



**US Army Corps
of Engineers**
St. Paul District
Mississippi Valley Division

**DRAFT
SECTION 205 FEASIBILITY REPORT
AND ENVIRONMENTAL
ASSESSMENT**

ADA, MN.

WILD RICE AND MARSH RIVERS, MN

**January 2009
Public Review**



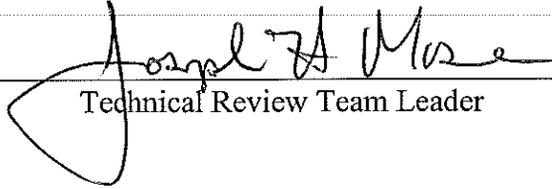
**US Army Corps
of Engineers**
St. Paul District

CERTIFICATION OF TECHNICAL AND LEGAL REVIEW

PROJECT: Wild Rice and Marsh Rivers, Ada, Minnesota
 PRODUCT: Section 205 Draft Feasibility Report and Environmental Assessment
 SPECIFICATION NUMBER: N/A

I. Completion of Independent Technical Review

The District has completed the Section 205 draft feasibility report and environmental assessment for a flood risk management project located at Ada, Minnesota. Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Project Management Plan. During the independent technical review of the draft report, compliance with established policy principles and procedures, utilizing justified and valid assumptions were verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by an independent district team.

 _____ Technical Review Team Leader	_____ 7-16-08 Date
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II. Certification of Independent Technical Review

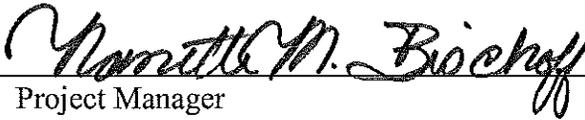
Significant concerns and the explanation of the resolution are as follows:

DRChecks was used to track ITR comments, responses and resolutions. These comments are attached to the ITR endorsement memorandum. There are several issues either identified by the ITR team or the project delivery team that will need to be addressed in the final feasibility report, or during the design phase. These issues are as follows. Additional information is needed in the hydraulics and interior flood control appendices in the final report. A real estate plan and implementation cost estimate will be included in the final feasibility report. Additional cultural resources surveys and Hazardous, Toxic, and Radioactive Waste surveys will be needed during the design phase. Settlement factors must be considered during the design phase. Additional drawings will be provided in the final feasibility report.

Following certification, below, the draft feasibility report and environmental assessment will be forwarded to MVD for approval to distribute the draft report and environmental assessment to the public for review. It is anticipated that this public review of the draft report and

environmental assessment will result in comments from the public, and from local, state and Federal agencies, which will be considered in preparation of the final report.

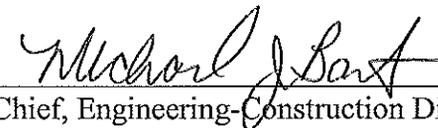
As noted above, all concerns resulting from independent technical review of the draft feasibility report and environmental assessment have been considered. The draft report and all associated documents required by the National Environmental Policy Act have been fully reviewed.


Project Manager

16 July 08
Date


Deputy for Project Management

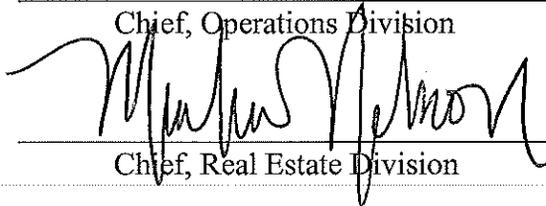
16 July 08
Date


Chief, Engineering-Construction Division

22 July '08
Date

N/A
Chief, Operations Division

Date


Chief, Real Estate Division

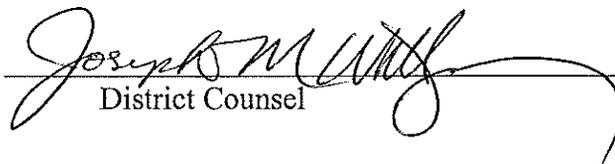
23 July '08
Date

N/A
Chief, Contracting Division

Date

III. Certification of Legal Review

The draft feasibility report for Ada, Minnesota, including all associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, St. Paul District and is approved as legally sufficient.


District Counsel

23 July 08
Date

Draft Feasibility Report
Ada, Mn - Section 205 Feasibility Study

January 2009

EXECUTIVE SUMMARY

This draft feasibility report documents the analysis that was performed to determine the economic feasibility of constructing a flood risk management project in the city of Ada, MN. under the authority of Section 205 of the Flood Control Act of 1948, as amended.

This draft report is being distributed for the purpose of coordinating the tentatively selected plan and draft environmental assessment with state and local agencies and the general public.

This draft report documents the identification of flooding problems in the City of Ada, Mn., the formulation and selection of alternatives to address flooding problems, the computation of benefits and costs, and the selection of a recommended plan. This draft report outlines the requirements for local cooperation. This draft report also includes an environmental assessment, in accordance with National Environmental Policy Act.

This report concludes that construction of a Federally-sponsored flood risk management project is feasible. This report further concludes that the National Economic Development plan (the plan which produces the maximum net benefits), includes relocation of a portion of Judicial Ditch 51 in the vicinity of Ada, and construction of a 200-year levee and appurtenant interior drainage facilities.

Comments made on this draft feasibility report will be considered in the preparation of the final feasibility report and environmental assessment. Pursuant to approval of the final feasibility report, the next phase will be design and implementation of the recommended plan, which includes preparation of plans and specifications, and construction of the project.

Following construction, the project would be turned over to the City of Ada for operation and maintenance.

FEASIBILITY REPORT
ADA, MINNESOTA – SECTION 205 FEASIBILITY STUDY
JANUARY 2009

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FEASIBILITY REPORT
ADA, MINNESOTA – SECTION 205 FEASIBILITY STUDY
JANUARY 2009

GENERAL

1. The U.S. Army Corps of Engineers, St. Paul District, conducted this study under the authority of Section 205 of the Flood Control Act of 1948 (Public Law 80-858), as amended, in response to a request from the city of Ada, Minnesota.

STUDY PURPOSE AND SCOPE

2. The purpose of this study is to determine the feasibility of a flood risk management project for the city of Ada. The project would reduce damages in the city caused by flooding on the Wild Rice and Marsh Rivers and Judicial Ditch 51. This report identifies the National Economic Development (NED) plan, which yields the maximum benefits.

STUDY AREA DESCRIPTION

3. Ada is in central Norman County in northwestern Minnesota approximately 210 miles northwest of Minneapolis-St. Paul, Minnesota, and approximately 32 miles northeast of Moorhead, Minnesota. Ada lies approximately 2 miles north of the Wild Rice River near the headwaters of the Marsh River, both tributaries of the Red River of the North. Judicial Ditch 51 (JD 51) flows around the northern limits of the city and provides an outlet for the city and agricultural lands north of the city, as well as occasional overflows from the Wild Rice River.

4. The study area is shown on Figures 1, 2 and 3.

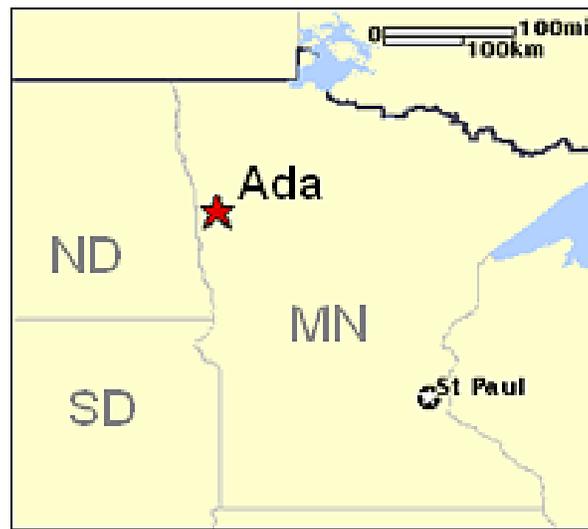


Figure 1 - Location of Ada, Minnesota

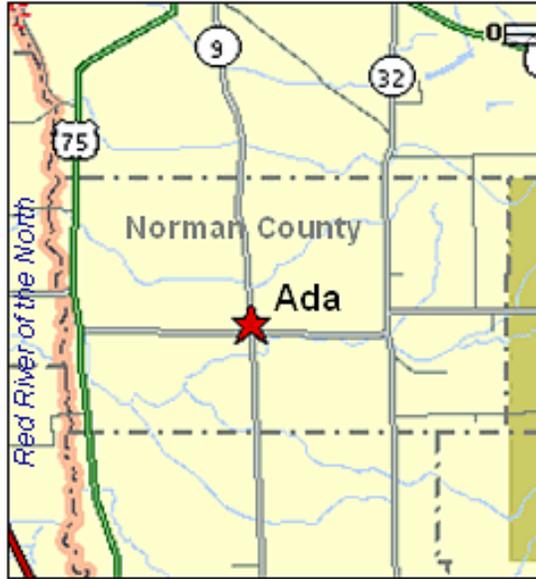


Figure 2 - Location of Ada within Norman County, Minnesota

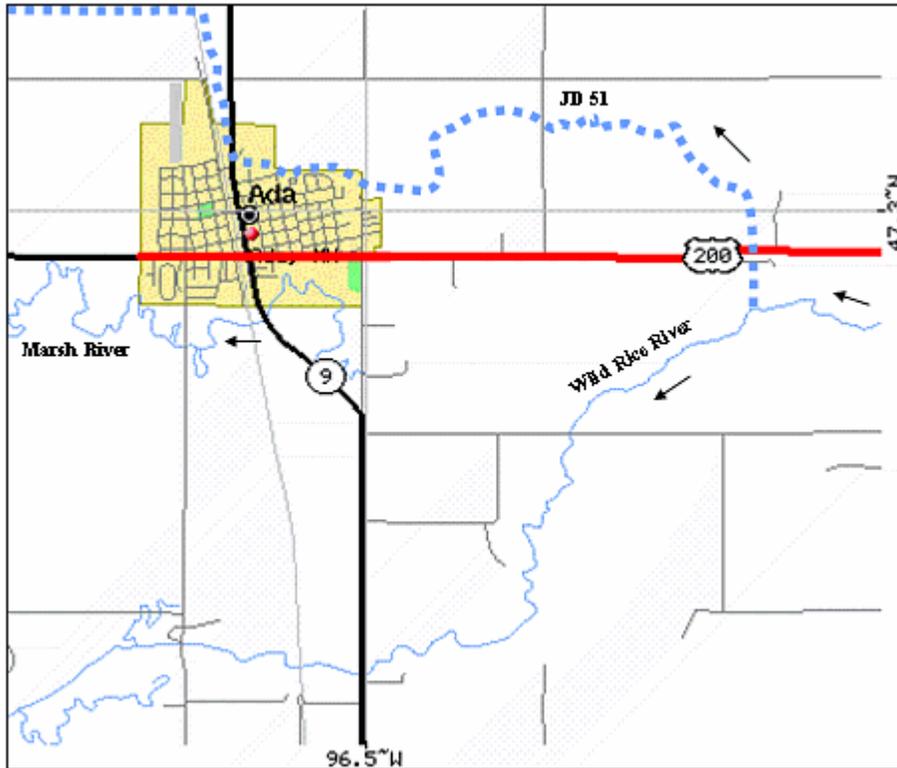


Figure 3 - Location of the Wild Rice River, the Marsh River and Judicial Ditch 51 in the vicinity of Ada

