

FLOOD SALES TAX COMMITTEE
AGENDA FOR MAY 7, 2018

Cass County Commission
Conference Room
1:00 PM

1. Call to Order
2. Approve minutes from previous meeting
3. Appoint Jason Benson to committee
4. Flood sales tax fund update
5. Status of previously approved projects
6. Review of projects and selection of projects to be funded in 2018
7. Other business
8. Adjournment

cc: Local Media

**FLOOD SALES TAX COMMITTEE
NOVEMBER 20, 2017—1:00 PM**

1. MEETING TO ORDER

Commissioner Mary Scherling called a meeting of the Flood Sales Tax Committee to order on Monday, November 20, 2017, at 1:00 PM in the Commission Conference Room, Cass County Courthouse, with the following present: County Commissioner Mary Scherling; County Commissioner Rick Steen; County Administrator Robert Wilson; and Sarah Heinle, Accountant from the Auditor's Office. County Auditor Michael Montplaisir and Cass County Joint Water Resource District Vice Chairman Rodger Olson were absent. Also present was County Engineer Jason Benson.

2. AGENDA APPROVED

MOTION, passed

Mr. Steen moved and Mr. Wilson seconded to approve the order of the agenda. Motion carried.

3. MINUTES APPROVED

MOTION, passed

Mr. Wilson moved and Mr. Steen seconded to approve the meeting minutes from October 2, 2017, as presented. Motion carried.

4. DRAFT POLICY ON USE OF FLOOD SALES TAX FUNDS

MOTION, passed

Mr. Steen moved and Mr. Wilson seconded to add language to the policy on the use of flood sales tax funds to include individual homesteads and rural subdivisions to the entities eligible for funding.

Mr. Steen said he is comfortable with the cost share guidelines in the policy as they encourage entities to seek out additional funding sources and provide parameters for funding, while still allowing the committee to grant additional funding if desired.

Mr. Benson said road projects have not been eligible for funds in the past but the policy addresses specific projects that may be eligible for funding going forward.

Mr. Wilson said previous discussions on this policy did not raise any major concerns, and now that the committee has had more time to study the policy all issues have been addressed.

Motion carried.

MOTION, passed

Mr. Steen moved and Mr. Wilson seconded to approve the County Sales Tax for Flood Risk Reduction and Recovery Projects Policy and to forward it to the County Commission for adoption. Motion carried.

5. ADJOURNMENT

MOTION, passed

On motion by Steen, seconded by Mr. Wilson, and all voting in favor, the meeting was adjourned at 1:24 PM.

Minutes prepared by Brielle Edwards, HR Assistant

Cass County Sales Tax Activity (420)			
Cash Basis - 2018			
4/30/2018			
Date	Description	Amount	Balance
	Balance Forward		6,866,648.04
2018	Sales Tax	4,600,150.95	11,466,798.99
2018	Interest	6,405.86	11,473,204.85
1/3/2018	Diversion Board of Authority	(1,108,758.03)	10,364,446.82
2/5/2018	County Projects	(246,619.50)	10,117,827.32
2/5/2018	County Projects	(2,472.45)	10,115,354.87
2/6/2018	Diversion Board of Authority	(841,164.99)	9,274,189.88
2/12/2018	County Projects	(131,355.70)	9,142,834.18
2/27/2018	Diversion Board of Authority	(1,703,217.66)	7,439,616.52
4/3/2018	Diversion Board of Authority	(992,606.68)	6,447,009.84
			6,447,009.84
			6,447,009.84

Reserved for County Projects - Cash	5,765,515.62	
Reserved for Diversion Project	681,494.22	6,447,009.84

Summary

2018 Receipts

Transfer	-
Sales Tax Revenue	4,600,150.95
Interest Revenue	6,405.86
Total Receipts	<u>4,606,556.81</u>

2017 Expenditures

Diversion Board of Authority	(4,645,747.36)
City of Fargo - Cash Flow Other Sources	-
County Projects	(380,447.65)
Land Purchase	-
Total Expenditures	<u>(5,026,195.01)</u>

Receipts over Expenditures (419,638.20)

Balance from 2017 6,866,648.04

Balance Current 2018 6,447,009.84

Sales Tax by Year

Year	Amount	Chg from Prev Yr
2011	\$ 7,612,423	Partial Year
2012	\$ 14,494,309	
2013	\$ 14,964,867	
2014	\$ 15,986,941	\$ 1,022,074
2015	\$ 16,929,904	\$ 942,963
2016	\$ 16,179,223	\$ (750,681)
2017	\$ 15,530,079	\$ (649,143)
Actual through April, est at 3% remainder of year	2018 \$ 15,367,147	\$ (162,933)

Current County Projects			
4/30/2018			
Project	Total Approved	Paid	Left to Pay
Round Hill Project	\$ 350,696.00	\$ 350,696.00	\$ -
City of Oxbow Diking	\$ 105,284.29	\$ 105,284.29	\$ -
2012 City of Argusville Diking	\$ 168,925.00	\$ 168,925.00	\$ -
2012 Maple-Steele WRD Study	\$ 20,562.00	\$ 20,562.00	\$ -
2012 City of Mapleton - Lift Station	\$ 52,500.00	\$ 52,500.00	\$ -
2013 Pontiac Township - Project No 73	\$ 448,000.00	\$ 448,000.00	\$ -
2013 City of Argusville - Levee improvement	\$ 23,874.73	\$ 23,874.73	\$ -
2013 City of Casselton - Levee Repairs	\$ 23,750.00	\$ 18,710.95	\$ 5,039.05
2013 Maple-Steele - Dam Project	\$ 17,500.00	\$ -	\$ 17,500.00
2014 City of Mapleton Levee Recertification 2012-1	\$ 543,324.58	\$ 543,324.58	\$ -
2014 Pontiac township Project no 73 additional	\$ 52,000.00	\$ 52,000.00	\$ -
2014 Upper Maple River Dam	\$ 706,000.00	\$ 706,000.00	\$ -
2014 Lake Bertha Flood Water Detention (reduced from 242500)	\$ 66,215.45	\$ -	\$ 66,215.45
2014 Detention project Development	\$ -	\$ -	\$ -
2015 Normanna Township Slide Repair and Road Move	\$ 40,500.00	\$ 40,500.00	\$ -
2015 Upper Maple River Detention Study Phase II	\$ 45,500.00	\$ -	\$ 45,500.00
2015 Rush River Detention Study Phase II	\$ 45,500.00	\$ -	\$ 45,500.00
2015 Swan Creek Detention Study Phase II	\$ 45,500.00	\$ -	\$ 45,500.00
2015 Harwood Levee Improvements	\$ 556,935.00	\$ 324,985.74	\$ 231,949.26
2015 Casselton Industrial Park Improvements	\$ 255,000.00	\$ 246,619.50	\$ 8,380.50
2015 Reed Township Road Raise	\$ 60,308.18	\$ 60,308.18	\$ -
2016 City of Mapleton Levee Raise	\$ 99,812.68	\$ 88,057.80	\$ 11,754.88
2016 City of Mapleton Levee Recert change order	\$ 14,867.00	\$ 14,867.00	\$ -
2016 Erie Dam Repairs (25,000 removed)	\$ -	\$ -	\$ -
2016 Absaraka Dam Repairs	\$ 11,183.50	\$ 11,183.50	\$ -
2016 Garsteig Dam Repairs	\$ 12,202.64	\$ 12,202.64	\$ -
2016 Embden Dam Repairs	\$ 10,263.87	\$ 10,263.87	\$ -
2016 Drain 77 Study Maple River Water Resource	\$ 20,000.00	\$ 20,000.00	\$ -
2017 Upper Maple River Dam Project	\$ 361,500.00	\$ 361,500.00	\$ -
2017 Erie Dam Project (10,000 removed)	\$ -	\$ -	\$ -
2017 Casselton Map Revision Project	\$ 12,472.45	\$ 12,472.45	\$ -
2017 Davenport Flood Risk Reduction Project	\$ 32,500.00	\$ -	\$ 32,500.00
2017 Sheldon Addition Ring Levee Project	\$ 462,750.00	\$ -	\$ 462,750.00
2017 Casselton Storm Water Improvments Projects	\$ 131,355.70	\$ 131,355.70	\$ -
Total	\$ 4,796,783.07	\$ 3,824,193.93	\$ 972,589.14

Reserve for County Projects 2018 Activity

Balance of Cash Carried forward from 2017	\$ 5,731,373.16
2018 Reserves (9%)	414,590.11
Total	<u>6,145,963.27</u>
Paid in 2018	380,447.65
Encumbrances	972,589.14
Un-encumbered Balance	<u>\$ 4,792,926.48</u>

City of Arthur

PO Box 161

Arthur, ND 58006

02/05/2018

RECEIVED
CASS COUNTY COMMISSION

FEB 21 2018

Rick Steen
Chairman
Cass County Commission
211 9th St S
Fargo, ND 58103

Re: City of Arthur Flood Risk Reduction

Dear Chairman Steen,

The City of Arthur ("City") is submitting this letter to ask for assistance through the Cass County Flood Sales Tax for funding a flood risk reduction project. FEMA has notified the City that they are planning to update the Flood Insurance Rate Maps (FIRM) based on an updated floodplain. With the proposed changes, additional homes will be added into the floodplain, thus requiring costly flood insurance for those homes. The floodplain is based on the two main ditches that drain through the City through a combination of ditches and storm sewer pipes. A majority of that storm sewer pipe is corrugated steel pipe and a section of it recently failed.

The City has worked with Moore Engineering to review FEMA's proposed floodplain. Upon a review of the floodplain, and reviewing the proposed storm sewer installation of larger pipe, Moore Engineering believes that an update to the map can be completed and sent into FEMA for their review. This update will be contingent upon the city replacing the storm sewer with larger storm sewer. The proposed map update would drastically reduce the floodplain area and reduce the number of structures that would need to purchase flood insurance.

The corrugated steel pipe that conveys rainwater and snowmelt has failed and is in need of replacement. Increasing the size of the pipe will prevent areas from going into the floodplain, eliminate the bottleneck that the system currently has, reduce the flood risk, and save additional residents from having to purchase costly flood insurance. The total estimated cost for the project is \$532,500.

The City has submitted a funding request to the Governor's Office for Governor's Fund money. The City has also submitted a funding request to the Community Development Block Grant (CDBG) Urgent Need Fund. It is unknown how much will come from these funding sources at this point. Since it is currently unknown how much will come from these sources, the City respectfully requests cost-share assistance from the Cass County Flood Sales Tax Committee for \$266,250, which is 50% of the project cost. The City will continue to pursue additional funding sources that will reduce the local share and the final reimbursement request from the Cass County Flood Sales Tax.

Included are maps of the existing storm sewer system, the area to be addressed by the project, and a map of the floodplains. On the floodplain map, the proposed FEMA floodplain is shown in green and the proposed floodplain after the larger pipe is installed is shown in purple.

It would be very much appreciated if you could please consider this request at the next Cass County Flood Sales Tax Committee meeting. We are planning to design and bid the project this spring and complete construction this summer. Thank you for your consideration in helping us address this important matter. Please do not hesitate to contact me at either my email (nelson.greg@hotmail.com) or my cell phone at 701-238-1868 if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Greg Nelson".

Greg Nelson, Mayor
City of Arthur

Attachments



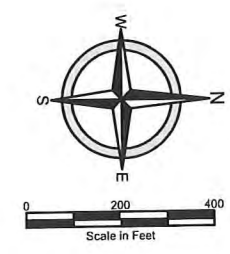
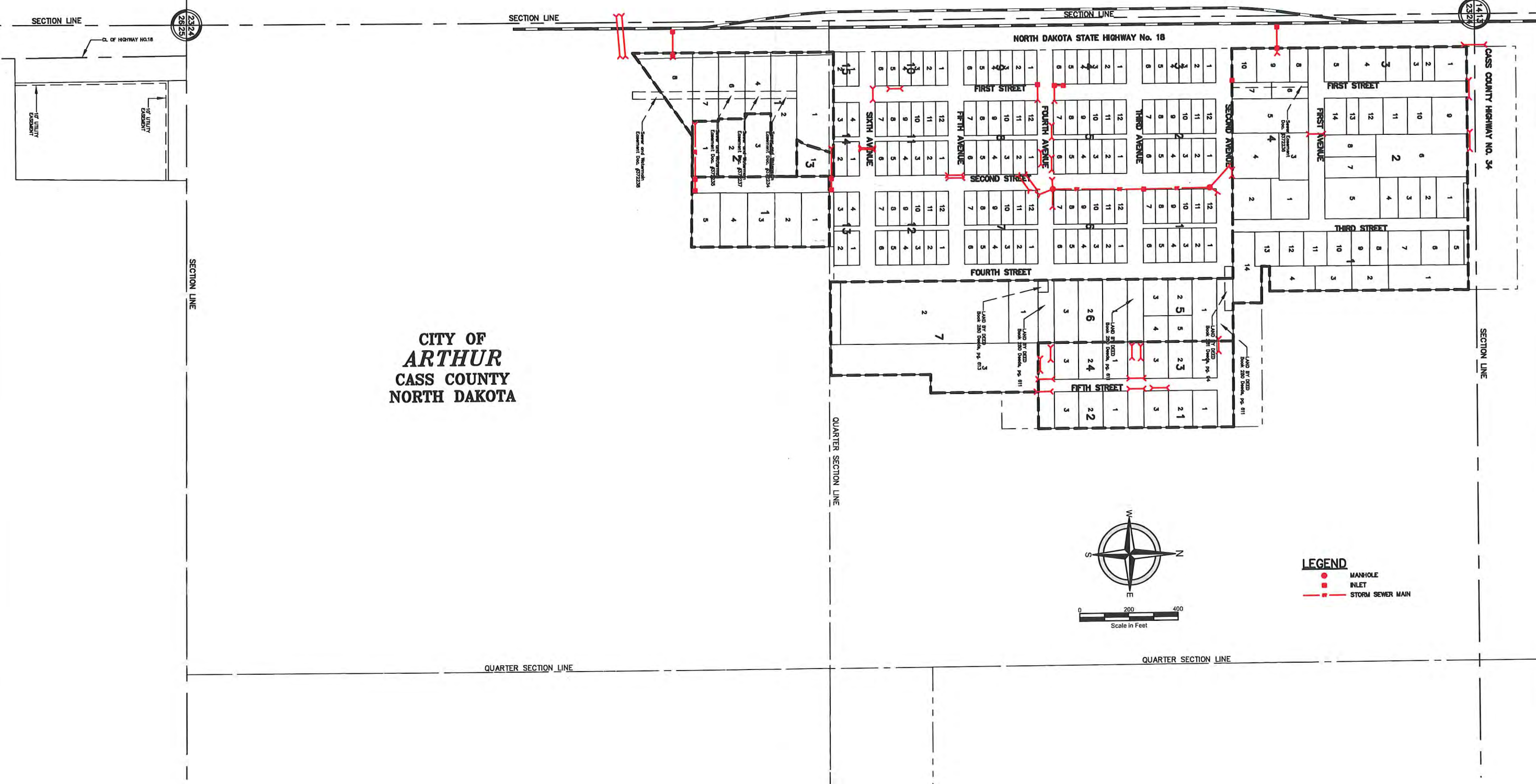
**STORM SEWER REPLACEMENT
CITY OF ARTHUR
CASS COUNTY, NORTH DAKOTA**

Created By: GZ Date Created: 12/14/2017 Date Saved: 12/14/17 Date Plotted: 12/14/17 Date Exported: 12/14/17
 Plotted By: gary.zimmer Parcel Date: NA Aerial Image: 2016 County NAIP SIDS Elevation Data: NA
 Horizontal Datum: NAD 1983 StatePlane North Dakota South FIPS 3302 Feet Vertical Datum: NA
 T:\Projects\20000\20044\20044_Arthur_storm_sewer_replacement.mxd



moore
engineering, inc.

