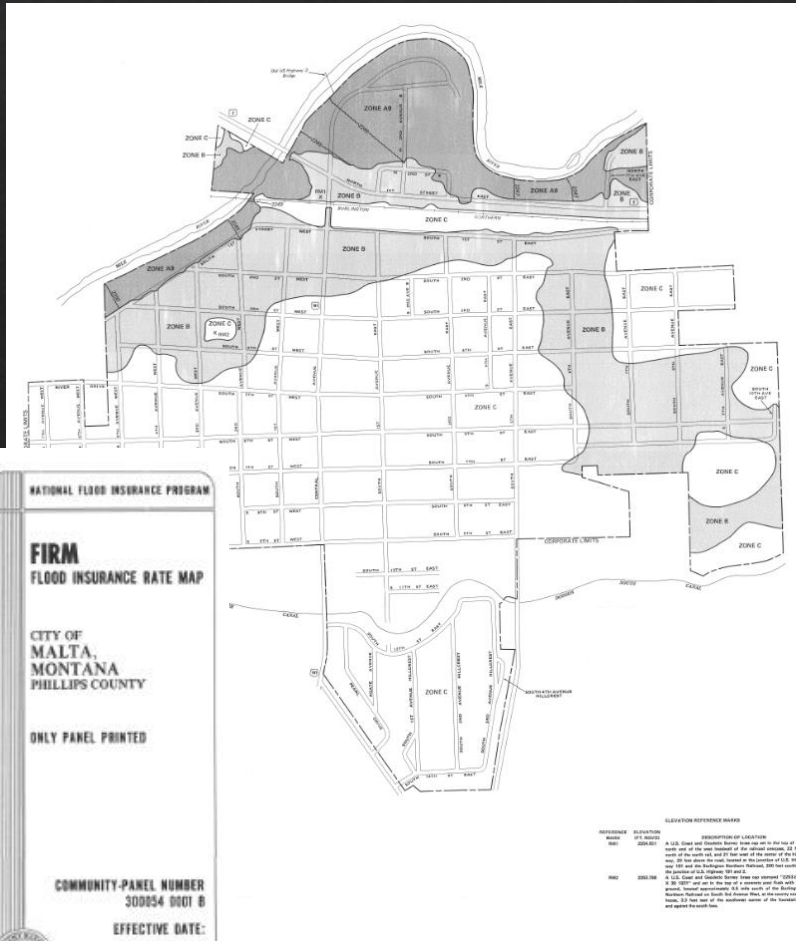
Phillips County - Floodplain Maps

- ◇ 1978 1st floodplain maps issued
- ◇ 1987 update to the floodplain maps



City of Malta- Floodplain Maps

City of Malta
 1987 First map issued
 2006 Map Revision



Project Background

CITY OF MALTA

39 SOUTH 2ND STREET * PO BOX 1300 * MALTA, MT 59538
CROSSROADS OF THE HI-LINE
406-654-1251

JOHN DEMARAIS, MAYOR
BONNIE WIEDERICK, COUNCILPERSON
JAMES SINTLEE, COUNCILPERSON

LOUIE R. BOND, CLERK/TREASURER
DAVID RUMMEL, COUNCILPERSON
WILLIAM HICKS, COUNCILPERSON

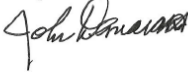
April 23, 2019

Mr. Stephen Story
Water Operations Bureau Chief
MT DNRC
PO Box 201601
1924 9th Avenue
Helena MT 59620-1601

The City of Malta supports the DNRC's grant request to FEMA to update the flood study and existing floodplain mapping on the Milk River. The existing floodplain map for the City of Malta was produced in 1987 and is based on study information collected in the mid 1980's. We understand this is part of a large multi-county effort to update floodplain information.

Updated floodplain information would help us better manage flood risks in the City and provide our residents with more accurate and updated information for building and insurance purposes.

Respectfully,



John Demarais
Mayor
City of Malta

PHILLIPS COUNTY

COUNTY COMMISSIONERS
BRUCE CHRISTOFFERSON
RICHARD DUNBAR
JOHN F. CARNAHAN

Clerk & Recorder
LYNNEL LABRIE

Treasurer/Assessor
JEAN MAVENCAMP

Sheriff/Coroner
JERRY LYTLE



PO BOX 360, MALTA, MONTANA 59538

Clerk of Court
TAMI CHRISTOFFERSON
Superintendent of Schools
DARLENE KOLCZAK

County Attorney
EDWARD A. AMESTOY

Justice of Peace
GAYLE STAHL

District Judge
YVONNE LAIRD

Steve Story
Chief Montana DNRC Water Operations
1424 9th Ave
P. O. Box 201601
Helena, MT 59620-1601

Dear Mr. Story,

Phillips County supports efforts to update flood studies and existing floodplain maps in our county. All the mapped floodplains on our Flood Insurance Rate Maps are based off flood studies and information from 1985. We support updating the floodplain studies to replace our existing, outdated floodplain maps.

Most of the floodplain maps for the Milk River in Phillips County are approximate-type maps, based on study information that is more than 30 years old, with no flood elevations. This makes it hard for landowners wanting to do work in the floodplain, and for our county to administer our program. Having accurate ground elevation data and updated hydrology information would provide our county with very helpful information.

Phillips County is committed to protecting the river systems, managing flood risks and participating in the National Flood Insurance Program. Updated, detailed studies would be a benefit to Phillips County residents and current information would allow for better regulation of flood prone areas.

Thank you for the opportunity to participate in this effort to update floodplain studies in Phillips County. Having better available data will provide much needed support that the county has needed for a long time.

