

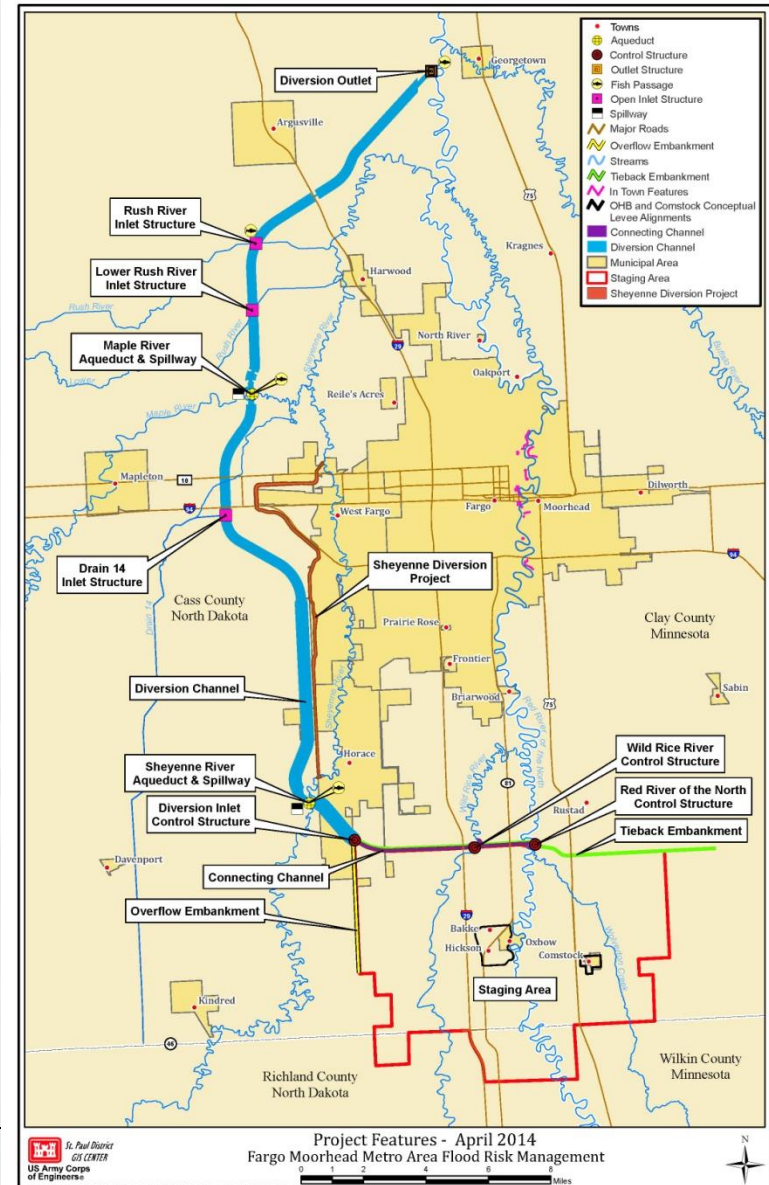
Fargo-Moorhead Metropolitan Flood Risk Management Project

*Flood Diversion Board of Authority meeting
July 9, 2015*



Corps Monthly Update

- Work continues on the operation plan and adaptive management plan for the project
- Assisting with OHB and In-Town Levee design and support of construction
- Released draft Cemetery Mitigation Plan on 4 June 2015



Corps Monthly Update

- In Town Levees: Reviewing designs for:
 - ▶ WP42I: Mickelson Levee Extension
 - ▶ WP42H.2: El Zagal FRM Phase 2
 - ▶ WP42F.1 SOUTH: 2nd Street/Downtown Area
 - ▶ WP42C.2 Park East Demolition

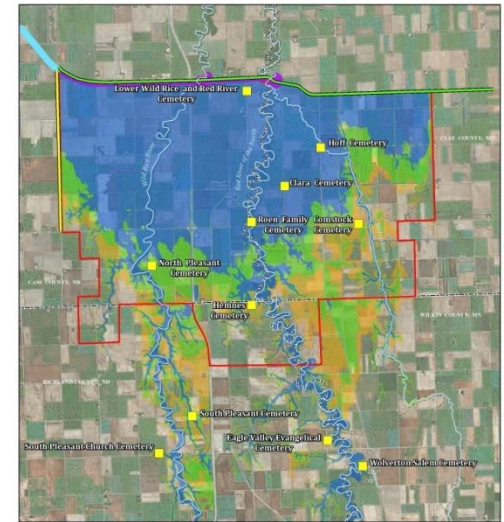
- MN DNR EIS
 - ▶ Continue review/coordination of draft documents
 - ▶ Reviewed entire draft report in June-July
 - ▶ Public release in late August 2015 (subject to change)