PRIOR STUDIES, REPORTS, AND EXISTING PROJECTS

5. The city of Ada received substantial damage during the 1997 flood. Following that flood, emergency levees were built and the hospital and high school were relocated to higher ground.
6. After the 1997 flood, the city of Ada asked the Corps of Engineers to conduct studies to determine the feasibility of developing a small flood control project at Ada. The feasibility study began on April 7, 2000. Several alternatives were studied. The preferred alternative was to raise the levees around Ada so that the entire city would be protected to the level of the 1997 flood. An economic analysis completed in February 2001 concluded that a project was not feasible. At the request of the local sponsor, the study was put on hold.
7. In June 2002, two record-breaking floods occurred in the basin. During the floods, weaknesses were observed in the existing levee system. As a result of the 2002 event, the Corps updated the discharge-frequency relationships and credit-to-levee analysis used in the prior feasibility analysis. This reanalysis indicated that the benefit-cost ratio had increased to a level suggesting economic feasibility.
8. While the study continued to remain on hold, the city of Ada made further improvements to the existing levee system with the assistance of the State of Minnesota.
9. On January 6, 2004, the city of Ada passed resolution 2004-01-01, authorizing reactivation of the study, which was forwarded to the Corps on March 28, 2004. A new feasibility cost share agreement was signed with the city on October 3, 2005; and the new study began.
10. Previous reports pertinent to this study include the following:
 - a. 1975 Design Memorandums 1 and 2, Flood Control, Twin Valley Lake, Wild Rice River, Minnesota.
 - b. December 1986 Section 205 Flood Control Reconnaissance Report – Wild Rice River at Ada, Minnesota.
 - c. March 1987 Design Memorandum No. 2, Flood Control, Twin Valley Lake, Wild Rice River, Minnesota.
 - d. May 1992, Feasibility Report and Environmental Assessment, Section 205 Flood Control, Wild Rice River, Hendrum and Lee Townships
 - e. August 1992, Feasibility Report and Environmental Assessment, Section 205 Flood Control, Wild Rice River, Lake Ida Township
 - f. Interim Report – Initial Section 205 Feasibility Study, Ada, Minnesota, 14 August 2001
 - g. Section 205 initial appraisal, Borup, Minnesota Minnesota, terminated 2007. May be pursued as a Section 206 study.

h. Section 205 Feasibility Study, Marsh Creek, Minnesota, October 2006. On hold pending outcome of Ada feasibility study.

11. Existing projects in the area include the following:

a. Judicial Ditch 51 diversion from the Wild Rice River – Constructed in 1895, by the Red River Drainage Commission.

b. In 1906, channel cutoffs were dredged along 5 miles of the Wild Rice River by the State of Minnesota.

c. Another channel-straightening project in the 1920s cut off more oxbows in the Wild Rice River downstream from Ada.

d. 1950's Wild Rice River channel straightening project – Constructed by the Corps of Engineers and Wild Rice-Marsh River Drainage and Conservancy District (WRMRDCD), straightened 15½ miles of the Wild Rice River, improved 24 miles of the Marsh River, cleared and snagged another 3 miles of the Marsh River, and constructed a dike and control structure between the Wild Rice River and old Marsh River channels southeast of Ada.

e. In 1964, the Corps and WRMRDCD cleared and snagged a 12-mile reach of the Wild Rice River downstream of the 15½-mile reach channelized in the 1950s.

f. Between 1966 and 1970, local interests enlarged and straightened the Wild Rice River channel downstream of the Marsh River diversion. In 1975, the Wild Rice Watershed District (WRWD), successor to the WRMRDCD, added an ice control structure at the mouth of the Marsh River diversion.

g. In 1977, the Soil Conservation Service constructed wing dams and levees at 14 locations along the Wild Rice River.

h. In 1977, the WRWD and Norman County rebuilt the Heiberg Dam on the Wild Rice River near Twin Valley. In June 2002, the Heiberg Dam failed; it was rebuilt in 2007.

i. In the early 1980s, the Corps and WRWD did about 2½ miles of debris removal and 14½ miles of channel improvement on the South Branch Wild Rice River and about 1 mile of debris removal, 16¼ miles of channel improvement, and 3 miles of levee construction along Felton Creek.

j. Following the 1997 floods, some additional levees were built in Ada. During the June 2002 flood emergency, the Corps raised those levees. The city has since incorporated much of that levee raise into a permanent system to protect against breakouts from the Wild Rice River and JD 51.

- k. The WRWD's Rural Ring Dike Program has constructed more than 40 ring dikes around farmsteads, homes, and outbuildings.
- l. The WRWD's Acquisition/Relocation Program has removed over 40 flood-prone homes since the 1997 flood.
- m. The WRWD also assisted the city of Borup with levee improvements to protect against breakouts from the South Branch Wild Rice River.
- n. The WRWD recently completed a combination flood damage reduction/ecosystem restoration project on Dalen Coulee, a tributary to the lower Wild Rice River.
- o. The Corps has repeatedly made post-flood repairs to locally-built levees along the Wild Rice River riverbank under the authority of Public Law 84-99.
- p. Congress recently authorized restudy of the upstream storage projects on the Wild Rice River (such as the Twin Valley Dam).

EXISTING CONDITIONS

CLIMATE

12. The climate of the Wild Rice-Marsh River basin varies seasonally, with hot, humid summers; freezing, cold winters; and moderate precipitation. Climatological data for Ada show the record high was 111°F on July 6, 1936, and the record low was -53°F on February 15, 1936. The mean annual temperature is 40°F and mean monthly temperatures vary from 70°F in July to 5°F in January. Average annual precipitation is 24 inches. The greatest annual precipitation observed was 33.39 inches at Ada in 1941, and the least observed was 10.25 inches at Mahnomen in 1936. Normal monthly precipitation for the basin ranges from a maximum of 4.3 inches in June to a minimum of 0.6 inch in February. Average snowfall is 40 inches and amounts to about 16 percent of the total annual precipitation. The most snowfall occurred in the winter of 1996-1997 with 104 inches. Construction seasons vary, depending upon the nature of work; many outdoor construction activities are limited to the period between May 1 and October 15, due to either spring road load limitations (hauling) or cold weather (paving).

TOPOGRAPHY

13. The topography of the Wild Rice River basin and of the upper portion of the Marsh River basin is divided into three distinct areas. The upstream areas are characterized by gently undulating to rugged terrain. The downstream areas are characterized by an extremely flat plain. Between those two areas exists a transition composed of a series of sandy ridges. Elevations range from more than 1500 feet msl (above mean sea level, 1929 adj.) near the source of the Wild Rice River to 818 feet msl at the mouth of the Marsh River. Riverward slopes throughout the entire area above the plain are sufficient for adequate drainage, but those in the lower reaches of the watershed are very flat and drainage is sluggish. About 60 percent of the upland area is cultivated, and about 94 percent of lower area is cultivated. The transition ridge area and the valleys in the upper portion of the basin contain substantial timber cover, and the upland area includes numerous small lakes.

GEOLOGY

14. The upper one-third of the basin is covered by glacial drift containing numerous deposits of sand and gravel. Loam or silty loams comprise the generally light soils of the glacial drift area. Immediately downstream from the glacial drift area and covering the transitional area described above are a series of beach ridges formed by the old glacial Lake Agassiz during successively lower recessional stages. Throughout these ridges the soils contain much fine sand, classified generally as silty sand. The remainder of the watershed downstream from the ridges is a nearly flat lacustrine plain that was the bed of the glacial lake. Lacustrine deposits extend to great depths over this plain, particularly in the vicinity of the Red River of the North.

DRAINAGE

15. The Wild Rice River starts at Upper Rice Lake in Clearwater County, Minnesota. The normal elevation of this lake is 1,503 feet msl. About 20 miles downstream the Wild Rice River

flows through Lower Rice Lake. The river then flows generally in a westerly direction until it joins the Red River of the North about 30 miles north of Moorhead, Minnesota. The total length of the river is about 185 miles. In the lower 50-mile reach, the river crosses the flat floor of the Red River Valley.

16. In the latter part of the 19th century, JD 51 was constructed to divert a part of the Wild Rice River flood flows into the Marsh River. Before JD 51 was constructed, the source of the Marsh River was in the low, flat terrain just south of Ada. Construction of JD 51 expanded the drainage area of the Marsh River, so that its source is now about 3 miles east of Ada at the flow diversion structure. The ditch trends just north of Ada and generally westerly for about 10 miles to its junction with the Old Marsh River channel. From this point the Marsh River flows northwesterly about 35 miles to its confluence with the Red River of the North about 15 miles north of the mouth of the Wild Rice River.

17. The Marsh River drains an area of about 300 square miles, and the Wild Rice River drainage area is about 1,650 square miles. During times of high flow, a portion of the Wild Rice River flows may flow into the Marsh River, either through the JD 51 channel or from breakouts along the Wild Rice River.

18. The principal tributaries of the Wild Rice River are the White Earth River (mile 99), Marsh Creek (mile 72), South branch Wild Rice River (mile 29.5), and Felton Ditch (mile 20.5) with drainage areas of 202, 154, 253, and 144 square miles, respectively. The principal tributary of the Marsh River is Spring Creek which has a drainage area of 135 square miles.

19. Streamflow is small during the winter season. The Marsh River usually has no flow for long periods in the winter months. Streamflow usually rises in late March or in April, often reaching the highest flow of the year in April. Often the streamflow remains relatively high through June but usually recedes slowly in the summer, except after heavy rains. In the fall months the stream flow is rather low. The numerous lakes in the upper portion of the Wild Rice Basin tend to sustain the low flow on the mainstem during the dryer seasons of the year.

20. The JD 51 diversion ditch results in a portion of the flows being diverted from the Wild Rice River into the Marsh River when the river stage is high.