Sincerely,

Phillips County Commissioners



Pre 2019- Discussions to have a new flood study and updated maps/ LiDAR work began

June 2019- Communities provided letters of support for the project

July 2019- DNRC applied for FEMA grant

September 2019- Grant awarded by FEMA

Fall 2019- project underway

Milk River Floodplain Mapping Project

Update 2,325.5 stream miles

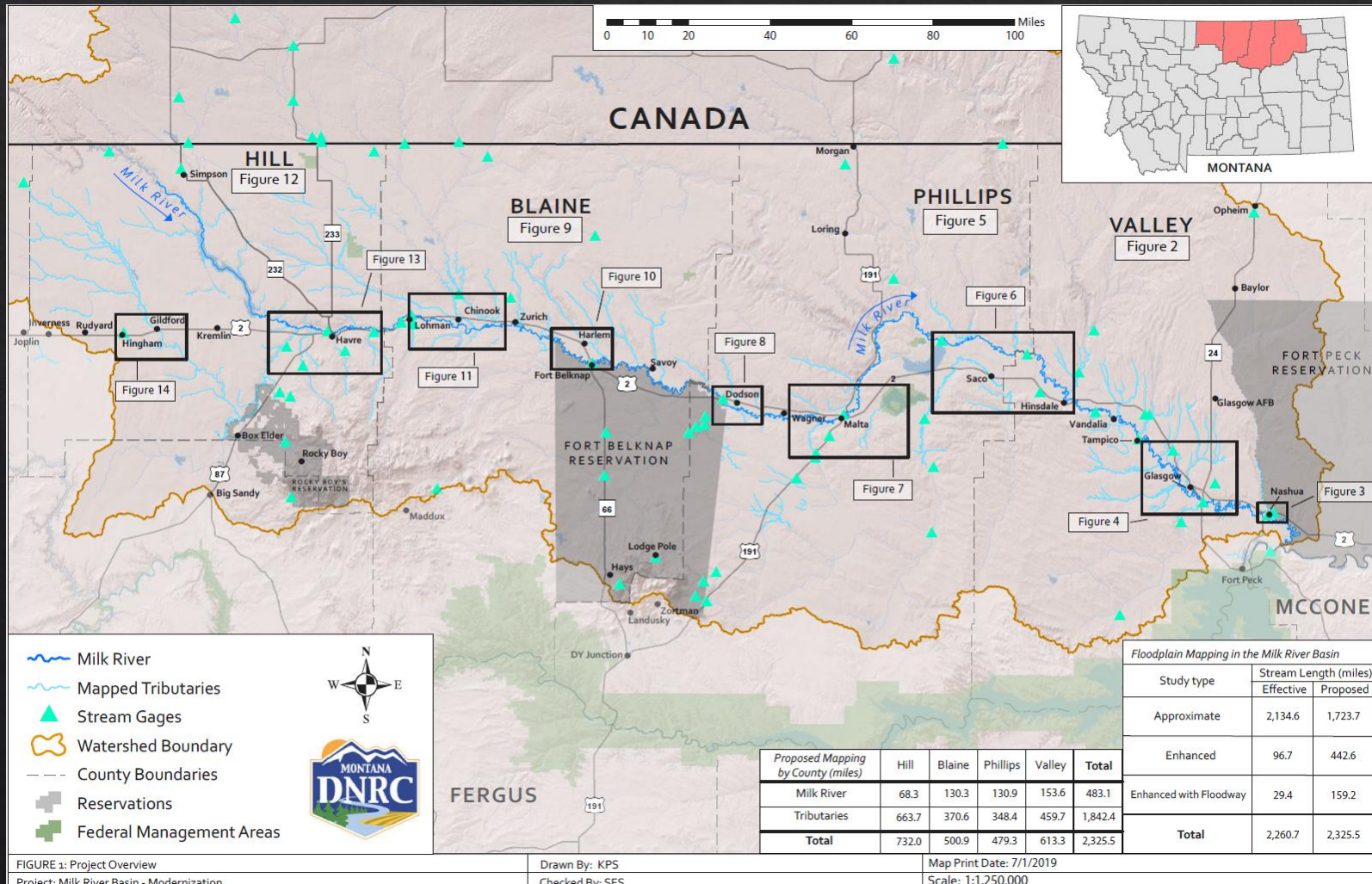
732 miles in Hill County

500.9 miles in Blaine County

479 miles in Phillips County

613 miles in Valley County

Project Funding:
\$3,544,000 FEMA



Project Team – Milk River project

- ◆ DNRC Floodplain Staff – Tiffany Lyden, Nadene Wadsworth, Steve Story, Katie Shank, Doug Brugger, Worby McNamee, Traci Sears



- ◆ Communities



Valley
County
Montana

- ◆ FEMA Region VIII



- ◆ DNRC Contractors:

- ◆ Topography/LiDAR – Quantum Spatial



- ◆ Survey Work– Bathymetric survey-River Design Group



Structure survey- Great West



- ◆ Hydrology- USGS and Michael Baker



- ◆ Hydraulic Analysis and Floodplain Mapping -



Michael Baker

Understanding the Flood Study Process

Photo taken

Flood Study Steps

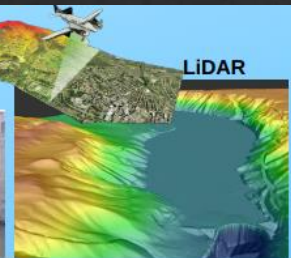
Step 1 - Survey: measurements are made of the topography around the river, along with any culverts, bridges, and road crossings. LiDAR uses an airplane to collect ground elevation over a large area, and ground survey supplements the airborne data.

Step 2 - Hydrology: determines how much water there will be in the river during a flood event. Data from stream gages will tell how many cubic feet of water per second the river will carry during the flood.

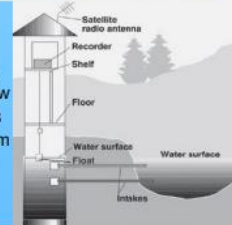
Step 3 - Hydraulics: once the first two steps are complete, calculations can show where the water will go during the flood. The elevation data is combined with the flood flow data to determine where the water will go when it overflows the channel.

Step 4 - Mapping (delineation): the results from step 3 are combined with the elevation data and official maps to see how far the water will spread out. The area shown to be underwater during the flood is the regulatory floodplain.

Step 1 - Survey: The type of the survey depends on the size of the study area and type of study.



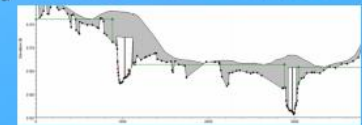
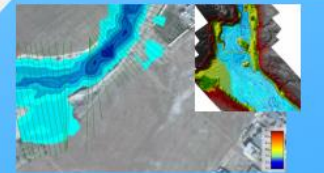
Step 2 - Hydrology: Stream gage stations are an important tool to determine flow rates. If nearby stream gages aren't available, gage data from a similar location is used to determine the flow rate.



Step 3 - Hydraulics:

5 main components to the model

- 1) Hydrology (stream flow data)
- 2) Cross Sections (measurements of the river bottom at key locations)
- 3) Roughness (thickness of vegetation, land cover, etc determined by surveyors)
- 4) Structures (road crossings, culverts, bridges, etc.)
- 5) Downstream conditions



Step 4 - Mapping (delineation):

The result will be the floodplain boundary and a depth grid identifying the shallower and deeper areas of flooding.



