

**CEDAR RIVER, CEDAR RAPIDS, IOWA  
FLOOD RISK MANAGEMENT  
FEASIBILITY STUDY REPORT WITH  
INTEGRATED ENVIRONMENTAL ASSESSMENT**

**REPORT SUMMARY FOR CIVIL WORKS REVIEW BOARD  
18 NOV 2010**

Feasibility Scoping Meeting:	11 MAR 2009
Alternative Formulation Briefing:	08 JUL 2010
AFB Guidance Memorandum:	30 JUN 2010
Draft Report Guidance Memorandum:	27 AUG 2010
FONSI signed	15 OCT 2010
Division Engineer Transmittal:	20 OCT 2010
Received at CECW-PC:	25 OCT 2010
CWRB Briefing:	18 NOV 2010
30-Day S&A Review start:	23 NOV 2010
30-Day S&A Review end:	22 DEC 2010

**STUDY INFORMATION**

**Study Authority.** The *Cedar River, Cedar Rapids, Iowa Flood Risk Management Feasibility Study Report with Integrated Environmental Assessment* (the Study) was prepared in response to the authority of House Resolution adopted April 5, 2006, by the Committee on Transportation and Infrastructure of the U.S. House of Representatives and Senate Resolution adopted May 23, 2006, by the Committee on Environment and Public Works of the United States Senate. Both resolutions read as follows:

*“...that the Secretary of the Army is requested to review the report of the Chief of Engineers on the Iowa and Cedar Rivers, Iowa and Minnesota, published as House Document 166, 89<sup>th</sup> Congress, 1<sup>st</sup> Session, and other pertinent reports, to determine whether any modifications to the recommendations contained therein are advisable at the present time in the interest of flood damage reduction, ecosystem restoration, recreation, and related purposes along the Cedar River in Cedar Rapids, Iowa.”*

**Study Sponsor.** The City of Cedar Rapids, Iowa, (City) is the non-Federal Sponsor for ownership, operation and maintenance of the flood risk management system.

**Study Purpose and Scope.** The purpose of this Study is to formulate and evaluate cost effective, environmentally-sensitive, and technically feasible flood risk management (FRM)

alternatives for the City. This Study documents the plan formulation studies conducted by the US Army Corps of Engineers, Rock Island District (District) in close cooperation with the City.

**Project Location/Congressional District.** The project study area is located along both banks of the Cedar River through the City of Cedar Rapids, within Linn County, Iowa (Figure 1). The Cedar River Watershed is in northeastern Iowa, approximately 70 miles west of Dubuque, Iowa; 30 miles north of Iowa City, Iowa; and 130 miles northeast of Des Moines. From southern Minnesota through north central Iowa, the Cedar River drainage area at the City is 6,510 square miles.

