Presentation
to the

CIVIL WORKS REVIEW BOARD

Roseau River, Roseau Minnesota
Flood Damage Reduction
Feasibility Study

COL Mike Pfenning, Commander
Army Corps of Engineers St. Paul District

September 20, 2006

US Army Corps of Engineers

Purpose

- To present the findings and recommendations of the Roseau, Minnesota Flood Damage Reduction Feasibility study and Environmental Assessment.

- To demonstrate that the proposed project is technically feasible, economically justified, and environmentally sound

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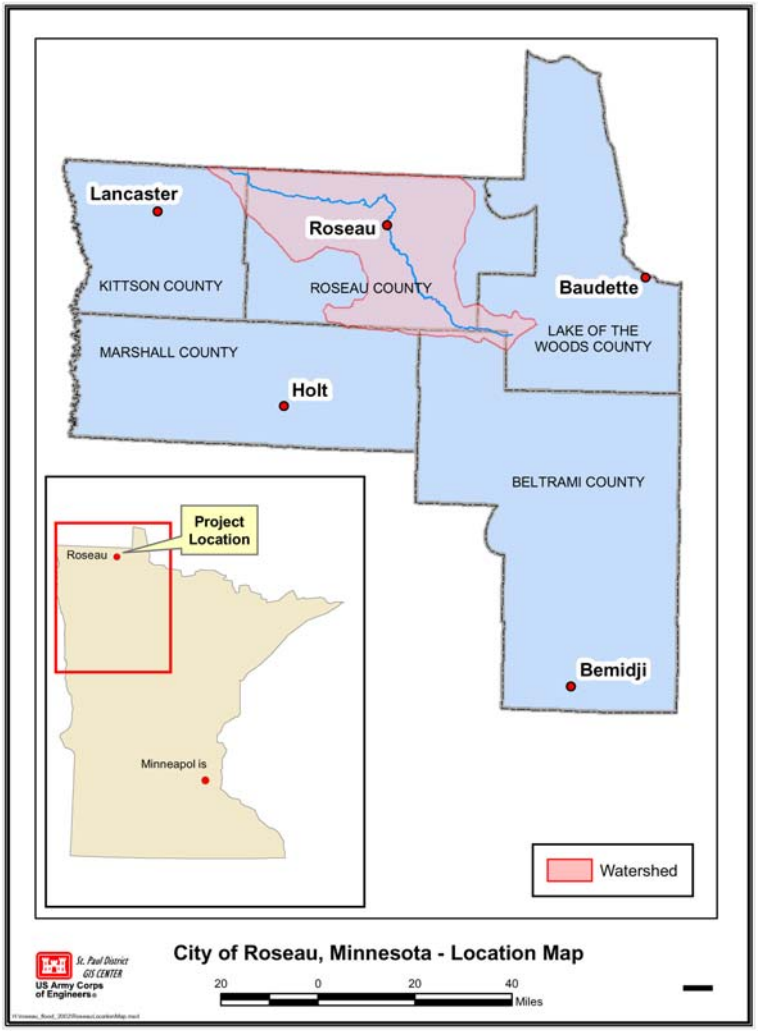
Agenda

- Background
- Project Summary
- Project Details
- Project Costs and Benefits
- Milestone Schedule
- Overview of Reviews and Performance
- Recommendation
- Questions/Comments

Roseau, Minnesota



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2002 Summer Flooding
Roseau, Minnesota

City Underwater

US Army Corps of Engineers

2002 Summer Flooding
Roseau, Minnesota

Downtown

Debris During Cleanup

Summary of Roseau River, Roseau Minnesota Flood Damage Reduction Feasibility Study Recommended Plan

The recommended plan is:

- 4.5 mile diversion channel to the east of the City of Roseau
- Two storage areas (Locally Preferred Plan)
- Recreational trails and features
- Estimated cost = $24.4 million
- Benefit-to-Cost Ratio = 2.9
- Net Annual Benefits = $ 2.8 million

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Project Study Authorization

"RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review 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, waste water management and allied purposes."