S33.T2N.R12W

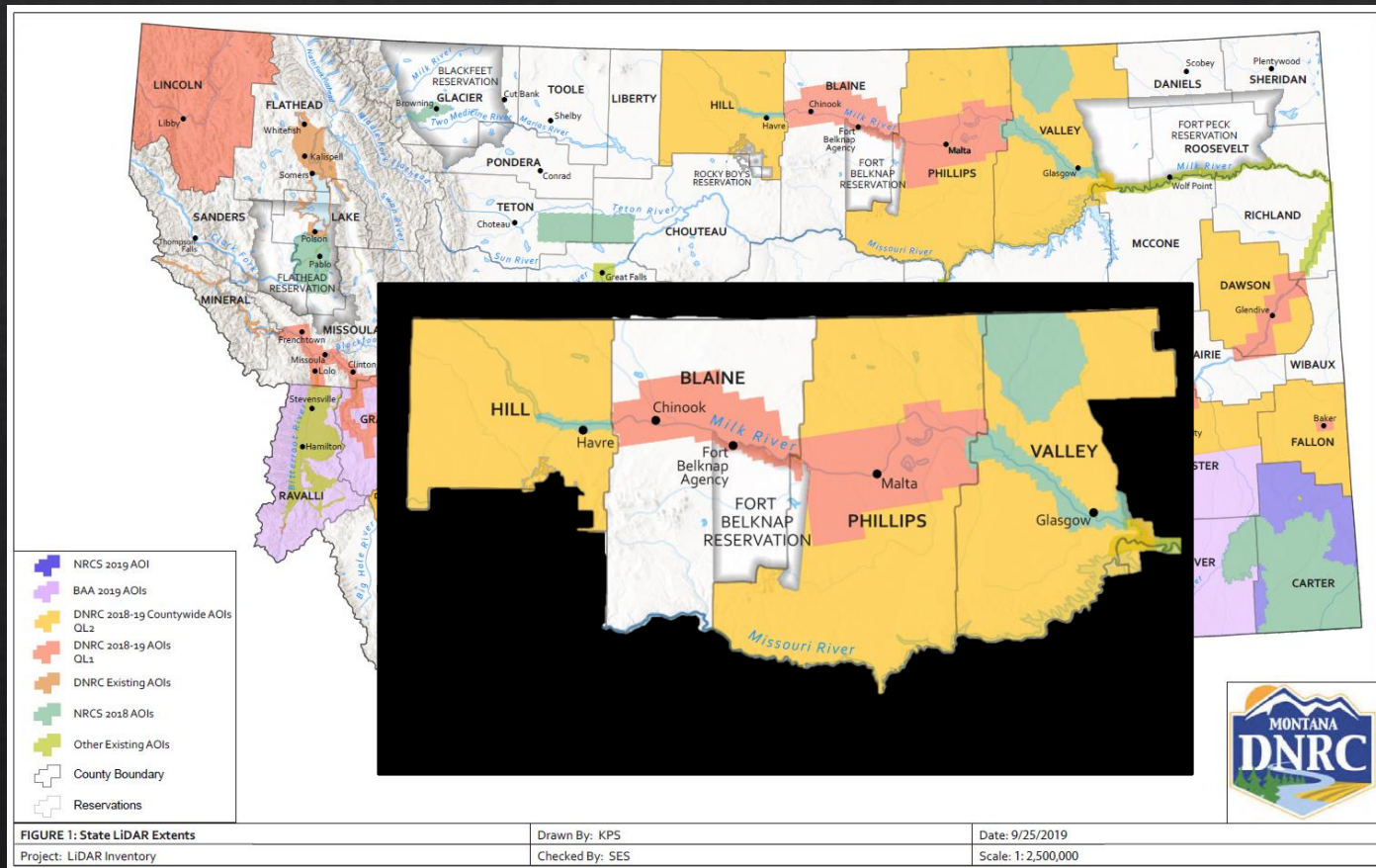
Project Scope

Topographic Data Collection



◆ Lidar Data Acquisition:

◆ LiDAR uses an airplane to collect ground elevation over a large area, and Ground Survey supplements the airborne data.



Project Scope

Survey Work

Provides in-stream and bridge/crossing data needed for hydraulic modeling and floodplain mapping.