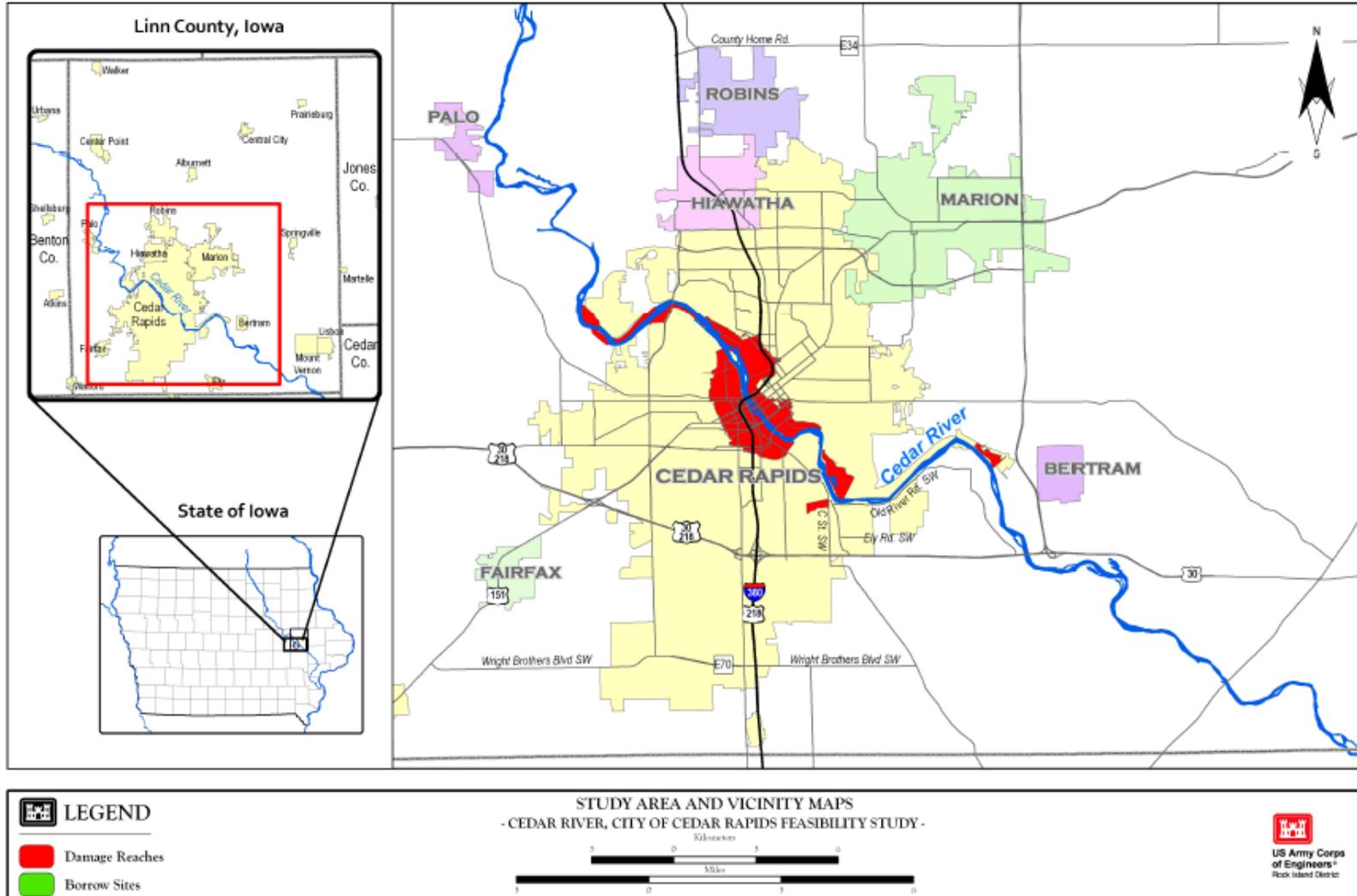
Congressional District IA-02 is represented by Honorable Dave Loebsack. Iowa's Senators are Charles Grassley and Tom Harkin.

**Prior Reports and Existing Water Projects.** Since July 1946 a total of 15 studies and reports have been prepared that have relevance to the Corps Feasibility Study. These documents have been prepared by the Corps, FEMA and other entities in the study area. There are no existing Federal water projects in the study area or upstream of the City that have any significant impacts on flood risk management in Cedar Rapids. The Iowa-Cedar River Basin Study is examining management planning options throughout the watershed.

**Federal Interest.** Much of downtown Cedar Rapids lies within the 1% event floodplain of the Cedar River. The City has a discontinuous system of levees and flood walls. The existing flood protection system does not meet Corps standards and does not reduce flood risks from a 1% or greater flood event. Historically flooding in Cedar Rapids resulted from heavy rain or heavy rain with accompanying snow melt. Prior to June 2008 the flood of record was less than the 2% event (50-year flood)

In October 2003, the Corps initiated a Continuing Authorities Program Section 205-Flood Control Study (CAP Study). The CAP Study was completed in May of 2004 and approved by memorandum July 8, 2004. That CAP Study Initial Appraisal concluded that an acceptable alternative could be developed, finding sufficient Federal interest to initiate this feasibility study. The Corps and the City entered into a Feasibility Cost Share Agreement (FCSA) in May 2008 to study FRM alternatives for the Time Check Neighborhood. Shortly after the signing of the FCSA, the City experienced a record flooding event in June 2008 that led to the expansion of the Study area to include the entire Cedar River corridor within Cedar Rapids.