(Adopted September 30, 1974)

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Support for the Project

- City of Roseau, Minnesota (Project Sponsor)
- Senators Mark Dayton & Norm Coleman
- Congressman Collin Peterson (MN-7)
- State of Minnesota

Roseau, Feels Like Home

Partnerships & Contributors

- City of Roseau, Minnesota (Sponsor)
- Roseau River Watershed
- U.S. Fish & Wildlife Service
- Minnesota Department of Natural Resources

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Planning Process (ER 1105-2-100)

1. Specify problems & opportunities
2. Inventory & forecast conditions
3. Formulate alternative plans
4. Evaluate effects of alternative plans
5. Compare alternative plans
6. Select recommended plan

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Policy & Technical Review Process

• **Feasibility Scoping Meeting**	**April 2004**
• **Formal Independent Technical Review (Rock Island District)**	**August 2005**
• **Alternative Plan Formulation Briefing (AFB)**	**March 2006**
• **HQ Policy/Report Review**	**June 2006**

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Existing Conditions

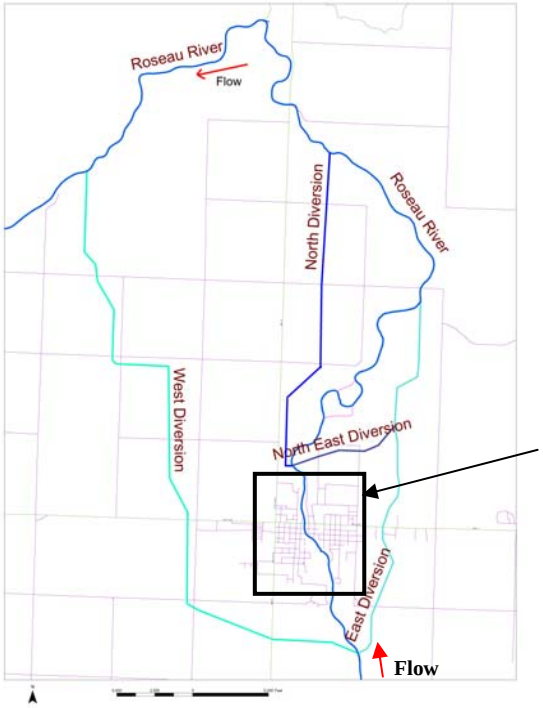
- Annual Flood damages = $2.6 million
- No permanent protection
- Reliance on temporary emergency levees
- Major flooding in 8 of last 10 years
- Project area – primarily agricultural

Alternative Plans

Evaluated:

- **11 flood damage reduction alternatives**
- **Ecosystem restoration**
- **Recreation**

Used engineering, economic, and social input to develop the recommended plan.



City of Roseau

Measures Screened from Further Consideration

- Levee - floodwall system
- Upstream storage
- Channel modifications
- Cutoff Channels
- Non-structural measures
- Ecosystem restoration

Recommended Plan

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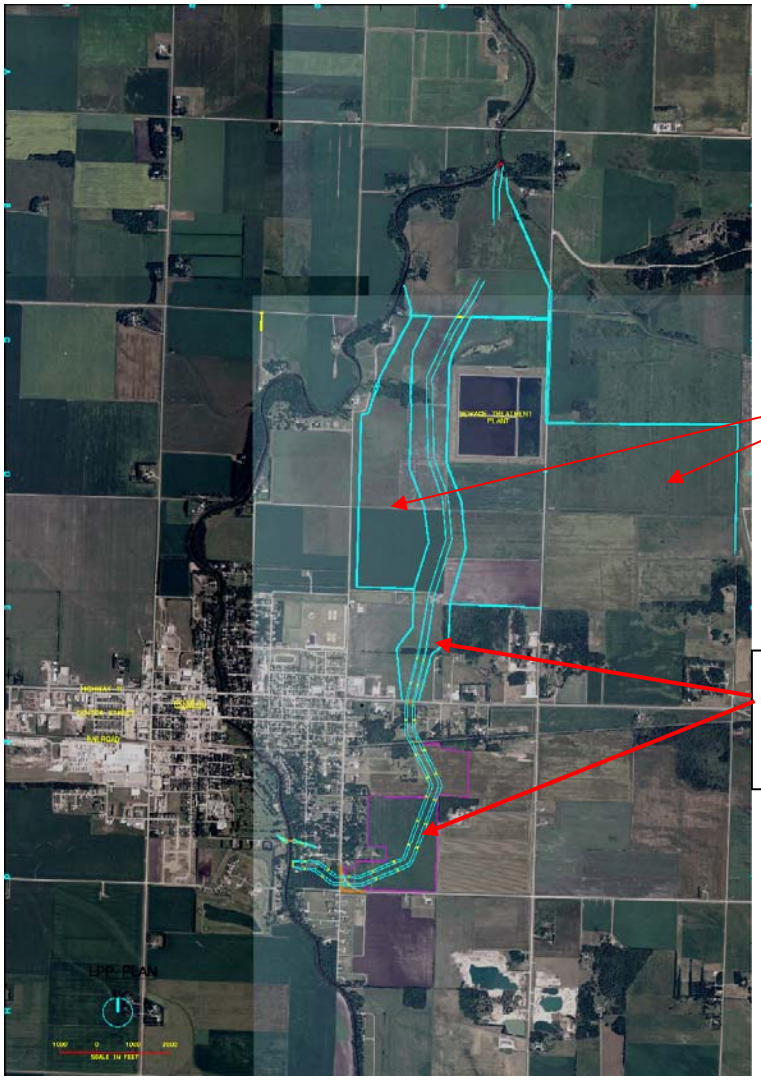
NED - 150 foot wide - east diversion plan