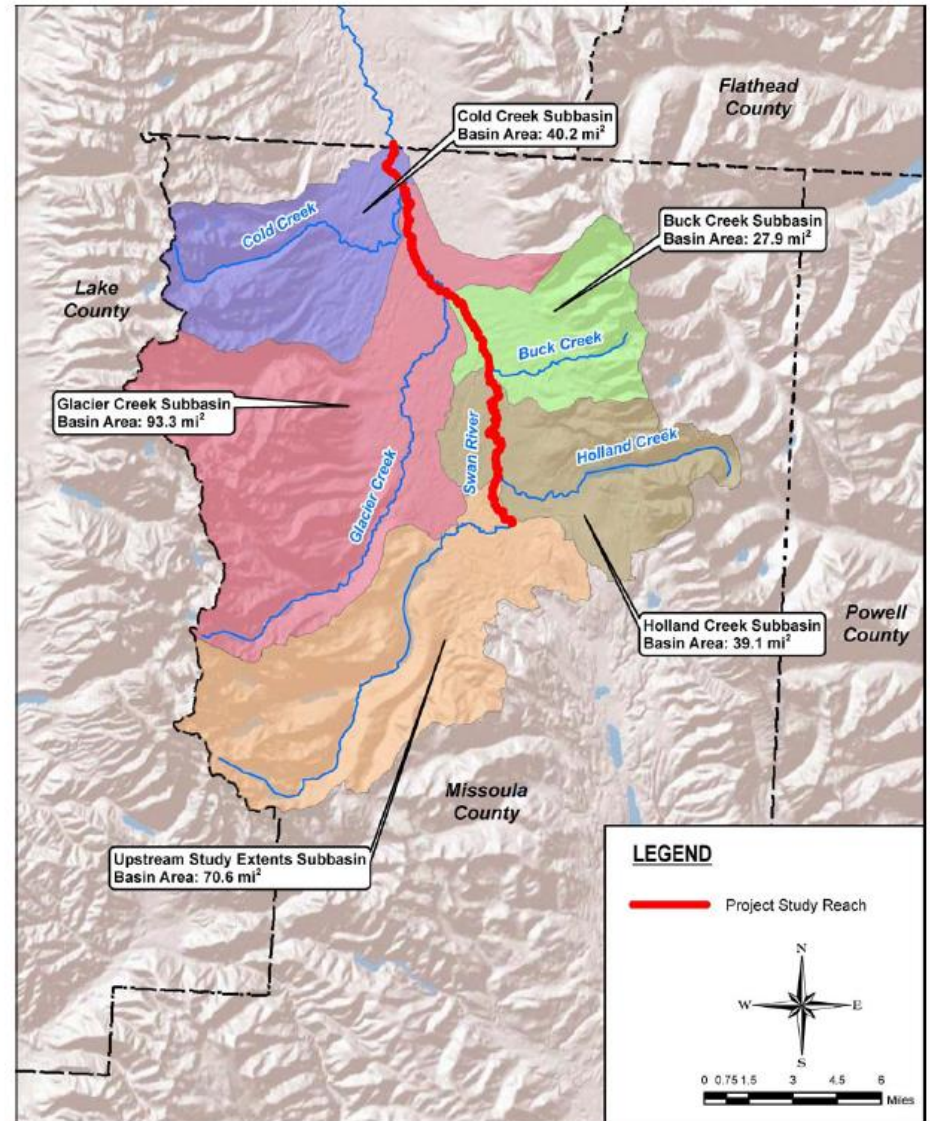


Project Scope

Hydrology

Determines how much water there will be in the river during a flood event. Data from stream gages will tell how many cubic feet per second the river will carry.

Figure 3: Drainage Basin Area



Project Scope

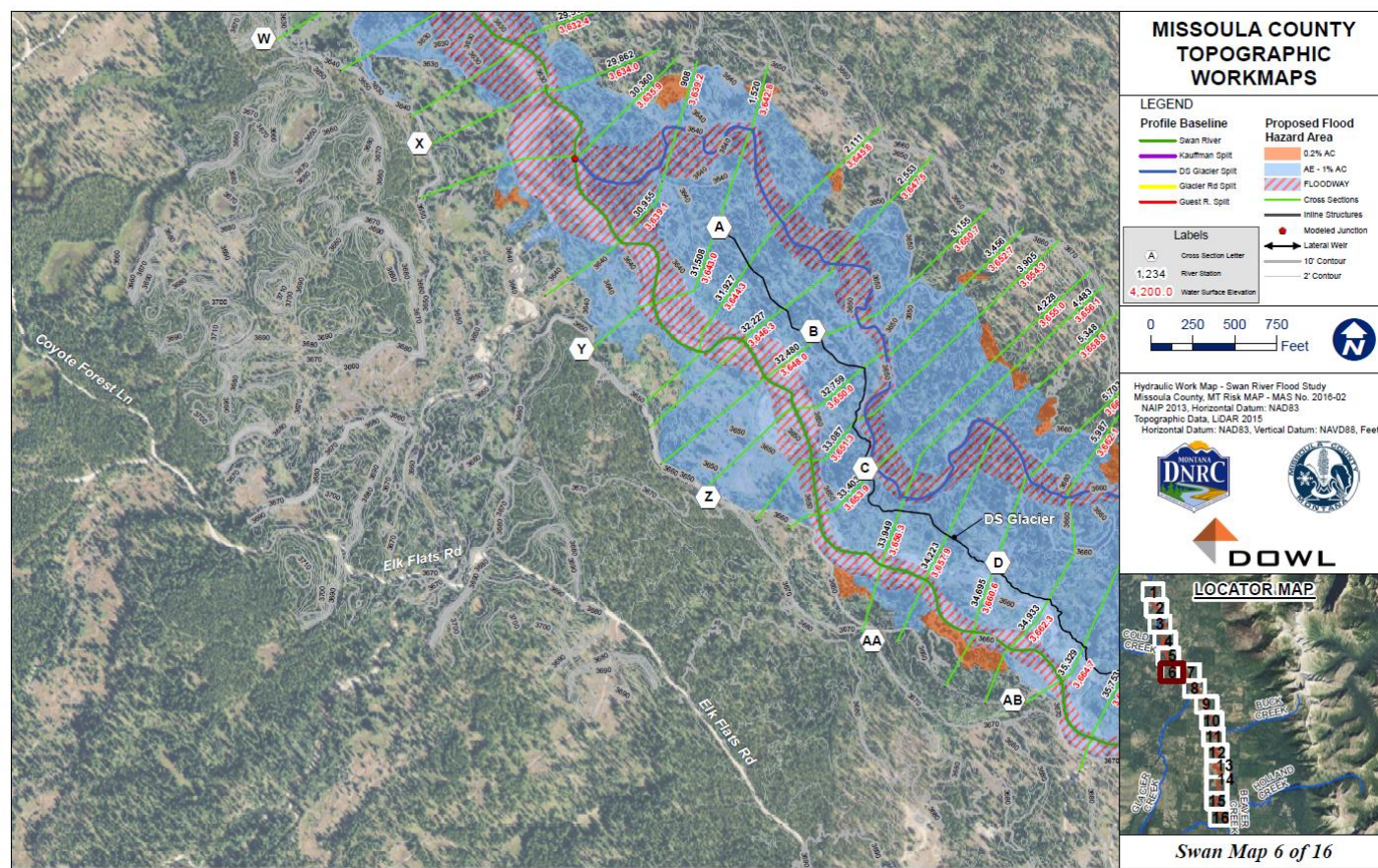
Hydraulic Analysis and Floodplain Mapping

Hydraulic modeling (where the water will go when it overflows the channel) and engineering to produce draft maps.