CITY OF
ARTHUR
CASS COUNTY
NORTH DAKOTA

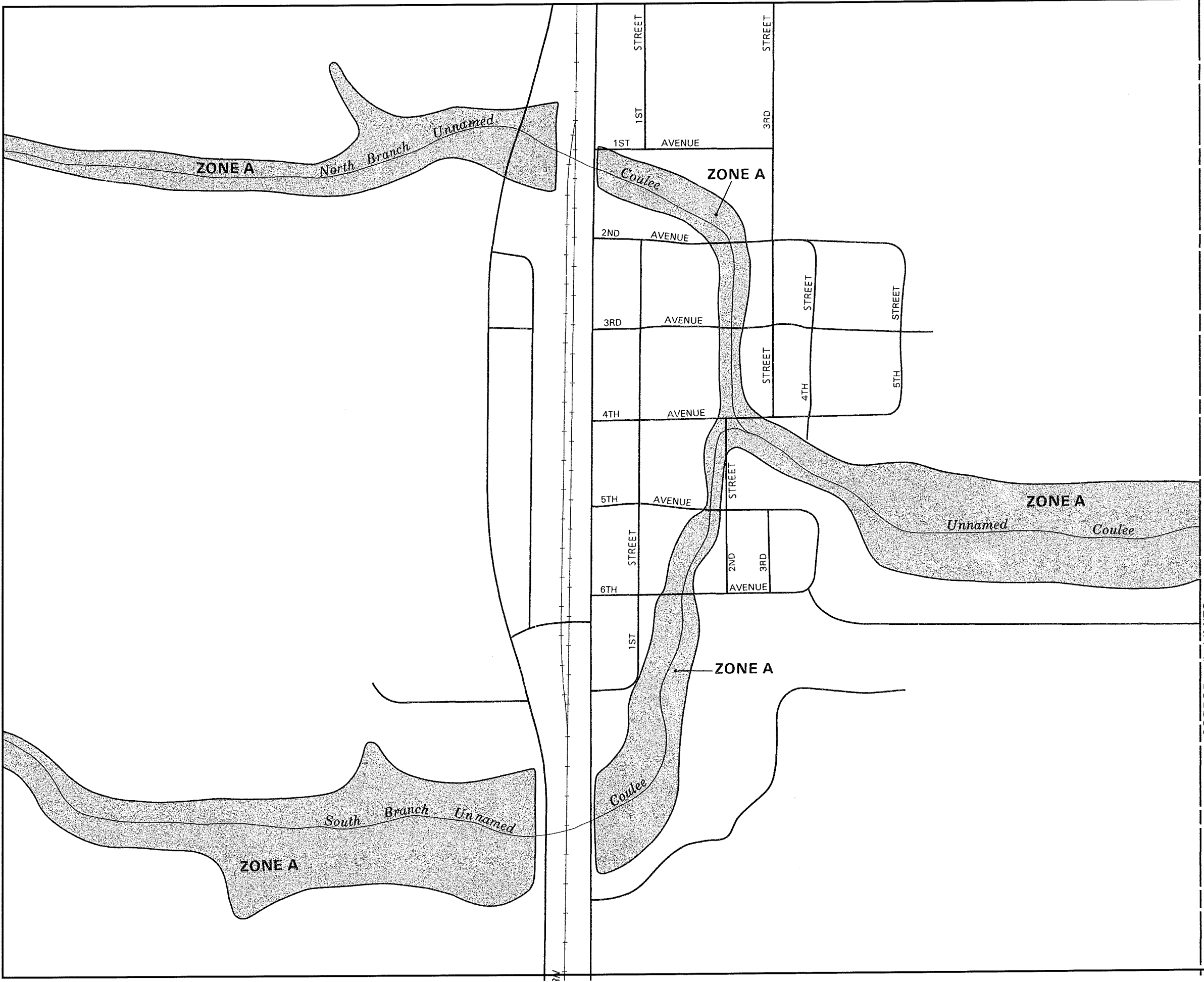


LEGEND
 ● MANHOLE
 ■ INLET
 — STORM SEWER MAIN

CITY STORM SEWER MAP
 CITY OF ARTHUR
 CASS COUNTY, NORTH DAKOTA

DRAWN BY:	NAS
DATE:	03.28.07
REVISED:	06.22.09
REVISED:	12.27.17
REVISED:	





APPROXIMATE SCALE IN FEET
 400 0 400

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
 FLOOD INSURANCE RATE MAP**

CITY OF
ARTHUR,
 NORTH DAKOTA
 CASS COUNTY

ONLY PANEL PRINTED

**COMMUNITY-PANEL NUMBER
 380156 0001 B**

**MAP REVISED:
 SEPTEMBER 30, 1993**



Federal Emergency Management Agency

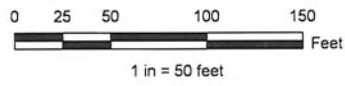
CORPORATE LIMITS

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



- Proposed 64x43 CSPA floodplain
- Proposed Corrected floodplain
- Preliminary FIS floodplain

ARTHUR FLOODPLAIN CASS COUNTY, NORTH DAKOTA



Created By: ARD Date Created: 11/29/17 Date Saved: 12/15/17 Date Plotted: 11/29/17 Date Exported: 12/15/17
Plotted By: alexa.ducioame Parcel Date: NA Aerial Image: 2016 County NAIP SIDS Elevation Data: Lidar
Horizontal Datum: NAD 1983 StatePlane North Dakota South FIPS 3302 Feet Vertical Datum: NAVD1988
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CITY OF HUNTER

P.O. BOX 56 • HUNTER, NORTH DAKOTA 58048

March 7, 2018

Rick Steen
Chairman
Cass County Commission
211 9th St S
Fargo, ND 58103

RECEIVED
CASS COUNTY COMMISSION

MAR - 9 2018

Re: City of Hunter - Hunter Dam Projects

Dear Chairman Steen,

The City of Hunter ("City") is submitting this letter to ask for assistance through the Cass County Flood Sales Tax for two separate projects at the Hunter Dam. One is for funding an Emergency Action Plan ("EAP") for the dam and the second is for repairs to the dam. The City is also requesting funding assistance for repairs to the Hunter Dam. The State Water Commission ("SWC") notified the City of a requirement to complete an EAP and to complete the repairs via a letter notification in May of 2017. This letter is attached.

Hunter Dam is classified as a high hazard dam due to the potential impacts to the City if the dam were to fail. The City currently has no protocol in place to protect residents from flooding if the dam fails and by completing the EAP the City will have a plan in place to protect residents from flooding issues should the dam fail. As part of the EAP, a dam failure analysis is required to be completed and this analysis will produce an inundation map that will note potential impacts to the City from a dam failure.

Part 1: The City has selected Moore Engineering ("Moore") to complete the EAP for the Hunter Dam. The City has received cost share assistance from the SWC for 80% of the costs of the EAP, which equates to \$46,108 of the total \$57,635 estimated costs. This proposal is also attached. The City is requesting \$8,645.25 from the Flood Sales Tax Committee, which is equal to 75% of the remaining local amount of the cost of the EAP.

Part 2: The City has discussed the repairs with a local contractor who would be able to complete the repairs to the dam. The City is estimating that the repairs and inspection to the dam will be approximately \$20,000. Those costs are unable to be funded through the SWC, which is funding a portion of the EAP costs only. With that in mind, the City is requesting \$15,000 from the Flood Sales Tax Committee, which is equal to 75% of the local amount.

Overall, the City is requesting a total of \$23,645.25 from the Flood Sales Tax Committee. This is broken down as follows:

Part 1: \$8,645.25
Part 2: \$15,000.00

The City would greatly appreciate consideration of this this important matter at the next Cass County Flood Sales Tax Committee meeting. Please do not hesitate to contact me at either my email (bolson@dhbanknd.com) or my cell phone at 701-261-7081 if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Ben Olson". The signature is fluid and cursive, with the first name "Ben" and last name "Olson" clearly distinguishable.

Ben Olson, Mayor
City of Hunter

Attachments



State of North Dakota

Office of the State Engineer

Regulatory Division

900 EAST BOULEVARD AVE. • BISMARCK, ND 58505-0850

Regulatory Division (701) 328-2752 • FAX (701) 328-3696 • <http://swc.nd.gov>

RECEIVED
JUN 02 2017

May 30, 2017

Mayor Ben Olson
City of Hunter
PO Box 56
Hunter, ND 58048

RE: Hunter Dam

Dear Mayor Olson:

In 2015, the North Dakota legislature enacted legislation requiring that an Emergency Action Plan (EAP) be developed for all medium hazard and high hazard dams (North Dakota Century Code [N.D.C.C.] Section 61-03-25). Hunter Dam is classified as a high hazard dam due to potential impacts to the City of Hunter if the dam were to fail. An EAP identifies potential emergency situations that could occur at the dam and specifies the course of action to be taken when an emergency situation arises. Guidelines for developing an EAP meeting the requirements of N.D.C.C. 61-03-25 are enclosed. In order to meet the requirements of N.D.C.C. 61-03-25, the City will need to hire a qualified engineer to develop an EAP for the dam. The State Water Commission may provide cost share assistance up to 80 percent to develop an EAP for the dam.

One critical component of an EAP for a high hazard dam is an inundation map showing the area that could be flooded if the dam were to fail. The inundation map should be based on a dam failure analysis completed by a qualified professional engineer. To the State Water Commission's knowledge, a dam failure analysis has never been completed for Hunter Dam and an inundation map does not currently exist for the dam. As a result, potential impacts to the City from a dam failure have not been clearly identified.

As noted in the EAP guidelines, one of the pieces of information an engineer must have in order to complete the necessary inundation mapping is an updated hydrologic analysis of the dam. This analysis involves determining the flow into the reservoir during a major storm event. The State Water Commission is contracting with Moore Engineering to complete this hydrologic analysis. The results of this analysis will be made available to any engineer hired by the City to take it to the next step and prepare the inundation mapping and EAP for the dam. As part of this analysis, the elevation of the top of the dam and the spillways will also be surveyed to verify that the information we have is correct.

Also enclosed for your reference is a report from the last full inspection of Hunter Dam by our dam safety program on June 28, 2016. Please note the recommendations on page 4. The biggest maintenance issue that should be addressed is the removal of trees from the upstream slope of the

dam and the area at the downstream toe of the embankment. This is discussed further in the attached report.

I would also like to make you aware that recently, a priority of the National Dam Safety Program has been to have condition ratings entered into the National Inventory of Dams for all high hazard dams in the United States. In an effort to comply with this goal as part of North Dakota's participation in the National Dam Safety Program, the State Water Commission has worked to assign condition ratings to all non-federally owned high hazard dams in the state. A condition rating of "poor" was assigned to Hunter Dam. A "poor" rating is defined in the National Inventory of Dams as:

"Poor - A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary."

In the case of Hunter Dam, the current "poor" rating is the result of a combination of factors, including the need for maintenance to remove the trees, as well as uncertainties regarding whether the dam meets all current dam safety standards. The hydrologic analysis discussed above, which the State Water Commission is contracting to have completed, will help address some of this uncertainty by verifying that the dam meets current standards for spillway capacity.

If you have any questions regarding any of this information, please contact Karen Goff at (701) 328-4953.

Sincerely,



John Paczkowski, P.E.
Assistant State Engineer

JP:kg/619

Enclosures

c: Wes Ecker, Chairman, North Cass Water Resource Board
Randy Gjestvang – SWC West Fargo Office

**NORTH DAKOTA STATE WATER COMMISSION
INSPECTION CHECKLIST FOR EMBANKMENT DAMS**

Name of Dam: Hunter Dam

Date Inspected: 06/28/16

Hazard Classification: High

Pool Elevation: approximately 1 inch below normal pool

Inspected By: Karen Goff - Dam Safety Engineer, Jeff Berger - Dam Safety Technician

Accompanied By: N/A

UPSTREAM SLOPE	Status	Comments
Erosion	No	
Wave erosion / scarp at waterline	Yes	minor in places, especially around spillway
Riprap inadequate	Yes	around spillway
Grass cover inadequate	No	
Trees / bushes	Yes	1 small tree left end of embankment, a couple of large trees right end of embankment
Animal burrows	No	
Cracks	No	
Settlement / depressions	No	
Sinkholes	No	
Slides / bulges	No	
Additional Comments:		
CREST	Status	Comments
Erosion	No	
Trees / bushes	No	
Animal burrows	No	
Visible settlement / low areas	No	
Sinkholes	No	
Misalignment	No	
Cracks	No	
Grass cover inadequate	No	
Ruts or puddles	No	
Additional Comments:		spillway barricaded on both sides, crest partially mowed

DOWNSTREAM SLOPE	Status	Comments
Erosion	No	
Grass cover inadequate	No	
Trees / bushes	Yes	large trees at downstream embankment toe left of spillway, large trees adjacent to right side of spillway at plunge pool
Animal burrows	No	
Livestock damage	No	
Cracks	No	
Settlement / depressions	No	
Sinkholes	No	
Slides / bulges	No	
Seepage	No	
Boils visible	No	
Toe drains flowing Left _____ gpm (est.)	N/A	
Right _____ gpm (est.)	N/A	
Abutment drain flow	N/A	
Relief wells flowing _____ gpm (est.)	N/A	
Additional Comments:		
PRINCIPAL SPILLWAY Not Applicable <input type="checkbox"/>	Status	Comments
A. Inlet Not Applicable <input checked="" type="checkbox"/>		
Inlet clogged or obstructed		
Trash rack damaged or corroded		
Concrete cracking		
Concrete spalling		
Concrete reinforcement exposed		
Metal corroding / rusting		
Separation / displacement of joints		
Gates damaged		
Gates leaking		
Additional Comments		

B. Conduit	Not Applicable <input checked="" type="checkbox"/>	Status	Comments
Visible Damage			
Visible seepage			
Additional Comments			
C. Concrete Chute Spillway	Not Applicable <input type="checkbox"/>	Status	Comments
Concrete cracking	Yes		fine cracks right downstream wall
Concrete spalling	No		
Concrete reinforcement exposed	No		
Joints show separation	No		
Joints displacement	No		
Joints show loss of joint material	No		
Joint seepage	No		
Drains / weep holes flowing	N/A		
D. Outlet / Stilling Basin		Status	Comments
Erosion	Yes		bank erosion downstream end of right wingwall
Riprap inadequate	Yes		
Outlet channel obstructed	No		
Energy dissipators deteriorated	N/A		
Seepage	No		none seen- however combination of tree growth, large pieces of concrete and erosion make inspection of the area very difficult
LOW LEVEL DRAWDOWN	Not Applicable <input type="checkbox"/>	Status	Comments
Valve/Stem damage	N/A		
Valve Leaking	N/A		
Stoplogs damaged	N/A		
Stoplogs leaking	N/A		
Low-level operated	No		believed to be inoperable
Additional Comments			wet well covered with boards- can't be opened
EMERGENCY SPILLWAY	Not Applicable <input type="checkbox"/>	Status	Comments
Grass cover inadequate	No		
Erosion	No		
Slides on spillway slopes	No		
Obstructions	No		

ADDITIONAL COMMENTS:

- 1) There is no Emergency Action Plan (EAP) for Hunter Dam.

RECOMMENDATIONS:

Critical Repairs – It is strongly recommended that the following critical repairs be completed as soon as possible to ensure the continued safety of the dam:

There are no recommendations in this category.

Other Priority Actions - It is strongly recommended that the following items be completed to improve the long-term safety of the dam:

- 1) Remove all trees from the upstream slope of the embankment, the downstream toe of the embankment, and the stilling basin area. Detailed information on the impacts of trees on dams and methods of controlling them is available in the publication "Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams (FEMA 534)", available at http://www.swc.state.nd.us/pdfs/impacts_plants_earth_dam_fema534.pdf

In general, trees and woody vegetation should be cut flush with the ground and disposed of off-site. Stumps can be chemically treated to prevent regrowth. For any trees larger than about 8 inches in diameter, a backhoe should be used to remove the entire stump and rootball, and the rootball cavity should be backfilled with well-compacted soil. On the lower half of the downstream slope and in the area at the downstream toe of the dam, any trees larger than about 4 inches in diameter should be removed in their entirety and a filter should be installed in the rootball cavity to prevent problems due to seepage. A professional engineer should supervise the removal of any trees in this category.

Maintenance and Monitoring - It is recommended that the following items be addressed as part of a regular maintenance and monitoring plan:

- 1) Add riprap in areas where erosion is occurring around the upstream spillway wing walls.
- 2) Repair the erosion on the south bank immediately downstream of the south spillway wall.
- 3) The dam has a history of seepage around the spillway. Monitor the banks downstream of the spillway walls for any increase in seepage around the spillway.

Additional Studies or Analyses - It is recommended that the following additional studies or analyses be completed:

- 1) Prepare an Emergency Action Plan (EAP) for Hunter Dam.

INSPECTION PHOTOS:



Photo #1 – Hunter Dam, looking south.



Photo #2 – Upstream slope, looking south.



Photo #3 – Large trees growing at south end of upstream slope.



Photo #4 – Downstream slope, looking south. Note the large trees growing at the toe of the embankment.



Photo #5 – Principal spillway, looking south.



Photo #6 – Fine cracks on south wall of spillway.



Photo #7 – Large trees growing at the toe of the embankment on the south side of the spillway.



Photo #8 – Bank erosion and tree growth at the downstream end of the south spillway wall.



Photo #9 – Bank erosion and tree growth at the downstream end of the south spillway wall (April 2012 photo).



Photo #10 – Principal spillway, looking north. Cover on low level outlet wet well in foreground.



Photo #11 – Emergency spillway, looking upstream.



Photo #12 – Emergency spillway, looking downstream.

North Dakota Office of the State Engineer

Emergency Action Plan Guidelines for Dams

I. Introduction

An Emergency Action Plan (EAP) is “a formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize loss of life and property damage”.¹

North Dakota Century Code (N.D.C.C.) Section 61-03-25, which became effective August 1, 2015, states:

“The owner of a high-hazard or medium-hazard dam shall develop, periodically test, and update an emergency action plan to be implemented if there is an emergency involving the dam. The emergency action plan and any subsequent updates must be submitted to the state engineer for approval.”

This purpose of this document is to provide additional guidance for developing, testing, and updating EAPs in order to comply with N.D.C.C. Section 61-03-25.

EAP's are the responsibility of the dam owner. However, the dam owner will need to hire a qualified registered professional engineer to prepare inundation mapping for their dam, which is one component of the EAP as discussed in more detail later in this document. Typically, the dam owner will have their engineer prepare the entire EAP.

Development of the EAP must be coordinated with local emergency management authorities. Copies of the completed EAP should be provided to local emergency management authorities and the ND Office of the State Engineer.