LPP – NED plus two storage areas

Used engineering, economic, and social input to further develop the recommended plan.



Storage areas

Diversion Channel

Project Features

- 4.5 mile diversion channel
- 2 levee enclosed storage areas
- Inlet control structure
- Restriction bridge
- 3 bridges (2 highway, 1 railroad)
- Multipurpose trails
- Off-road vehicle trails
- Trailhead

Roseau River – Roseau, Minnesota
Flood Damage Reduction
Feasibility Study Project Costs & Benefits

Item	Flood Damage Reduction	Recreation	Total Costs
Investment Cost			
Total Project Costs	22,756,000	1,661,000	24,417,000
Interest During Construction [1]	1,173,720	85,670	1,259,390
Total	23,929,720	1,746,670	25,676,390
Average Annual Cost			
Interest and Amortization [2]	1,336,189	97,531	1,433,720
OMRR&R	54,998	12,828	67,826
Subtotal	1,391,187	110,359	1,501,546
Average Annual Benefits			
Monetary (FDR) & (Recreation)	2,265,300	2,074,900	4,340,200
Net Annual Benefits	874,100	1,964,500	2,838,600
Benefit-Cost Ratio	1.63	18.79	2.89
FDR Benefit-Cost Ratio (at 7%) [4]	1.24	14.60	2.21

1 Two year period of construction

2 Based on October 2005 price levels, 5 1/8 percent rate of interest, and a 50-year period of analysis

3 Operation, Maintenance, Repair, Replacement, and Rehabilitation

4 Per Executive Order 12893

ALLOCATION OF TOTAL PROJECT COSTS
ROSEAU, MINNESOTA FLOOD DAMAGE REDUCTION PROJECT
(October 2005 price levels)

Item	Federal ($) NED	Non-Federal ($)			Total ($)
		NED	LPP (Increment)	Total	
Flood Damage Reduction					
Lands and Damages	102,000	1,924,000	1,958,000	3,882,000	3,984,000
Relocations	999,000	3,493,000	0	3,493,000	4,492,000
Channels and Canals	8,007,000	0	427,000	427,000	8,434,000
Levees and Floodwalls	1,616,000	0	287,000	287,000	1,903,000
Planning, Engineering, & Design	2,083,000	514,000	131,000	645,000	0 2,728,000
Construction Management	742,000	415,000	58,000	473,000	1,215,000
Cash Contribution	-995,000	995,000	_	995,000	0
Total FDR	12,554,000	7,341,000	2,861,000	10,202,000	22,756,000
Recreation					
Lands and Damages	0	0	0	0	0
Relocations	0	0	0	0	0
Recreation Facilities	1,312,000	0	0	0	1,312,000
Planning, Engineering, & Design	238,000	0	0	0	238,000
Construction Management	111,000	0	0	0	111,000
Cash Contribution	-830,500	830,500	0	830,500	0
Total Recreation	830,500	830,500	0	830,500	1,661,000
Total Project	13,384,500	8,171,500	2,861,000	11,032,500	24,417,000

Cost Share Summary

Estimated Implementation Costs (October 2005 price level)