Hydraulic Analysis Report

Swan River
Missoula County, MT
July 2016



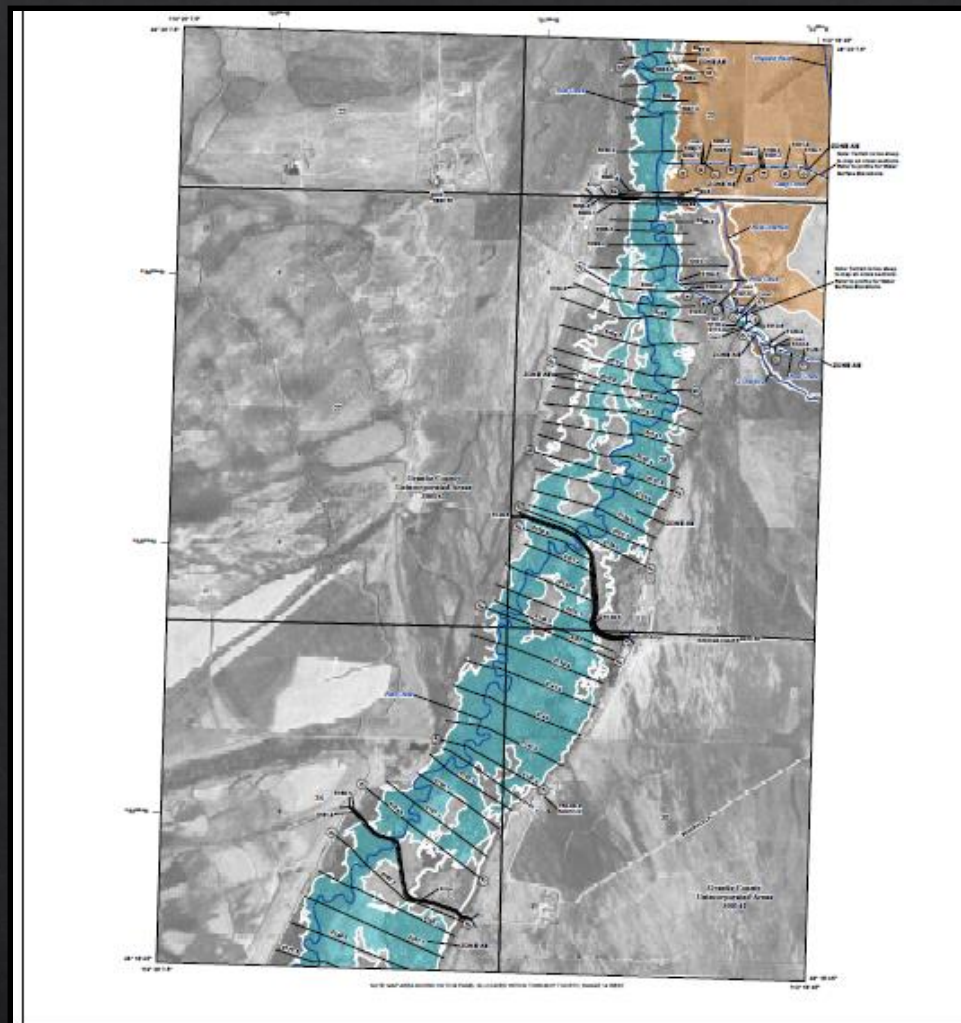
Prepared For:
Montana Department of Natural Resources and Conservation
Water Resources Division
24 9th Avenue
Helena, MT 59620

Prepared By:
DOWL
2 North 32nd Street, Suite 700
Helena, MT 59101

Project Scope

FEMA Map Production

- ◇ Preliminary Maps
- ◇ Public Review
- ◇ Maps Finalized



<p>FLOOD HAZARD INFORMATION</p> <p>FOR INFORMATION PURPOSES ONLY. THIS MAP IS FOR PUBLIC USE ONLY. THE INFORMATION SHOWN ON THIS MAP IS BASED ON THE BEST AVAILABLE INFORMATION AND IS NOT GUARANTEED. FOR MORE INFORMATION, VISIT HTTP://WWW.FEMA.GOV</p> <p>SPECIAL FLOOD HAZARD AREAS</p> <ul style="list-style-type: none"> 1% Annual Chance Flood (Zone A) 0.2% Annual Chance Flood (Zone B) 1% Annual Chance Flood with Average Depth (Zone C) Area with Backwater Flood Hazard (Zone D) Area of Moderate Flood Hazard (Zone E) Area of Unsettled Flood Hazard (Zone F) Channel, Canal, or Storm Drain (Zone G) Coastal Flood Hazard (Zone H) Coastal Flood Hazard (Zone I) Coastal Flood Hazard (Zone J) Coastal Flood Hazard (Zone K) Coastal Flood Hazard (Zone L) Coastal Flood Hazard (Zone M) Coastal Flood Hazard (Zone N) Coastal Flood Hazard (Zone O) Coastal Flood Hazard (Zone P) Coastal Flood Hazard (Zone Q) Coastal Flood Hazard (Zone R) Coastal Flood Hazard (Zone S) Coastal Flood Hazard (Zone T) Coastal Flood Hazard (Zone U) Coastal Flood Hazard (Zone V) Coastal Flood Hazard (Zone W) Coastal Flood Hazard (Zone X) Coastal Flood Hazard (Zone Y) Coastal Flood Hazard (Zone Z) 	<p>NOTES TO USERS</p> <p>This map was prepared using the best available information and is not guaranteed. For more information, visit http://www.fema.gov.</p> <p>This map is for informational purposes only and is not intended for use in any legal proceeding.</p> <p>This map is not a substitute for a professional engineering or architectural drawing.</p> <p>This map is not a substitute for a professional engineering or architectural drawing.</p> <p>This map is not a substitute for a professional engineering or architectural drawing.</p>	<p>SCALE</p> <p>Graphic scale: 1 inch = 1000 feet</p> <p>Graphic scale: 1 centimeter = 100 meters</p> <p>PANEL LOCATOR</p> <p>Map grid showing panel location: 17E, 17F, 17G, 17H, 17I, 17J, 17K, 17L, 17M, 17N, 17O, 17P, 17Q, 17R, 17S, 17T, 17U, 17V, 17W, 17X, 17Y, 17Z, 18A, 18B, 18C, 18D, 18E, 18F, 18G, 18H, 18I, 18J, 18K, 18L, 18M, 18N, 18O, 18P, 18Q, 18R, 18S, 18T, 18U, 18V, 18W, 18X, 18Y, 18Z, 19A, 19B, 19C, 19D, 19E, 19F, 19G, 19H, 19I, 19J, 19K, 19L, 19M, 19N, 19O, 19P, 19Q, 19R, 19S, 19T, 19U, 19V, 19W, 19X, 19Y, 19Z, 20A, 20B, 20C, 20D, 20E, 20F, 20G, 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Estimated Project Schedule

Topographic (LiDAR) – Complete

Survey Work- completed early 2021

Hydrology- completed mid to late 2021

Hydraulics-

 Tributaries-completed mid 2022

 Milk River- phase II

Draft Maps

Public review of draft maps

FEMA Map Production/
Preliminary Maps

Public review of preliminary maps

FEMA maps finalized



Community Contribution

ATTENTION SWAN RIVER PROPERTY OWNERS in or near the FLOODPLAIN...

Missoula County is currently working with FEMA and Montana DNRC to update floodplain maps for the Swan River. FEMA's Preliminary Digital Flood Insurance Rate Maps (DFIRM) are intended to provide more reliable and detailed information about flood-prone areas along the Swan River. You are receiving this postcard because proposed floodplain mapping changes could affect your property.

www.missoulacounty.us/swanfp

Visit the County's website above to view FEMA's Preliminary DFIRM showing proposed floodplain changes and/or attend the public open house to get more information about this project.