II. Format of an EAP

An EAP should contain the following basic information:

- Procedures to assist the dam owner in detecting and evaluating an emergency situation at the dam
- Responsibilities and expected actions of all parties involved in responding to an emergency at the dam
- A map identifying downstream areas that could be impacted by a dam failure (see section III of this document for further details)

routing. The use of a 2D hydraulic model, such as HEC-RAS 2D, is acceptable and is encouraged in situations where the conditions warrant the use of such a model. Field surveyed cross-sections or LIDAR data should be used in the model as necessary to adequately define the area downstream of the dam.

Inundation mapping should be prepared for a dam failure under both normal “sunny day” operating conditions and flood conditions. The sunny day failure assumes that the dam fails with the reservoir and inflow at normal operating levels. For the flood condition failure, the dam is assumed to fail during a flood event. The inflow to the reservoir is assumed to be the probable maximum flood (PMF) or other technically justifiable value such as the inflow design flood (IDF). Failure of a dam during a flood event will result in downstream inundation at higher elevations and will result in additional impacts compared to a sunny day failure. Other model assumptions are left to the judgment of the engineer, but must be technically sound and justifiable.

The flood wave must be routed downstream to a point where the floodwaters are contained within the channel banks, or to a point where the floodwaters no longer present a hazard to life or property. For a failure during the PMF or IDF, the flood routing may be stopped at a point where the incremental impacts resulting from the dam failure no longer present a hazard to life or property.

In order to model the flood failure scenario, the reservoir inflow hydrograph must be determined for the flood event to be modeled. This hydrograph must be determined by an updated, or verifiable, hydrologic analysis. Specifically, the hydrology given in the National Dam Safety Program Phase I Inspection Reports, prepared for many dams in the late 1970’s and early 1980’s, is not acceptable unless verified. A suitable program such as HEC-HMS must be used for the hydrologic analysis.

The inundation map should identify and label all downstream hazards that are within the inundation zone. The map should also show the estimated travel time and depth at selected locations. Further guidance on preparing inundation maps is available in the document “*Federal Guidelines for Dam Safety – Emergency Action Planning for Dams*”, FEMA 64, July 2013. This document is available on the ND State Water Commission website at http://www.swc.nd.gov/reg_approp/damsafety/.

B. Medium (Significant) Hazard Dams

The EAP for a medium, or significant, hazard dam must include a map of potential downstream hazards identifying homes, roads, and any other infrastructure that could be impacted by a dam failure. A dam break model is not required to prepare the map. However, the map must be prepared by a professional engineer registered in North Dakota with experience in hydrology, hydraulics, and dam failure analysis. Downstream hazards can be identified based on engineering judgment and a field

Contact information in the EAP should be verified as part of each review by calling the contacts to verify that the phone numbers and persons in the specified positions are current. The EAP should also be revised as necessary based on improvements identified in the EAP exercise. Inundation maps and contact information may need to be updated if new development occurs in the downstream area.

Copies of all EAP updates should be provided to everyone who has a copy of the EAP, including local emergency management authorities and the ND Office of the State Engineer.

VI. Changes in Hazard Classification

The hazard classification of a dam can change over time due to changes in development downstream of the dam. When the classification of a dam changes from low hazard to medium hazard or high hazard, an EAP must be completed for the dam in accordance with N.D.C.C. Section 61-03-25 and the requirements outlined in this document.

If a medium hazard dam with an existing EAP is upgraded to a high hazard dam, the inundation mapping in the EAP must be updated to meet the requirements for a high hazard dam, as outlined in this document.

VII. A Note on Low Hazard Dams

Although not required, owners of low hazard dams are encouraged to develop a simplified EAP for their dams. The EAP for a low hazard dam may consist of only a notification list of individuals and agencies to be contacted upon dam failure. An EAP for a low hazard dam can be completed by the dam owner.

*For more information, contact the
North Dakota Dam Safety Program
Karen Goff, P.E., Dam Safety Engineer
(701) 328-4953
kgoff@nd.gov*

¹ "Federal Guidelines for Dam Safety – Emergency Action Planning for Dams", FEMA 64, July 2013.



925 10th Avenue East
West Fargo, ND 58078

P: 701.282.4692
F: 701.282.4530



December 18, 2017

Ben Olson, Mayor
City of Hunter
P.O. Box 56
Hunter, ND 58408

Subject: Letter Agreement

Emergency Action Plan (E.A.P.) for Hunter Dam
Hunter, ND
MEI #19609

Dear Mayor Olson:

Moore Engineering, Inc. (MEI) is pleased to submit our proposal to provide Engineering Services to complete the referenced project.

Project Understanding

- **BACKGROUND:** The City of Hunter is a small rural community in north central Cass County, located approximately 35 miles northwest of Fargo, N.D. Having a population of approximately 260, the community is vital to the surrounding agricultural region. It is important that the City has safe, reliable infrastructure to continue its prominence in the area. Without basic services, the City would not be able to support the residents and businesses of the community.

As per the attached letter, included as Exhibit C, the City of Hunter was directed by the Office of the State Engineer to comply with recently passed legislation regarding dam safety (N.D.C.C. Section 61-03-25). The City was directed to prepare an Emergency Action Plan (E.A.P.) for the Hunter Dam, which is classified by the state as a high hazard dam.

Having served as the city engineer since 1977, Moore Engineering has completed numerous infrastructure improvement projects for the City. The City recently re-selected Moore Engineering through an RFQ process to provide professional engineering services and requested a proposal for the preparation of the E.A.P.

- **GENERAL DESCRIPTION OF PROJECT:** The City is in need of assistance to prepare an E.A.P. for the Hunter Dam. The E.A.P. must follow guidelines identified by the state, be prepared by a qualified professional engineer, and may be cost shared by the state at up to 80%. Specifically mentioned within the guidelines is the requirement to prepare inundation mapping for a dam failure under both sunny day operating

conditions and flood conditions. In addition, the development of the E.A.P. must be coordinated with local emergency management authorities.

The engineer's scope of work will include identifying the full scope of the study, identify the cost of the study, aiding the City by preparing cost share assistance applications, completing HEC-RAS modeling to identify inundation mapping during dam failures, develop the E.A.P. report, conduct public meetings, and coordinate with owner, State Water Commission, and local emergency authorities on the implementation of the E.A.P.

- **PROJECT OBJECTIVES:** MEI will provide the City of Hunter with professional engineering to develop the E.A.P. for the Hunter Dam as directed by the Office of the State Engineer. The deliverables will consist of a final report with copies distributed to all local emergency management authorities.

Scope of Work

To meet the project objectives above, MEI proposes to provide the following services:

- A. Preliminary Planning, Scoping and Funding
 - Develop scope of feasibility study
 - Coordinate approval of scope with SWC
 - Develop proposed roadmap for funding/repayment
 - Assist owner by preparing cost share applications (SWC and Cass County)
 - Attend council meetings, coordinate final approval and agreements with City and funding sources
- B. Accumulation of Data, Modeling and Inundation Maps
 - Field visit, obtain records/plans/maps from city and county, review available GIS data
 - Analyze obtained information to determine gaps to be filled by field survey, survey request
 - Field survey, CADD drafting, consolidate records and maps, GIS preparation of surface and support for 2-D modeling effort
 - HEC-RAS geometry development, flow file with boundary conditions, model runs, maps of model runs, 2-D Report write-up
 - QA/QC of 2-D Modeling and write-up
- C. Preparation of Emergency Action Plan
 - Development of flowchart
 - Detection and classification of dam failure
 - Determination of emergency action responsibilities
 - Map of downstream hazards
 - Draft E.A.P.: cover, table of contents, body, maps and exhibits
 - Review and revise report, final E.A.P., QA/QC
- D. Public Meetings
 - Prepare public meeting presentation materials
 - City council meeting(s), public information meeting, meetings with local emergency management authorities
 - Final revisions to report based on city/county/SWC/authority review
 - Distribute final E.A.P. to city and all local authorities.

Basis of Proposal

The following items form the basis of this Proposal:

- The field visit to photograph the existing site conditions will take no longer than 1 day in the field.

- MEI will attend no more than 5 City council meetings
- Field survey will take no longer than a single 10 hour day
- CADD drafting and incorporation of field survey into mapping will take no more than 10 hours
- MEI will utilize existing aerial photography and LIDAR available to prepare the project maps.
- Project engineer will present initial recommendations at a council meeting. Revisions will be made and project engineer and project manager will attend a subsequent meeting with final revisions.
- Project team will prepare and present E.A.P. at one (1) public meeting in the City.
- Does not include evaluation of existing infrastructure such as roadway crossings, spillway, dikes, etc.
- Does not include recommendations for improvements, opinion of cost for improvements, design plans, or construction engineering services for improvements.
- City will provide construction history, maintenance history, old plans and specification, plats, right-of-way documents.

Schedule

MEI will perform the Scope of Work listed above in accordance the following schedule:

- Visit the City to collect information within 30 days of Authorization to Proceed from City Council.
- Present preliminary modeling and draft E.A.P. at a council meeting in Hunter no later than 90 days after Authorization to Proceed.
- Make revisions and present maps, modeling and E.A.P. to local emergency management officials within 30 days of receiving revisions from City.
- Present final E.A.P. at council meeting in Hunter upon conclusion of revisions within 30 days of receiving comments from SWC and local emergency management officials.
- Present at a public meeting in Hunter as requested by the City. It is estimated that the public meeting will be held in July or August 2018.

Fee

MEI will perform the following tasks, specified in the Scope of Work above, on a Category Billing Rate basis using the actual hours worked times the appropriate Category Billing Rate plus the actual direct expenses incurred. Category Billing Rates are provided in ATTACHMENT A to this proposal. Category Billing Rates and expense costs listed in Attachment A are valid through the end of the current year. On January 1 in each subsequent year, Category Billing Rates and reimbursable expenses may be adjusted to meet market conditions.

Preliminary Planning, Scoping and Funding

Estimated to be FOUR THOUSAND THREE HUNDRED FIVE DOLLARS (\$4,305.00).

Accumulation of Data, Modeling and Inundation Maps

Estimated to be THIRTY-FIVE THOUSAND ONE HUNDRED NINETY DOLLARS (\$35,190.00).

Preparation of Emergency Action Plan

Estimated to be THIRTEEN THOUSAND SIX HUNDRED THIRTY DOLLARS (\$13,630.00).

The total cost is estimated to be approximately \$57,635.00. It is agreed that this is a not-to-exceed contract amount unless the scope of the work is changed. If the scope is changed, MEI will notify the City of any additional fees to complete the work, and the revisions will need to be agreed to in writing by both City of Hunter and MEI.

Standard Terms and Conditions

Our services will be provided in accordance with the ATTACHMENT B "Standard Terms and Conditions for Professional Services," which are integral to this proposal.


Closing

Should you find this Proposal acceptable, please have an authorized representative of the City of Hunter sign the Acceptance portion of this letter below and return one (1) fully executed copy of this Proposal to me. Receipt of a fully executed copy of this Proposal will serve as our Agreement and our Notice to Proceed.

We appreciate the opportunity to submit this Proposal to the City of Hunter, and we look forward to working with you on this Project. Should you have any questions or need additional information, please contact me by phone at 701-282-4692 or by e-mail at jklabunde@mooreengineeringinc.com.

Sincerely,

Jerod Klabunde, P.E.
Project Manager



Lee T. Beauvais, PE
Vice President

Enclosure: As noted

Acceptance for the City of Hunter

I hereby authorize Moore Engineering, Inc. to proceed with the work described above.

Signature: Ben Olson

Name: Ben Olson

Title: Mayor

Date: 1-8-2018

Address for giving notices: _____

PO Box 56

Hunter, ND 58408

MOORE ENGINEERING, INC.**2017 BILLING SCHEDULE**

Effective January 1, 2017

NOTE: Rates contained in this Billing Schedule are valid until December 31, 2017. After December 31, 2017, Hourly Billing Rates will be escalated annually and direct expenses may be adjusted to meet market conditions.

		(Minot-Bismarck)	(Standard)	(Preferred)	
	<u>Description</u>	<u>Billing Rate</u>	<u>Billing Rate</u>	<u>Billing Rate</u>	
		<u>Per Hour</u>	<u>Per Hour</u>	<u>Per Hour</u>	
1	Principal	\$220.00	\$210.00	\$200.00	
2	Senior Project Manager	\$200.00	\$190.00	\$180.00	
3	Senior Professional Engineer	\$195.00	\$185.00	\$175.00	
4	Senior Technical Advisor	\$195.00	\$185.00	\$175.00	
5	Grants and Funding Specialist	\$190.00	\$180.00	\$170.00	
6	Project Manager	\$190.00	\$180.00	\$170.00	
7	Professional Engineer II	\$185.00	\$175.00	\$165.00	
8	Professional Engineer I	\$170.00	\$160.00	\$150.00	
9	Project Coordinator	\$170.00	\$160.00	\$150.00	
10	Municipal Administrative Specialist	\$160.00	\$150.00	\$140.00	
11	Project Engineer	\$155.00	\$145.00	\$135.00	
12	Senior Construction Engineer/Specialist	\$160.00	\$150.00	\$140.00	
13	Construction Engineer/Specialist II	\$150.00	\$140.00	\$130.00	
14	Construction Engineer/Specialist I	\$140.00	\$130.00	\$120.00	
15	Graduate Engineer	\$140.00	\$130.00	\$120.00	
16	Senior Engineering Designer	\$155.00	\$145.00	\$135.00	
17	Engineering Designer II	\$140.00	\$130.00	\$120.00	
18	Engineering Designer I	\$135.00	\$125.00	\$115.00	
19	Expert Witness	\$310.00	\$300.00	\$290.00	
20	Building Codes Administrator	\$140.00	\$130.00	\$120.00	
21	Project Manager Assistant	\$135.00	\$125.00	\$115.00	
22	Engineering Technician III	\$125.00	\$115.00	\$105.00	
23	Engineering Technician II	\$115.00	\$105.00	\$95.00	
24	Engineering Technician I	\$105.00	\$95.00	\$85.00	
25	CADD Technician III	\$130.00	\$120.00	\$110.00	
26	CADD Technician II	\$125.00	\$115.00	\$105.00	
27	CADD Technician I	\$120.00	\$110.00	\$100.00	
28	Communications Manager	\$170.00	\$160.00	\$150.00	
29	Communications Specialist	\$140.00	\$130.00	\$120.00	
30	GIS Manager	\$170.00	\$160.00	\$150.00	
31	GIS Developer	\$155.00	\$145.00	\$135.00	
32	GIS Programmer III	\$145.00	\$135.00	\$125.00	
33	GIS Programmer II	\$135.00	\$125.00	\$115.00	
34	GIS Programmer I	\$130.00	\$120.00	\$110.00	
35	GIS Technician III	\$130.00	\$120.00	\$110.00	
36	GIS Technician II	\$125.00	\$115.00	\$105.00	
37	GIS Technician I	\$120.00	\$110.00	\$100.00	
38	Senior Land Surveyor	\$175.00	\$165.00	\$155.00	
39	Land Surveyor	\$160.00	\$150.00	\$140.00	
40	Survey Manager	\$145.00	\$135.00	\$125.00	
41	Survey Crew Chief II	\$140.00	\$130.00	\$120.00	
42	Survey Crew Chief I	\$130.00	\$120.00	\$110.00	
43	Survey Technician III	\$105.00	\$95.00	\$85.00	
44	Survey Technician II	\$95.00	\$85.00	\$75.00	
45	Survey Technician I	\$90.00	\$80.00	\$70.00	
46	Human Resources Generalist	\$120.00	\$110.00	\$100.00	
47	Administrative Assistant	\$90.00	\$80.00	\$70.00	
Travel Expenses	Project Mileage	\$0.65	\$0.65	\$0.65	per mile
	Lodging	Cost * 1.15	Cost * 1.15	At Cost	
	Meals	Cost * 1.15	Cost * 1.15	At Cost	
	Per Diem	\$64.00	\$60.00	\$60.00	per day
Survey Supplies	Iron Pins	\$1.25	\$1.25	\$1.25	each
	Fence Posts	\$5.00	\$5.00	\$5.00	each
	Motorized Offroad Vehicles	\$75.00	\$75.00	\$75.00	per day
Miscellaneous	Project Expenses	Cost * 1.15	Cost * 1.15	At Cost	
	Sub Consultants	Cost * 1.15	Cost * 1.15	At Cost	

STANDARD TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

1. General

1.1 The following Standard Terms and Conditions, together with the attached Proposal, constitutes the Agreement between Moore Engineering, Inc. (hereinafter referred to as "ENGINEER") and the person or entity to whom the Proposal is addressed (hereinafter referred to as "OWNER") for the performance of professional and related services. If OWNER requests that ENGINEER begin work prior to OWNER's execution of this Agreement and ENGINEER performs work in accordance with this Agreement, then this Agreement shall constitute the agreement between OWNER and ENGINEER even if OWNER fails to return an executed counterpart of this Agreement to ENGINEER.

1.2 No provision of this Agreement, including without limitation these Standard Terms and Conditions, may be waived, altered, or modified in any manner, unless the same shall be set forth in writing and signed by a duly authorized agent of ENGINEER. OWNER may use its standard business forms (such as purchase orders) to administer any agreement between ENGINEER and OWNER, but use of such forms shall be for convenience purposes only, and any typed provision in conflict with the terms of these Standard Terms and Conditions or ENGINEER's Proposal and all pre-printed terms and conditions contained in or on such forms shall be deemed stricken and null and void.