FLOODING

21. The city of Ada is subject to flooding from high stages on the Marsh and Wild Rice Rivers and on JD 51. Flooding occurs from both snowmelt and excessive summer rains. Sometimes snowmelt is made worse by spring rains. Spring rains following snowmelt may either extend the duration of high flows or result in additional high peak flows. During the early stages of snowmelt, rivers and ditches are often clogged by ice and snow. Ice jams have been known to increase river stage by several feet. The primary source of flooding is from the Wild Rice River overflow into JD 51 and the Marsh River. While some levees are along the Wild Rice River, high stages will occasionally break out, and overland flow will lead to flooding in Ada. JD 51, in addition to carrying local runoff, diverts a portion of the flow from the Wild Rice River. High

flows in JD 51 and the old Marsh River will cause flooding in Ada. The Marsh River lies directly to the south of Ada, between the city and the Wild Rice River.

April 1997 Floods

22. Significant flooding occurred in Ada in April 1997. The spring 1997 flood was a snowmelt runoff event. Flooding conditions were exacerbated by a wet autumn, which saturated the ground; heavy winter snowfall; cool temperatures during March and April that delayed snowmelt; ice jams on the Wild Rice River; and the addition of 2 to 3 inches of rainfall on top of the melting snow.

23. Flooding in the spring of 1997 occurred in two waves. The first wave was caused by the formation of ice jams on the Wild Rice River. The ice jams increased stages that sent massive flows into JD 51 and resulted in failure of the Wild Rice River dike systems, which sent flow overland toward Ada. The peak stage on the Wild Rice River during the first wave of flooding was 13.5 feet at the gage located near Ada, which fell short of the record stage by only 0.1 foot.

24. The second wave of flooding occurred when a powerful storm combined 2 to 3 inches of rainfall with freezing rain and snow. The rainfall quickly melted the remaining snowpack. This second wave of flooding overtopped levees in many locations throughout the basin. Road crossings downstream of the Heiberg Dam were overtopped. Highways 200 and 9 were overtopped. The South Branch of the Wild Rice River overflowed its banks. The railroad track that had been acting as a levee between the eastern and western portions of Ada was overtopped by about 6 inches. The city of Ada was evacuated. Some streets in Ada were under more than 5 feet of water. The peak stage on the Wild Rice River for the second wave of flooding was 16.5 feet at the gage located near Ada, which surpassed the flood of record by 2.9 feet.

25. Once water spilled over the levees, it flowed overland through Ada and continued overland downstream. Culverts between the 1-mile-square U.S. Geological Survey sections were not large enough to pass the overland flows. The sections acted like reservoirs, filling with water until they overtopped or breached roadways, spilling into the next section. Almost all of Hegne Township, Minnesota, was flooded. Water submersed fields in bands from 5 to 10 miles wide.

June 2002 Floods

26. The June 2002 floods were the result of heavy rainfall that swept across the region on June 9 and 10 and again on June 22 to 24 2002. Preflood precipitation had been below normal since late summer 2001 and as of June 1, 2002, the flooded area was in a moderate drought.

27. During the June 2002 floods, a peak discharge of 14,000 Cubic Feet per second (cfs) occurred June 9 on the Wild Rice River at Twin Valley, Minnesota. The peak discharge exceeded the previous peak that occurred in 1997 by 40-percent and had a recurrence interval of about 200 years. Flooding was extensive in the city of Ada just downstream of Twin Valley; however, flood fighting efforts prevented most damage.

28. A peak discharge of 20,300 cfs occurred June 24 on the Wild Ricer River at Twin Valley. The peak discharge exceeded the peak on June 9 by 36-percent and had a recurrence interval of about 1,000 years.

29. Numerous other floods have occurred in the basin. It should be noted that eight out of the highest nine flood peaks at Twin Valley occurred in the last 18 years. Other notable floods were in 1989, 1978, 1979, 2000, 2001, and 2006.

NATURAL RESOURCES

30. The project area, within the bed of glacial Lake Agassiz is extremely flat and, aside from stream courses, devoid of woody vegetation. It is located in the northern floodplain forest and prairie ecosystems but native prairie is rare and confined to small remnant patches, many of which are along railroad right-of-way. This is the result of almost complete conversion of the area to agricultural cultivation and to development of the city of Ada.

31. Water resources include JD 51, which drains to the west on the north side of the city of Ada, and the Marsh River, which borders the city to the south. A few small temporarily or seasonally flooded wetlands are within the project area. Wooded areas are limited primarily to riparian areas along the river and JD51.

32. Adverse effects on natural resources from the construction of this project would be minor. Wetlands are limited in the area and would be avoided. Terrestrial habitat is mostly absent in the city and would not be reduced. Riparian trees that would be removed would be replaced in an area that would be set aside as a natural area after construction. Interior stormwater ponds would be designed to have wetland attributes.

33. The project would have no adverse effect on endangered or threatened species.

CULTURAL RESOURCES

34. This portion of Minnesota contains numerous cultural resources indicating continual human occupation for approximately 12,000 years. Cultural resource sites within the region exist on a variety of landforms, including uplands, terraces, floodplains and glacial beach ridges. Precontact cultural resources include lithic and artifact scatters and burial mounds. Historic cultural resources include Euro-American structural ruins, standing structures, cemeteries, roads and trails.

35. Within the city of Ada, three historic structures are listed on the National Register of Historic Places (NRHP): the Ada City Hall/Fire Hall, Norman County Courthouse and the Ada Congregational Church. The Ada Public School has been determined eligible for listing on the NRHP. An additional 34 historic architectural properties have been identified in and around Ada. Two precontact sites are located within the construction limits of the proposed project. Site 259-1 consists of a single artifact find spot, and site 259-2 is a single piece of lithic debris (Florin 2008).

DEVELOPMENT AND ECONOMY

36. Population – The population of Ada as of the latest census (2000) was 1,657, which represents a continuation of population decline in recent decades. Population was 2,076 in 1970, 1,971 in 1980, and 1,708 in 1990. In contrast, Fargo, North Dakota-Moorhead, Minnesota, located 40 miles to the southwest, has experienced population growth in recent years increasing from 137,574 in 1980 to 174,367 in 2000.

37. Income – Per capita income for Norman County in 2005 was \$27,414, which was lower than that for the state of Minnesota (\$37,290) and for the nation as a whole (\$34,471). Income growth since 1990 was also lower than State and national figures. From 1990 to 2005, per capita income for Norman County grew 56.0 percent while Minnesota's per capita income grew 87.5 percent and that of the U.S. grew 77.0 percent.

38. Employment – The largest employment sectors for Norman County are farm-related (21.8 percent), government (13.9 percent), health care/social assistance (12.2 percent), retail trade (9.7 percent), and finance and insurance (5 percent). Compared with State averages, the agricultural sector comprises a larger percentage of the local economy (21.8 percent versus 2.9 percent) while manufacturing plays a much lesser role (0.2 percent versus 10.4 percent).

EXISTING PROBLEMS AND OPPORTUNITIES

39. The city of Ada is subject to flood damages resulting from flooding on the Wild Rice River, the Marsh River and JD 51. Flooding may occur either as a result of snowmelt, rainfall or a combination of snowmelt and rainfall. Snowmelt flooding can be exacerbated by the formation of ice dams. The largest flooding events occurred April 1997 and June 2002. During extreme flooding, access routes in and out of Ada are cut off, with Trunk Highway 9 north of Ada being the last route to be inundated.

40. Problem 1: The city of Ada must contend with overland flooding from flows in JD 51, flows from the Marsh River, and breakout flows from the Wild Rice River, which flow into JD 51 and the Marsh River. The spoil bank levees that separate the city from flows in JD 51 are in very poor condition, and offer no protection to the city.

41. Problem 2: During extreme flooding, access routes in and out of Ada become flooded, limiting ingress to and egress from the city.

42. Problem 3: During extreme flood events, the gravity line to the existing wastewater treatment plant does not flow, meaning that untreated wastewater must be discharged directly into the floodwaters surrounding the city, which requires approval from the Minnesota Pollution Control Agency.

43. Problem 4: During extreme flood flows, stormwater cannot be discharged into JD 51, causing indirect flood damages from backup into the city's storm sewer.

44. Opportunity 1: The risk of flood damage in the city of Ada can be reduced by preventing flows from JD 51, the Marsh River and the Wild Rice River from entering the city and causing damages.

45. Opportunity 2: The risk of flood damage in the city of Ada can be reduced by providing a barrier between the damageable areas and the flood flows, by diverting the flood flows to a different area, or by removing or flood proofing flood-prone structures.

46. Opportunity 3: The lack of flow to the wastewater treatment plant during flooding can be addressed by providing a means to continue wastewater flow, such as changing the gravity line into a pressurized line.

47. Opportunity 4: Indirect flood damages can be reduced by providing areas to store and facilities to discharge interior drainage.

48. Opportunity 5: Ingress and egress out of the city of Ada can be improved during flooding, but may require a more integrated effort by State and county transportation authorities.

PLAN FORMULATION

PUBLIC INVOLVEMENT AND COORDINATION

49. As a result of the 1997, 2001 and 2002 floods, the city of Ada expressed interest in the Corps of Engineers investigating the feasibility of constructing a flood risk management project under the authority of Section 205 of the 1948 Flood Control Act, as amended.

50. The non-Federal sponsor (the city of Ada) is an equal partner in this cost-shared study. The city of Ada relied heavily on funding provided by the Minnesota Department of Natural Resources (MnDNR) through the Department of Waters to meet the local cost obligations. Close coordination was maintained throughout the study with the non-Federal sponsor and the MnDNR.

51. Meetings have been held with representatives from the city of Ada and its engineering firm. In turn, the city has discussed the study and its recommendations at its council meetings, which are open to the public, and documented for the public record. Initial meetings were conducted to determine the city's goals and objectives in constructing a flood risk management project. Further meetings were held to brief the city on the progress of the study. A public information meeting was held in Ada on October 1, 2008, to discuss the proposed project. A coordination meeting was held on October 2, 2008, with representatives from the Wild Rice Watershed, the Minnesota Department of Transportation and Norman County to discuss design aspects of the recommended plan.

52. It is intended that the draft feasibility report and environmental assessment be made available to the public for review as part of the National Environmental Policy Act (NEPA) process in January 2009. The public comments will be documented and considered prior to finalizing the report.

PLANNING CONSIDERATIONS

53. The formulation of alternatives for this study was influenced by the past history of flooding; the location of benefits within the proposed project area; current and projected land usage; and the locations of potential hazardous, toxic and radioactive waste (HTRW).