Cemetery Mitigation Plan

- Sent draft Mitigation Plan to the 11 Cemetery POC's and SHPOs on 4 June 2015. Requested their comments by 13 July
- Posted on www.fmdiversion.com
- DA considering mitigation in addition to federally-required flowage easements
 - ▶ Will form subcommittee after MN EIS is completed
- Flowage easement will not restrict normal cemetery operations including burials and O&M activities.
- Engineering analysis has shown that Grave Buoyancy/Eruption will not be an issue

FARGO-MOORHEAD METRO AREA FLOOD RISK MANAGEMENT PROJECT CEMETERY MITIGATION PLAN



Draft Report
June 2015



Maple River Physical Model

- 3-year effort is complete
- Contractor/JV: Bergmann, Hanson, HDR, St. Anthony Falls Laboratory
- Resulted in optimization of:
 - Conduits, upstream channel, spillway, flows, ice handling
- Technical summary included in monthly handout
- Representative from HDR available for questions

FMM Maple River Aqueduct Hydraulic Modeling Summary

The Maple River Aqueduct will carry Maple River flow over a man-made diversion channel providing continuous aquatic and hydraulic connectivity while reducing flooding in the flood risk management area. An aqueduct was recommended for the crossing during feasibility, a barge layout was selected during the design charrette, and physical and numeric modeling analyses were conducted to refine the design and develop hydraulic design criteria. Bergmann, Hanson, HDR, and St. Anthony Falls Laboratory conducted the hydraulic analysis in cooperation with the U.S. Army Corps of Engineers (USACE). The USACE is developing the plans for the Maple River Aqueduct based on the results of the hydraulic analysis.



Analysis

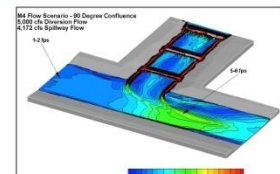
- Hydraulic model calibration (Physical, 1-D, 2-D, 3-D)
- Preferred alternative hydraulic investigation
- Hydraulic optimization of the aqueduct, spillway, and engineered channel
- Optimization of the flow split between the spillway and flood risk reduction area
- Ice effects/investigation investigation
- Review of fish passage across the aqueduct

Results

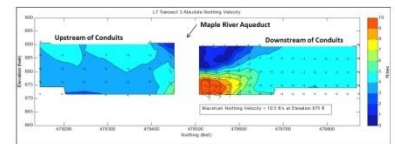
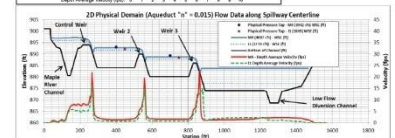
- Optimization of the conduits resulted in six elevations in the diversion channel. The diversion channel bottom width from 300 ft
- Spillway realignment and narrowing result were provided for erosion protection along
- Flow transitions upstream and downstream channel were optimized.
- Dimensions for a bypass channel layout to
- The ice evaluation provided recommended structures, erosion protection at the spillway
- Reporting of hydraulic design parameters (elevations) through spillway, relocated ch
- Lessons learned in design of the Maple R
- River Aqueduct.

USACE St. Paul District

FMM Maple River Aqueduct Hydraulic Modeling Summary



Top Figure: 3-D results in diversion channel
Middle Figure: 2-D results through the spillway
Bottom Figure: Physical model results in the diversion, at the aqueduct/conduits



USACE St. Paul District 2 June 30, 2015



Project Path Forward

- Continue to support MN EIS process
- Continue to conduct surveys in ND (cultural, HTRW, borings, land surveys)
- Continue to develop and review design products
- Continue refining the project to reduce impacts
- Continue to advance Alternative Financing/Split Delivery Plan



BUILDING STRONG®

Next

- Administrative/Legal
- Technical



BUILDING STRONG®