DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF

CECW-MVD (1105-2-10a)

DEC 19 2011

SUBJECT: Fargo-Moorhead Metropolitan Area Flood Risk Management Project, North Dakota and Minnesota

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on flood risk management in the Fargo-Moorhead metropolitan area of North Dakota and Minnesota. It is accompanied by the report of the district and division engineers. These reports are in response to a resolution of the Senate Committee on Public Works, adopted 30 September 1974. The resolution requested the review of "reports on the Red River of the North Drainage Basin, Minnesota, South Dakota and North Dakota, submitted in House Document Numbered 185, 81st Congress, 1st Session, and prior reports, with a view to determining if the recommendations contained therein should be modified at this time, with particular reference to flood control, water supply, wastewater management and allied purposes." Preconstruction engineering and design activities will be continued under the authority provided by the resolution cited above.

2. The reporting officers recommend authorization of a plan to reduce flood risk in the Fargo-Moorhead metropolitan area by constructing a diversion channel within North Dakota combined with upstream floodwater staging and storage. The recommended plan consists of a 36 mile 20,000 cubic feet per second (cfs) diversion channel that would start approximately four miles south of the confluence of the Red and Wild Rice rivers and extend west and north around the North Dakota cities of Horace, Fargo, West Fargo and Harwood and ultimately re-enter the Red River of the North downstream of the confluence of the Red and Sheyenne rivers near Georgetown, Minnesota. The diversion channel would cross the Wild Rice, Sheyenne, Maple, Lower Rush and Rush rivers and incorporate the existing Horace to West Fargo Sheyenne River diversion channel. The main line of protection at the south end of the project includes the embankments adjacent to the diversion channel, floodwater Storage Area 1 embankments, and two tie-back levees. Project features would be located in both North Dakota and Minnesota. Unavoidable environmental impacts would be mitigated for with construction of fish passage structures along the Red and Wild Rice rivers; construction of additional fish passage projects in the Red River basin; stream restorations on tributaries near the project; conversion of floodplain agricultural land to floodplain forest; and creating wetlands within the diversion channel footprint. These mitigation features along with adaptive management would be monitored for up

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to twenty years to ensure their performance. This would include pre- and post-project monitoring. The recommended plan is a deviation from the national economic development (NED) plan and is the locally preferred plan (LPP).

3. The currently identified NED Plan is a diversion channel located east of Moorhead, MN with a capacity of 40,000 cfs. The NED Plan diversion channel would be approximately 25 miles long with approximately 10 miles of tie-back levees and includes a large control structure on the Red River of the North. The NED Plan would reduce the stage from the 0.2 percent flood event from approximately 46.7 to 37.6 feet on the Fargo gage.

4. The recommended LPP (following an alignment in North Dakota) would reduce flood stages on the Red River to a lesser degree than the NED plan (following an alignment in Minnesota); the LPP would reduce the stage from the 0.2 percent flood event from approximately 46.7 to 40.0 on the Fargo gage. But the LPP would benefit a larger geographic area and address flooding on four tributaries to the Red River that are not addressed by the NED plan. The LPP provides approximately $6,000,000 less in average annual flood risk management benefits than the NED plan. Since the LPP provides fewer average annual benefits than the NED plan, a comparable smaller scale plan with similar outputs to the LPP was identified along the NED alignment to set the Federal cost share. This plan was identified as the Federally Comparable Plan (FCP) and serves as the basis to determine the project cost sharing apportionment. Federal investment in the flood risk management features of the LPP is capped at the investment that would have been made for the FCP. Based on October 2011 price levels, the estimated first cost of the FCP flood risk management features is $1,205,207,000. In accordance with the cost sharing provisions of Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended, the Federal share of the first cost of the FCP flood risk management features is estimated at $783,384,000 (65 percent).