PLANNING GOALS AND OBJECTIVES

54. The goal is to manage the flood risk to the city of Ada from the Marsh River, JD 51 and the Wild Rice River. The proposed project should be acceptable to the city of Ada. The proposed project should address interior flood control within the city when flooding occurs in the landscape surrounding Ada. The objective of the study is to determine if there is a Federal interest in providing flood management measures to the city of Ada. If a Federal interest exists, the study then determines the NED plan, which maximizes net benefits.

55. The Federal objective of water and related land resources planning is to contribute to NED, consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

56. Direct flooding is defined as that flooding that is caused by overland flow. Indirect flooding is defined as that flooding that is caused by backup of the sewer system.

57. The objective of reducing the risk of flood damages to existing development within the city of Ada forms the basis for the formulation of alternative plans. The city also expressed interest in protecting an undeveloped area on the northwest quadrant of the city and two developed areas to the west and to the east of the city limits.

PLANNING CONSTRAINTS

58. The recommended plan must meet NED standards. The recommended plan must comply with NEPA. The recommended plan cannot induce flooding on the Red River of the North, which means that the JD 51 flow regime downstream of Ada cannot change. The recommended plan must not violate Executive Order (EO) 11988, in that first it must be determined if the proposed project is located in a floodplain (area subject to a 1- percent or greater chance of flooding in any given year) as defined by a Department of Housing and Urban Development (HUD) flood map and, second, if the project is located in a floodplain, that alternatives to avoid adverse impacts and incompatible development have been considered; that the proposed action has been coordinated with the agencies responsible for floodplain management; and that opportunities for public review have been provided . The city of Ada desires that the project provide protection to at least the level of the 1997 flood and would not be interested in implementing a lesser plan. The recommended plan must be within the city's means to operate and maintain. The city has condemnation rights only within 2 miles of the city. Basin-wide measures are being considered by the WRWD. The feasibility of these other measures may be affected by the construction of a flood control project at Ada.

59. The proposed project cannot change the hydraulic character of JD 51, the Wild Rice River or Marsh Creek, such as would make flooding worse for downstream communities. Small, localized hydraulic impacts may be unavoidable, and will be addressed in the takings analysis for real estate.

FORMULATION AND EVALUATION OF ALTERNATIVE PLANS

WITHOUT-PROJECT CONDITION

60. The without-project condition serves as the basis for evaluating other alternatives.

61. Without a flood risk management project, slow growth in residential development is expected to continue in the community of 1657 people. Development that does occur will require flood proofing, typically by elevating buildable lots with fill material. Annual flood damages are expected to continue at a rate of \$704,000 per year. The city will continue to incur flood-fighting expenses and will continue to pay flood insurance on many structures. The WRWD will continue to maintain JD 51 along its current alignment, but it may take additional measures to stabilize the eroding slopes. The costs of maintaining JD 51 will continue to be assessed to the benefiting landowners, including the city of Ada. The city will continue to operate and maintain their existing levees.

62. The WRWD will continue to actively seek to study and construct other flood damage reduction projects in the Wild Rice River basin. These other projects may or may not yield benefits at Ada. Ongoing WRWD-sponsored Corps studies include the Section 205 project located at Marsh Creek, which is upstream of Ada on a tributary of the Wild Rice River. This project would produce some benefits at Ada, but it would not protect it in the same way as a local levee project would. The outcome of this study is uncertain at this time.

63. Studies and activities being conducted by the WRWD are numerous, and involve creating storage for floodwater, improving ditching to convey runoff, building ring dikes to protect farmsteads, and conducting maintenance and other improvements intended to provide flood damage reduction mostly to agricultural areas. Congress recently authorized a study of the Twin Valley Dam (and alternatives), which was previously studied by the Corps in the 1980s. This study may or may not result in a constructed mainstem flood retention project upstream of Ada on the Wild Rice River. Large dams have been opposed by the MnDNR.

WITH-PROJECT CONDITION

64. The with-project condition is that which exists with a project in place. The benefits of an alternative compare the with-project condition to the future without-project condition. A 50-year planning period is used. The with-project condition will vary, depending on the alternative under consideration. Alternatives may be nonstructural or structural in nature, or a combination of both. The with-project conditions are discussed later in this report under the “Evaluation of Alternatives” section.

NONSTRUCTURAL ALTERNATIVES

65. Nonstructural alternatives could include such measures as flood proofing, structure raising, relocation, ring dikes acquisition, and demolition. Nonstructural flood control features were considered wherever they would be more appropriate than a structural feature, as protection to isolated dwellings, or in areas in which structural measures were more expensive.

STRUCTURAL ALTERNATIVES

66. Structural alternatives are sometimes favored for densely populated areas, in which nonstructural measures are not practical or are more expensive. Structural measures could include flood walls, levees, ditches, pumping stations and diversion channels.

FORMULATION OF ALTERNATIVE PLANS

67. The first step in formulating plans was to determine what to do with the flows passing through JD 51. It was determined early in the study that the disposition of JD 51 flows, would affect the development of all other flood risk management features. Currently, JD 51 passes through the city of Ada, where it must flow through a narrow channel adjacent to a residential area and then through a concrete underpass beneath Highway 9. The JD 51 side slopes are nearly vertical in some areas, and the channel bank is sloughing. This portion of the JD 51 channel was included in a Corps' channel-improvement project in the mid 1950s. The channel was designed with 1 vertical on 3 horizontal side slopes. The easements for the 1950s channel improvement project extended 20 feet beyond the top edge of the channel. These channel side slopes are not stable. Based on current geological information, it is recommended that the JD 51 channel be designed with 1 vertical on 6 horizontal side slopes. The proposed project features would include stabilization of a portion of the JD 51 channel.

68. We considered four different alignments for JD 51. These four alignments are shown on the following figure. JD 51 flows from right to left on the figure shown.

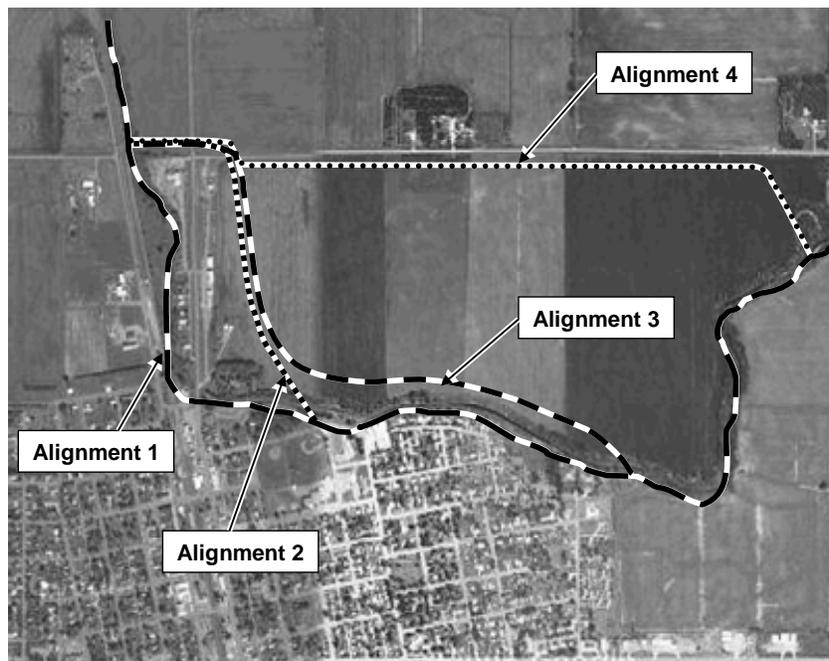


Figure 4 – JD 51 Ditch locations

69. The next step was to develop alternative plans that combined flood damage reduction features with each of the JD 51 alignments. The objective was to formulate alternative plans that yielded similar benefits so that the most economical JD 51 alignment could be chosen. Areas within the Ada city limits were targeted. For screening purposes, the 200-year flood level was used. Because of the extent of the area and the number of structures affected, use of nonstructural measures, such as flood proofing and relocations, was dismissed as a viable alternative. However, nonstructural measures are considered later in the analysis for several option areas.

70. For each JD 51 alignment, a corresponding primary levee was designed. Four alternatives, corresponding to the four alignments for JD 51 were developed. These alternatives are described below.

71. Alternative 1 includes levees and interior drainage structures to provide flood damage reduction to structures and facilities within the city of Ada corporate limits, combined with stabilization of JD 51 in its present location. JD 51 alignment 1 follows the current alignment for JD 51. The primary levee for alternatives 1, 2, 3 and 4 are similar, except for in the northeast quadrant (adjacent to JD 51). For Alternative 1, the northeast levee must be built on both sides of JD 51 to provide a flood barrier on the north and south sides of the ditch. This levee construction involves removing several dwellings to facilitate levee construction. Alternative 1 is shown in Figure 5 located at the end of the main section of this report.

72. Alternative 2 includes levees and interior drainage structures to provide flood damage reduction to structures and facilities within the city of Ada corporate limits, combined with relocation of JD 51 to alignment 2. JD 51 alignment 2 follows a portion of the current JD 51 alignment, then diverts JD 51 around the northeast portion of the city. For Alternative 2, the northeast levee is built so that JD 51 can remain in its present streambed until it is diverted northward. This levee alignment still involves removing several dwellings to facilitate levee construction. Alternative 2 is shown in Figure 6 located at the end of the main section of this report.

73. Alternative 3 includes levees and interior drainage structures to provide flood damage reduction to structures and facilities within the city of Ada corporate limits, combined with relocation of JD 51 to alignment 3. JD 51 alignment 3 diverts JD 51 farther northward than alignment 2, and beginning closer to the eastern city limits. For Alternative 3, the northeast levee and the proposed JD 51 channel are moved to the north side of the present JD 51 streambed, which preserves all of the houses on the south side, adjacent to JD 51. Alternative 3 is shown in Figure 7 located at the end of the main section of this report.

74. Alternative 4 includes levees and interior drainage structures to provide flood damage reduction to structures and facilities within the city of Ada corporate limits, combined relocation of JD 51 to alignment 4. JD 51 alignment 4 diverts JD 51 much farther northward from its current alignment, beginning further upstream on JD 51. For Alternative 4, the levee is identical to the levees used in Alternative 3. Only the location of JD 51 has changed. Alternative 4 is shown in Figure 8 located at the end of the main section of this report.

75. The interior drainage requirements for Alternatives 2, 3 and 4 would be identical. Much of the interior runoff would be stored in the abandoned JD 51 channel. Alternative 1 would require additional flap-gated outlet structures adjacent to JD 51 and pumping facilities to control interior runoff.