**FIGURE 1**  
**Vicinity Area**



## STUDY OBJECTIVES

**Problems and Opportunities.** Presently, the City has a discontinuous levee system and must perform emergency flood fighting activities to protect gaps in the system. Opportunities exist to provide a more comprehensive FRM plan to reduce the risk of inundation and associated flood damages. The existing levee system has an unacceptable risk of flooding due to insufficient design. Opportunities exist to reduce the flood risks of the existing levees. Prior to the record flood event of 2008, the City did not have a comprehensive and updated floodplain management plan. The opportunity exists to provide a comprehensive flood risk management system.

**Planning Objectives.** The following planning objectives reflect the problems and opportunities in the Study area.

- Reduce flood damages to private and public infrastructure caused by Cedar River flooding in the City through 2060.
- Improve the response by local, state, and Federal agencies to the all flood events along the Cedar River in the City.
- Increase public awareness to the risk of flooding from the Cedar River in the City through 2060.
- Increase recreational opportunities in the City along the Cedar River that are compatible with an implementable FRM plan.

**Planning Constraints.** Planning constraints considered to this point are as follows:

- **Hazardous, Toxic, Radioactive Waste (HTRW):** Alternatives cannot cause disturbance of HTRW to minimize and prevent Federal liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- **Flood Heights:** Alternatives cannot negatively impact the 100-year flood profile.
- **Environmental and Cultural Resources:** Alternatives should be designed to minimize adverse impacts to these resources.
- **FEMA Voluntary Acquisition Program:** Alternatives will not be developed that interfere with restrictive use guidelines established for properties purchased with Hazard Mitigation Grant Program funding.

## ALTERNATIVES

**Plan Formulation Rationale.** The Recommended Plan must meet some or all of the planning objectives of this study, maximize the net annual economic benefits, and consider the other social effects with no significant adverse environmental effects. Through several iterations of the Corps planning process, the study formulated, evaluated, and compared a wide array of structural and nonstructural FRM features, measures, and alternatives plans to address one or more of the planning objectives.

**Management Measures and Alternative Plans.** The Corps is required to consider the option of “No Action” as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act. For planning purposes, the No Action Alternative forms the basis against which all other alternatives are measured.

During the first iteration, potential features were formulated, based on the identified problems and opportunities, project goals, and objectives. Measures include structural features (reservoirs, levees and floodwalls, channels, and diversions) and nonstructural measures.

Features were screened using the following criteria:

1. potential for reduction in flood crest
2. flood management effectiveness
3. construction timeline
4. permitting timeline
5. conceptual level of detail costs

As a result of this screening, no action, levees/floodwalls, and nonstructural features were identified to be carried forward for more analysis.

During the second iteration, the Study team performed additional technical analysis of the remaining proposed features and developed an array of levee/floodwall alignments which were screened using the reconnaissance level analysis, benefit cost ratios (BCR) and best professional judgment. Measures carried forward were combined into levee/floodwall alternatives and various levee heights were analyzed in order to optimize levee/floodwall heights (letters Z, A, B, C, and D identified the various levee height options).

During the third iteration these alternatives were screened in a four-step process based on preliminary BCR, planning objectives, local planning objectives, residual damages.

During the fourth iteration, the Study team reworked and refined the alternatives continuing to analyze and assimilate the updated data gathered during the Study process on hydraulic, hydrologic, economic, engineering design, and engineering cost estimates to refine and optimize alternatives. The criteria used for comparison purposes were NED and Planning Objectives.

1. National Economic Development. The economic performance data used for screening alternatives are presented in Table 1. Alternatives 4 and 10 were identified as the alternatives with positive net annual benefits.

2. Planning Objectives. All of the alternatives considered meet the Planning Objectives to varying degrees. Alternatives 1C and 1A-C (87.8 and 85 percent) reduce the most damage in the entire Study area as would be expected since they reduce risk to the most area and property. Alternative 4C reduces damage to the entire Study area by 56.8 percent and Alternative 10E by 36.5 percent.

3. Local Planning Objectives. City’s objectives considered were potential flood risk management alignment, flood level impact, and overall study area impact.