Federal	
Corps of Engineers - flood damage reduction (65%)	$12,554,200
Corps of Engineers - recreation (50%)	$830,500
Corps of Engineers - total	$13,384,500
Non-Federal	
City of Roseau - flood damage reduction (35%)[1, 2]	$7,341,000
City of Roseau - recreation (50%)	$830,500
City of Roseau - locally preferred plan (100%)	$2,861,000
City of Roseau - total	$11,032,500
Total	**$24,417,000**

[1] $6448000 of this amount is LERRD credit and the remainder is cash

[2] This is greater than 35% due to the cost of the LERRDs and the required 5% cash contribution

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Milestone Schedule

Action Item	Estimated Completion Date
Chief of Engineer's Report	Oct-06
Complete Design Phase	Sep-07
Execute Project Cooperative Agreement (PCA)	Nov-07
Start Construction Contract	Apr-08
Complete Construction	Apr-10

Public Review Process

- Newsletters
- Public meetings
- Project website with reports & presentations
- Formal public review

Roseau Flood Study

Volume 1, Issue 1, June 2005

Study Progress

The U.S. Army Corps of Engineers, the State of Minnesota and the City of Roseau are working in partnership to develop a flood damage reduction project for the Roseau community. The project team is currently working on refining the east diversion plan and determining the best size for the channel. Good progress has been made!

However, the process is scheduled to be completed sometime in August, slightly behind the expected schedule. Following the development of a final draft plan, the Corps and city will host public meetings to present the revised plan to members of the community.

Why the East Diversion Plan?

The study partners selected the east diversion plan because it was the most cost effective plan and it offered the least social and environmental impacts. The west diversion plan, at $42 million, would have cost approximately twice as much to construct the east diversion plan, at $21 million. And although twice as much, the west diversion plan would only provide the same amount of flood protection as the eastern plan.

The east diversion plan fit better, than other alternatives, such as levees levees, with local and state long-range watershed flood reduction plans already being pursued in the area. In addition, the east diversion plan had significantly less social impacts than the other alternatives, an important aspect for the city and the Corps.

The east diversion plan will provide a significant amount of stage reduction for the Roseau community in times of high water. It will provide flood protection to the city of Roseau and to its adjacent areas east, west and south all the way to the Malung dam, with no adverse effects to the north.

The Corps incorporated a number of design changes to the east diversion plan as a result of public comments received at an open house in April. These changes include: there will no longer be a need to buy any private farmsteads, as was originally expected; there will be a bridge crossing county road 24, and the inlet to the diversion channel will now go through the city park. Additionally, some recreational features have been added to the project.

It is important to note that during the planning process, there may be a need to make a number of small changes to the design. However, the goal is to further minimize any social impacts to landowners and areas downstream of the city.

With the east diversion plan, the Corps and the city will be able to add recreational and aesthetic features into the design. The Corps and city will seek additional public input on what the community would like to see in these features.

Law of the Land

Many concerns have been raised by landowners who feel the east diversion plan may negatively impact them. These concerns revolve primarily around property values and compensation for lands needed for the project. It is important to know that federal law requires that affected landowners be fairly compensated for the taking of land and any damages which occur as a result of a project.

Even though there will be some landowners who are negatively impacted, there will be many more who will benefit. There will be both long- and short-term benefits. Many homeholds and businesses will no longer be located in the floodplain, resulting in savings on flood insurance. Property values in the area should benefit in the long-term from the added protection, since there will be less chance of damage to properties. Additionally, the project offers an opportunity to add recreational features in the community.

The project delivery team plans on making every attempt to reduce or avoid any negative impacts to all landowners and to maximize the many benefits.

Roseau, Feels Like Home

US Army Corps of Engineers

Strategic Plan Goals

1. Water Resource Management

- The project is environmentally acceptable and has an overall Project B/C of 2.9.

2. Environmental Protection

- Project design/operation will result in some agricultural fields naturally returning to wetlands.

3. Project Performance

- Project maintenance by the local sponsor consistent with the OMRR&R manual will ensure that design levels are realized.

Strategic Plan Goals

4. Reduce Losses

- The project will reduce flood damages in the City of Roseau by nearly 86 percent.

5. World-Class Organization

- Project will compete for funding using performance based budgeting
- Timely and easily accessible information about the project was posted on a Roseau Project web-site.