1.3 OWNER acknowledges and agrees that ENGINEER's services are on behalf of and for the exclusive use of OWNER and shall consist solely of those services described in ENGINEER's scope of services and shall not be based upon scientific or technical tests or procedures beyond the scope described therein, or the time and budgetary constraints imposed by OWNER. OWNER further acknowledges and agrees that ENGINEER's services require decisions that are not always based upon pure science, but also include judgmental considerations.

2. Standards of Performance

2.1 The standard of care for all professional engineering and related services under this Agreement shall be the care and skill ordinarily used by members of the same profession practicing under similar circumstances at the same time and in the same locality. ENGINEER makes no warranties, expressed or implied, under this Agreement or otherwise, in connection with any services performed or furnished by the ENGINEER.

2.2 ENGINEER shall perform the professional engineering and related services under this Agreement as expeditiously as is consistent with such professional skill and care and the orderly progress of the project.

2.3 Subject to the standard of care set forth in Paragraph 2.1, ENGINEER and its Consultants may use or rely upon design elements in information ordinarily or customarily furnished by others, including, but not limited to, specialty contractors, manufacturers, suppliers and publishers of technical standards.

2.4 ENGINEER shall review laws, rules, regulations, ordinances, codes, and OWNER-mandated standards policies, procedures and instructions provided to the ENGINEER in writing and that are in effect as of the date of this Agreement applicable to the ENGINEER's performance services under this Agreement subject to the standard of care set forth in Paragraph 2.1 and to the extent compliance is consistent with professional practice requirements. ENGINEER shall respond in the design of the Project to requirements imposed by governmental authorities having jurisdiction over the Project. Changes to any laws, rules, regulations, ordinances, codes, OWNER-mandated standards, policies procedures and instructions or requirements of governmental authorities after the effective date of this Agreement may be the basis for modifications to OWNER's responsibilities or to ENGINEER's scope of services, times of performance, and/or compensation. If, during ENGINEER's review of applicable laws, rules, regulations, ordinances and codes, and OWNER-mandated standards, ENGINEER identifies any conflict between such laws, rules, regulations, ordinances and codes, and OWNER-mandated standards, ENGINEER shall notify OWNER of the nature and impact of such conflict. OWNER agrees to cooperate and work with ENGINEER in an effort to resolve any such conflict.

2.5 ENGINEER shall not be required to sign any document or certification, no matter by whom requested, that would result in ENGINEER having to certify, guarantee or warrant the existence of conditions whose existence ENGINEER cannot ascertain, or that extends ENGINEER's duties, responsibilities or liability beyond that

contemplated by this Agreement. In the event that ENGINEER executes any such document or certificate, OWNER acknowledges that such execution by ENGINEER shall not operate as a waiver of this provision, but shall be considered a mistake of fact or law. OWNER agrees not to make resolution of any dispute with ENGINEER or payment of any amount due to ENGINEER in any way contingent upon ENGINEER's signing any such certification.

3. Contingency

3.1 OWNER and ENGINEER acknowledge and agree that certain increased costs and changes may be required as a result in whole or part of imprecision, incompleteness, errors, omissions, ambiguities or inconsistencies in the drawings, specifications and other documents furnished by ENGINEER or contained within other professional services performed or furnished by ENGINEER under this Agreement and, therefore, the final construction cost of the Project may exceed the OWNER's estimated construction cost. Accordingly, OWNER agrees to set aside a reserve in the amount of three (2) percent of the estimated construction cost as a contingency to be used as required to pay for such increased costs and changes resulting from the imprecision, incompleteness, errors, omissions, ambiguities or inconsistencies in the drawings, specifications and other documents furnished by ENGINEER or contained within other professional services performed or furnished by ENGINEER. The contingency percentage listed above should be included as a portion of the OWNER's overall construction contingency established to address unforeseen events or circumstances that arise during construction.

3.2 Any responsibility of ENGINEER for the costs of Covered Change Orders in excess of such percentage will be determined on the basis of applicable contractual obligations and professional liability standards. For purposes of this paragraph, the cost of Covered Change Orders will not include any costs that OWNER would have incurred if the Covered Change Order work had been included originally without any imprecision, incompleteness, error, omission, ambiguity, or inconsistency in the Contract Documents or in the Opinion of Probable Construction Cost and without any other error or omission of ENGINEER related thereto. Nothing in this provision creates a presumption that, or changes the professional liability standard for determining if, ENGINEER is liable for the cost of Covered Change Orders in excess of the percentage of Construction Cost stated above or for any other Change Order. Wherever used in this paragraph, the term ENGINEER includes Engineer's officers, directors, members, partners, agents, employees, and Consultants.

3.3 OWNER further agrees not to sue or make any claim by way of direct or third-party action against ENGINEER for the increased costs within the contingency because of such changes or because of any claims made by the Contractor relating to such changes.

4. OWNER's Responsibilities

4.1 OWNER shall make decisions and carry out its other responsibilities in a timely manner and shall bear all costs incident thereto so as not to unreasonably delay or interfere with the services of ENGINEER.

4.2 OWNER shall be responsible for, and ENGINEER may rely upon, the accuracy and completeness of all requirements, programs, instructions, reports, data, and other information furnished by OWNER to ENGINEER pursuant to this Agreement. ENGINEER may use such requirements, reports, data, and information in performing or furnishing services under this Agreement. Nothing in this paragraph shall be construed to require ENGINEER to affirmatively determine the accuracy of information that is prepared for OWNER by other licensed professionals (including, but not limited to, land surveyors, geotechnical engineers, accountants, insurance and surety professionals, and attorneys) who are not engaged directly by ENGINEER.

4.3 OWNER shall provide for ENGINEER's right to enter the property owned by OWNER and/or others in order for ENGINEER to fulfill its services.

4.4 OWNER shall promptly report to ENGINEER any deficiencies or suspected deficiencies in ENGINEER's work or services of which OWNER becomes aware so that ENGINEER may take measures to minimize the consequences of such deficiencies. Upon notice to ENGINEER and by mutual agreement between the parties, ENGINEER shall correct such deficiencies without additional compensation except to the extent such action is attributable to deficiencies in OWNER-furnished information.

5. Environmental Conditions.

5.1 OWNER shall provide (or cause the Site owner to provide) ENGINEER with the identity and location of all subsurface facilities and obstructions on the Site. OWNER agrees to waive any claims against ENGINEER and to indemnify, defend and hold ENGINEER harmless from any claims, demands or causes of action for damages to subsurface facilities or obstructions that are not accurately identified or located by OWNER or others. OWNER assumes responsibility for air, subsurface and/or ground pollution and environmental impairment from toxic substances or hazardous materials existing at the Site and shall indemnify and defend ENGINEER from any claims, demands and causes of action of third parties related thereto, except where such claims, demands and causes of action are caused by the sole negligence or willful misconduct of ENGINEER; it being the intention of the OWNER to assume any liability alleged to have resulted from ENGINEER's joint or concurrent negligence.

6. Ownership and Use of Documents

6.1 All original reports, plans, specifications, field data and other documents, whether in written or electronic format, prepared by ENGINEER or ENGINEER's consultants are instruments of professional service (hereinafter collectively referred to as "Documents") and ENGINEER shall retain the ownership and property interest therein (including the copyright and the right of reuse at the discretion of the ENGINEER) whether or not the Project is completed.

6.2 Copies of Documents that may be relied upon by OWNER are limited to the printed copies (also known as hard copies) that are signed and/or sealed by ENGINEER or ENGINEER's consultants. Files in electronic media format of text, data, graphics or of other types that are furnished by ENGINEER or ENGINEER's consultants to OWNER are only for the convenience of OWNER. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.

6.3 Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, OWNER agrees that it will perform acceptance tests or procedures within 60 days after receipt of such data, after which OWNER shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by ENGINEER at no cost to OWNER. However, ENGINEER shall not be responsible to maintain documents stored in electronic media format after acceptance by OWNER.

6.4 When transmitting documents in electronic media or digital format, ENGINEER makes no representations as to long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems or computer hardware differing from those used by ENGINEER for this Project.

6.5 OWNER may make and retain copies of Documents for information and reference in connection with use of the Documents on the Project by OWNER. ENGINEER grant OWNER a limited license to use the Document on the Project subject to receipt by ENGINEER of full payment due and owing for all services relating to preparation of the Documents. Such limited license shall not create any rights in third parties. Such Documents are not intended or represented to be suitable for reuse by OWNER or others on extensions of the Project or on any other project. Any such reuse or modification without written verification or adaptation by ENGINEER will be at the user's sole risk. OWNER shall, to the fullest extent permitted by law, indemnify, defend, and hold ENGINEER, its officers, directors, employees, partners, agents and Consultants, harmless from and against any and all claims, suits, judgments, liabilities, damages, costs, and expenses (including, but not limited to, reasonable attorneys' fees and defense costs) arising or allegedly arising from out of any unauthorized reuse or modification of said Documents by OWNER or any person or entity for whom OWNER is legally liable without the written authorization of ENGINEER.

6.5.1 In the event OWNER subsequently reproduces or otherwise uses ENGINEER's Documents or creates a derivative work based upon the Documents, OWNER shall, where permitted or required by law, remove or completely obliterate the original professional seals, trademarks, logos, and other indications on said Documents of the identity of ENGINEER, its employees and consultants.

6.6 Under no circumstances shall delivery of the electronic files for use by OWNER be deemed a sale by ENGINEER, and ENGINEER makes no warranties, either expressed or implied, of merchantability and fitness for

any particular purpose. In no event shall ENGINEER be liable for any loss of profit or any consequential damages as a result of OWNER's use or reuse of the electronic files.

7. Confidentiality

7.1 "Confidential Information" means all technical, economic, financial, pricing, marketing or other information that has not been published and/or is not otherwise available to members of the public and includes, without limitation, trade secrets, proprietary information, customer lists, scientific, technical and business studies, analyses, processes, methods, procedures, policies and information.

7.2 In the event that either party discloses Confidential Information to the other party in connection with this contract (excluding ENGINEER's Work Product that is delivered to OWNER or others hereunder), the party receiving such Confidential Information agrees to hold as confidential and to not disclose to others the Confidential Information for a period of ten (10) years from the date of disclosure. These restrictions shall not apply to information that (i) the parties had in their possession prior to disclosure; (ii) becomes public knowledge through no fault of the receiving party; (iii) the receiving party lawfully acquires from a third party not under an obligation of confidentiality to the disclosing party; (iv) is independently developed by the receiving party; or (v) is required to be disclosed by law or court order.

7.3 OWNER agrees that ENGINEER may use and publish OWNER's name and a general description of the Services provided to OWNER in describing ENGINEER's experience and qualifications to other clients and potential clients.

8. Work Product

8.1 "Work Product" consists of all reports, notes, laboratory test data and other information prepared by ENGINEER for delivery to OWNER. OWNER shall have the right to make and retain copies and use all Work Product; provided, however, such use shall be limited to the particular Site and project for which the Work Product is provided.

8.2 OWNER may release the Work Product to third parties at its sole risk and discretion; provided, however, ENGINEER shall not be liable for any claims or damages resulting from or connected with such release or any third party's use of the Work Product, and OWNER shall indemnify, defend and hold ENGINEER harmless from any and all such claims or damages.

9. Billing and Payment

9.1 Invoices shall be submitted monthly by ENGINEER, are due upon presentation, and shall be considered past due if not paid within 30 days of the invoice date. If payment is not received by ENGINEER within 45 days of the invoice date, OWNER shall pay as interest an additional charge of one percent (1.0%) or the maximum allowable by law, whichever is lower, of the past due amount per month. Payment thereafter shall first be applied to accrued interest and then to the unpaid principal.

9.2 If OWNER objects to any portion of an invoice, OWNER shall so notify ENGINEER in writing within 10 days of receipt of the invoice. OWNER shall identify the specific cause of the disagreement and shall pay when due that portion of the invoice not in dispute. Interest as stated above shall be paid by OWNER on all disputed invoiced amounts resolved in ENGINEER's favor and unpaid for more than 45 days after date of submission.

9.3 In the event legal action is necessary to enforce the payment provisions of this Agreement, the prevailing party shall be awarded its reasonable attorney fees, and costs and expenses incurred. If both parties receive judgment in any dollar amount, the court will determine the prevailing party, taking into consideration the merits of the claims asserted by each party, the amount of the judgment received by each party, and the relative equities between the parties.

9.4 If OWNER fails to make payments when due or otherwise is in breach of this Agreement, ENGINEER may suspend performance of services upon seven (7) days' notice to OWNER. ENGINEER shall have no liability whatsoever to OWNER for any costs or damages as a result of such suspension caused by any breach of this Agreement by OWNER.

9.5 Real Estate Improvements: If the services provided under this Agreement result in or could lead to improvement to real estate, ENGINEER reserves the right to file a construction lien against the property/real estate on which these services are being provided for OWNER's failure to make payment for services.

9.6 If and to the extent the time initially established by this Agreement for completion of ENGINEER's services is exceeded or extended through no fault of ENGINEER, compensation for any services rendered during the additional period of time shall be computed in accordance with the additional services provision of this Agreement, or, in the absence thereof, on the basis of ENGINEER's then-current standard hourly billing rates, plus reimbursable expenses at a multiplier of 1.15 times the actual expense incurred by ENGINEER, its employees and consultants, in the interest of the Project.

9.7 Payments Upon Termination.

9.7.1 In the event of any termination under the terms of this Agreement, ENGINEER will be entitled to invoice OWNER for all services performed or furnished and all expenses incurred through the effective date of termination.

9.7.2 In the event of termination by ENGINEER for cause, in addition to invoicing for those items identified in paragraph 9.7.1, above, ENGINEER shall be entitled to invoice OWNER and shall be paid a reasonable amount for services and expenses directly attributable to termination, both before and after the effective date of termination, such as reassignment of personnel, costs of terminating contracts with ENGINEER's consultants, and other related close-out costs.

10. Insurance

10.1 During the term of this Agreement, ENGINEER shall maintain not less than the following insurance coverages:

10.1.1 Workers' Compensation Insurance – statutory amount

10.1.2 Employer's Liability Insurance - \$100,000 each accident, \$500,000 disease policy limit, \$100,000 disease each employee

10.1.3 Commercial General Liability Insurance - \$1,000,000 per occurrence / \$1,000,000 aggregate

10.1.4 Automobile Liability Insurance - \$1,000,000 combined single limit

10.1.5 Professional Liability Insurance - \$1,000,000 per claim / \$1,000,000 aggregate

10.2 At any time, OWNER may request that ENGINEER, at OWNER's sole expense, provide additional insurance coverage or increased limits that are more protective than those maintained by ENGINEER.

11. Allocation of Risks; Limitation of Remedies

11.1 It is intended by the parties to this Agreement that ENGINEER's services in connection with the Project shall not subject ENGINEER's individual employees, officers, or directors to any personal legal exposure for the risks associated with this Project. Therefore, OWNER agrees that as OWNER's sole and exclusive remedy, any claim, demand or suit arising out of ENGINEER's services in connection with the Project shall be directed and/or asserted only against ENGINEER and not against any of ENGINEER's individual employees, officers, or directors.

11.2 In recognition of the relative risks and benefits of the Project to both OWNER and ENGINEER, OWNER agrees, to the fullest extent permitted by law and notwithstanding any other provision in this Agreement, that any liability created by or arising out of this Agreement on the part of ENGINEER to OWNER and any person or entity claiming by, through or under OWNER, for any and all claims, liabilities, losses, costs, damages of any nature whatsoever, or claims expenses from any cause or causes (including without limitation any attorneys' fees under this Agreement), shall be limited to the lesser of \$100,000 or the total amount of compensation received by ENGINEER hereunder.

11.3 Allocations of risks and limitations of remedies in this Agreement are business understandings between the parties and shall apply to all the different theories of recovery, including, without limitation, breach of contract

or warranty (expressed or implied), tort (including, without limitation, negligence), strict or statutory liability, or any other cause of action. These limitations of remedies will not apply to any losses or damages that have been found by a trier of fact to have been caused by ENGINEER's gross negligence or willful or wanton misconduct. The parties agree that the Owner will not seek damages in excess of the contractually agreed limitations through suits with other parties who may join ENGINEER as a third-party defendant.

11.4 Notwithstanding any other provision in this Agreement, neither ENGINEER nor OWNER shall be liable to the other party for any special, incidental, indirect or consequential damages whatsoever arising out of, resulting from, or in any way related to the Project or performance of this Agreement.

12. Certificate of Merit

12.1 OWNER shall make no claim for professional negligence, either directly or in a third-party claim, against ENGINEER unless OWNER has first provided ENGINEER with a written certification executed by an independent design professional currently practicing in the same discipline as ENGINEER and licensed in the state in which the Project is located. This certification shall: (i) contain the name and license number of the certifier; (ii) specify each and every act or omission that the certifier contends is a violation of the standard of care expected of a design professional performing professional services under similar circumstances in the same location; and (iii) state in complete detail the basis for the certifier's opinion that each such act or omission constitutes such a violation. This certificate shall be provided to ENGINEER not less than 30 days prior to the presentation of any claim or the institution of any mediation, arbitration, or judicial proceeding.

13. Integration, Severability and Survival

13.1 This Agreement comprises the final and complete agreement between OWNER and ENGINEER. It supersedes all prior or contemporaneous communications, representations or agreements, whether oral or written, relating to the subject matter of this Agreement. Amendments to this Agreement shall not be binding unless made in writing and signed by both OWNER and ENGINEER. Any provision of this Agreement later held to be unenforceable for any reason shall be deemed void, and all remaining provisions shall continue in full force and effect, if the essential provisions of this Agreement for each party remain valid, binding, and enforceable.