PUBLIC OPEN HOUSE

Tuesday, June 20, 2017 | 6:00 p.m. - 7:00 p.m.
Swan Valley Community Hall | 6803 HWY 83N, Condon, MT

Staff from the DNRC Floodplain Program and Missoula County will be on hand during the open house to answer questions and provide an overview of the project. We ask anyone with information relevant to potential flood hazards to share information at the meeting.

We look forward to seeing you there. For more information, contact Todd or Tiffany.



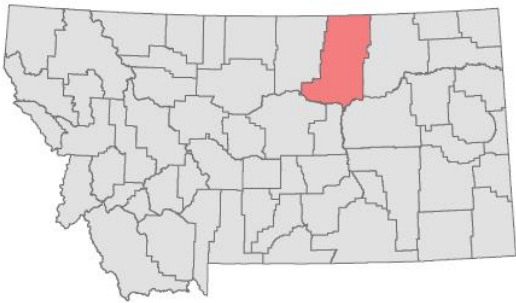
TODD KLIETZ

Missoula County Floodplain Administrator
tklietz@missoulacounty.us
406.258.4841

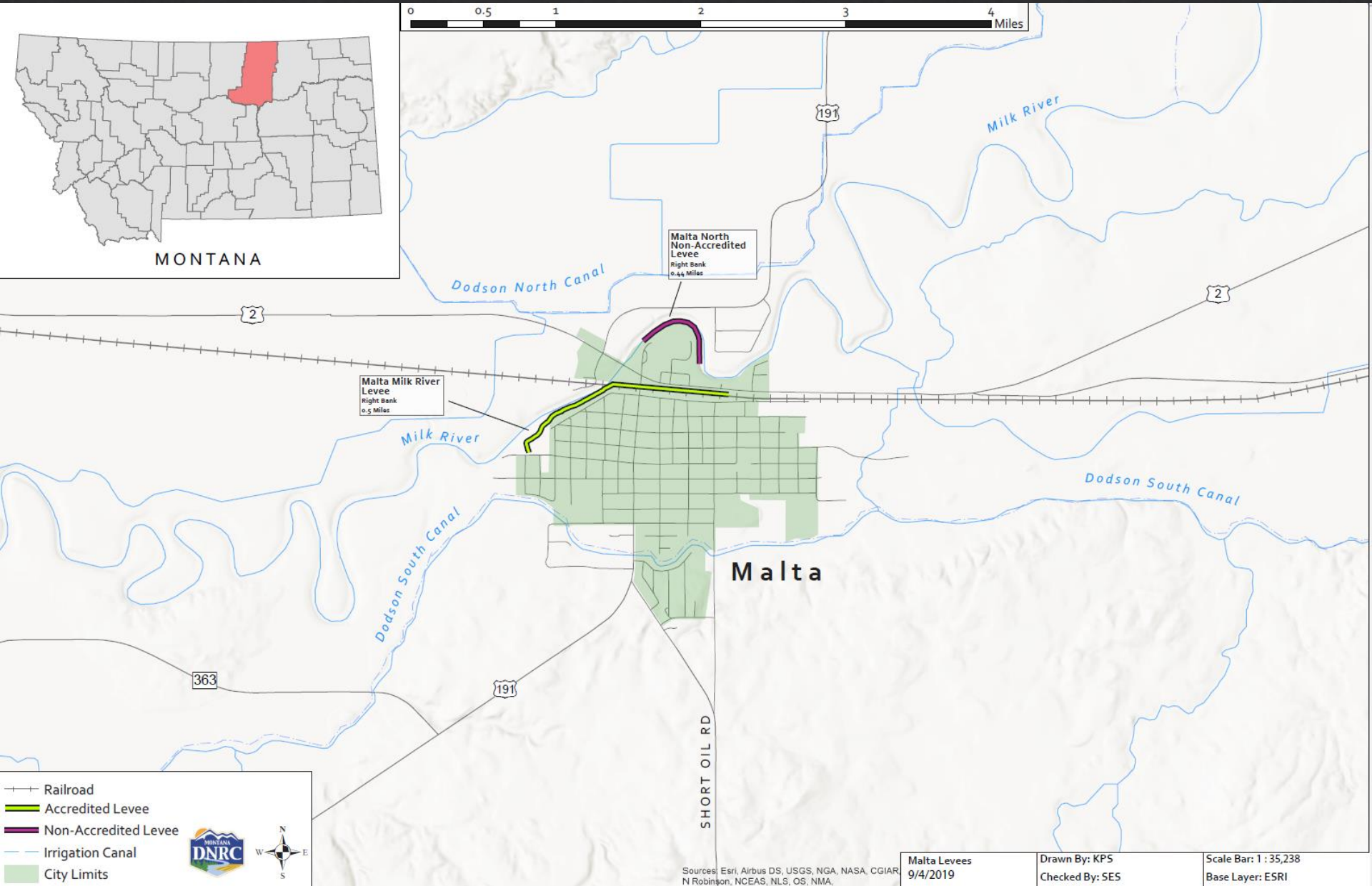
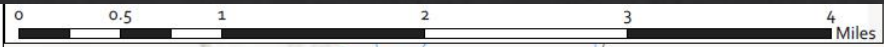
TIFFANY LYDEN

MT DNRC
tlyden@mt.gov
406.444.0599





MONTANA



Malta North Non-Accredited Levee
Right Bank
0.44 Miles

Malta Milk River Levee
Right Bank
0.5 Miles

- Railroad
- Accredited Levee
- Non-Accredited Levee
- Irrigation Canal
- City Limits



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA.

Malta Levees
9/4/2019

Drawn By: KPS
Checked By: SES

Scale Bar: 1 : 35,238
Base Layer: ESRI

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION



STEVE BULLOCK
GOVERNOR

DIRECTOR'S OFFICE (406) 444-2074
TELEFAX NUMBER (406) 444-2684

STATE OF MONTANA

WATER RESOURCES DIVISION (406) 444-6601
TELEFAX NUMBERS (406) 444-0533 / (406) 444-5918
<http://www.dnrc.mt.gov>

1424 9TH AVENUE
PO BOX 201601
HELENA, MONTANA 59620-1601

October 28, 2019

Mayor John Demarais
39 South 2nd St. East
Malta, MT 59538

Dear Mayor Demarais:

The Department of Natural Resources and Conservation (DNRC) floodplain program, The City of Malta, and Phillips County have been collaborating to undertake a new flood hazard study for the Milk River watershed which will update the existing Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). FEMA recently awarded DNRC a grant to complete the project. Accordingly, we are beginning the process of scheduling community kickoff meetings and launching the initial project tasks.