5. Based on October 2011 price levels, the estimated first cost of the recommended LPP is $1,781,348,000. The first cost of the recommended LPP includes approximately $1,745,033,000 for flood risk reduction and approximately $36,315,000 for recreation. In accordance with Section 103 of WRDA 1986, as amended, recreation features would be shared 50 percent Federal and 50 percent non-Federal. Federal cost sharing in the recommended LPP is limited to the Federal share of the FCP and the non-Federal sponsor would be required to provide 100 percent of the additional costs associated with design and construction of the LPP. The flood risk management features have an estimated first cost of $1,745,033,000, with the Federal and non-Federal shares estimated at $783,384,000 and $961,649,000, respectively. The recreation features have an estimated first cost of $36,315,000, with the Federal and non-Federal shares estimated at $18,157,500 and $18,157,500 respectively. Thus, the overall Federal share of the first costs of the LPP, including recreation, is estimated at $801,542,000, and the non-Federal share is estimated at $979,806,000. The cost includes $17,600,000 for environmental monitoring and adaptive management. The cities of Fargo, North Dakota and Moorhead, Minnesota are the

non-Federal cost sharing sponsors for the recommended plan. The cities of Fargo and Moorhead would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction, a cost currently estimated at $3,631,000 per year. The OMRR&R estimate includes $527,135 for monitoring and adaptive management beyond the construction phase.

6. Based on a 4.0-percent discount rate, October 2011 price levels and a 50-year period of analysis, the total equivalent average annual costs of the recommended LPP, including OMRR&R, are estimated to be $99,952,000, including $98,098,000 for flood risk management and $1,854,000 for recreation. The recommended LPP would significantly reduce risk to the Fargo-Moorhead metropolitan area from a flood which has a 1-percent chance of occurrence in any year; the 1-percent chance stage would be reduced from approximately 42.4 feet to 30.6 feet on the Fargo gage, which would require only minimal emergency measures to pass safely. The recommended LPP would leave average annual residual damages estimated at $32,000,000. The equivalent average annual benefits are estimated to be $174,617,000 for flood risk management and $5,130,000 for recreation, respectively. The net average annual benefits would be $76,519,000 for flood risk management and $3,276,000 for recreation, respectively. The benefit-to-cost ratio for flood risk reduction is 1.78 to 1; and the benefit- to-cost ratio for recreation is 2.77 to 1; and the overall project benefit-to-cost ratio is 1.8 to 1.

7. The project would modify three existing Federal projects: the Rush River Channel Improvement project authorized by the Flood Control Acts of 1948 and 1950; the Lower Rush River Channel Improvement project authorized under provisions of Section 205 of the 1948 Flood Control Act; and the Sheyenne River project authorized by the 1986 Water Resources Development Act. The modifications to these projects will not impact the purposes for which they were authorized or the benefits they currently provide, and in some cases will curtail or eliminate the need for their continued operation and maintenance. All modifications will be carried out in a manner that fulfills the authorized purposes and provides the intended benefits of existing projects as well as the recommended plan. For example, approximately 2.1 miles of the Rush River project and 3.4 miles of the Lower Rush River project between the diversion channel and their respective confluences with the Sheyenne River, while no longer necessary to reduce flood risk in the same manner as when they were originally constructed, would continue to convey local drainage and need some measure of maintenance. The Horace to West Fargo portion of the existing Sheyenne River Diversion project would be incorporated into the LPP.

8. The recommended LPP was developed in coordination and consultation with various Federal, State and local agencies using a systems approach in formulating flood risk management solutions and in evaluating the impacts and benefits of those solutions. Study formulation looked at a wide range of structural and non-structural alternatives.

9. The non-Federal sponsors wish to perform design and construction of structural flood risk management measures that are elements of the recommended plan. Pursuant to Section 221 of the Flood Control Act of 1970 as amended, and in accordance with existing guidance governing in-kind contribution credit, the non-Federal sponsors will be eligible to receive credit for the work, not to exceed their share, subject to a determination by the Secretary of the Army that the work is integral to the project. Prior to the work being carried out by the non-Federal sponsors, an In-Kind Memorandum of Understanding must be executed between the Corps and the non-Federal sponsors.