13.2 All provisions of this Agreement related to assignment, indemnification, limitation of remedies, and limitations on actions, or otherwise allocating responsibility or liability between the parties, shall survive the completion of the services hereunder and the termination of this Agreement and shall remain enforceable between the parties.

14. Assignment

14.1 Neither party to this Agreement may assign, sublet, or transfer any rights or obligations under or interest (including, without limitation, moneys that are due or may become due) in this Agreement, or any claims, causes of action or rights against the other party arising from or under this Agreement; or any proceeds from claims arising from or under this Agreement as security, collateral or the source of payment for any notes or liabilities to the Contractor or any other third party; or any control of any claims or causes of action arising from or under this Agreement without the written consent of the other party, except to the extent that any assignment, subletting, or transfer is mandated or restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement. This section shall not, however, apply to any subrogation rights of any insurer of either party. The provisions of this paragraph shall survive the completion or termination of this Agreement for any reason and shall remain enforceable between the parties.

14.2 Notwithstanding the provisions of Section 14.1, above, or any other provision of this Agreement, ENGINEER may assign or otherwise transfer its rights and obligations under this Agreement to any parent, subsidiary, or affiliated company of ENGINEER or to any purchaser of the business of ENGINEER that agrees to assume the obligations of ENGINEER under this Agreement.

15. Suspension of Services

15.1 If the Project is suspended for more than 30 days in the aggregate, ENGINEER shall be compensated for services performed and charges incurred prior to suspension and, upon resumption, an equitable adjustment in fees to accommodate the resulting demobilization and remobilization costs. In addition, there shall be an equitable adjustment in the Project schedule based on the delay caused by the suspension. If the Project is suspended for

more than 90 days in the aggregate, ENGINEER may, at its option, terminate this Agreement upon giving notice in writing to OWNER. If OWNER fails to make payments when due or otherwise is in breach of this Agreement, ENGINEER may suspend performance of services upon seven days' prior written notice to OWNER. ENGINEER shall have no liability whatsoever to OWNER for any costs or damages as a result of such suspension caused by any breach of this Agreement by OWNER.

16. Force Majeure

16.1 Neither party shall be liable for any delay in, or failure of, its performance of any of its obligations under this Agreement if such delay or failure is caused by events beyond the reasonable control of the affected party, including, but not limited to, any acts of God, governmental embargoes, restrictions, quarantines, strikes, riots, wars or other military action, civil disorder, acts of terrorism, fires, floods, vandalism, sabotage or the acts of third parties (a "Force Majeure Event").

16.2 Upon completion of the Force Majeure Event the party affected must as soon as reasonably practicable recommence the performance of its obligations under this Agreement.

16.3 A Force Majeure Event does not relieve a party from liability for an obligation that arose before the occurrence of that event, nor does that event affect the obligation to pay money in a timely manner that matured prior to the occurrence of that event.

17. Ownership of Waste

17.1 "Pre-Existing Waste" is any hazardous or non-hazardous wastes, substances or materials existing on the Site prior to the date that the Services are initiated.

17.2 OWNER shall be responsible for the proper handling, storage, transportation and/or disposal of the Pre-Existing Waste in accordance with all applicable federal, state and local laws and regulations. OWNER shall provide appropriate disposal identification numbers, select the disposal site(s) and sign all required manifests, disposal contracts and other documentation necessary to allow ENGINEER to complete the Services in a timely manner. OWNER acknowledges that ENGINEER is performing professional services for OWNER and that ENGINEER is not and shall not be required to become an "owner", "arranger", "operator", "generator", or "transporter" of Pre-Existing Waste which are or may be encountered at or near the Site in connection with ENGINEER's activities under this Agreement.

17.3 OWNER agrees to look solely to the disposal facility and/or transportation concern for any damages arising from improper transportation or disposal of the Pre-Existing Waste.

18. Termination

18.1 This Agreement may be terminated by either party upon 30 days' written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party.

19. Third Party Beneficiaries

19.1 All duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of the OWNER and not for the benefit of any other party. No other party shall have any claim against ENGINEER because of this Agreement or the performance or nonperformance of services hereunder. Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party again either OWNER or ENGINEER.

20. Dispute Resolution

20.1 ENGINEER and OWNER will attempt in good faith to resolve through negotiation any dispute, claim, counterclaim, or controversy arising out of or relating to this Agreement (hereafter collectively referred to as "Dispute"). If the Dispute is not resolved by these negotiations, the parties agree to submit any such unresolved Dispute to mediation. Either party may commence mediation by providing the other party a written request for mediation, setting forth the subject of the Dispute and the relief requested. The parties will cooperate with one another in selecting a mediator, and in scheduling the mediation proceedings. The parties will share equally in the costs of the mediator. Neither party may commence a civil action with respect to the matters submitted to mediation until after the completion of the initial mediation session, or 45 days after the date of filing the written

request for mediation, whichever occurs first. Mediation may continue after the commencement of a civil action, if the parties so desire. The provisions of this paragraph may be enforced by any Court of competent jurisdiction.

21. Limitations on Actions

21.1 Causes of action by either party against the other party, however denominated, shall be barred two years from the day ENGINEER's services are completed or ENGINEER otherwise ceases providing the services called for in this Agreement, whichever first occurs.

22. Controlling Law

22.1 This Agreement is to be governed by the laws and regulations of the state in which the project is located, without regard to any choice of law principles that may otherwise have permitted the application of the laws of any other jurisdiction.

23. Interpretation

23.1 The parties expressly agree that this Agreement shall be construed neither against nor in favor of either party, but shall be construed in a neutral manner.

24. Notices

24.1 Any notice required under this Agreement will be in writing, addressed to the appropriate party at its address as listed in the Agreement and given personally, by registered or certified mail post prepaid or by a commercial courier service. All notices shall be effective upon the date of receipt.

End of Standard Terms and Conditions for Professional Services

EXHIBIT B

CITY OF HUNTER - HUNTER DAM EMERGENCY ACTION PLAN (EAP)

LIST OF TASKS AND ESTIMATED PERSON HOURS



TASK NO.	WORK TASK DESCRIPTION	Defined Limits	PRINCIPAL	PM	SR PE / GI	Prof. Eng. 1	Project Eng.	Survey/GIS Manager	GIS Tech 2	Survey - 2 Person	CLERICAL
A HUNTER DAM - DEVELOPMENT OF EMERGENCY ACTION PLAN FOR HIGH HAZARD DAM											
1.0 Preliminary Planning, Scoping, Funding & Authorization											
1.01	Develop Scope of Feasibility Study		1	4	2	1					
1.02	Coordinate Scope of Work with SWC				1	1					
1.03	Develop Proposed Roadmap for Funding/Repayment			1	1	1					
1.04	Presentation of Study & Roadmap at Hunter Council Meeting - August 14, 2017			1		2					
1.05	Assist Sponsor to Acquire Cost Share from SWC & Cass County for Feasibility Study				1	2					1
1.06	Coordinate Final Approval of Cost Share, Scope, Notice to Proceed - Estimated October 9, 2017		1	1		2					1
SUBTOTAL - TASK 1.0			2	7	5	9					2
2.0 Accumulation of Data, Modeling, Inundation Maps											
2.01	Field Visit, obtain records, plans, maps from City & County, Review GIS Data			1	1	8					
2.02	Analyze obtained information to determine gaps to be filled by field survey, Survey Request				1	1	1				
2.03	Field survey, CADD Drafting, Consolidate records and maps			1		2	4	1	2	10	
2.04	GIS Preparation of Surface and Support for the 2-D Modeling effort				1.5	4					
2.05	HEC-RAS Geometry Development			1	3	32					
2.06	HEC-RAS Flow File with Boundary Conditions(Assumes PMF Hydrology is available but includes time for TR60 Hydrograph)			1	1.5	12					
2.07	HEC-RAS Model Runs			1	6	32					
2.08	Maps of Model Results			1	4	16					
2.09	2-D Report Write-up			1	6	40					
2.10	QA/QC of Just 2-D Modeling & 2-D Write-up			1	3	12					
SUBTOTAL - TASK 2.0			8	27	159	5	1	2	10		
3.0 Preparation of Emergency Action Plan											
3.01	Development of Flowchart			1		2	2				1
3.02	Detection and Classification of Dam Failure				4		16				
3.03	Determine Emergency Action Responsibilities			1	1	4	2				1
3.04	Map of Downstream Hazards			1	2		4				
3.05	EAP Report - Cover, TOC and Body			2	2	8	8				2
3.06	EAP Report - Maps and Exhibits				1	2	4	2	8		2
3.07	QA/QC: Review & revise report prior to submittal to the owner		2	2	4						

Note: All items that contain no hours are EXCLUDED from the Proposal.

EXHIBIT B

**CITY OF HUNTER - HUNTER DAM EMERGENCY ACTION PLAN (EAP)
LIST OF TASKS AND ESTIMATED PERSON HOURS**



TASK NO.	WORK TASK DESCRIPTION	Defined Limits	PRINCIPAL	PM	SR PE / GL	Prof. Eng. 1	Project Eng.	Survey/GIS Manager	GIS Tech 2	Survey - 2 Person	CLERICAL
SUBTOTAL - TASK 3.0			2	7	14	16	36	2	8		6
4.0	Attend City/WRD Meetings to Present Report and Recommendations										
4.01	Prepare for, Attend City of Hunter meeting to review recommendations			2		4					
6.02	Make revisions to EAP based on City/County/WRD/SWC review, Prepare Final Document, Distribute				2	2	2		2		1
6.03	Prepare for, Present at public meeting in City of Hunter (assume August 2018)			2	4	6					1
SUBTOTAL - TASK 4.0				4	6	12	2		2		2

Task	COST/HOUR	PRINCIPAL	PM	SR PE / GL	Prof. Eng. 1	Project Eng.	Survey/GIS Manager	GIS Tech 2	Survey - 2 Person	CLERICAL	Reimb	TOTAL
NTER DAM - DEVELOPMENT OF EMERGENCY ACTION PLAN FOR HIGH HAZARD DAM												
Preliminary Planning, Scoping, Funding & Authorization	HOURS	2	7	5	9					2		
	TOTAL	\$420	\$1,260	\$925	\$1,440					\$160	\$100	\$4,305
Accumulation of Data, Modeling, Inundation Maps	HOURS		8	27	159	5	1	2	10			
	TOTAL		\$1,440	\$4,995	\$25,440	\$725	\$130	\$210	\$2,150		\$100	\$35,190
Preparation of Emergency Action Plan	HOURS	2	7	14	16	36	2	8		6		
	TOTAL	\$420	\$1,260	\$2,590	\$2,560	\$5,220	\$260	\$840		\$480		\$13,630
Attend City/WRD Meetings to Present Report and Recommendations	HOURS		4	6	12	2		2		2		
	TOTAL		\$720	\$1,110	\$1,920	\$290		\$210		\$160	\$100	\$4,510
ALL TOTAL												\$57,835

Note: All items that contain no hours are EXCLUDED from the Proposal.



North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
(701) 328-2750 • TTY 1-800-366-6888 • FAX (701) 328-3696 • <http://swc.nd.gov>

February 23, 2018

Ben Olson, Mayor
City of Hunter
PO Box 56
Hunter, ND 58048

Re: Hunter Dam Emergency Action Plan

Dear Mayor Olson,

Enclosed are two copies of a cost-share agreement between the North Dakota State Water Commission and Hunter Dam Emergency Action Project.

The City and its attorney should review the agreements. Should you note an error or required revisions, please return the document with appropriate documentation. If the terms of the agreements are acceptable, sign both copies and return one copy to me. Along with the signed agreements, please forward the City's "certificate of insurance." All agreements returned without insurance requirement documentation are voidable by the North Dakota State Water Commission.

The agreements are void if not signed and returned by the City within 60 days of the Secretary's signature. Don't hesitate to contact me at 701-328-4862 if you have any questions or concerns regarding this process.

Sincerely,

Beth Nangare
Cost Share Administrator

BN/2099
Enclosures

**Agreement for Cost-Share Reimbursement
City of Hunter
Hunter Dam Emergency Action Plan**

1. PARTIES. This agreement is between the State of North Dakota (State), by and through the State Water Commission (Commission), and the city of Hunter (City).

2. COMMISSION'S RESPONSIBILITY AND INTENT. Commission will provide City with cost-share, not to exceed \$46,108, as approved by Chief Engineer, to reimburse 80 percent of the actual eligible costs incurred in City's Hunter Dam Emergency Action Plan (Plan) contingent on availability of funds and conditions of this agreement. Commission's intent in providing this funding to City is merely to help City financially afford Plan. City retains sole and absolute discretion in the manner and means of carrying out Plan, except to the extent specified in this agreement.

3. CITY'S RESPONSIBILITIES. City must:

- a. Develop a Plan for Hunter Dam that complies with the *Emergency Action Plan (EAP) Requirements for Cost Share (January 2009)*.
- b. Maintain and revise Plan as necessary to keep current.
- c. Maintain a Plan file containing documents relevant to Plan for the lifetime of Plan. State is not responsible for maintaining file.
- d. Prior to signature, inform Commission and any other relevant party regarding Plan of any errors, misinterpretations, changes, modifications, miscalculations, incorrect Plan descriptions, or any other information stated herein that is inaccurate.
- e. Provide a progress report to Commission at least every four years if the term of Plan exceeds four years. If a progress report is not timely received, or if after a review of a progress report Commission determines Plan has not made sufficient progress, Commission may terminate the agreement for Plan funding.

4. PROJECT DESCRIPTION AND LOCATION. Plan will develop an EAP for Hunter Dam, which is located in Sections 13-14 and 23-24, Township 143 North, Range 52 West, near City in Cass County. Hunter Dam is classified as a high hazard dam.

5. ELIGIBLE COSTS. Commission has sole discretion to determine eligible costs and availability of Commission funds. Additional information is outlined in Commission's cost-share policy.

6. **PAYMENT.** Commission will make partial payments upon receipt and approval of District's written request. Request for final payment must include a copy of Plan. Commission representative may review Plan for satisfaction of Commission's cost-share requirements before Commission makes payment to City.

7. **INDEMNIFICATION.** City must require all subcontractors, other than state employed subcontractors, before commencement of an agreement between City and the subcontractor, to defend, indemnify, and hold harmless State, from and against claims based on the vicarious liability of State or its agents, but not against claims based on State's negligence or intentional misconduct. The legal defense provided by subcontractor to State under this provision must be free of any conflicts of interest, even if retention of separate legal counsel for State is necessary. Subcontractor also agrees to reimburse State for all costs, expenses, and attorneys' fees incurred if State prevails in an action against subcontractor in establishing and litigating the indemnification coverage required herein. This obligation continues after the termination of this agreement.

8. **INSURANCE.** State and City each must secure and keep in force during the term of this agreement, from an insurance company, government self-insurance pool, or government self-retention fund authorized to do business in North Dakota, commercial general liability with minimum limits of liability of \$250,000 per person and \$500,000 per occurrence.

In addition, District must require all subcontractors, other than state employed subcontractors, before commencement of an agreement between District and the subcontractor, to secure and keep in force during the term of this agreement, from insurance companies authorized to do business in North Dakota, the following insurance coverages:

- a. Commercial general liability, including premises or operations, contractual, and products or completed operations coverages (if applicable), with minimum liability limits of \$1,000,000 per occurrence.
- b. Automobile liability, including Owned (if any), Hired, and Non-owned automobiles, with minimum liability limits of \$250,000 per person and \$1,000,000 per occurrence.
- c. Workers compensation coverage meeting all statutory requirements. The policy must provide coverage for all states of operation that apply to the performance of this contract.
- d. If subcontractor is domiciled outside State, employer's liability or "stop gap" insurance of not less than \$1,000,000 as an endorsement on the workers compensation or commercial general liability insurance.

The insurance coverages listed above must meet the following additional requirements:

- e. Any deductible or other similar obligation under the policies is the sole responsibility of the subcontractor. The amount of any deductible is subject to approval by State.

- f. This insurance may be in policy or policies of insurance, primary and excess, including the so-called umbrella or catastrophe form, and must be placed with insurers rated "A-" or better by A.M. Best Company, Inc., provided any excess policy follows form for coverage. Less than an "A-" rating must be approved by State. The policies must be in form and terms approved by State.
- g. State will be defended, indemnified, and held harmless to the full extent of any coverage actually secured by the subcontractor in excess of the minimum requirements set forth above. The duty to defend, indemnify, and hold harmless State under this agreement is not limited by the insurance required in this agreement.
- h. State must be endorsed on the commercial general liability policy, including any excess policies, as additional insured. State must have all the benefits, rights, and coverages of an additional insured under these policies that are not limited to the minimum limits of insurance required by this agreement or by the contractual indemnity obligations of District.
- i. The insurance required in this agreement, through a policy or endorsement, must include:
 - (1) A "Waiver of Subrogation" waiving any right to recovery the insurance company may have against State;
 - (2) A provision that subcontractor's insurance coverage is primary (i.e., pay first) as respects any insurance, self-insurance, or self-retention maintained by State and that any insurance, self-insurance, or self-retention maintained by State must be in excess of the subcontractor's insurance and must not contribute with it;
 - (3) Cross liability/severability of interest for all policies and endorsements;
 - (4) The legal defense provided to State under the policy and any endorsements must be free of any conflicts of interest, even if retention of separate legal counsel for State is necessary;
 - (5) The insolvency or bankruptcy of the insured subcontractor must not release the insurer from payment under the policy, even when such insolvency or bankruptcy prevents the insured subcontractor from meeting the retention limit under the policy.
- j. The subcontractor must furnish a certificate of insurance to Commission before commencement of this agreement. All endorsements must be provided as soon as practicable.
- k. Failure to provide insurance as required in this agreement is a material breach of contract entitling State to terminate this agreement immediately.
- l. The subcontractor must provide at least 30 days' notice of any cancellation or material change to the policies or endorsements. During the term of this agreement, subcontractor must provide renewal certificates 10 days before coverage expiration.