**TABLE 1**  
**Economic Performance of the Alternatives <sup>1</sup>**

Alternative	With Project Residual EAD	Project First Costs	Total Annual Costs	Total Annual Benefits	BCR	Annual Net Benefits
1Z	6,199	190,145	9,507	6,213	0.65	-3,294
1A	4,788	227,568	11,362	7,625	0.67	-3,737
1B	3,450	251,897	12,568	8,963	0.71	-3,605
1C	1,957	278,571	13,891	10,455	0.75	-3,436
1D	1,084	311,868	15,542	11,329	0.73	-4,213
1A-Z	6,256	189,406	9,465	6,157	0.65	-3,308
1A-A	4,900	222,031	11,083	7,513	0.68	-3,570
1A-B	3,657	243,388	12,141	8,756	0.72	-3,386
1A-C	2,244	266,081	13,267	10,169	0.77	-3,098
1A-D	1,399	293,906	14,646	11,013	0.75	-3,633
4Z	8,271	80,392	4,021	4,141	1.03	121
4A	7,392	94,700	4,730	5,021	1.06	291
4B	6,836	105,587	5,270	5,576	1.06	307
4C	6,269	115,760	5,774	6,144	1.06	370
4D	5,965	129,336	6,447	6,447	1.00	0
10Z	9,499	44,141	2,205	2,914	1.32	709
10A	9,007	54,226	2,705	3,405	1.26	700
10B	8,592	63,779	3,179	3,820	1.20	641
10C	8,398	72,091	3,591	4,015	1.12	424
10D	8,312	82,199	4,092	4,101	1.00	9
10-E	8,673	60,347	3,009	3,740	1.24	731

<sup>1</sup> February 2010 Prices, 4.375% Interest Rate, 50 year period of analysis, \$1,000's, used during plan formulation.

**Final Array of Alternatives.** In the final iteration, five alternatives in the final array were evaluated and screened using 1) the non-Federal Sponsor’s Views; 2) NED Benefits and Residual Damages; 3) Reducing Flood Risk; 4) Emergency Measures; 5) Critical Public Infrastructure; and 6) Study Objectives. The on-going implementation of nonstructural measures throughout the floodplain was considered as additional features to each alternative. Alternatives 4C and 10E were the alternatives identified with the greatest net benefits. Three alternatives (no action and the two with the greatest net benefits) were analyzed in more detail; costs were updated to reflect the best available data. In addition to the NED account, the team considered Environmental Quality (EQ), Regional Economic Development (RED),

and Other Social Effects (OSE) criteria to facilitate evaluation and effects among the alternatives.

**Comparison of Alternatives.** As explained in Section 4.3.2.2. and Table 48, when comparing the best performing alternatives based on 2010 prices, the BCR for 4C is 1.15 and the BCR for 10E is 1.27. Alternative 4C produces larger overall economic benefits to more people (more than 500 residents compared to fewer than 100 residents) and positively affects a greater geographic area than Alternative 10E (523 acres compared to 122 acres). Alternative 4C produces 65 percent greater average annual benefits: \$6,144,000 compared to \$3,740,000 for Alternative 10E. Alternative 4C would require an additional Federal investment of \$28.6 million compared to Alternative 10E to get increased NED benefits of \$2,404,000 per year. Alternative 4C also results in 33 percent less annual residual damages than Alternative 10E: \$6,056,000 compared to \$8,460,000. Estimated Annual Damages (EAD) for the east side of the river exclusively is approximately \$7.3 million. Thus, for a reduction of \$7,000 in net NED benefits, Alternative 4C achieves approximately an 84.2 percent reduction in residual damages on the east side of the river as compared to approximately a 51.2 percent reduction associated with Alternative 10E.

The key trade-off considered in evaluating the final alternative plans was between the No Action Alternative and the other action alternatives. The No Action Alternative would leave the Study area at significant and unacceptable risk from flooding. For trade-off comparisons among the action alternatives for the level of flood risk management, the highest level of risk management that meets the four formulation criteria for completeness, effectiveness, efficiency and acceptability and generates the greatest net benefits is Alternative 4C.

**Key Assumptions.** The Future without Project and Existing Conditions are dynamic as the City recovers from the 2008 record flood event. However, the Study team must use a static set of criteria in order to conduct the analyses. In the immediate aftermath of a flood there may be a tendency to overestimate the flood threat, thus depressing structure values below their true long-term value. Long-term market values were used for this analysis.

