

CEMVP

MEMORANDUM FOR RECORD

SUBJECT: Vegetation within the Fargo-Moorhead Metro Diversion Channel

PURPOSE

1. The purpose of this memorandum is to outline the technical appropriateness of establishing vegetation within the diversion channel in light of conveyance capacity, Inspection of Completed Works rating guidelines, and future Operation and Maintenance.

BACKGROUND

2. In Section 5.5.2.3, Wetland Mitigation, of the Final Feasibility Report and Environmental Impact Statement (EIS) for the Fargo-Moorhead Metropolitan Area Flood Risk Management project, it states, "For all of the diversion channel alternatives, wetland acres that will be adversely affected by diversion channel construction will be offset by the creation of wetlands within the diversion channel bottom....Wetland areas will be planted with native seed mixes appropriate for the intended plant communities and managed for invasive species such as reed canary grass and purple loosestrife."

"Features that will be used to facilitate the creation of wetlands will include meandering the low flow channel.... The low flow channel would be ... located in the middle of the larger diversion channel, and could meander back and forth within the 250-400 foot wide diversion channel bottom."

3. In the Inspection of Completed Works / Levee Safety Inspection Guidelines that apply to Flood Damage Reduction Channels and Levee Embankments, the Ratings Guidelines state that:
 - A. An acceptable channel has "No obstructions, vegetation, debris, or sediment accumulation within the channel."
 - B. Minimally acceptable channels are characterized where "Obstructions, vegetation, debris, or sediment are minor and have not impaired channel flow capacity, but should be removed. Sediment shoals have not developed to the extent that they can support vegetation other than non-aquatic grasses."
 - C. Unacceptable channels are ones where "Obstructions, vegetation, debris or sediment have impaired the channel flow capacity. Sediment shoals are well established and support woody and/or brushy vegetation. Sediment and debris removal is required to re-establish flow capacity."

INVESTIGATIONS AND COLLABORATION

4. Engineering and Construction Division identified two major areas of concern regarding the establishment of wetland vegetation in the diversion channel as per the EIS recommendation:

- A. Establishment of certain types of wetland vegetation, such as willows and cattails, may affect conveyance efficiency of the channel. The Inspection of Completed Works inspection guidelines identify that the presence of aquatic vegetation is not acceptable in a diversion channel and makes no distinction as to the species of vegetation.

- B. Creating a sinuous low flow channel, as identified in the EIS, in association with the wetland vegetation creates the concern that the meander could migrate too close to the side of the channel and cause a slope failure.

5. Planting Guidelines:

Turf establishment guidelines for the diversion channel have been developed with the goal of a planting plan that will limit the potential for the establishment of undesirable species (such as cattails, willow, etc), be compatible with Conveyance criteria (resulting in a Manning's roughness n value of .03 or less), and be resilient to maintenance activities (attached MFR). In addition, plants selected within the plan will provide a measure of erosion control for all planted areas. In consultation with a variety of experts, planting guidelines and initial seed mixes for various zones of the channel cross section have been identified that will ensure we to meet our overall objectives.

6. Manning's N :

A Manning's N coefficient of 0.03 was used in modeling conveyance in the diversion. To insure that this N would satisfactorily characterize the planned vegetation in the channel, Aaron Buesing and Alex Nelson sought the advice of Dr. Craig Fischenich, of the Corps Engineering Research and Development Center (ERDC). Dr. Fischenich reviewed the models created for the diversion and investigated the planting plan (attached) which identified the species of plants intended for the diversion. In his review Dr. Fischenich stated that a Manning's N of 0.03 was the appropriate factor of roughness for the plants as identified. Dr. Fischenich stated that at low water levels the N may be higher than 0.03, however, as water levels in the diversion would increase, the effect of the roughness would decrease. When water was at a level approximately two to three times higher than the level of the wetland vegetation, the Manning's N may be significantly lower. Dr. Fischenich stated that he thought the modeling efforts performed by the St. Paul District, along with the design of the low flow channel, were well done, and he stated that no unforeseen problems should be encountered regarding conveyance with the vegetation planting plan implemented.

7. Vegetation and Inspections:

A meeting to discuss the Inspection of Completed Works / Levee Safety Inspection Guidelines was held on 10 February 2012. Aaron Buesing, Dana Werner, Rick Hauck, Michael Bart, Mike Knoff, Jon Sobiech, Randy Devendorf, Brett Coleman, and Roland Hamborg attended. At the meeting both the inspection guidelines for diversion channels and the inspection of the meandering low flow channel were discussed. There was agreement that we are on an acceptable design path with respect to vegetation, and that it contributes to meeting the goals of a multi-purpose approach of ensuring the establishment of an effective diversion channel while optimizing wetland/habitat outputs with the vegetation plan.

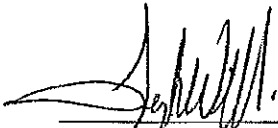
During the In-Progress Review (IPR) meeting on 22 February 2012, the impact of the Inspection of Completed Works/Levee Safety Inspection Guidelines on vegetation within the low flow channel was discussed. Judy DesHarnais, Tom Crump, and Michael Bart agreed that the low flow channel is an environmental feature constructed to meet mitigation requirements and must be identified as such for subsequent inspections and O&M actions.

The PDT will work to ensure that inspections can be conducted in accordance with defined national criteria and that O&M requirements/costs with respect to channel cleanout or erosion protection will be clearly understood. These are issues facing many current projects on a nationwide basis.


RECOMMENDATIONS

8. Vegetation will be planted in/along the diversion channel in accordance with the guidelines that have been developed for the project (as attached at Appendix A).
9. The O&M manual will specifically reference the final planting plan that is implemented, identify guidelines for acceptable vegetation and identify needed remedial actions for unacceptable vegetation in accordance with the requirements of the Inspection of Completed Works guidelines.
10. A plan will be developed to monitor the constructed channel in order to determine O&M activities to correct erosion problems, remove sediment that has impacted conveyance beyond acceptable limits, or correct low flow channel migration that encroaches on the 50 ft buffer between the top of the low-flow channel and the toe of the diversion channel. The best approach for this is not identified at this time, but the use of comparative LIDAR mappings may be one cost effective approach.


DECISION MEMO SUBJECT: Vegetation within the Fargo-Moorhead Metro Diversion


 Terry Williams
 Project Manager, MVP
 USACE


4/10/12
Date


 Bruce Spiller
 CH2MHill
 Sponsor's Program Management Consultant


31 MAY 2012
Date


 Marsha Mose
 Chief, Design Branch, MVP
 USACE

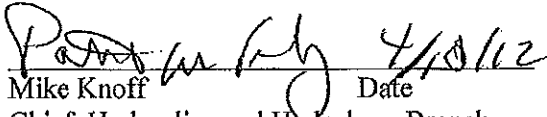
4/10/12
Date


 Randall Devendorf
 Chief, Environmental Planning Section,
 MVP
 USACE

10 April 2012
Date


 Michael Bart
 Chief, Engineering and Construction
 Division MVP
 USACE

4/26/12
Date


 Mike Knoff
 Chief, Hydraulics and Hydrology Branch,
 MVP
 USACE

4/10/12
Date

for