9. BREACH. Violation of any provision of this agreement by City constitutes breach of this agreement. A breach obligates City to reimburse Commission for all funds paid to City and relieves Commission of all obligations under this agreement.

10. AGREEMENT BECOMES VOID. This agreement is void if not signed and returned by City within 60 days of Commission's signature.

11. TERMINATION.

- a. Commission may terminate this agreement effective upon delivery of written notice to City, or a later date as may be stated in the notice, under any of the following conditions:
 - (1) If Commission determines an emergency exists.
 - (2) If funding from federal, state, or other sources is not obtained and continued at levels sufficient to provide the funds necessary to comply with this agreement. The parties may modify this agreement to accommodate a reduction in funds.
 - (3) If federal or state laws or rules are modified or interpreted in a way that the services are no longer allowable or appropriate for purchase under this agreement or are no longer eligible for the funding proposed for payments authorized by this agreement.
 - (4) If any license, permit, or certificate required by law, rule, or this agreement is denied, revoked, suspended, or not renewed.
 - (5) If Commission determines that continuing the agreement is no longer necessary or would not produce beneficial results commensurate with the further expenditure of public funds.
- b. Any termination of this agreement is without prejudice to any obligations or liabilities of either party already accrued prior to termination.
- c. The rights and remedies of any party provided in this agreement are not exclusive.

12. APPLICABLE LAW AND VENUE. This agreement is governed by and construed under the laws of State. Any action to enforce this agreement must be adjudicated exclusively in the District Court of Burleigh County, North Dakota.

13. SEVERABILITY. If any term of this agreement is declared by a court having jurisdiction to be illegal or unenforceable, the validity of the remaining terms is unaffected, and if possible, the rights and obligations of the parties are to be construed and enforced as if the agreement did not contain that term.

14. SPOILIATION – PRESERVATION OF EVIDENCE. City agrees to promptly notify Commission of all potential claims that arise or result from this agreement. City must also take all reasonable steps to preserve all physical evidence and information that may be relevant to the circumstances surrounding a potential claim, while maintaining public safety, and grants to Commission the opportunity to review and inspect the evidence, including the scene of an accident.

15. MERGER AND MODIFICATION. This agreement constitutes the entire agreement between the parties. There are no understandings, agreements, or representations, oral or written, not specified within this agreement. This agreement may not be modified, supplemented, or amended in any manner, except by written agreement signed by both parties.

**NORTH DAKOTA STATE WATER
COMMISSION**

By:



GARLAND ERBELE, P.E.
Chief Engineer - Secretary

Date: February 23, 2018

CITY OF HUNTER

By:

BEN OLSON
Mayor

Date: _____



April 4, 2018

Cass County
Joint Water
Resource
District

Richard Steen
Chairman
Cass County Commission
P.O. Box 2806
Fargo, ND 58108-2806

Dear Chairman Steen:

RE: FEMA floodplain mapping efforts
City of Arthur
Townships in northern Cass County

Dan Jacobson
Chairman
West Fargo, North Dakota

Rodger Olson
Manager
Leonard, North Dakota

Lance Yohe
Manager
West Fargo, North Dakota

Ken Lougheed
Manager
Gardner, North Dakota

Jacob Gust
Manager
Fargo, North Dakota

The Cass County Joint Water Resource District (CCJWRD) has acted as the coordinating agency on the Western Cass Flood Insurance Study (FIS) since 2013. The CCJWRD has put forth an extensive effort to review the technical information produced by FEMA in order to ensure that the information is reasonable and that the actual flood risks are properly identified. This is particularly important because any properties located within the FEMA high risk flood zones may be required to purchase expensive flood insurance. This review effort has resulted in FEMA re-scoping their study twice due to the significant errors identified by CCJWRD's review efforts. Part of this effort included multiple public meetings with city and township officials to communicate the ongoing study and collect input on concerns over FEMA's study and other issues. The CCJWRD serviced as a conduit between local entities and FEMA for information pertaining to the study. An accounting report is enclosed setting out total costs to-date in the amount of \$141,346.08.

CCJWRD has been contacted recently to work with the City of Arthur and townships in northern Cass County to assist with floodplain mapping efforts related to the Western Cass FIS project. At this time, the estimated cost for the future effort is \$25,000; however, this is dependent upon the accuracy of the technical data prepared by FEMA which will be reissued later in 2018. The CCJWRD may also provide assistance to local entities throughout Cass County on the filing of any technical appeals that may be necessary as the process moves forward.

The CCJWRD respectfully requests consideration for funding of costs previously incurred for the Western Cass FIS, as well as costs for future efforts in Arthur and townships in northern Cass County.

If you have any questions, please feel free to contact us or the engineer for CCJWRD, Mike Opat, Moore Engineering, Inc., at 701-282-4692.

Sincerely,

CASS COUNTY JOINT WATER RESOURCE DISTRICT

Carol Harbeke Lewis
Secretary-Treasurer

Enclosure

Carol Harbeke Lewis
Secretary-Treasurer
1201 Main Avenue West
West Fargo, ND 58078-1301

701-298-2381
FAX 701-298-2397
wrld@casscountynnd.gov
casscountygov.com

03/27/18
13:05:27

CASS COUNTY WATER RESOURCE DISTRICTS
Detail Ledger Query
For the Accounting Periods: 1/ 9 - 3/18

Page: 1 of 2
Report ID: L091

Funds 1000-1000, AND ACCT=441070

Fund/Account/ Doc/Line #	Description	Vendor/Receipt From	Acct. Period	Debit	Credit
1000 SOUTHEAST CASS WATER RESOURCE DISTRICT					
441070 WESTERN CASS FIS (2013)					
304 LEGAL FEES-MAPLE RIVER					
CL 7783 5 120915	Floodplain Management	OHNSTAD TWICHELL, P.C.	6/13	115.20	
CL 7910 22 122104	Floodplain Management	OHNSTAD TWICHELL, P.C.	7/13	33.35	
	Object Total:			148.55	
305 LEGAL FEES-NORTH CASS					
CL 7783 6 120915	Floodplain Management	OHNSTAD TWICHELL, P.C.	6/13	57.60	
CL 7910 23 122104	Floodplain Management	OHNSTAD TWICHELL, P.C.	7/13	16.68	
	Object Total:			74.28	
306 LEGAL FEES-RUSH RIVER					
CL 7783 7 120915	Floodplain Management	OHNSTAD TWICHELL, P.C.	6/13	57.60	
CL 7910 24 122104	Floodplain Management	OHNSTAD TWICHELL, P.C.	7/13	16.68	
	Object Total:			74.28	
401 LEGAL FEES					
CL 7783 1 120915	Floodplain Management	OHNSTAD TWICHELL, P.C.	6/13	345.60	
CL 7910 21 122104	Floodplain Management	OHNSTAD TWICHELL, P.C.	7/13	100.06	
	Object Total:			445.66	
402 ENGINEERING FEES					
CL 7785 46 5451	Western Cass FIS Review	MOORE ENGINEERING INC	6/13	3,497.50	
CL 8321 39 6692	Western Cass FIS Review	MOORE ENGINEERING INC	11/13	4,109.10	
CL 8500 39 7080	Western Cass FIS Review	MOORE ENGINEERING INC	1/14	3,505.00	
CL 8608 39 7246	Western Cass FIS Review	MOORE ENGINEERING INC	2/14	2,207.50	
CL 8775 39 7505	Western Cass FIS Review	MOORE ENGINEERING INC	4/14	187.50	
CL 9338 39 8722	Western Cass FIS Review	MOORE ENGINEERING INC	10/14	12,560.00	
CL 9502 41 9007	Western Cass FIS Model R	MOORE ENGINEERING INC	11/14	15,800.00	
CL 9611 41 9316	Western Cass FIS Model R	MOORE ENGINEERING INC	12/14	9,537.50	
CL 9927 41 9733	Western Cass FIS Model R	MOORE ENGINEERING INC	3/15	2,497.50	
CL 10321 41 10321	Western Cass FIS Model R	MOORE ENGINEERING INC	6/15	7,527.50	
CL 10540 41 10594	Western Cass FIS Model R	MOORE ENGINEERING INC	7/15	350.00	
CL 10700 41 10807	Western Cass FIS Model R	MOORE ENGINEERING INC	8/15	935.00	
CL 10831 41 11073	Western Cass FIS Model R	MOORE ENGINEERING INC	9/15	17,162.50	
CL 10936 42 11279	Western Cass FIS Model R	MOORE ENGINEERING INC	10/15	17,064.10	
CL 11076 42 11577	Western Cass FIS Model R	MOORE ENGINEERING INC	11/15	4,650.00	
CL 11149 42 11777	Western Cass FIS Model R	MOORE ENGINEERING INC	12/15	435.00	
CL 11316 42 11983	Western Cass FIS Model R	MOORE ENGINEERING INC	1/16	1,132.50	
CL 11497 42 12342	Western Cass FIS Rev-Stu	MOORE ENGINEERING INC	3/16	2,590.00	
CL 11611 46 12566	Western Cass FIS Model R	MOORE ENGINEERING INC	4/16	2,955.16	
CL 11889 55 13295	Western Cass FIS Review	MOORE ENGINEERING INC	7/16	702.50	
CL 11987 55 13462	Western Cass FIS Review	MOORE ENGINEERING INC	8/16	165.00	
CL 12063 55 13645	Western Cass FIS Review	MOORE ENGINEERING INC	9/16	165.00	
CL 12239 147 14230	Western Cass FIS	MOORE ENGINEERING INC	11/16	660.00	
CL 12459 55 14495	Western Cass FIS Review	MOORE ENGINEERING INC	1/17	1,650.00	
CL 12459 61 14622	Western Cass FIS Review	MOORE ENGINEERING INC	1/17	441.10	
CL 12748 60 15132	Western Cass FIS-Arthur	MOORE ENGINEERING INC	4/17	817.50	
CL 12812 56 15334	Western Cass FIS Review	MOORE ENGINEERING INC	4/17	200.00	
CL 13043 66 15853	Western Cass FIS Review	MOORE ENGINEERING INC	7/17	1,287.50	
CL 13113 60 16161	Western Cass FIS Rev-Art	MOORE ENGINEERING INC	7/17	7,633.85	
CL 13208 60 16373	Western Cass FIS Rev-Art	MOORE ENGINEERING INC	8/17	2,315.00	
CL 13303 63 16725	Western Cass FIS Rev-Art	MOORE ENGINEERING INC	9/17	1,800.00	

03/27/18
13:05:29

CASS COUNTY WATER RESOURCE DISTRICTS
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Fund/Account/ Doc/Line #	Description	Vendor/Receipt From	Acct. Period	Debit	Credit
1000	SOUTHEAST CASS WATER RESOURCE DISTRICT				
441070	WESTERN CASS FIS (2013)				
402	ENGINEERING FEES				
CL 13383 63 16953	Western Cass FIS Rev	MOORE ENGINEERING INC	10/17	3,025.00	
CL 13651 57 17536	Western Cass FIS Rev-COA	MOORE ENGINEERING INC	1/18	7,662.50	
CL 13693 57 17663	Western Cass FIS-City Ar	MOORE ENGINEERING INC	1/18	3,375.00	
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	Account Total:			141,346.08	
	Fund Total:			141,346.08	0.00
	Grand Total:			141,346.08	0.00



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Email: auditor@cityofharwood.com
www.cityofharwood.com

April 25, 2018

Flood Sales Tax Committee
c/o Richard Steen, Chair
PO Box 2806
211 Ninth Street South
Fargo, ND 58108

Dear Flood Sales Tax Committee,

The City of Harwood is requesting funding assistance for a flood risk reduction project from the Flood Sales Tax Committee.

In 2015, Harwood did receive funding for a portion of the Harwood Levee Improvements project. One of the components of that project did not occur, due to the inability to reach an agreement with the landowner on a buyout of the property at 116 Oak Circle.

The City of Harwood is resubmitting updated information for the purpose of completing this project. The project involves purchasing the property at 116 Oak Circle, which is located on the east bank of the Sheyenne River in Harwood. The City operates and maintains a levee at that location and the house and associated features on this property are within feet of the levee, which does not allow certain maintenance or construction activities to occur. The intent of the project is to demolish the structure and restore the property to a vacant lot as well as reconstruct the levee, which is sloughing, off of the shoulder of the river bank.

Attached to this letter are the following:

- Location map
- Estimate of total project cost
- Photos of the levee at this location

The total project cost is estimated to be \$402,000 and City of Harwood is requesting 50% cost participation from the sales tax program, which totals \$201,000. The other half of the cost is to be contributed by the City. Thank you for your consideration of this request.

Sincerely,

Bill Rohrich
Mayor of Harwood

Cass County

<input type="button" value="Zoom In"/>	<input type="button" value="Zoom Out"/>	<input type="button" value="Pan"/>	<input type="button" value="Zoom Prev"/>	<input type="button" value="Zoom Next"/>	<input type="button" value="Zoom Select"/>	<input type="button" value="Zoom Extent"/>	<input type="button" value="Clear"/>	<input type="button" value="Search Commands"/>	<input type="button" value="Identify"/>	<input type="button" value="Legend"/>
Navigation										



Scale 1: 2400

X: 2871109.718

Y: 500181.3661



Harwood Levee Modification

*116 Oak Circle
City of Harwood, ND*

4/25/2018

Engineer's Preliminary Opinion of Probable Cost

						POTENTIAL FUNDING SOURCES	
ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL	County Sales Tax (50%)	LOCAL (50%)	
<u>Real Estate Acquisition Items</u>							
1. 116 Oak Circle, Harwood ND	LS	1	\$292,000.00	\$292,000.00	\$146,000.00	\$146,000.00	
Total Real Estate Acquisition				\$292,000.00	\$146,000.00	\$146,000.00	
<u>Construction Items</u>							
1. Mobilization	LS	1	\$5,000.00	\$5,000.00	\$2,500.00	\$2,500.00	
2. Demolition	EA	1	\$30,000.00	\$30,000.00	\$15,000.00	\$15,000.00	
3. Clear and Grub	LS	1	\$3,000.00	\$3,000.00	\$1,500.00	\$1,500.00	
4. Topsoil Stripping and Spreading	SY	400	\$3.00	\$1,200.00	\$600.00	\$600.00	
5. Backfill - Basement	CY	670	\$15.00	\$10,050.00	\$5,025.00	\$5,025.00	
6. Inspection Trench	CY	945	\$4.00	\$3,780.00	\$1,890.00	\$1,890.00	
7. Embankment - Import	CY	800	\$15.00	\$12,000.00	\$6,000.00	\$6,000.00	
8. Utility Abandonment	LS	1	\$1,000.00	\$1,000.00	\$500.00	\$500.00	
9. Seeding - Type III	SY	400	\$0.50	\$200.00	\$100.00	\$100.00	
10. Storm Water Management	LS	1	\$1,000.00	\$1,000.00	\$500.00	\$500.00	
11. Material Testing	Invoice	Allowance	\$5,000.00	\$5,000.00	\$2,500.00	\$2,500.00	
Total Construction				\$72,200.00	\$36,100.00	\$36,100.00	
Contingencies (20%)				\$14,800.00	\$7,400.00	\$7,400.00	
Engineering				\$12,000.00	\$6,000.00	\$6,000.00	
Geotechnical / Environmental				\$4,000.00	\$2,000.00	\$2,000.00	
Bidding				\$5,000.00	\$2,500.00	\$2,500.00	
Legal & Adm. Fees				\$2,000.00	\$1,000.00	\$1,000.00	
TOTAL PROJECT COST				\$402,000.00	\$201,000.00	\$201,000.00	

NOTES:

1. Demolition item includes structural demolition of residence and detached garage, removal of all concrete.
2. Levee anticipated to be 8' wide with 3:1 side slopes.
3. Unit price for 116 Oak Circle includes 2017 assessed value plus outstanding special assessment balance.