SCREENING OF ALTERNATIVES

76. Screening of alternatives was done in several steps. The first step was a screening to determine the most economical location for JD 51. The second step was to further evaluate the recommended alternative from step one at various flood levels to determine the NED plan. A final screening step will be performed to determine if several option areas are incrementally justified.

77. Screening Step 1 – JD 51 location: A preliminary cost screening was done on the four JD 51/primary levee alignments to determine the most economical location for JD 51. For screening purposes, the alternatives were evaluated at the 200-year flood level. The alternatives screening estimates are shown in Appendix G. These estimates show relative cost differences between the alternatives. They do not include costs for features that are common to all plans.

- Alternative 1: \$8,532,000 + costs of common features
- Alternative 2: \$6,377,000 + costs of common features
- Alternative 3: \$4,333,000 + costs of common features
- Alternative 4: \$4,767,000 + costs of common features

78. The lowest cost alternative is Alternative 3, which is roughly \$434,000 less than Alternative 4, \$2,044,000 less than Alternative 2, and \$4,199,000 less than Alternative 1. Costs dropped dramatically for plans that moved JD 51 away from its current location, which passes through the city. Alternatives 1 and 2 were higher in cost because they involved removing many houses along the current JD 51 alignment.

79. Based on the above screening, Alternative 3 was determined to be the most economical alignment for JD 51. Alternative 4 costs are very similar to those of Alternative 3.

80. Based on this first screening, the second screening step would include the Alternative 3 levee and ditch alignment with the levee evaluated at several different flood levels. The end product of this second screening would be the NED plan. Further analysis would be done after the NED screening to evaluate several option areas to determine if they are incrementally justified.

81. Screening Step 2 – Design Flood Level (NED Analysis): Once the most economical location for JD 51 was determined, the next step is to evaluate the plan at different flood levels to determine the NED plan. Prior to performing the NED screening, some minor modifications were made to the basic levee/ditch plan. These changes do not affect the outcome of the alternatives screening, because they either would be common to all alternatives or would further reduce the cost of the chosen alignment. These changes include moving a portion of the levee in the northwest quadrant of the city northward to allow an area for interior ponding and moving the levee and JD 51 in the northeast quadrant of the city northward to compensate for slope

stability issues on JD 51 and to provide an area for disposal of excess material excavated from JD 51.

82. This modified alignment is shown in Figure 9 located at the end of the main section of this report.

83. In theory, both structural and nonstructural measures could be combined with the relocated JD 51 ditch to achieve the flood damage reduction goals in Ada. However, because there are existing levees around Ada, it was cost effective to upgrade these levees and extend them around the city to complete the flood barrier. Nonstructural measures, such as flood proofing and relocations, were not deemed to be practical, because the levees were already in place for most of Ada. Nonstructural measures are discussed further in the evaluation of the option areas.

84. The typical cross section of the levee used in the NED analysis is a trapezoidal section with 1 vertical on 4 horizontal side slopes, with a top-of-levee width of 10 feet. The top-of-levee elevation varies with the flood level being analyzed (either 50-year, 100-year, 200-year or 500-year elevations). The cross section of the relocated JD 51 is a trapezoidal excavation, with 1 vertical on 6 horizontal side slopes. The design for JD 51 is identical for all alternatives considered in the NED analysis. The relocated JD 51 ditch is intended to provide identical flow conveyance as the existing JD 51 channel, so as not to affect the flood characteristics upstream and downstream of Ada. The design for JD 51 is based on a bankfull discharge of 657 cfs which is equivalent to a 10-year event flow on the ditch. The JD 51 channel design is the same for all alternatives in the NED analysis.

85. The real estate interests included in the estimates assume that there would be fee title or permanent easements acquired for the levees and relocated JD 51, permanent easements for conducting maintenance and inspection, and temporary construction easements.

86. Alternative 3 was first evaluated at the 50-, 100- and 200-year flood levels. When the net benefits at the 200-year flood level were determined to be the greatest, an additional flood level (500-year) was added to the analysis to ensure that the NED plan was identified.

87. The following table summarizes the NED screening costs, in code of accounts format, for Alternative 3 at various flood levels. The NED screening estimates are shown in Appendix I.

Table 1 - NED Screening costs for Alternative 3 at various levels of protection (in \$1000s)

Code of Accounts	Level of Protection	50-year	100-year	200-year	500-year
01	Lands and Damages	\$ 819	\$ 822	\$ 826	\$ 1,158
02	Relocations	\$ 84	\$ 104	\$ 106	\$ 110
08	Roads, Railroads, Bridges	\$ 1,448	\$ 1,575	\$ 1,724	\$ 1,856
09	Channel and Canals	\$ 1,614	\$ 1,387	\$ 1,358	\$ 1,115
11	Levees and Floodwalls	\$ 1,912	\$ 2,355	\$ 2,560	\$ 3,430
30	Planning, Engineering and Design	\$ 607	\$ 651	\$ 690	\$ 781
31	Construction Management	\$ 354	\$ 379	\$ 402	\$ 456
	Total*	\$ 6,840	\$ 7,270	\$ 7,670	\$ 8,910

* Total number rounded to the nearest \$10,000

88. The following table summarizes the average annual flood damage reduction benefits, flood-proofing cost savings, and flood insurance savings associated with each flood level, yielding an average annual benefit for each.

<u>Category</u>	<u>50-Yr Levee</u>	<u>100-Yr Levee</u>	<u>200-Yr Levee</u>	<u>500-Yr Levee</u>
Existing condition average annual flood damages	\$704,000	\$704,000	\$704,000	\$704,000
Residual damages with project in place	\$157,100	\$87,500	\$44,600	\$900
Flood damage reduction for each flood level	\$546,900	\$616,500	\$659,400	\$703,100
Flood proofing cost savings		12,700	12,700	12,700
Flood insurance savings		<u>5,600</u>	<u>5,600</u>	<u>5,600</u>
Total Avg Ann Benefits	546,900	634,800	677,700	721,400

89. The following table summarizes the average annual costs for Alternative 3 for each flood level:

Table 3 - Calculation of average annual costs of Alternative 3 at various flood levels				
	<u>50-Yr Levee</u>	<u>100-Yr Levee</u>	<u>200-Yr Levee</u>	<u>500-Yr Levee</u>
Project Costs	\$6,840,000	\$7,270,000	\$7,670,000	\$8,910,000
Interest During Const.*	\$164,741	\$175,098	\$184,732	\$214,597
Total Investment	7,004,741	7,445,098	7,854,732	9,124,597
Int & Amort Factor	0.05372	0.05372	0.05372	0.05372
Avg Ann Investment	\$376,295	\$399,951	\$421,956	\$490,173
Avg Ann O&M	<u>25,286</u>	<u>27,107</u>	<u>28,741</u>	<u>32,552</u>
Total Avg Ann Costs	\$401,581	\$427,058	\$450,697	\$522,725
* Based on 1-year construction schedule				

90.

91. The following table summarizes the average annual costs and benefits for Alternative 3 at the various flood levels.

Table 4 - Summary of benefits, costs, benefit-cost ratios, and net benefits for Alternative 3 at various flood levels				
	<u>50-Yr Levee</u>	<u>100-Yr Levee</u>	<u>200-Yr Levee</u>	<u>500-Yr Levee</u>
Average Annual Benefits	\$546,900	\$634,800	\$677,700	\$721,400
Average Annual Costs	\$401,581	\$427,058	\$450,697	\$522,725
Benefit-Cost Ratio	1.36	1.49	1.50	1.38
Net Benefits	\$145,319	\$207,742	\$227,003	\$198,675

92. This table shows that the plan designed to the 200-year flood level has the maximum net annual benefits and is, therefore, the NED plan.

93. Screening Step 3 – Option Areas: In addition to what is protected by the primary levee, the project non-Federal sponsor requested that flood protection be considered for several areas that were physically separate from the main benefit area.

94. These option areas are identified as the northwest, west and east option areas, according to their location in town. These option areas are shown in Figure 10 located at the end of the main section of this report.

95. The west option area includes two farmsteads, including dwellings and outbuildings. One farmstead contains a historically significant barn.

96. The northwest option area does not contain any structures, so the only benefit would be from a reduction in costs or an increase in benefits to the cropland.

97. The east option area has several commercial properties That lie outside the city limits of Ada but which may benefit from being included in the plan.

98. In evaluating the option areas, it seemed appropriate to consider structural as well as nonstructural measures. However, as the primary levee has been optimized at the 200-year flood level, any levee extensions around the option areas were evaluated only at the 200-year flood level.

99. West Option Area: The measures evaluated for the west option area include structural measures, such as extension of the basic levee, and nonstructural measures, such as provision of ring dikes and flood proofing of structures. Cost estimates were prepared for the west option alternatives. The incremental cost differences for the various western option area alternatives for various flood levels are shown on the following table:

Table 5 – Incremental costs for West Option Area alternatives at various flood levels			
Incremental cost	100-year	200-year	500-year
Ring dike around Structures	\$80,989	\$101,155	\$137,978
Raise the houses and ring dike some structures	\$315,525	\$325,571	\$345,262
Extend main levee to encompass option area*	-	(\$10,000)	-
* Only the 200-year flood level was analyzed for the levee extension option. Because the NED plan for the main levee was the 200-year flood level, we would not provide a higher or a lower design for the option area encompassed by an extension of the main levee.			

100. These cost estimates show that extension of the basic levee is the most cost-effective means of reducing the risk of floods to the west option area. Benefit analysis shows that the west option area costs \$10,000 less than the basic levee plan. Extending the levee around the west option area actually reduces the overall cost of the project by reducing the cost of hauling excess material excavated from JD 51 and disposing of it in a different location. In addition to lowering the project construction cost, including the west option area yields an additional \$1,220 in average annual benefits. Therefore, the west option with levees is incrementally justified. The NED-level cost estimate for the basic 200-year levee plan, plus the recommended west option area with levees, is shown in Appendix I.

101. Northwest Option Area: The primary levee at the northwest corner of the proposed project was realigned to follow the northwest levee alignment. The resulting cost estimate showed that the northwest levee option costs \$20,000 less than the basic levee plan. Extending the levee around the northwest option area actually reduces the overall cost of the project due to being able to reduce the cost of hauling excess material excavated from JD 51 and disposing of it in a different location. The northwest option area would also yield a small amount of additional benefit. Nonstructural measures, such as flood proofing and ring dikes for the northwest option area were not evaluated, because no structures are located in this area. Because it results in a lower overall project cost, the northwest levee option is incrementally justified. The NED-level cost estimate for the basic 200-year levee plan, plus northwest option area, is shown in Appendix I.