**Recommended Plan.** Alternative 4C is the plan that reasonably maximizes net benefits and is the most effective in reducing residual risk and addressing the planning objectives. Areas of risk and uncertainty are analyzed and described so that decisions can be made with knowledge of the degree of reliability of the plan. The recommended plan has a 99.99% chance of containing a 1% flood event and a 91.24% chance of containing a 0.2% flood event. The recommended plan, Alternative 4C, is comprised of floodwalls and levees that total 3.15 miles in length. The design height of the system would correspond to an elevation of 733.7 feet, 1988 NAVD, at the USGS gage just upstream of the 8<sup>th</sup> Avenue Bridge. The recommended plan reduces flood risks for the central business and industrial corridor on the east side of the Cedar River for a more viable, sustainable community.

**Systems / Watershed Context.** The Cedar River, Cedar Rapids, Iowa Study area is a highly developed urban region of the Cedar River Basin. The recommended plan would have

minimal influence on the functions of the Cedar River watershed functions or on flooding upstream or downstream from Cedar Rapids. Multi-agency Iowa-Cedar Basin watershed team discussed a framework for collaboration and development of a watershed based plan that will coordinate on-going watershed planning efforts in the Iowa-Cedar Rivers Basin through multiple avenues. These efforts are expected to help reduce any increases in future flood discharges impacting Cedar Rapids.

### **Environmental Operating Principles**

Environmentally sound plan formulation and design (EOP 1, 2 & 5)

- Airport property designated for borrow instead of more wooded or habitat areas
- Alternatives avoid work in the river to minimize aquatic resource impacts

Environmental balance and sustainability (EOP 1, 2, 3 & 4)

- Project avoids or minimizes environmental impacts while maximizing future safety and economic benefits to the community
- Project complies with applicable Federal laws and Corps guidance

Assess and mitigate cumulative impacts (EOP 2, 4 & 5)

- System approach ensures reliability of complete levee system
- Avoids cumulative impacts to the Iowa-Cedar River basin system
- Seeks public input and comment (EOP 7)

**Peer Review.** The PDT tapped expertise from St. Paul and Omaha Districts for economic and socio-economic analyses, and contracted engineering design, cost and schedule estimates, and preliminary cultural resource assessment.

**Product Delivery Team (PDT) Internal Review (PDT Review)** occurred 11 May to 04 Jun 2010. Review of the AFB document resulted in a total of 210 comments, consisting of 10 about cost engineering, 22 about cultural resources, 5 economics, 11 environmental, 4 environmental engineering (HTRW), 33 general, 1 geotechnical, 17 hydraulics, 92 program management, 16 project management, and 1 real estate. Four project management comments deemed “critical” pointed out the need to focus on the study area, recreation, suitable borrow areas, and authorizing legislation. PDT evaluators resolved each comment with every reviewer.

Primarily due to the expedited schedule, during the public review period in September, the PDT held several additional “page turn review meetings” to internally identify and correct any apparent technical inconsistencies prior to the public review meeting 21 Sep 2010. Several dozen were incorporated into the Policy Review Draft forwarded to Division 08 Oct 2010.

**Pre-AFB Agency Technical Review (ATR)** occurred 11 May to 04 Jun 2010. Review of the AFB document resulted in a total of 134 comments, consisting of 2 about civil, 25 about cost engineering, 4 about cultural resources, 5 economics, 7 environmental, 14 geotechnical, 26 hydraulics, 13 other, 35 planning/plan formulation, and 3 project management. Five planning comments deemed “critical” pointed out the need for an executive summary, better use of ER

1105-2-100 App. G, better OMRR&R costs, clearer floodplain impacts, and better cost estimates. PDT evaluators resolved each comment with every reviewer.

**Value Engineering** was captured in a report dated 8 Jun 2010 about two separate efforts during project development:

1. An evaluation of flood mitigation proposals was done via a report entitled *Cedar Rapids Corridor Redevelopment, Flood Mitigation Options*, March 2009.
2. During the further development of proposals in the feasibility study report, additional cost-savings were achieved by: adjusting unit prices for concrete floodwalls and architectural concrete, replacing removable floodwalls with permanent floodwalls, shortening the FRM system alignment, utility line relocations, and pump station modifications. The resulting savings totaled nearly \$90 million.

A more detailed VE study will be performed on the final recommended plan early in the Preliminary engineering and design (PED) phase, prior to the 35 percent PED level.