Red River Basin Commission

26 April, 2018

RRBC US Office:

1120 28th Ave. N., Suite C
 Fargo, ND 58102
 T. 701-356-3183/ F. 701-235-7394

RRBC Canada Office:

205-1100 Concordia Avenue
 Winnipeg, MB R2K 4B8
 T. 204-982-7250/ F. 204-982-7255

Funding and timeline Proposal for Long Term Flood Solutions Update

Discussion

The RRBC's Long Term Flood Solutions was always intended to be a living document. Many flood damage reduction projects have been completed in the Basin and additional years and technology have improved the overall understanding of the hydrology of the basin. As such a deliberate update of the LTFS is overdue. Additional details of the proposed update are described in the proposal. This document supplements the proposal with additional

Timeline

- | | |
|-------------------|---|
| 1. 7 May 2018 | Proposal to Cass county Flood Sales Tax Committee |
| 2. Late June 2018 | Final funding increase decision from MN Legislature
Matching request to NS SWC
Finalize US Army Corps of Engineers (USACE) funding commitment |
| 3. Late July 2018 | Request to RRJWRD and NDJWRB for contributions |
| 4. September 2018 | Start project |
| 5. March 2020 | Publish updates |

Funding arrangements

RRBC Base funding from MN&ND	\$75,000 (project contribution based on increases from state)
USACE contribution in modelling	\$85,000 (Corps estimates not completed yet)
Requests to RRJWRD and NDJWRB	\$130,000 (potential to request based on finalization of ND/MN commitment and USACE estimates)
Request from Cass Flood Sales Tax	<u>\$210,000</u> \$500,000

RED RIVER BASIN
COMMISSION



photo credit: April Walker



photo credit: April Walker

proposal to update the **long-term flood solutions (LTFS) report**

April 6, 2018



photo credit: April Walker

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need for an LTFS report update	2
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estimated costs and project timeframe	12

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executive summary

The 2011 long-term flood solutions (LTFS) report presents recommendations to reduce flood risk and the damaging effects of floods throughout the Red River Basin. Progress has been made in the basin to address some of the LTFS report's recommendations; however, many of the recommendations have seen little or no progress. To truly reduce flood risk and flood damage throughout the basin, the LTFS needs to be a working document and will require periodic updates. Since completion of the LTFS, the hydrologic and hydraulic modeling tools in the basin have significantly improved. To continue assisting communities and other jurisdictions with implementing actions and projects that will build upon basin-wide flood risk and flood damage reduction efforts, improved analyses and implemented recommendations need to be incorporated into an updated LTFS report. These updates include:

changes in hydrology and FEMA designation of flood risk

Flood levels that have been defined for floodplain regulation are usually based on Federal Emergency Management Agency (FEMA) studies; however, as these flood studies become out of date and are updated, and/or flood projects are being developed, the regulatory flood levels often change. There is a need for a clearer understanding of how various factors affect the designated flood levels, why changes in the regulatory flood levels occur, and what factors need to be considered for the future, such as climate change, tile drainage, length of flow records, variation in snowpack/rainfall distribution, and confidence of technical data and analyses.

assessment of needs to protect against larger floods and implications for certifiable levels of protection

LTFS-recommended levels of protection for major urban areas for 500-year events and for smaller communities for 200-year events are rarely found in the basin. The actions needed to achieve these higher levels of protection, as well as flood emergency actions to address these larger floods, must be better defined throughout the basin.

As flood levels change, the level of protection provided by a flood-risk reduction project can also change and, in some cases, can cause a community to lose its certifiable level of protection. An assessment of which communities in the basin may be at risk of losing certification would be helpful in determining future flood risk.

effectiveness of upstream-retention structures to increase levels of protection

Technical upstream-retention analyses have focused on percent reductions in peak flood flows for 100-year events. However, at any given location, the flood risk is defined by flood levels. Target goals of flood-stage reduction at various communities/locations along the Red River and its tributaries should be addressed for not only the 100-year flood, but also the 200- and 500-year events.

The basin-wide map developed for the 2011 LTFS report identified within each tributary watershed where flood runoff from that basin contributed to the flood peak flow on the Red River and where retention on the tributaries would be most effective in reducing peak flows on the Red River. This map should be revised using updated runoff models developed after the LTFS was completed.

consistency and effectiveness of floodplain and stormwater management regulations

Floodplain and stormwater management regulations and their implementation vary throughout the basin. An assessment of the consistency and effectiveness of these regulations is needed. Development of sample model regulations would provide more consistency throughout the basin.

benefits of an update

An LTFS report update will yield numerous short- and long-term benefits, both locally and basin-wide.

table 1: LTFS update benefits

	short-term	long-term
local	Assist with prioritizing siting of local retention/storage projects by county and watershed district to benefit Red River main stem.	Assist communities with floodplain ordinance-update guidance.
	Provide communities with tools to update local emergency action plans for 100-year and larger floods.	Assist communities with stormwater ordinance update guidance.
	Assess potential issues with future certification of existing levee and interior drainage systems.	Provide guidance for incorporating basin-wide goals into local regulatory frameworks.
basin-wide	Incorporate recently implemented and planned flood-risk reduction projects and tools into the basin database.	Inform policy related to tile drainage and climate-change potential effects on flooding.
	Provide public information and education about recently implemented projects and tools related to flood-risk reduction.	Manage expectations about real flood risks in the basin, particularly for the largest floods.
	Provide basin-wide information for elected officials, decision-makers, and the public.	Provide guidance for siting basin-wide retention projects to reduce flooding along the Red River main stem.
	Support continued improvement of basin-wide assessment for ongoing prioritization of efforts and projects.	

background

The Red River Basin Commission (RRBC) produced the LTFS report in 2011, after the 2009 flood, when the states of Minnesota and North Dakota expressed a need for a coordinated, comprehensive, and proactive plan that responds to and mitigates flooding and flood damages throughout the Red River watershed. The 2009 flood was a record flood in the southern portion of the Red River Basin. It also followed a series of major flood events throughout the basin during the previous decade, including the devastating 1997 flood. The LTFS report provided 48 specific recommendations for action, ranging from immediate needs and critical risks to long-term studies. These recommendations are available in the LTFS executive summary report on the RRBC website: <https://www.redriverbasincommission.org/resources>



Federal, state, and local flood-mitigation efforts in the basin have continued since the LTFS report was created, implementing some of its recommendations. In 2015, an RRBC-prepared progress report documented the status of the LTFS report's recommendations. The status report showed that substantial implementation progress had been made for about 20 percent of the recommendations, but that limited or no progress had been made for about 50 percent of the recommendations.

Several completed and nearly completed major studies will help with implementation of the LTFS' recommended projects:

- Tributary-sub-basin upgraded hydrologic models
- Red River upgraded hydraulic model
- Halstad upstream retention study
- Red River of the North comprehensive watershed management plan
- Red River retention study (Halstad to Canadian border)

need for an LTFS report update

Multiple issues and needed updates focus on LTFS report recommendations relating to flood-risk reduction, floodplain management, and potential effectiveness of upstream floodwater retention meeting protection-level goals (recommended by the RRBC in the 2011 LTFS). Several report recommendations are of major concern and need further study to advance implementation (see table at the end of this section).

raising levels of protection and retention

Progress has been made on recommendations 1.1, 1.3, 2.B.1, and 2.B.3 (focused on raising levels of protection for communities throughout the basin) and recommendations 2.C.4 and 2.C.5 (focused on implementing upstream floodwater retention to reduce peak flows for major floods). However, the rate of progress has been less than anticipated, and additional efforts are needed to move toward implementation.

What actions and measures are needed to successfully protect our community from floods larger than the 100-year event?

It is critical to develop information to help the public, stakeholders, and decision-makers (at all levels from local to federal) better understand the risk of flooding and the adequacy of basic information used to define flood risk. For many communities, the main flood-risk reduction project goal focuses on achieving a certifiable level of protection so that communities can be removed from the FEMA definition of high-risk flood zones (i.e., a 100-year level of protection). However, the risk of larger floods and RRBC's recommended higher levels of protection receive little consideration, and emergency action plans seldom address protection from larger floods. LTFS-recommended levels of protection for major urban areas for 500-year events and smaller communities for 200-year events are rarely found in the basin. The actions needed to achieve these higher levels of protection, as well as flood emergency actions to address these larger floods, must be better defined throughout the basin. Understanding the level of effort and potential repetitive expenses, as well as the potential damages of doing nothing, will help officials make informed decisions about permanent protection for higher-level flood events.

Additional analyses are needed that focus on the relationship of retention in each sub-basin watershed to increased levels of protection for communities experiencing major flood-damage risk potential along the main stem of the Red River. To date, completed studies have focused on flow-reduction goals; however, for most communities, a focus on flood-stage reduction goals to provide increased levels of protection would offer greater value.

non-structural strategies

Recommendations 2.A.1, 2.A.3, 2.A.4, 2.A.6, 2.A.7, and 2.A.9 relate to reviewing and updating existing floodplain management regulations and guidance; developing floodplain management educational materials; and coordinating inter-jurisdictional floodplain mitigation/management efforts throughout the

basin. To date, these recommendations have received very little attention. They now need to be addressed.

Several key study needs require a basic understanding of flood risk throughout the basin. However, many existing FEMA floodplain maps and risk assessments are not based on the most recent flood history, hydrologic analysis, and methodology. An analysis of current floodplain maps and risk assessments for communities throughout the basin would provide a better basis for understanding how future floods and updated analyses might impact floodplain maps and flood risks.

table 2: selected 2011 LTFS recommendations requiring additional implementation effort

- 1.1** Flood protection trajectory for Fargo-Moorhead metro area should continue
- 1.3** Retention storage upstream of Hickson-Abercrombie should be advanced
- 2.A.1** Floodplain regulations and zoning should contain criteria for higher protection applicable to new construction
- 2.A.3** Local governments should update floodplain ordinances, not permit new development in areas of high-risk flooding, and minimize the use of variances.
- 2.A.4** A review of floodplain regulations and programs should be undertaken.
- 2.A.6** A Floodplain Bill of Rights should be developed by the Red River Basin Commission.
- 2.A.7** Red River Basin Commission should develop educational materials on floodplain issues.
- 2.A.9** Minnesota and North Dakota Silver Jackets teams should collaborate on an interstate strategy for flood recovery and flood mitigation projects.
- 2.B.1** Grand Forks and East Grand Forks should strive to increase level of protection to 500 year or greater.
- 2.B.3** State emergency managers should document at-risk critical infrastructure.
- 2.C.4** The Red River Retention Authority should work with water management boards to implement retention
- 2.C.5** The Red River Retention Authority should develop a project prioritization methodology.

proposed update studies

Several studies are needed to update the LTFS report and help implement the original report recommendations.

risk reduction/raising levels of protection/retention

The following tasks will help improve flood-risk understanding, increase levels of protection, and advance implementation of upstream floodwater retention.

task 1: update basin-wide HEC-HMS hydrology analysis

task 1a: update basin-wide HEC-HMS hydrology analysis

The U.S. Army Corps of Engineers (USACE) is developing a HEC-WAT model that connects updated HEC-HMS and HEC-RAS models throughout the basin. As part of the USACE study, updated 100-year base hydrographs along the Red River were developed to evaluate the effect of proposed flood-retention projects. As a continuation of the current USACE study, the RRBC may coordinate directly with the USACE to develop 200- and 500-year base hydrographs along the Red River. The base hydrographs for the 200- and 500-year events can be used to evaluate the effects that currently proposed floodwater-retention projects would have on peak water-surface elevations for these events at up to 16 communities along the Red River.

During the updates, model results will be reviewed and coordinated with the USACE project delivery team to obtain the necessary information for updating the LTFS report. Updated discharges will be compared to hydrology estimates based on the full period of record and historic floods along the Red River.

task 1b (alternate): update basin-wide HEC-HMS hydrology analysis

It is understood that the RRBC may request the USACE to perform this task along with their ongoing work for the 100-year base hydrographs. Therefore, two budget estimates have been provided for this task. The estimate for Task 1a assumes the hydrologic model updates will be completed by the USACE as part of a separate contract. The second estimate, for Task 1b, assumes that the basin-wide hydrology updates for the 200- and 500-year events will be completed as part of this contract without USACE assistance and that results will be incorporated into the LTFS report. In this case, Task 1b would be required in addition to Task 1a.

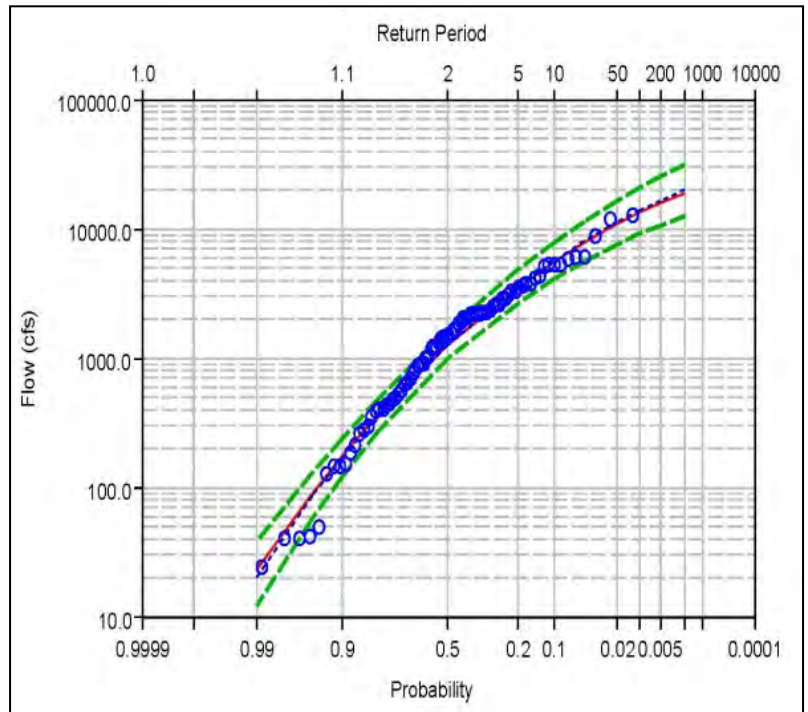
task 2: update hydrology changes and FEMA flood-risk designations and perform basin-wide hydrology analyses

task 2a: assess current and existing FEMA floodplain maps/hydrology

To determine the period of record used in the analysis, effective FEMA floodplain maps, hydrology, and 100-year water-surface elevations would be reviewed and summarized at selected communities along the Red River and its tributaries. The assessment would include up to 16 communities along the Red River and up to 30 communities on tributaries to the Red River. Primarily, the communities would be selected from those listed in Table D-5 of the 2011 LTFS report.

task 2b: analyze full period of record for Red River main stem and tributaries

The full period of discharge records would be used to determine the discharges and elevations that would be used for updating the FEMA floodplain analyses along the Red River main stem and tributaries. These analyses would use current guidelines for discharge/frequency analyses and the period of record through 2009, or more recent as appropriate. However, these results would be for planning and evaluation purposes only and would not be the basis for updating the official FEMA maps. Up to 16 locations along the Red River would be selected for analysis, as well as up to 30 locations on the tributaries. The locations would be similar, as much as possible, to the locations listed in Table D-5 of the LTFS report.



The update would include discharge-frequency analyses for the full period of record.

task 2c: compare current FEMA hydrology to full period of record and floods of record

A table will be developed that summarizes the differences in discharges and elevations between effective FEMA discharges and elevations, estimated updated analyses using the full period of record, and actual floods of record for those communities/locations evaluated as part of Task 2b.

task 2d: coordinate hydrologic analyses with agencies

Hydrology analyses results using the full period of record would be coordinated with the North Dakota State Water Commission (NDSWC), Minnesota Department of Natural Resources (MNDNR), FEMA, USACE, National Weather Service River Forecast Center, and U.S. Geological Survey (USGS).

task 2e: discuss sensitivity of hydrology to climate change, upstream floodwater retention, drainage, and other factors

The LTFS update will discuss the factors that can affect flood flows and levels, the FEMA-designated floodplains, and estimations of flood risk. These factors could include climate change, updated national Atlas 14 rainfall guidelines, confidence limits, distribution of precipitation/snowpack, surface and subsurface drainage systems, and floodwater-retention structures. This task would be primarily based on a review of existing studies and information pertinent to the Red River Basin area.

climate change

Climate-change information and studies developed and used by the Minnesota state climatologist, Manitoba agencies, National Weather Service, and other pertinent sources would be reviewed and summarized in the context of potential effects on floods in the Red River Basin.

Atlas 14 rainfall guidelines

Subsequent to the 2011 LTFS report, updated rainfall guidelines for the entire United States were published by the National Oceanic and

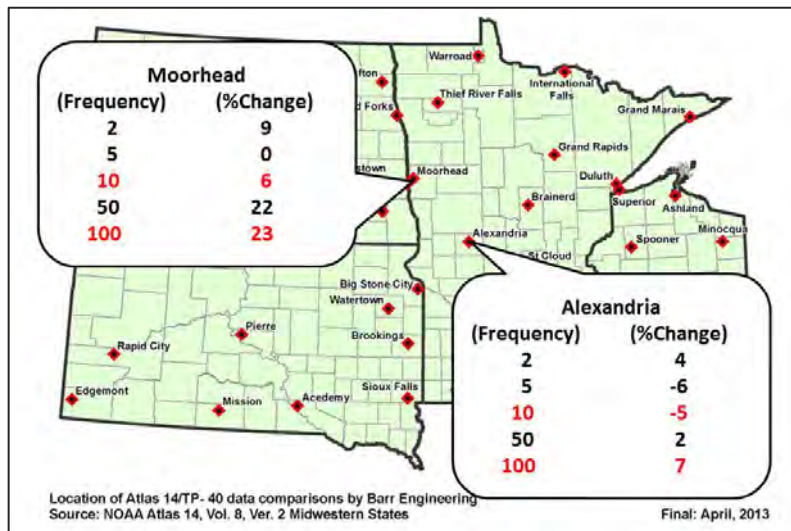
Atmospheric Administration in 2013 as Atlas 14. These guidelines used the most current available rainfall data and replaced the older TP-40 guidelines, which were developed in the 1960s. The update will discuss the implications of these new guidelines for interior drainage systems, impoundments, flood flows and frequencies on the Red River and its tributaries.

confidence limits

FEMA-designated floodplains are based on the determination of flood magnitudes and frequencies at given locations. These determinations are based on the availability of measured flood discharges and elevations. The relative accuracy/reliability of these estimates depends on several factors, including availability of reliable measurements, length of record, etc. Although FEMA selects a specific value for defining the base flood level and associated floodplain, this value can be subject to wide variation, which is not usually recognized by the public and interests affected by the floodplain designation. Thus, any changes to the floodplain designation due to improved technical information, which would more accurately represent the flood risk, are typically resisted by the affected public. How the various factors, such as length of record and occurrence of large flood events, affect the determination of flood frequencies and flood levels would be discussed in the update.

distribution of precipitation/snowpack

Every flood has different causative factors. For spring snowmelt floods, these factors include snowpack/water-content amount and distribution, melt rates, coincidental rainfall, and antecedent conditions such as frost depth and saturation extent of soil. For summer rainfall events, the amount, intensity, and distribution of rainfall are the predominant variants, although antecedent conditions such as soil saturation also play a role. A flood of a specific magnitude at a given location, such as the 100-year (1-percent-chance) flood, can be caused by many different upstream conditions. The larger the upstream watershed area, the greater the number of possible combinations that can cause that magnitude of flood.