102. East Option Area: The levee was extended around several commercial structures on the east end of town. The resulting cost estimate showed that the east levee option had the same cost as the basic levee plan. Extending the levee around the east option area, even though it is a longer levee, did not increase the cost of the project, because material costs were offset by reducing the cost of hauling excess material excavated from JD 51 and disposing of it in a different location. The east option area would also yield a small amount of additional benefit. Nonstructural measures, such as flood proofing and ring dikes, for the east option area were not evaluated, because they would obviously add to the cost (as shown in the evaluation of the west option area) rather than reduce it. Because it results in a lower overall project cost, the east option with levees is incrementally justified. The NED-level cost estimate for the basic 200-year levee plan, plus eastern area, is shown in Appendix I.

103. The following table shows the summary for incremental justification of the option areas.

Table 6 - Economic summary of adding option areas to 200-year levee plan			
	200-year levee plan plus option area		
	<u>East</u>	<u>West</u>	<u>Northwest</u>
First cost with option	\$ 7,670,000	\$7,660,000	\$ 7,650,000
First cost - Basic 200-yr levee	<u>7,670,000</u>	<u>7,670,000</u>	<u>7,670,000</u>
Incremental Cost	0	-\$10,000	-\$20,000
Avg Ann Incremental Cost	0	--	--
Avg Ann O&M	28,700	28,700	28,700
Avg Ann O&M - Basic 200-yr levee	<u>28,700</u>	<u>28,700</u>	<u>28,700</u>
Avg Ann Incremental O&M	0	0	0
Total Avg Ann Incremental Cost	\$0	\$537	\$1074
Avg Ann Incremental Benefit	> 0	1,350	> 0
Incremental BCR	> 1.0	1.25	>1.0

NATIONAL ECONOMIC DEVELOPMENT (NED) PLAN

104. Based on the preceding cost analysis, the NED plan is alternative 3, built to the 200-year flood level, plus option areas. The NED plan includes realignment of a portion of JD 51 (alignment 3) combined with levees constructed to the 200-year level. The NED plan includes the west, northwest and east option areas, as they have been shown to be incrementally justified.

TENTATIVELY SELECTED PLAN

105. The tentatively selected plan is Alternative 3 with the east, west and northwest option areas, built to the 200-year level. This plan includes realignment of approximately 7,500 feet of JD 51 (alignment 3) combined with approximately 34,500 feet of flood barrier, including levees, combined levee/road raises and incorporation of existing high ground.. The tentatively selected plan includes extending the levee around the west, northwest and east option areas, because they have been shown to be incrementally justified. The tentatively selected plan is shown in Figure 11 located at the end of the main section of this report.

106. The tentatively-selected plan's effectiveness in addressing the study goals, objectives and constraints and its comparison to other alternatives is discussed in the following section.

EVALUATION OF ALTERNATIVES

107. The purpose of this section is to describe the with-project conditions expected with each alternative plan and to compare how well each plan addresses the planning goals and objectives. One plan will be recommended as the selected plan, based on this comparison.

WITH-PROJECT CONDITIONS

Alternative 1

108. The with-project condition for Alternative 1 would be the city of Ada with reliable 200-year flood protection, including continuance of JD 51 in its present location (alignment 1). Such a scenario would result in potential growth in the community of Ada in the areas bounded by the levees, but some houses would be removed to construct stable levees along the JD 51 alignment, which would subtract from some of the benefits of the project. Flood damages would decrease from \$704,000 per year to \$44,600 per year. Flood proofing cost savings would be \$12,700 per year. Mortgage companies may waive the requirement to carry flood insurance on mortgaged properties, saving \$5,600 per year. The city of Ada will incur maintenance costs on the project, including the levees, interior drainage structures, and JD 51. During extreme flooding, access routes in and out of Ada will continue to be inundated, resulting in brief periods of isolation.

109. The Wild Rice Watershed District will continue to study and construct other flood damage reduction projects in the Wild Rice River basin. Benefits for other projects, based on flood damage reduction at Ada, will be decreased

Alternative 2

110. The with-project condition for Alternative 2 would be the city of Ada with reliable 200-year flood protection, including diversion of a portion of JD 51 along alignment 2. Such a scenario would result in potential growth in the community of Ada in the areas bounded by the levees, but some houses would be removed to construct stable levees along the JD 51 alignment, which would subtract from some of the benefits of the project. Some farmland would be lost in the construction of the rerouted JD 51. Flood damages would decrease from \$704,000 per year to \$44,600 per year. Flood proofing cost savings would be \$12,700 per year. Mortgage companies may waive the requirement to carry flood insurance on mortgaged properties, saving \$5,600 per year. The city of Ada will incur maintenance costs on the project, including the levees, interior drainage structures, and the rerouted portion of JD 51. During extreme flooding, access routes in and out of Ada will continue to be inundated, resulting in brief periods of isolation.

111. The WRWD will continue to study and construct other flood damage reduction projects in the Wild Rice River basin. Benefits for other projects, based on flood damage reduction at Ada, will be decreased.

Alternative 3

112. The with-project condition for Alternative 3 (tentatively-selected plan) would be the city of Ada with reliable 200-year flood protection, including diversion of a portion of JD 51 along alignment 3. Such a scenario would result in potential growth in the community of Ada in the areas bounded by the levees. Some farmland would be lost in the construction of the rerouted JD 51. Flood damages would decrease from \$704,000 per year to \$44,600 per year. Flood proofing cost savings would be \$12,700 per year. Mortgage companies may waive the requirement to carry flood insurance on mortgaged properties, saving \$5,600 per year. The city of Ada will incur maintenance costs on the project, including the levees, interior drainage structures, and the rerouted portion of JD 51. During extreme flooding, access routes in and out of Ada will continue to be inundated, resulting in brief periods of isolation.

113. The WRWD will continue to study and construct other flood damage reduction projects in the Wild Rice River basin. Benefits for other projects, based on flood damage reduction at Ada, will be decreased.

Alternative 4

114. The with-project condition for Alternative 4 would be the city of Ada with reliable 200-year flood protection, including diversion of a portion of JD 51 along alignment 4. Such a scenario would result in potential growth in the community of Ada in the areas bound by the levee. Some farmland would be lost in the construction of the rerouted JD 51, and a large swath of farmland would be more difficult for the landowner to access for farming. Flood damages would decrease from \$704,000 per year to \$44,600 per year. Flood proofing cost savings would be \$12,700 per year. Mortgage companies may waive the requirement to carry flood insurance on mortgaged properties, saving \$5,600 per year. The city of Ada will incur maintenance costs on the project, including the levees, interior drainage structures, and the rerouted portion of JD 51. During extreme flooding, access routes in and out of Ada will continue to be inundated, resulting in brief periods of isolation.

115. The WRWD will continue to study and construct other flood damage reduction projects in the Wild Rice River basin. Benefits for other projects, based on flood damage reduction at Ada, will be decreased.

Option Areas

116. The with-project condition for the west option area would be reliable flood protection for two farmsteads located on the west end of Ada. Annual flood damages would decrease by \$1,220 per year. Annual costs of the overall project would decrease slightly.

117. The with-project condition for the northwest option area would be reliable flood protection to an undeveloped agricultural field on the northwest side of Ada. Annual flood damages would decrease slightly. Annual costs for the overall project would decrease slightly.

118. The with-project condition for the east option area would be reliable flood protection to several businesses located on the east side of Ada. Annual flood damages would decrease slightly. Annual costs of the overall project would decrease slightly.

COMPARISON OF PLANS BASED ON GOALS AND OBJECTIVES

119. This discussion documents the performance of each of the alternatives in meeting the planning goals and objectives and complying with the planning constraints. The planning goal is to provide more complete, efficient, effective and reliable flood risk management to the city of Ada. The recommended plan must be acceptable to the city of Ada. The planning objective is to determine if there is Federal interest in providing flood risk management measures to the city of Ada and, if there is Federal interest, to determine the NED plan. The planning constraints include compliance with NEPA, avoiding induced flooding on the Red River of the North or downstream communities, compliance with EO 11988, providing a minimal level of protection equal to the 1997 flood, and must be within the city of Ada's means to operate and maintain.

120. Alternative 1 meets the planning goal of providing more complete, efficient, effective and reliable flood risk management to the city of Ada. It is less acceptable than other plans because it will require relocating or demolishing several existing houses. It adheres to the planning constraints including compliance with NEPA, avoiding induced flooding on the Red River of the North or downstream communities, and compliance with EO 11988. Even though a small portion of the project area is within the 1-percent chance floodplain, this area is already fully developed, and there are no practicable alternatives to siting in the floodplain. However, there is no Federal interest in constructing this plan, because it costs roughly \$4,199,000 more than other available alternatives that provide similar benefits (based on the alternatives screening cost estimates).

121. Alternative 2 meets the planning goal of providing more complete, efficient, effective and reliable flood risk management to the city of Ada. It is less acceptable than other plans because it will require relocating or demolishing several existing houses. It adheres to the planning constraints including compliance with NEPA, avoiding induced flooding on the Red River of the North or downstream communities, and compliance with EO 11988. Even though a small portion of the project area is within the 1-percent chance floodplain, this area is already fully developed, and there are no practicable alternatives to siting in the floodplain. However, there is no Federal interest in constructing this plan, because it costs roughly \$2,044,000 more than other available alternatives that provide similar benefits (based on the alternatives screening cost estimates).

122. Alternative 3 (tentatively-selected plan) meets the planning goal of providing more complete, efficient, effective and reliable flood risk management to the city of Ada. It is thought to be acceptable to the majority of residents in the Ada area. It adheres to the planning constraints including compliance with NEPA, avoiding induced flooding on the Red River of the North or downstream communities, and compliance with EO 11988. Even though a small portion of the project area is within the 1-percent chance floodplain, this area is already fully developed, and there are no practicable alternatives to siting in the floodplain. There is Federal interest in constructing this plan, because it costs between \$434,000 and \$4,199,000 less than other alternatives (based on the alternatives screening cost estimates), it has a benefit-cost ratio higher than 1, and it is within the means of the city of Ada to operate and maintain.

123. Alternative 4 meets the planning goal of providing more complete, efficient, effective and reliable flood risk management to the city of Ada. It would be slightly less acceptable than

124. Inclusion of the west, northwest and east option areas meets the planning goal of providing more complete and reliable flood risk management. While the west, northwest and east option areas are not strictly within the city of Ada, they are part of the extended Ada community, and merit consideration. Inclusion of these option areas adheres to the planning constraints including compliance with NEPA, avoiding induced flooding on the Red River of the North or downstream communities, and compliance with EO 11988. The west, northwest and east option areas are not in the 1-percent chance floodplain. There is Federal interest in including these option areas as part of the selected plan, because they are all incrementally justified, and it is within the means of the city of Ada to operate and maintain the levee that will encompass these option areas.