## EXPECTED PROJECT PERFORMANCE

**Project Costs.** Table 2 summarizes the recommended plan costs.

**TABLE 2**  
**Cost Summary**  
**Cedar River, Cedar Rapids, IA, Feasibility Study**  
**(October 2010 Price Levels, \$1,000s)**

	<b>Recommended Plan</b>
Construction Item	
Lands & Damages	\$ 11,700
Elements	
Relocations	\$12,080
Floodwalls and Levees	\$53,939
Pumping Plant	\$ 2,722
Subtotal*	\$68,741
Planning Engineering & Design (PED)	\$12,375
Construction Management (E&D, S&A)	\$ 5,500
<b>Total First Cost</b>	<b>\$99,004</b>

\*Project costs associated with potential HTRW cleanup is accounted for in the overall project contingency percentage. This contingency was developed through the Cost and Schedule Risk Assessment conducted by the Cost Directory of Expertise (Cost DX), Walla Walla.

**Equivalent Annual Costs and Benefits.** Table 3 summarizes the economic performance of the recommended plan.

**TABLE 3**  
**Equivalent Annual Benefits and Costs**  
**Cedar River, Cedar Rapids, IA, Feasibility Study**  
**(October 2010 Price Level, 50-year Period of Analysis, 4.125 % Discount Rate, \$1,000s)**

	<b>Recommended Plan</b>
<b>Investment Costs</b>	
NED Cost Estimate <sup>1</sup>	\$ 98,544
Interest During Construction	\$ 8,864
<b>Total Investment Cost</b>	<b>\$107,408</b>
<b>Average Annual Costs</b>	
Interest and Amortization of Initial Investment	\$ 5,107
OMRR&R	\$ 18
<b>Total Average Annual Costs</b>	<b>\$ 5,125</b>
<b>Average Annual Benefits</b>	<b>\$ 6,144</b>
<b>Net Annual Benefits</b>	<b>\$ 1,019</b>
<b>Benefit-Cost Ratio (BCR) <sup>2</sup></b>	<b>1.20</b>
<b>Benefit-Cost Ratio (at 7%) <sup>3</sup></b>	<b>0.69</b>

<sup>1</sup> \$99,004,000 Total Cost less \$460,000 Federal Relocation Assistance Expense = 98,544,000 Construction Costs

<sup>2</sup> BCR based on Cost DX certified costs at October 2010 price level.

<sup>3</sup> Per Executive Order 12893

**Cost Sharing.** Table 4 indicates the allocation of funds between the City and the Federal government.

**TABLE 4**  
**Project Cost Apportionment - October 2010 Price Level**

<b>Non-Federal Cost Share – 35%</b>	
Non-Federal Lands, Damages, Relocations <sup>1</sup>	\$23,460,000
Non-Federal Cash Contribution	\$11,191,000
<b>Total Non-Federal Cost Share</b>	<b>\$34,651,000</b>
<b>Federal Cost Share – 65%</b>	
<b>Total Federal Cost Share</b>	<b>\$64,353,000</b>
<b>Total Project Cost Estimate</b>	<b>\$99,004,000</b>

<sup>1</sup> \$23,780,000 total LERRD total less \$320,300 Incidental Federal Acquisition Costs  
= \$23,460,000 Non-Federal share for Lands, Damages, Relocations

Table 5 presents the total estimated project costs and cost sharing.

**TABLE 5**  
**Total Estimated Project Costs and Cost Sharing**  
**Cedar River, Cedar Rapids, IA, Feasibility Study**  
**(October 2010 Price Level, \$1,000s)**

Item	Federal Cost	Non-Federal Cost	Total
FRM <sup>1</sup>			
PED <sup>2</sup>	\$8,044 (65%)	\$4,331 (35%)	\$12,375
LERRD	\$320	\$23,460	\$23,780
Flood Risk Management	\$52,286	\$4,374	\$56,661
Cultural Resources	446	241	687
Construction Management	3,575	1,925	5,500
<b>FRM Subtotal</b>	<b>\$64,353</b>	<b>\$34,651</b>	<b>\$99,004</b>
Total Project	\$64,353 (65%)	\$34,651 (35%)	\$ 99,004
Associated Costs <sup>3</sup>	0	4,000	4,000
<b>Total with Associated Costs</b>	<b>\$64,353</b>	<b>\$38,651</b>	<b>\$103,004</b>

<sup>1</sup> Non-Federal Sponsor cash amount must be 5% or more in accordance with Section 103 of WRDA 1986.