The new study requires a review and assessment of any existing flood protection systems in the Milk River watershed. FEMA requires that Levee Sponsor/Owners provide engineering certification to ensure the levees are sound and to qualify for a reduced flood risk category on the landward side of the levee systems, in accordance with FEMA's accreditation requirements (44 CFR 65.10). DNRC has identified two levees that are owned and maintained by The City of Malta: Malta-Milk River Right Bank and Malta North Levee (see attached figure). The existing status of these levees, based on the effective FIRMs is:

- The Malta-Milk River Right Bank levee shows a reduced risk on the landward side of the levee
- The Malta North levee was not previously certified/accredited and does not show a reduced risk on the landward side of the levee

As the Owner/Sponsor of these levee systems, the city is responsible for providing all the necessary data, documentation, and certification (by a licensed professional engineer) to FEMA and DNRC, demonstrating that the levee systems comply with FEMA's minimum requirements for accreditation (per 44 CFR 65.10).

This letter serves as our formal request of the city's intent to pursue FEMA accreditation of the levee systems defined above.

The city may choose to pursue certification at the city's expense for potential accreditation by FEMA. Accreditation status from FEMA will result in the levee(s) showing reduced risk on the landward side of the levee system(s) on the future FIRMs. Residents that live behind an accredited

levee may receive reduced flood insurance premiums.

The city may choose not to pursue certification/accreditation, which would result in a different flood mapping process. The levee would be modeled and potentially mapped as not reducing the risk on the landward side of the levee system(s). As a result, residents living behind non-certified/non-accredited levees that have a federally backed mortgage would be required to carry flood insurance at the high-risk premium.

Understanding the city's intent will help DNRC facilitate the flood study process along with coordinating the project schedule and study methods. Additionally, we request the city provide us with a designated point of contact for all levee related information and questions, as well as the contact information for whichever engineering firm the city may choose to work with, if certification/accreditation is the path forward. Should you have any questions, please contact Nadene Wadsworth at Nadene.wadsworth@mt.gov (406) 444-6732 or myself sestory@mt.gov (406) 444-6816.

For your convenience, we have prepared a sample 'letter of intent' template. If you could, please fill it out and return it to our office with all the information by February 28, 2020.

Thank you,

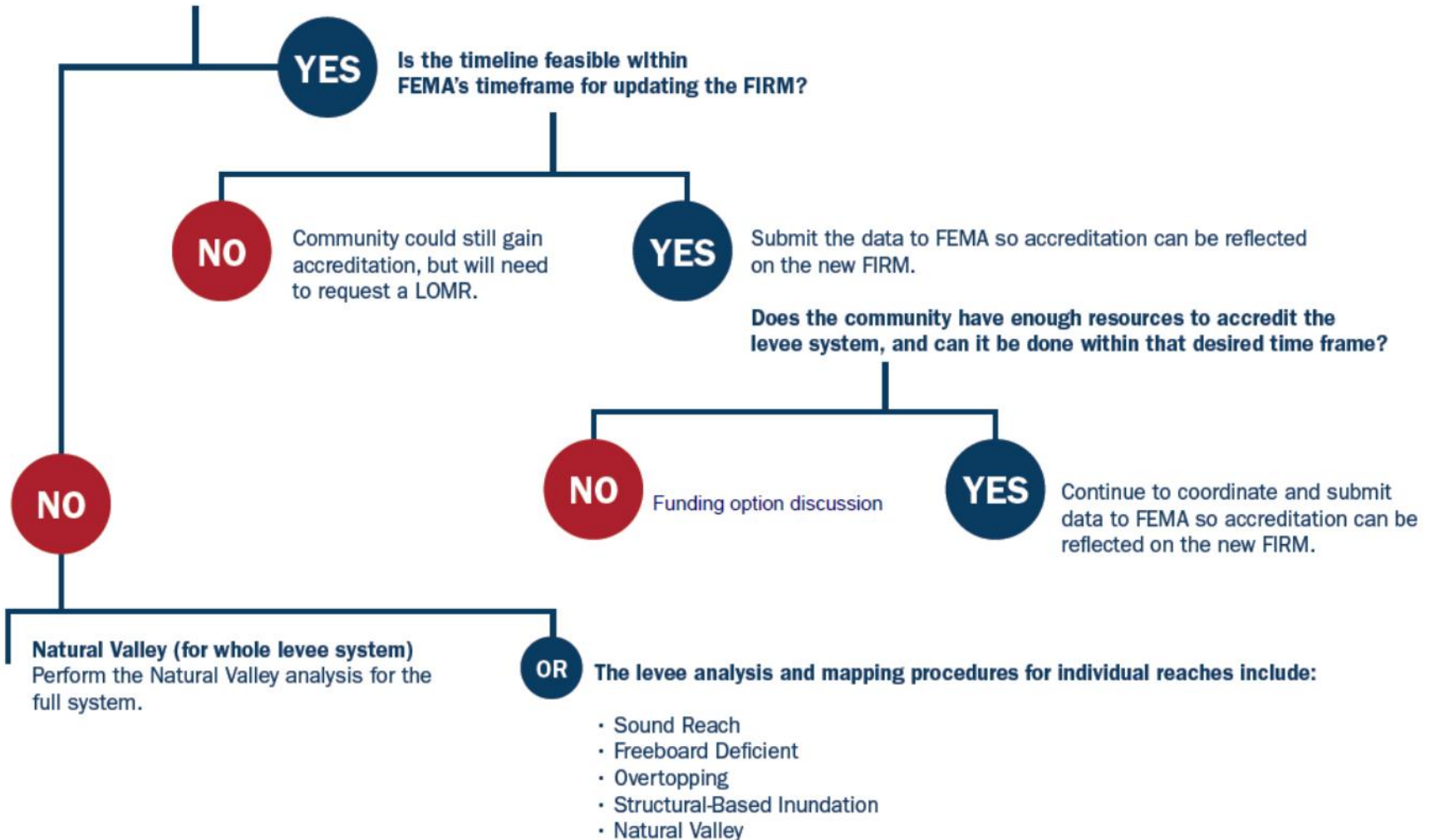
A handwritten signature in blue ink, appearing to read "Steve Story".