SELECTED PLAN

125. It is recommended that Alternative 3 be the selected plan, because it meets all of the planning goals and objectives, while being the least-cost plan. Alternative 3 includes realignment of a portion of JD 51 along alignment 3. It is further recommended that the levees included in the selected plan be constructed to the 200-year flood level, because that has been determined to be the NED Plan. It is further recommended that the selected plan include the east, west and northeast option areas, because protection of these areas has been shown to be incrementally justified. This selected plan is consistent with the planning goal of providing more complete and reliable flood risk management to the city of Ada. This plan complies with NEPA, because it avoids, or offsets, adverse effects on natural, social and cultural resources. This plan will be designed to avoid induced flooding on the Red River of the North and downstream communities. This plan complies with EO 11988, because it does not encourage new development in the floodplain. The floodplain is defined as any lowland areas subject to a 1-percent or greater chance of flooding in any given year. While the recommended plan does encompass a large, undeveloped area, this area is not located in the defined floodplain. The selected plan is within the city of Ada's means to operate and maintain, because the city of Ada is already operating and maintaining similar levees and interior drainage structures. The added cost of annual maintenance for the new features is offset by savings in flood fighting and recovery costs.

126. The selected plan is shown on Plates C-001 and C-002 at the end of this section. (Overall plan and typical section sheets are provided for draft report. The final report will include more detailed plan and profile sheets).

RESIDUAL DAMAGES AND RISKS

127. Table 2 showed that, with the 200-year design level, average annual flood damages in the city of Ada would decrease from \$704,000 to \$44,600. This means that, even with levees designed to provide a 200-year design level, the city of Ada will still incur \$44,600 in average annual flood damages. This is because, occasionally, a flood event larger than the 200-year event will occur and will cause damage in the city of Ada. The reality that the 200-year levee plan will not protect the city against all flooding was discussed at a meeting with representatives from the city of Ada on December 19, 2007. It was discussed that a higher design level could be pursued. However, in the case of Ada, increasing the design level to the 500-year flood event versus the 200-year flood event would have increased the average annual cost by \$72,000, while only adding average annual benefits of \$43,700. It was decided that, because the incremental cost of providing a higher level of flood risk reduction outweighed the incremental benefits, the 200-year design was the preferred plan. After this discussion, the recommended project was discussed at a city council meeting, and a resolution was passed supporting the proposed project with 200-year design.

128. While awareness of the project benefits and residual risks is high at this time, over time city leaders will change, and the residents may become less aware of the limitations of the project. To prevent this, measures will have to be taken to ensure that the community is aware of residual flood risk and has an emergency action plan for larger floods.

129. While the residents' risk of flood damage will be reduced to the point where their mortgage holders may not require flood insurance, each property owner within the project area will have to assess their willingness to accept the risk of not carrying additional flood insurance.

LOCALLY-PREFERRED PLAN

130. Based upon discussions with the city of Ada, the locally-preferred plan is the same as the Corps-recommended plan.

ENVIRONMENTAL AND CULTURAL RESOURCES

131. A draft Environmental Assessment and Section 404(B)(1) evaluation has been prepared and is attached to this feasibility report. The following is summary of the anticipated impacts of the proposed project.

132. Natural Resources. Minor adverse effects on natural resources would be caused by removal of riparian trees, required to construct the realigned JD 51 and levees. Potential adverse effects on wetlands associated with levee construction would be avoided by design of the levee alignment to avoid wetlands. There would be no effect on threatened and endangered species.

133. Cultural Resources. The proposed project would have no effect on cultural resources.

134. Social Resources. The proposed action would have a positive social effect on the residents within the project area, due to reduction in their risk of flood damages and cost of flooding and enhanced public safety.

135. The proposed action may have some negative social effects on landowners whose property must be purchased to construct the project features (such as levees, ponding areas and the relocated JD 51), because they will lose the use of the purchased property. The project will be designed to ensure that the property owners will retain access to their remaining property, if any accesses are removed as part of the project.

136. The project may have some negative social effects on property owners who are facing similar flooding challenges but are not within the project area. The levee will be a visible barrier between the community of Ada and properties located outside of the levee. However, the project will help to ensure that the commercial and government services provided by Ada remain available even during flood events to residents both inside and outside the project area.

137. The project would have a negative hydraulic impact on a limited area along the Marsh River on the south side of town, south of the proposed levee, between Hwy 9 and Jamison Avenue. The hydraulic analysis contained in Appendix B indicates an increase in flooding elevations for this area of 0.1 to 0.3 foot. An attorney's opinion of compensability is being prepared to determine if the effect is compensable. If there is a compensable interest, it will be included in the real estate plan and will be reflected in the implementation cost estimate. The real estate plan and implementation cost estimate will be included in the final report.

138. Communities downstream of Ada on JD 51 may be concerned about flows being conveyed more quickly down JD 51. However, it is intended that the realigned JD 51 be designed to ensure that the JD 51 flows downstream of Ada are not increased.

139. Ada residents and businesses may experience temporary inconvenience inherent in any construction project, such as the increased traffic, construction noise, and disruptions to daily routines.

WATER QUALITY

140. There would be no long-term water quality impacts.

FLOODPLAIN IMPACTS

141. Appendix B discusses the hydraulic analysis of the Wild Rice River, the Marsh River and JD 51 as they pertain to the proposed Ada project. The proposed project will not change the flow distribution between the Wild Rice River, Marsh River and JD 51. The proposed project will encroach on a small portion of the Marsh River flow limits, which may cause some localized increase in flood stage for floods greater than the 10-year event. Increases in flood stage for this area are on the order of 0.1 to 0.3 foot. The affected area is bounded by South Jamison Avenue on the west and Highway 9 on the east. It is bounded on the north by the proposed levee and on the south by the sewage treatment lagoons and high ground. One property (the UAP distribution facility) on the edge of the area would be affected. Further elevation surveys will be performed

during the design phase to verify if there are any quantifiable impacts on this facility that will require compensation.

MITIGATION MEASURES

142. No separate mitigation is required. Any effects on natural resources are expected to be minor and will be offset by natural resource attributes within the design of the other project features.

143. There would be little difference in natural resources effects among alternatives, because alternatives would vary primarily in the amount of agricultural land affected.

144. The Marsh River is an established watercourse with an adjacent existing levee. The levee is to be raised and expanded in an upland area between the city and the river. Minimal tree clearing would be required, and trees would be replaced in suitable locations at a rate of 2:1. The area identified as a disposal area for excess excavated material could be planted with trees or allowed to revert to natural conditions after construction.

145. According to the National Wetland Inventory, few wetlands are in the project area and most are remnant oxbows of the Marsh River. Because the levee alignment has been adjusted to avoid known wetlands and because the relocated JD 51 is passing entirely through upland areas, no wetlands would be affected by the proposed alignment. Any unidentified wetlands that might be affected by the final alignment would be mitigated within the project features, such as by allowing the abandoned section of JD 51 to revert to natural conditions.

RELOCATIONS OF UTILITIES

146. Utility relocations will typically be required when they are affected by construction of the project or where their continued presence is inconsistent with the operation of the flood risk management project features. Potential utility relocations include a water line, fiber optic cables, electric utility poles and the sewer line to the wastewater treatment plant. More detailed utility relocations will be identified in the design and implementation phase.

ROADS AND RAILROADS

147. Road raises are often required when the levees intersect roads. Sometimes road closures are acceptable if the height of the closure is less than 3 feet and the advance warning time is sufficient to allow for city workers to place the closure. The proposed levee in Ada crosses several major roadways. Because these roadways are main routes in and out of Ada and access is cut off as soon as a closure is installed, it is recommended that they be full-height road raises, rather than closures, or a partial road raise combined with a closure. The levee construction will require raising a portion of Highway 9 by 3.2 feet where the levee crosses it on the north side of town. The intersection of West Main Street and 210th Avenue will have to be raised by 4.7 feet where the levee crosses them on the north side of town. A portion of Highway 200 will have to be raised by 5.5 feet where the levee crosses it on the west side of town. A portion of Jamison Street (County Road 142) will have to be raised by 2 feet where the levee crosses it on the

southwest side of town. A portion of Highway 9 will have to be raised by less than 1 foot where the levee crosses it on the south side of town. A portion of County Road 180 will have to be raised by 3.9 feet where the levee crosses it on the southeast side of town. The realignment of JD 51 will require relocating the intersection of Norman County Road 163 (210th Street) with Highway 9, by moving it northward. The levee construction will require raising the grade of an abandoned Burlington Northern-Santa Fe (BNSF) Railroad line, presently being used as a recreational trail. This will be accomplished by ramping up and over the levee. Detailed design of the proposed project features will be discussed with the Minnesota Department of Transportation, the BNSF railroad, Norman County and other entities affected by road and railroad raises during the design and implementation phase. Identification of issues would be welcome during the review of this draft report.

REAL ESTATE REQUIREMENTS

148. The real estate interests required for construction of the recommended plan are estimated at roughly 62 acres of permanent easements for the levee, 33 acres of fee title interests for the relocated JD 51, 55 acres of occasional flowage easement, 15 acres for road easements, and 219 acres for temporary construction and disposal of excess excavated material. The approximate limits of the real estate that will be required for construction and future operation of the project are shown on Drawing C-003. The real estate plan will be prepared following public review of the draft report and will be included in Appendix H in the final report.

VALUE ENGINEERING CONSIDERATIONS

149. A formal value engineering study will be performed during the design and implementation phase.

RECREATION

150. At this time, no recreation features have been identified.

151. Any recreation features are cost-shared 50 percent non-Federal and 50 percent Federal.

CONSTRUCTION

152. Construction is estimated to last for approximately 1 year and will be supervised and administered by the St. Paul District's Western Area construction office in Fargo. Earthen material excavated from the relocation of JD 51, if suitable, will be used for the construction of the levees.

TECHNICAL ANALYSES

153. The hydrologic analysis is attached as Appendix A.

154. The hydraulic and interior flood control analysis is attached as Appendix B.

155. The geotechnical analysis is attached as Appendix C.
156. The structural analysis is attached as Appendix D.
157. The HTRW analysis is attached as Appendix E.
158. The economic analysis is attached as Appendix F.
159. The alternatives screening cost estimate is attached as Appendix G.
160. The real estate plan is attached as Appendix H (will be in final report).
161. The NED screening cost estimate is attached as Appendix I.
162. The implementation cost estimate is attached as Appendix J (will be in final report).
163. The project management plan is attached as Appendix K.
164. Pertinent correspondence is attached as Appendix L.