Environmental Operating Principles

1. **Strive to achieve Environmental Sustainability**

- **Project design/operation will result in some agricultural fields naturally returning to wetlands**

2. **Interdependence of life and the physical environment**

- **Project designed to have minimal impacts on the environment and hydrology upstream and downstream of Roseau**

3. **Seek balance and synergy between human and natural systems**

- **The project's environmental assessment resulted in a Finding of No Significant Impact.**

Environmental Operating Principles

4. **Continue to accept corporate responsibility and accountability**

- **Complies with all applicable laws**

5. **Assess and mitigate cumulative impacts to environment**

- **This project does not require any separable mitigation**

6. **Build and share knowledge**

- **Coordination with state and federal resource agencies resulted in a better project design using past experiences**

7. **Respect the view of individuals and groups**

- **Input from resource agencies and the public were adequately addressed and incorporated**

Independent Technical Review Comments

- Rock Island District performed ITR
- 138 comments
- All comments were resolved
- Completed preliminary value engineering study

Policy Guidance Memo

Documentation of analyses

- Existing condition
- Future without project condition
- NED Plan vs. Locally Preferred Plan (LPP)
- All comments resolved

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PDT Performance

- **Performed well during study**
  - **Included a City representative on the PDT**
  - **Adequately addressed ITR and AFB concerns**
  - **Incorporated major changes at last minute (LPP)**
- **Identified & addressed problems**
  - **Geotechnical**
  - **Downstream effects**
- **Frequent communication, including face-to-face team meetings**

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Recommendation

I recommend the Civil Works Review Board approve the Roseau, Minnesota Feasibility Report and Environmental Assessment.

The recommended plan is technically sound, environmentally acceptable, and economically feasible. It complies with all current policies and laws.

The plan is supported by the local sponsor, the City of Roseau. The sponsor has indicated a willingness and ability to provide all non-Federal requirements.

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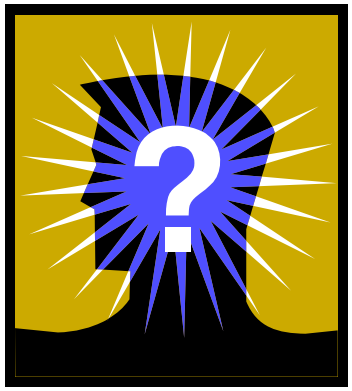
Questions & Comments



Roseau, Feels Like Home

City of Roseau

Roseau, Feels Like Home

Human Impacts

Roseau, Feels Like Home

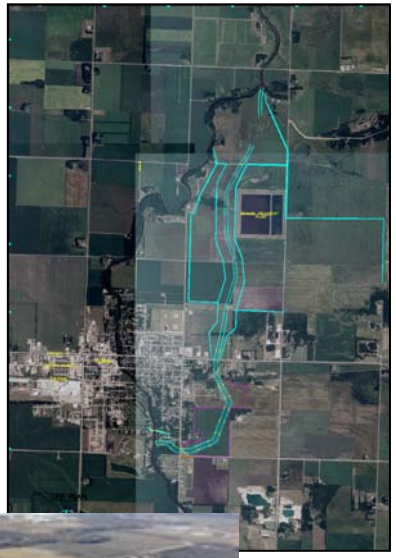
Flood Fighting

Roseau, Feels Like Home

The 2002 Summer Flood

Roseau, Feels Like Home

The Future



Presentation
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CIVIL WORKS REVIEW BOARD

Roseau River, Roseau Minnesota
Flood Damage Reduction
Feasibility Study

by

Michael B. Rogers

Director of Programs
Mississippi Valley Division

September 20, 2006

US Army Corps of Engineers®

Rationale for MVD Support

- Concur with St. Paul District (MVP) Commander's findings and recommendations
- Report complies with all applicable policies and laws in place at this time
- Anticipate a favorable response to the draft Chief's Report
- Plan supported by sponsor and congressional delegation

Certification of Legal and Policy Compliance

- Legal certification by MVP Counsel on 9 Jun 2006
- Technical and policy compliance:
  - Rock Island District (MVR) performed ITR
  - All ITR comments resolved
  - MVR ITR Team certified on 31 Jan 2006
  - MVR certified @Risk model on 1 Aug 2006
  - MVP study team certified on 29 Aug 2006

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MVD Quality Assurance Activities

- MVD reviewed ITR comments/responses to ensure appropriate resolution
- Active participation by vertical team
- Worked with MVP to successfully resolve HQ review comments
- MVP certified that project is technically, legally, and policy compliant
- MVD confirmed on 8 Sep 2006 that the project is technically, legally, and policy compliant