The update will address the impact of Atlas 14 rainfall data published since the 2011 LTFS report.

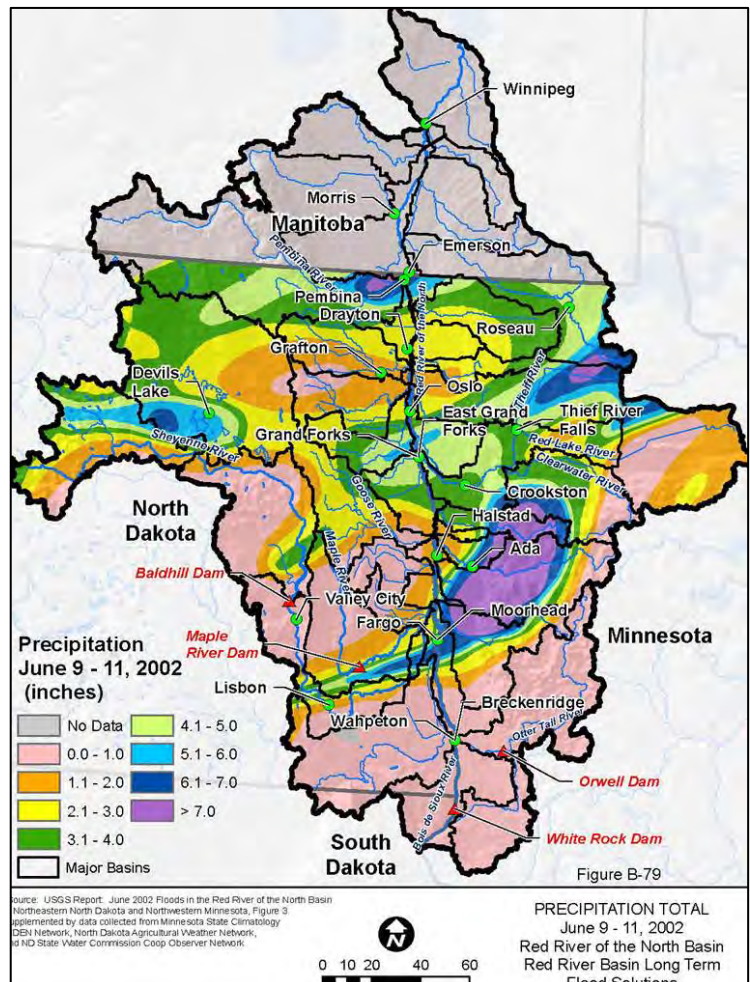
These possible variations are critical in determining the effectiveness of upstream retention structures in reducing flood levels at downstream communities. The update would discuss variations in causative flood factors relative to multiple locations on the Red River main stem and its tributaries.

drainage

Surface and subsurface drainage can affect the volume, rate, and timing of floodwater runoff. Whereas surface drainage systems throughout the basin have been a part of the landscape for decades, subsurface (tile) drainage systems are relatively new, and there is much to be learned about their effects on the downstream flood flows. Current studies related to tile drainage systems and a generalized sensitivity evaluation of the potential effects of these systems on larger floods on the main stem of the Red River would be conducted as part of the update.

floodwater retention structures

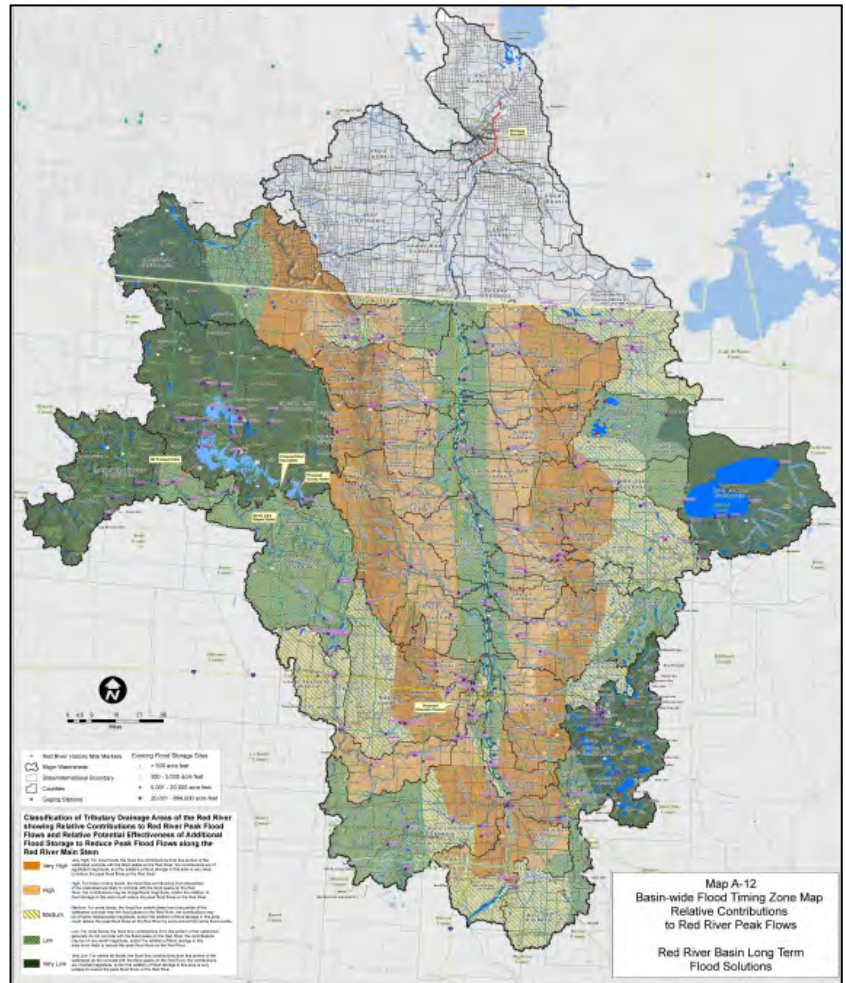
The location, amount of retention storage, and regulation of storage all have potential effects on flood-flow reduction at downstream locations. The Halstad upstream retention study and the Red River retention study illustrate the potential flow reductions that could be affected by a series of retention structures distributed throughout the basin. A sensitivity analysis would be conducted to review the effectiveness of controlled versus uncontrolled operations for reducing peak flood flows and flood levels along the Red River at five locations (Wahpeton/Breckenridge, Fargo/Moorhead, Halstad, Grand Forks/East Grand Forks, and Emerson) for the 100-, 200-, and 500-year flood events using the balanced hydrograph approach. The sensitivity analysis would also evaluate the effectiveness of a couple of scenarios related to the number of retention structures and amount of storage available within each of the tributary watersheds. Another sensitivity analysis would be conducted to estimate a timeline and scenarios under which the discharge-frequency analysis along the Red River might be affected by the floodwater retention structures and how such changes might be reflected in revisions to the FEMA-recognized floodplain and/or certified levels of protection.



Precipitation distribution is one causative flood factor that will be discussed in the LTFS update.

task 2f: evaluate updated tributary contributions to Red River peak flows and retention effectiveness (basin-wide maps)

The LTFS report presented two basin-wide maps. The original map (map A-11) depicts the effects of timing (early/middle/late) on Red River peak flows at the international border. Based on information used for map A-11, the second map (map A-12) illustrates relative contributions of various parts of the tributary watersheds to Red River peak flows. The relative-contributions map is particularly helpful in determining floodwater-retention storage locations that will be most effective for reducing peak flows along the Red River main stem. Since completion of the LTFS report, an upgraded runoff model (HMS model) has been developed for each tributary sub-basin using the consistent methodology. The map showing relative contributions to Red River peak flows should be updated using the updated sub-basin model results, with a view to where each tributary joins the Red River and flood-peak effects at subsequent downstream locations (e.g., Wahpeton/Breckenridge, Fargo/Moorhead, Halstad, Grand Forks/East Grand Forks, and the international border).



The map (map A-12) depicting retention effectiveness and relative peak-flow contributions will be updated to include new sub-basin runoff model results.

task 3: update to address certifiable levels of protection, assess larger-flood planning and protection, and analyze risk-reduction goals

task 3a: analyze updated hydrologic analyses and certified levels of protection

Any changes in hydrology will be compared to the certified levels of protection for up to 16 communities along the Red River main stem and up to 30 communities along the tributaries. The comparison would use the full period of record and/or other factors to determine the effect of updated hydrologic analyses on levels of certification.

task 3b: determine flood-risk levels at each community and risk-reduction measures

The certifiable/reliable, as well as the perceived, levels of flood protection will be determined for each community selected in Task 3a, along with identification of measures that could be implemented to reduce community flood risks. This task would look at past studies, floods and flood-fight history, and ability of various measures to reduce flood risk and improve the certifiable/reliable level of protection.

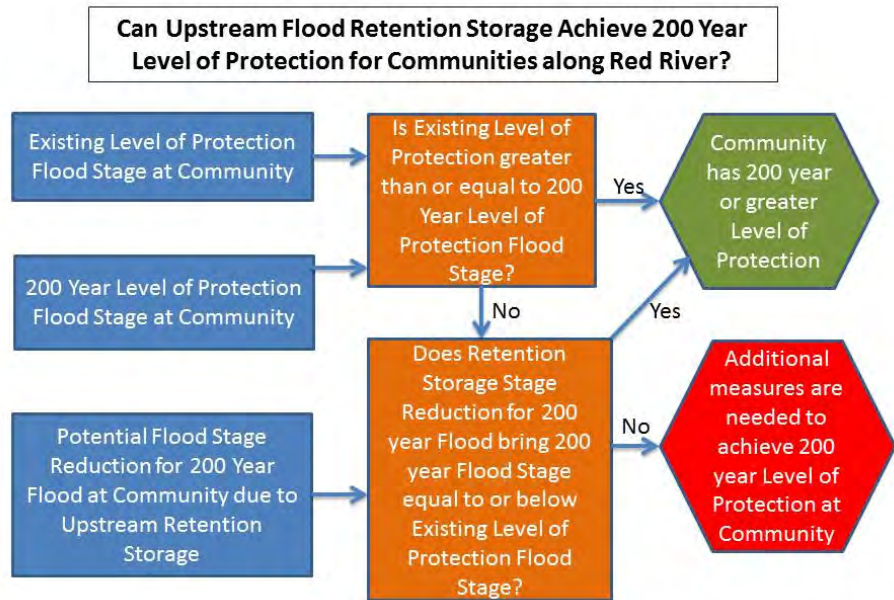
task 3c: assess emergency action plans and needs for addressing larger future floods

For each community identified in Task 3a, current emergency action plans would be assessed and amended to address future flood events greater than current protection levels. This task would be modeled upon a similar, current assessment occurring in Manitoba. Agency and public coordination and involvement would be required and could also involve the Silver Jackets flood and natural disaster response and recovery programs in Minnesota and North Dakota.

task 3d: re-evaluate flow-reduction goals of floodwater retention

In the 2011 LTFS report, the upstream-retention flow-reduction goal focused on a 20-percent peak-flow reduction along the Red River for the 1997 flood. This goal will be re-examined in the context of achieving higher levels of protection at communities along the Red River (and perhaps selected tributaries). The recommended levels of protection are 500-year events for major urban areas and 200-year events for other communities. The ability

of upstream retention to provide flood-stage reductions for these larger flood events should be considered. For communities and other stakeholders, actual flood-stage reductions are critical for determining protection needs to prevent flood damages. The effectiveness of upstream floodwater retention is best measured by the ability to reduce flood levels rather than flood flows. For example, Grand Forks/East Grand Forks currently has a 250-year level of protection, with a recommended goal of 500-year level of protection. The ability of upstream retention to assist this community in achieving the 500-year level of protection is of greater concern than in any reductions to the 100-year flood level.



floodplain management—non-structural strategies

The following analyses are crucial to the review and evaluation of existing floodplain management rules and regulations as well as to development of floodplain management policies and guidance.

task 4: update for consistency and effectiveness of floodplain regulations

task 4a: compile floodplain management rules and regulations

Existing floodplain management rules, regulations, and implementation policies and procedures throughout the basin will be compiled. Existing rules will be compared to federal and state requirements as well as to comparable rules/regulations in Manitoba and Saskatchewan. Rule implementation (i.e., full-time/part-time/volunteer staff, level of staff training, policy on variances, etc.) will be evaluated at each level. Coordination with the NDSWC, MNDNR, communities, townships, and other appropriate entities will be required.

task 4b: assess consistency across jurisdictions

The importance of consistent floodplain management rules/regulations and consistent application and enforcement across the basin's jurisdictions will be assessed. Riverbank development setbacks will be part of the assessment.

task 4c: compile model floodplain management ordinances

To promote uniformity and consistency across the basin and help communities and townships regulate development in their floodplains, the update will compile floodplain management ordinance models from various jurisdictions within the Red River Basin.

task 5: update for consistency and effectiveness of stormwater regulations

task 5a: compile stormwater management policies related to development

Existing stormwater management policies from the basin's communities and watershed districts will be assembled, with a focus on new developments and projects. These policies will be compared to stormwater management policies in other major urban areas and watershed districts such as those within the Twin Cities metropolitan area.

task 5b: assess need for upgraded stormwater management in the basin

The update will also assess how urban-watershed stormwater management policies that affect new developments could be applied to the Red River Basin's watersheds. This discussion would consider both surface and subsurface drainage. Extensive coordination will be required with the basin's watershed districts and communities and the RRBC's committees.

task 5c: develop model stormwater management guidance/policies

To provide uniformity and consistency across the basin, the update will include stormwater management policies and guidance models from various jurisdictions for consideration by other Red River Basin communities and watershed districts.

reports and coordination

Report development, coordination with the RRBC and other entities, and public outreach has been split out into several sub-tasks.

task 6: coordination, communication, and LTFS update report development

task 6a: assess implementation status of recommended actions

Each 2011 LTFS recommendation would be reviewed to estimate the level of implementation that has been accomplished. Coordination with various agencies, cities, watershed districts, and other entities will be required to identify completed actions and those slated for implementation. Based on the current status of flood-risk reduction actions taken throughout the basin, the LTFS update will modify the 2011 recommendations and/or recommend new ones.

task 6b: coordinate with RRBC committees

The update process will be undertaken in coordination with those committees identified by the RRBC to oversee and/or participate in LTFS update activities, including meeting participation, presenting information and activity status reports, and incorporating RRBC committee input into the LTFS studies.

task 6c: participate in public outreach events

Assistance would be provided to the RRBC for conducting up to two public meetings and outreach events as needed, including preparing public meeting information and presentations, as well as meeting documentation.

task 6d: prepare updated report

A final report, including detailed information and outcomes associated with all tasks and sub-tasks, will be prepared and submitted to the RRBC.

estimated costs and project timeframe

task		estimated hours	labor & expenses subtotal	estimated completion timeframe
1a	Update basin-wide HEC-HMS hydrology analysis (collaborate with USACE team performing HEC-HMS hydrology analysis, does not include USACE costs)	310	\$45,000	6–12 months
2	Update hydrology changes and FEMA flood-risk designations and perform basin-wide hydrology analyses	990	\$135,000	6–12 months
3	Update to address certifiable levels of protection, assess larger-flood planning and protection, and analyze risk-reduction goals	570	\$85,000	6–12 months
4	Update for consistency and effectiveness of floodplain regulations	340	\$55,000	3–6 months
5	Update for consistency and effectiveness of stormwater regulations	340	\$55,000	3–6 months
6	Coordination, communication, and LTFS update report development	200	\$40,000	12–18 months
total		2,750	\$415,000	18+ months

The overall estimated costs and implementation schedule, presented above, assume work proceeds as one continuous project. The costs and schedule will be refined once it is determined if tasks will need to be accomplished in series or simultaneously. This will depend on funding and if there is benefit to performing some tasks independently. Input from the RRBC will be used to refine a work plan and anticipated schedule. Project management costs are included within each task.

If the USACE does not perform the HEC-HMS hydrology analysis, then the following additional task would be necessary. The estimated hours, schedule, and budget shown below would be in addition to those included in the table above.

task		estimated hours	labor & expenses subtotal	estimated completion timeframe
1b (alt)	Update basin-wide HEC-HMS hydrology analysis (instead of USACE doing this work)	730 additional	\$85,000+ additional	3–6 months