10. In accordance with the Engineering Circular on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and rigorous review process to ensure technical quality. This included an independent Agency Technical Review (ATR), an Independent External Peer Review (IEPR), and a Corps Headquarters policy and legal review. All concerns of the ATR have been addressed and incorporated into the report. The IEPR was conducted by the Battelle Memorial Institute. IEPR of the draft report was completed on July 6, 2010. A total of 23 comments were generated; all were resolved to the satisfaction of the IEPR panel. A second IEPR review began on April 21, 2011 to assess the Supplemental Draft Feasibility Report and EIS and supporting analyses. The IEPR report was completed in July 2011. A total of 16 comments were documented, one was flagged as high, eleven were flagged as medium, and four were flagged as low significance. The comment of high significance addressed the potential risks associated with the operation of the gates at the diversion control structures and the need for redundancy. In response, the Corps will conduct additional hydraulic modeling in the design phase to address the issue and ensure that all structures are designed to be safe and meet all Corps criteria. All other comments from this review have been addressed and incorporated into the final project documents and recommendation as appropriate. Type II IEPR for Safety Assurance will be conducted during the Preconstruction Engineering and Design phase and throughout implementation.

11. I concur with the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the Fargo-Moorhead project be authorized in accordance with the reporting officers' recommended plan at an estimated flood risk management cost of $1,745,033,000 and estimated recreation cost of $36,315,000 for an overall cost of $1,781,348,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of Federal and State laws and policies, including Section 103 of WRDA 1986, as amended by Section 202 of WRDA 1996. Accordingly, the non-Federal sponsors must agree with the following requirements prior to project implementation.

a. Provide a minimum of 35 percent, but not to exceed 50 percent of total FCP flood risk management costs as further specified below:

(1) Provide the non-Federal share of design costs allocated by the Government to flood risk management in accordance with the terms of a design agreement entered into prior to commencement of design work for the flood risk management features;

(2) Provide, during construction, a contribution of funds equal to 5 percent of total FCP flood risk management costs;

(3) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the flood risk management features;

(4) Provide, during construction, any additional funds necessary to make its total contribution for flood risk management equal to at least 35 percent of total FCP flood risk management costs;

(5) Provide 100 percent of all incremental costs of the Locally Preferred Plan.

b. Provide 50 percent of total recreation costs as further specified below:

(1) Provide the non-Federal share of design costs allocated by the Government to recreation in accordance with the terms of a design agreement entered into prior to commencement of design work for the recreation features;

(2) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the recreation features;

(3) Provide, during construction, any additional funds necessary to make its total contribution for recreation equal to 50 percent of total recreation costs;

(4) Provide, during construction, 100 percent of the total recreation costs that exceed an amount equal to 10 percent of the Federal share of total FCP flood risk management costs;

c. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share therefore, to meet any of the non-federal obligations for the project

unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

d. Not less than once each year, inform affected interests of the extent of protection afforded by the flood risk management features;

e. Agree to participate in and comply with applicable Federal floodplain management and flood insurance programs;

f. Comply with Section 402 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 701b-12), which requires a non-Federal interest to prepare a floodplain management plan within one year after the date of signing a project cooperation agreement, and to implement such plan not later than one year after completion of construction of the flood risk management features;

g. Publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with protection levels provided by the flood risk management features;

h. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the level of protection the flood risk management features afford, hinder operation and maintenance of the project, or interfere with the project's proper function;

i. Keep the recreation features, and access roads, parking areas, and other associated public use facilities, open and available to all on equal terms;

j. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

k. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes

and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

l. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project;

m. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors;

n. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

o. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

p. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal

sponsors with prior specific written direction, in which case the non-Federal sponsors shall perform such investigations in accordance with such written direction;

q. Assume, as between the Federal Government and the non-Federal sponsors, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project;

r. Agree, as between the Federal Government and the non-Federal sponsors, that the non-federal sponsors shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA; and

s. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 103(j) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

12. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to Congress, the sponsors, the States, interested Federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

MERDITH W. B. TEMPLE
Major General, U.S. Army
Acting Chief of Engineers