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MVD Recommendation

- Approve Final Feasibility Report
- Release report for State and Agency Review
- Complete Chief's Report NLT 31 Dec 2006 to be postured to meet a contingent authorization in the event Congress passes WRDA 2006

Roseau, Minnesota
Flood Damage Reduction Project

Significant Policy Review Concerns

Roseau, Minnesota
Flood Damage Reduction Project

Thomas Hughes
Office of Water Project Review
Planning and Policy Compliance Division

Washington, DC – September 20, 2006

Roseau, Minnesota
Flood Damage Reduction Project

Areas of Policy Concern:

- Increased flooding
- Channel Sizing
- Natural Resource Impacts
- Contingency Rates

Roseau, Minnesota
Flood Damage Reduction Project

Increased Flooding

Concern: Page C-E-10 states "In order to eliminate any induced damages downstream of Roseau some high water storage areas will be created with levees".

Reason: Mitigation is appropriate when economically justified or there are overriding reasons of safety, economic or social concerns, or a determination of a real estate taking (flowage easement, etc.) has been made (ER 1105-2-100, pg. 3-3 Flood Damage Reduction (5) Induced Flooding, page 3-12). Conditions have not been met to justify mitigation.

Resolution: Cost have been developed for both the NED plan which does not include high water storage and the LPP which includes high water storage. The incremental cost between the NED and the LPP will be borne by the local sponsor.

Resolution Impact: Concern resolved

Roseau, Minnesota
Flood Damage Reduction Project

Channel Sizing

Concern: Three diversion channel bottom-widths (50', 150' and 350') were evaluated. The 150' bottom width was identified as the NED plan; however, with nearly $350,000 in residual annual damages there may be a slightly larger plan with higher net benefits (alternate NED).

Reason: Guidance for CW projects requires that the NED plan be bracketed to assure the there is not another plan that could achieve greater net benefits..

Resolution: A sensitivity analysis was conducted based on the relationships displayed in Table C-E-11 to determine if a 250' diversion channel could possibly be the plan with the highest net benefits. Even claiming the all the benefits calculated for the 350' diversion channel the 250' alternative would fall short of the net benefits needed to overtake the 150' plan.

Resolution Impact: Concern resolved

Roseau, Minnesota
Flood Damage Reduction Project

Natural Resource Impacts

Concern: The report is not clear on the issue of natural resource mitigation. In several places it states that no mitigation is needed for impacts to natural resources and in other places it indicates that mitigation will be done or that plantings will offset impacts.

Reason: Corps guidance requires an assessment of environmental impacts and a determination of measures to mitigate for such impacts. A cost effectiveness and incremental cost analysis is required to determine the best plan to mitigate potential impacts.

Resolution: The district revised the report to clearly indicate the quantity and quality of natural resources in the project area and the extent to which they will be impacted. The revised report indicates that mitigation is not needed to offset minimal impacts caused by the proposed project.

Resolution Impact: Concern resolved

Roseau, Minnesota
Flood Damage Reduction Project

Contingency Rates

Concern: The contingency rates applied to construction features exceeded guidelines described in ER 1110-2 1302.

Reason: Project cost could be overstated because of the application of high contingency rates.

Resolution: The cost estimate has been reviewed by the district resulting in the reduction of some contingencies. Items with increased levels of uncertainty have larger contingencies resulting in levels higher than the 20 percent indicated in ER 1110-2-1302. The contingencies for the FDR portions of the project vary between 25 and 26 percent

Resolution Impact: Concern resolved

Roseau, Minnesota
Flood Damage Reduction Project

HQUSACE Policy Compliance Review Team

RECOMMENDATION

Release the report and EA for S&A Review

Lessons Learned

US Army Corps of Engineers

Sustain:

- **Continue extensive communications with the public, agencies, and other organizations using multiple methods.**
- **Have another district perform the ITR**

Improve:

- **Document all analyses clearly**
- **Write the report throughout the formulation process**
- **Increase communications with vertical team**

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MVD
Lessons Learned

- Clear communication with vertical team about potential policy issues
- Clear documentation of all analyses would have reduced comments
- Writing the report throughout the formulation process makes draft report preparation less difficult
- Having another district perform the ITR improved the quality of the decision document