<sup>2</sup> Sponsor contributes 25% during the design phase and the remaining 10% during the construction phase.

<sup>3</sup> Non-creditable relocation, HTRW cleanup, or other costs

**Project Implementation.** Subject to project authorization, funding, and regulatory approval, construction is scheduled to be complete December 2015. The Planning, Engineering and Design phase can begin once the Division once the Division Commander’s transmittal has been sent, (completed October 21, 2010), the Design Agreement has been signed by the City of Cedar Rapids as the non-Federal sponsor, and funds are available. The project will require authorization in the next WRDA, or possibly other legislation, and the appropriation of construction funds. A continuous funding stream is needed to complete this project within the anticipated time line, and this will require continuing appropriations from Congress and the City in order to fund the design phase and to fully fund the construction contract.

Once construction funds are appropriated for this project the City and the Department of the Army will enter into a Project Partnership Agreement, (PPA). After the signing of the PPA the City can begin to acquire the necessary land, easements and rights of way to construct the project. Since the project cannot be advertised for construction until all real estate interests have been acquired, obtaining all of the necessary real estate in a timely fashion is critical to achieving the project completion date.

<b>Milestone</b>	<b>Start Date</b>	<b>Finish Date</b>
Review of Public Review Draft	Aug 2010	Sep 2010
Issue Public Notice for Permit	Aug 2010	Sep 2010
Review of Policy Review Draft	Sep 2010	Oct 2010
District Commander's Submittal	Oct 2010	----
Civil Works Review Board	Nov 2010	----
State and Agency Review	Nov 2010	Dec 2010
Execute Design Agreement	Dec 2010	----
Sign the Report of the Chief of Engineers	Jan 2011	----
Chief's Report sent to the ASA (CW)	Feb 2011	----
PED Phase	Jan 2010	Aug 2012
Real Estate Acquisition	Aug 2011	Aug 2012
Construction Contract Advertising and Award	Sep 2012	Dec 2012
Project Construction	Jan 2013	Dec 2015

At the completion of construction, the entire FRM system will be turned over to the City; the City will then be fully responsible for the OMRR&R of the system. Table 5 includes the cost estimate for the Recommended Plan. As sponsor, the City would be required to obtain all appropriate permits. The contractors would be responsible for acquiring all local licenses/permits required to comply with state and municipal laws, codes and regulations.

**Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R).** Future OMRR&R practices would include operations for inspection and monitoring, levee mowing, vegetation control, outfall cleaning, maintenance of pumps, etc. Additional cost will be added by the project with respect to maintenance of six new pumps. The appropriate Operation and Maintenance manuals will be updated accordingly at the conclusion of the project design and construction period. Annual OMRR&R Costs are estimated at \$18,000, including routine maintenance like mowing and gate maintenance, and replacement of pumps with a 30-year life expectancy. The non-Federal sponsor's responsibility for maintenance of all FRM components continues indefinitely beyond the 50-year period of this study.

**Key Social and Environmental Factors.** The Other Social Effects (OSE) analysis shows the beneficial and adverse effects of a FRM alternative on the social well-being of the City and the surrounding area. With the implementation of the recommended plan there may be the appearance of unequal treatment as it relates to implementing FRM on one side of the river and leaving the other side without a FRM alternative. However, the recommended plan, when combined with the City's actions (e.g., the buyouts, etc.), provides comprehensive FRM on both sides of the river.

**Stakeholder Perspectives and Differences.** The City has expressed the desire to implement the project in accordance with the items of local cooperation that are set forth in the Recommendations chapter.

Extensive coordination with several state and Federal agencies took place during development and evaluation of the Recommended Plan and the Environmental Assessment. The following

agencies were coordinated with and in some cases have provided comments or participated in the review of this project:

- Federal Emergency Management Agency
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Iowa Department of Natural Resources
- State Historical Preservation Officer

**Environmental Compliance.** The Cedar River, Cedar Rapids Flood Risk Management Feasibility Report includes an integrated Environmental Assessment (EA), and appropriate plates and appendices. There are no significant environmental or social impacts from construction of the Recommended Plan. The Corps has responded to all resource agencies and interested party comments, and the Statement of Findings and Finding of No Significant Impact were signed on 15 October 2010. On 12 Oct 2010 the State of Iowa issued a Section 401 water quality certification for the Recommended Plan.