Steve Story, PE, CFM
Chief, Water Operations Bureau

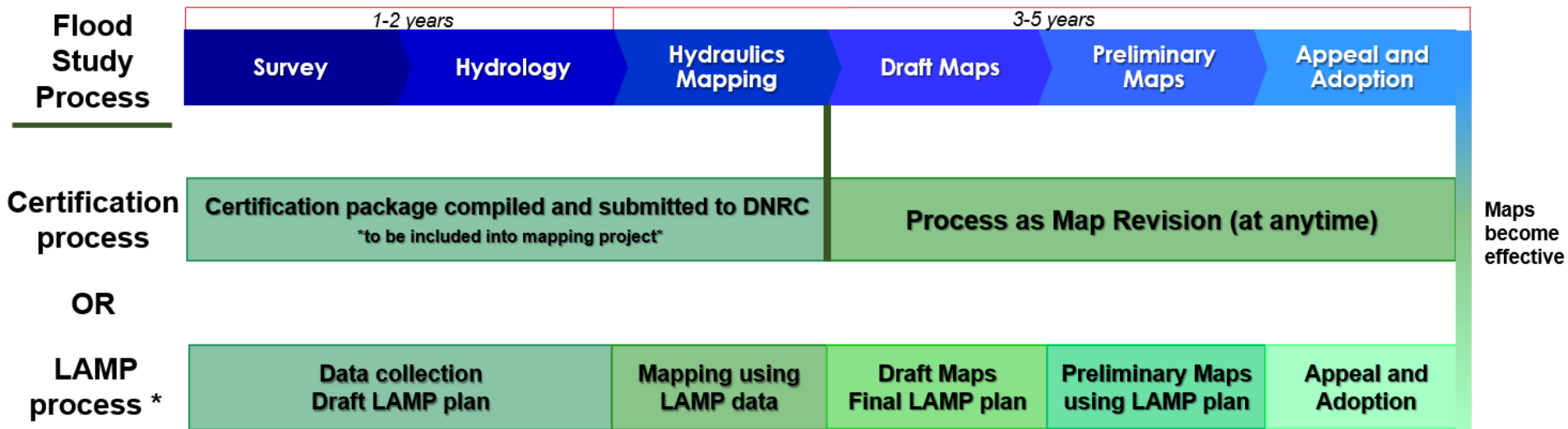
cc: Lori Bond, City of Malta Floodplain Administrator
Jim Truelove, City of Malta Public Works
Mark English, FEMA

Determining your path forward:

DO YOU INTEND TO ACCREDIT YOUR LEVEE SYSTEM?



Levee Mapping Timeframe



LAMP (Levee Analysis and Mapping Procedures) mapping process for non-accredited levees, or levees that may not be able to be certified during mapping projects.

Meeting the Criteria for Accrediting Levee Systems on Flood Insurance Rate Maps: How-To Guide for Floodplain Managers and Engineers

The National Flood Insurance Program (NFIP) defines a levee system in Title 44, Chapter 1, Section 59.1 of the Code of Federal Regulations ([44 CFR 59.1](#)) as a flood risk reduction system that consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices to protect a hydraulically distinct area. Within the NFIP, a levee is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

As part of the [flood mapping process](#), the Federal Emergency Management Agency (FEMA), and its State and local mapping partners, review and evaluate levee system data and documentation. Any community and/or other party seeking recognition or continued recognition of a levee system on a Flood Insurance Rate Map (FIRM) must provide FEMA with data and documentation, certified by a registered professional engineer, showing that the levee system is expected to provide 1-percent-annual-chance (base) flood risk reduction.

To be mapped on a FIRM as providing base flood risk reduction, levee systems must meet and continue to meet the NFIP minimum design, operation, and maintenance requirements described in Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations ([44 CFR 65.10](#)). FEMA has posted several guidance documents related to levee accreditation, mapping, and other topics. Please access the [Levee Resources Library](#) for updated guidance documents. To help clarify the responsibilities of community officials, levee owners, or other parties seeking recognition of a levee system identified during a study/mapping project, FEMA has posted several [guidance documents](#) related to levee accreditation, mapping, and other related topics. This document provides information regarding how FEMA maps levee systems, a checklist of the types of data and documentation that must be submitted for levee systems to be accredited on FIRMs, and an index of further resources.

A NOTE ABOUT FLOOD RISK AND FLOOD INSURANCE

Levee systems are designed to provide a specific level of protection. They can be overtopped or fail during flood events larger than those for which the system was designed. Levee systems also decay over time, which may increase the likelihood of failure. They require regular maintenance and periodic upgrades to retain their level of protection. When levees do fail, the resulting damage, including loss of life, may be much greater than if the levee system had not been built.

For all these reasons, FEMA strongly encourages people in levee-impacted areas to understand their flood risk, know and follow evacuation procedures, and protect their property by purchasing flood insurance, floodproofing their structure, or taking other precautionary measures. For more information on flood insurance, please visit [FloodSmart.gov](#).



Design Criteria		Section of the NFIP Regulations: 65.10(b)
<p>Description: For levee systems to be accredited by FEMA, communities and/or levee owners must submit data and documentation to show that adequate design and operations and maintenance systems are in place to provide reasonable assurance that the levee has, and will continue to have, base flood risk reduction capability.</p>		
<p>Checklist for Design Criteria:</p>		
■	<p>Freeboard. The minimum freeboard required is 3 feet above the Base Flood Elevation (BFE) all along the length of the levee, with an additional 1 foot within 100 feet of structures (such as bridges) or wherever the flow is restricted, and an additional 0.5 foot at the upstream end of a levee. Levees impacted by coastal flooding have special freeboard requirements (see Paragraphs 65.10(b)(1)(iii) and (iv)).</p>	
■	<p>Closures. All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.</p>	
■	<p>Embankment Protection. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.</p>	
■	<p>Embankment and Foundation Stability Analyses. Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided must evaluate expected seepage during loading conditions associated with the base flood and must demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (USACE) Engineer Manual 1110-2-1913, <i>Design and Construction of Levees</i>, (Chapter 6, Section II), may be used.</p>	
■	<p>Settlement Analyses. Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in USACE Engineer Manual 1110-1-1904, <i>Soil Mechanics Design—Settlement Analysis</i>, must be submitted.</p>	

RISK MAPPING, ASSESSMENT, AND PLANNING PROGRAM (RISK MAP)

The Federal Emergency Management Agency's Risk MAP Program delivers quality data that increases public awareness and leads to action to reduce risk to life and property. Risk MAP is a nationwide program that works in collaboration with States, Tribes, and Local communities using best available science, rigorously vetted standards, and expert analysis to identify risk and promote mitigation action, resulting in safer, more resilient communities.





Thank You

Tiffany Lyden
MT DNRC

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(406) 444-0599

Nadene Wadsworth
MT DNRC

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(406) 444-6732