PLAN IMPLEMENTATION

165. The implementation responsibilities refer to actions and financial arrangements of Federal and non-Federal interests. The project management plan, contained in Appendix K, outlines the responsibilities of the Federal and non-Federal partners and the proposed schedule for implementing the recommended project. The following table shows the economic summary for the selected plan, based on the NED-level cost estimates. (The cumulative incremental cost adjustments for the east, west and northwest option areas are not included in this estimate, but would reflect a slightly lower cost. A more detailed cost estimate, including the option areas and final economic analysis will be shown in the final feasibility report. The result will be similar to what is shown below.

Table 7 – Cost summary for selected plan (200-year levee plan including east, west and northwest option areas)	
Project Costs	\$7,670,000
Interest During Const.*	\$184,732
Total Investment	\$7,854,732
Int & Amort Factor	0.05372
Avg Ann Investment	\$421,956
Avg Ann O&M	<u>\$28,741</u>
Total Avg Ann Costs	\$450,697
Average Annual Benefits	\$677,700
Benefit-Cost Ratio	1.50
Net Benefits	\$227,003

166. A breakdown of Federal and non-Federal implementation costs, based on a 35 percent non-Federal share are presented in the following table. (For the purposes of this draft report, the following table is based on the NED screening cost estimates. A detailed implementation cost estimate will be included in the final feasibility report and will be located in Appendix J).

Table 8
Breakdown of Fully-Funded Federal and Non-Federal Costs

Account	Description	Federal Cost	Non-Federal Cost	Total Cost
01	Lands and Damages	\$ -	\$ 825,942	\$ 825,942
02	Relocations	\$ 68,875	\$ 37,086	\$ 105,961
08	Roads, Railroads and Bridges	\$ 1,120,467	\$ 603,329	\$ 1,723,796
09	Channels and Canals	\$ 882,668	\$ 475,283	\$ 1,357,950
11	Levees and Floodwalls	\$ 2,201,162	\$ 359,299	\$ 2,560,461
30	Planning Engineering and Design	\$ 448,357	\$ 241,423	\$ 689,780
31	Administration	\$ 261,542	\$ 140,830	\$ 402,372
	Interest during construction	\$ 120,076	\$ 64,656	\$ 184,732
	Total	\$ 5,103,146	\$ 2,747,848	\$ 7,850,994

ANNUAL COSTS

167. Annual operation and maintenance costs are anticipated at \$28,700 (based on the NED screening cost estimate; a more accurate number will be provided in the final report). Annual operation and maintenance costs include maintenance of the relocated JD 51 channel, the levees and interior flood control features. These costs would be funded entirely by the project non-Federal sponsor.

JD 51 is currently operated and maintained by the WRWD. When maintenance or repair is performed on a judicial ditch, landowners are assessed for the cost. Because a portion of JD 51 will be relocated as a feature of the Section 205 flood control project, it is Corps' policy that the non-Federal sponsor (the city of Ada) will be responsible for future operation and maintenance of this feature. It is anticipated that this will relieve the WRWD and, thereby, other landowners of the cost of maintaining a portion of JD 51. There may need to be a memorandum of understanding among the city of Ada, the WRWD and the Corps regarding future maintenance of this portion of JD 51. The annualized Federal and non-Federal costs are summarized in the following table.

Table 9

Annualized Federal and Non-Federal Costs of Recommended Plan

Description	Federal Cost	Non-Federal Cost	Total Cost
Interest and Amortization incl. IDC	\$274,271	\$147,685	\$421,956
Operation and Maintenance		\$28,741	\$28,741
Total	\$274,271	\$176,426	\$450,697

PROJECT IMPLEMENTATION

168. Project implementation includes the preparation of design documents and completion of construction and project turnover.

169. The project non-Federal sponsor, proposed to be the city of Ada, will be responsible for a minimum of 35 percent of the project implementation costs, including acquisition of all lands, easements, rights-of-way and disposal areas (LERRDs), but no more than 50 percent of project costs if the cost of LERRDs exceed 35 percent of the project costs. At least 5 percent of the non-Federal sponsor share must be in the form of cash.

170. The project non-Federal sponsor shall be responsible for 100 percent of the project operation and maintenance costs.

171. Currently, no part of the project implementation is projected to be done as work-in-kind.

FEDERAL RESPONSIBILITIES

172. The Flood Control Act of 1936 provides that, in the interest of general public welfare, flood control is a proper activity of the Federal Government in cooperation with the States and local entities. Federal responsibilities for the recommended plan include engineering, design and construction of the proposed features. The project management plan, which details the remaining activities through design and construction, is presented in Appendix J.

NON-FEDERAL RESPONSIBILITIES

173. The non-Federal sponsor for this project is the city of Ada. Federal implementation of the recommended project would be subject to the non-Federal sponsor agreeing to comply with applicable Federal laws and policies, including but not limited to:

- a. Provide a minimum of 35 percent, but not to exceed 50 percent of total project costs as further specified below:
- (1) Provide, during the design and implementation phase, a contribution of funds equal to 5 percent of total project costs.
 - (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 project.
 - (3) Provide, during the design and implementation phase, any additional funds necessary to make its total contribution equal to at least 35 percent of total project costs.
- b. Provide, during the design and implementation phase, 100 percent of all costs of planning, design, and construction for the project that exceed \$7,000,000.
- c. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share therefor, 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 by Federal law.
- d. Not less than once each year, inform affected interests of the extent of protection afforded by the project.
- 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 1 year after the date of signing a project cooperation agreement, and to implement such plan not later than 1 year after completion of construction of the project.
- 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 project.
- 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 that might reduce the level of protection the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function.
- i. 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 Code of Federal Regulations (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.

j. 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.

k. 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.

l. Hold and save the United States free from all damages arising from the design, 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.

m. 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 CFR Section 33.20.

n. 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.*).

o. 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 sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction.

p. Assume, as between the Federal Government and the non-Federal sponsor, 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.

q. Agree, as between the Federal Government and the non-Federal sponsor, that the non-Federal sponsor 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.

r. Provide, during the design and implementation phase, 35 percent of all costs that exceed \$70,000 for data recovery activities associated with historic preservation for the project.

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.

ABILITY TO PAY ANALYSIS

174. The city of Ada has indicated that it is financially capable of fulfilling the non-Federal sponsor requirements. Appendix K contains the city's self-certification of financial capability form.

RISK AND UNCERTAINTY

175. Expressions of uncertainty are among inputs to HEC-FDA; inputs affected include structure/content values, structure elevations, percent damages per depth of flooding, and frequency-discharge and stage-discharge relationships. Expression of the risk of levee overtopping will be presented in the final report.

176. The screening level estimates for the alternative design levels include a 25 percent contingency on all items of work to cover uncertainties in unit pricing, quantities, and unanticipated items of work.

177. Based on average annual benefits of \$677,700 and average annual costs of \$450,697 (including \$28,741 for operation and maintenance costs), the average annual costs would have to

increase by \$227,0000 to bring the benefit-cost ratio down to 1.0. Because the cost estimate used in the analysis already includes 25 percent contingencies to account for price uncertainty, it is unlikely that the benefit-cost ratio would drop below 1.0.

178. The proposed modifications to JD 51 will require coordination with the WRWD and may require a separate agreement to ensure that the watershed district does not make further changes to JD 51 in the project area without consultation with the city of Ada and the Corps.

179. Construction of the levee will require raising a portion of Highway 9 at the north and south ends of Ada. These road raises will require coordination with the Minnesota Department of Transportation.

180. The project team, including the non-Federal sponsor, anticipates some opposition by local landowners, which may require condemnation.

181. The non-Federal sponsor may request assistance from the State of Minnesota for the non-Federal share of the implementation costs. The State of Minnesota is on a 2-year funding cycle.

ENVIRONMENTAL COMPLIANCE

182. A draft Environmental Assessment and preliminary Section 404 (b) (1) Evaluation has been prepared along with this draft feasibility report, and will be made available for public and agency review. At the completion of the review it is expected that a finding of no significant impact (FONSI) will be signed. It is anticipated that a National Point Discharge Elimination Standard (NPDES) permit will be required. It is anticipated that a Section 401 Water Quality Certificate will be required. It is anticipated that the project will not require a protected waters permit.

VIEWS OF THE U.S. FISH AND WILDLIFE SERVICE

183. The U.S. Fish and Wildlife service has been consulted and has agreed with the tentative conclusions of the environmental assessment, including no adverse effect on threatened or endangered species. The MnDNR also agreed with the analysis.

OTHER PERMITS

184. It is anticipated that the proposed project will need to go through a Watershed District Improvement Hearing with regard to the JD 51 relocation.

SUMMARY

185. Ada has a history of flooding. Recent measures have been put in place by the city to reduce flood damages; however, these measures do not address flood risk management for the entire city of Ada.

186. Total expected annual damages to urban structures and other categories are approximately \$704,000 under existing conditions. The recommended project would reduce these annual flood damages to \$44,600. With a benefit-cost ratio of 1.50, the recommended project is economically justified.

CONCLUSIONS

187. The flood risk management project will provide flood damage reduction for the city of Ada. Estimated project costs are \$7,850,994 and are within the Federal cost limitations of the Continuing Authorities Program established by the Flood Control Act of 1948, as amended.

NON-FEDERAL SPONSOR VIEWS

188. The non-Federal sponsor (city of Ada) has indicated that it wishes to construct the recommended project as described herein. A letter of intent is attached in Appendix K.

RECOMMENDATIONS

189. The above plan is recommended for construction under the authority of Section 205 of the Flood Control Act of 1948, as amended. Under Section 205, Congress has delegated to the Secretary of the Army, through the Chief of Engineers, the authority to plan, design and construct small flood risk management projects without specific congressional approval. There is a Federal cost limit, currently \$7 million, to which the Federal Government can participate in such projects. Under this authority, the completed report will be submitted to the Mississippi Valley Division (CEMVD) for approval, and CEMVD will request from Headquarters funding for design and implementation.

190. I hereby recommend that the plan for flood risk management for Ada be authorized as a Federal project under Section 205 of the Flood Control Act of 1948, as amended, at a first cost to the United States of \$5,103,146, and a first cost to the non-Federal sponsor of \$2,747,848. This recommendation is contingent upon the provision that, prior to construction, the non-Federal sponsor provide the assurances of local cooperation as stated previously.

191. The recommendations contained herein reflect the policies governing formulation of individual projects and the information available at this time. They do not necessarily reflect program and budgeting priorities inherent in the local and State programs or the formulation of a national Civil Works construction program. Consequently, the recommendations may be modified prior to approval and implementation funding.

Jon L. Christensen
Colonel, Corps of Engineers
District Engineer