To avoid impacts to known and unknown significant historic properties, the Corps has executed the *Programmatic Agreement Among the United States Army Corps of Engineers Rock Island District, Iowa State Historic Preservation Officer, City of Cedar Rapids, and Advisory Council on Historic Preservation for Alternative 4C Implemented Under the Cedar River, Cedar Rapids, Iowa Flood Risk Management Feasibility Study – Linn County, Cedar Rapids, Iowa* (PA). The PA was executed October 12, 2010, in fulfillment of our responsibilities under Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation’s regulations.

The final U.S. Fish & Wildlife Service Coordination Act Report was received on May 18, 2010, and the Recommended Plan would result in no significant impacts on federally-listed species or habitats. The Findings of Compliance for Clean Water Act Section 404(b)(1) Evaluation was signed on 15 October 2010. The Clean Water Act Section 402 NPDES permits will be obtained from the Iowa Department of Natural Resources by the construction contractor before the start of construction.

**State and Agency Review.** To be completed by HQUSACE after completion of review.

**Certification of Peer and Legal Review.**

**District’s Quality Control (DQC)** assessment included PDT review and comment, including the Real Estate and Cost Estimates. Final Legal Certification was completed on 8 Oct 2008, by Rock Island District Counsel with the Feasibility Report and EA considered to be legally sufficient.

**Agency Technical Review (ATR)** of the subject document prepared by the District was managed by the FRM-PCX in SPD. The ATR was performed by a team composed of District staff of the Norfolk District in NAD, Jacksonville District in SAD, St. Paul District and St. Louis District in MVD, Chicago District in LRD, Omaha District and Walla Walla

District in NWD, Los Angeles District in SPD, and Tulsa District in SWD. Review of the document resulted in a total of 68 comments consisting of 2 comments regarding cultural resources, 6 comments regarding structural design, 32 comments regarding cost engineering, 6 plan formulation comments, 6 economic comments, 2 real estate comments, 1 hydraulics and hydrology comment and 13 environmental comments. All comments have been resolved and the ATR and cost estimate have been certified on 07 Oct and 20 Oct, respectively.

**Final Independent External Peer Review (IEPR)** of the subject document prepared by the District was managed by the FRM-PCX, in accordance with *Civil Works Review Policy*, ER 1165-2-209, dated 31 Jan 2010. The IEPR was contracted through the Army Research Office and administered by Battelle Memorial Institute, an independent consultant. Since the IEPR purpose is to “assess the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used,” the IEPR is limited to technical review, and does not involve policy review. The IEPR was conducted by four subject matter experts (i.e., IEPR Panel members) with extensive experience in economic, engineering, environmental resources, and plan formulation relevant to the project. The IEPR Panel was charged with responding to fifty specific technical questions as well as providing a broad technical evaluation of the overall project. A total of twelve IEPR Panel final comments were provided to the USACE on 28 Oct 2010. The two the Panel rated most significant regarded a) the potential for additional project costs for cultural resources mitigation and b) the economic justification of existing and future project damage estimates. Six comments rated “medium” were about economics, socio-economics, borrow areas, plan formulation and sedimentation. Four comments rated “low” addressed cost engineering contingencies, subwatershed hydrology, plan formulation and editing. All comments from this review have been addressed and incorporated into the final project documents and recommendation as appropriate.

**Policy Compliance Review.** The AFB Policy Compliance Review is documented in the Policy Guidance Memorandum dated 6 August 2010, which contains District responses and actions on all 42 comments – 8 plan formulation, 7 plan evaluation, 2 plan selection, 3 real estate, 4 cost engineering, 10 environmental, and 8 miscellaneous. All responses have been incorporated into the final report, EA, and appendices as appropriate.

The Public Review Draft Policy Compliance Review conducted to date is being documented in the Policy Guidance Memorandum dated 8 November 2010, which contains District responses and actions on all 21 comments – 3 plan formulation, 5 project management, 6 environmental, 1 engineering, 3 cost engineering, and 3 real estate. All responses have been incorporated into the final report, integrated environmental assessment and appendices as appropriate.

The final policy review findings will be documented herein when completed by HQUSACE.